

September 26, 2024

Jennie Turner, Assistant Planning Director  
County of Currituck  
Planning & Community Development  
153 Courthouse Rd.  
Currituck, NC 27929

**RE: H2OBX RV Park  
Major Site Plan**  
Parcel Identification No. 124000137L0000  
8528 Caratoke Highway, Powells Point, Currituck County, NC

Dear Ms. Turner:

On behalf of the H2OBX,LLC, Quible & Associates, P.C. hereby submit for your review the enclosed application package for H2OBX RV Park Major Site Plan Application.

The following digital documents are included and shall be considered part of this submittal package:

1. One (1) copy of the signed Major Site Plan Application and Submittal Checklist;
2. One (1) Copy of the Stormwater SW-002 Form;
3. One (1) copy of the Site Plan, including Landscaping;
4. One (1) copy of Lighting Plan;
5. One (1) copy of the Architectural Elevations;
6. One (1) copy of the Site Narrative and associated calculations;
7. One (1) copy of the centralized sewer provider's willingness to serve;
8. One (1) copy of an email from DWR with regard to the downstream WWTP;
9. One (1) copy of the H2OBX RV Resort Operational Plan;
10. One (1) copy of the DRAFT NCDEQ Stormwater Application;
11. One (1) copy of the DRAFT NCDEQ SESC Application;
12. One (1) copy of the DRAFT Fast Track Sewer System Extension Application;
13. One (1) copy of the DRAFT Application for Approval of Engineering Plans and Specifications For Water Supply Systems;
14. One (1) copy of the PCN Request filed with DWR and a copy of the Jurisdictional Determination for onsite wetlands;
15. One (1) copy of SAW-2022-00794



It is acknowledged that an invoice for \$7,500 (stormwater fee) and \$1,149 (site plan review fee based upon 7,657 sf building at \$0.15 per SF) will need to be paid prior to review. Please review the attached site plans and do not hesitate to contact me at 252.491.8147 if you have any questions, comments or requests for additional information.

Sincerely,  
WithersRavenel

A handwritten signature in blue ink, appearing to read "C. Saunders", is positioned below the typed name.

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





# Major Stormwater Plan Form SW-002

H2OBX RV Resort

OFFICIAL USE ONLY:

Permit Number: \_\_\_\_\_

Date Filed: \_\_\_\_\_

Date Approved: \_\_\_\_\_

### Contact Information

APPLICANT:

Name: H2OBX, LLC

Address: 13 Green Mountain Drive  
Cohoes, NY 12047

Telephone: 518-783-0038

E-Mail Address: kene@aquaticgroup.com

PROPERTY OWNER:

Name: H2OBX, LLC

Address: 13 Green Mountain Drive  
Cohoes, NY 12047

Telephone: 518-783-0038

E-Mail Address: kene@aquaticgroup.com

### Property Information

Physical Street Address: 8526 Caratoke Hwy

Parcel Identification Number(s): 0124000137L0000; 9837-54-9004

FEMA Flood Zone Designation: FIRM ZONE (AE 4') & ('X')

### Request

Project Description: Recreational Facility

Total land disturbance activity: 60.5 acres <sup>sf</sup> Calculated volume of BMPs: varies - see calcs <sup>sf</sup>

Maximum lot coverage: 1,696,955 <sup>sf</sup> Proposed lot coverage: 856,210 <sup>sf</sup>

TYPE OF REQUEST \*within campground designated area only \*within campground designated area only

- 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 purposes of determining compliance. All information submitted and required as part of this process shall become public record.

  
\_\_\_\_\_  
Property Owner(s)/Applicant

9/24/24  
\_\_\_\_\_  
Date



**WithersRavenel**

Our People. Your Success.



# Site Plan Narrative

## H2OBX RV Resort

Currituck County

## H2OBX, LLC

Prepared For:  
H2OBX, LLC  
13 Green Mountain Drive  
Cohoes, NY 12047  
Ken Ellis

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

WithersRavenel Project No. 24-0941

September 26, 2024

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## Project Description

The following narrative will detail the stormwater management plan for the proposed site improvements for the H2OBX RV Resort facility in Powells Point, Currituck County, NC.

The subject site is made up of a recombined parcel of approximately 96.77 acre area of land located at 8528 Caratoke Hwy. (US Hwy. 158) and is approximately 1,750 feet northwest of the Church Road and US Highway 158 intersection. H2OBX, LLC currently operates an existing waterpark within the parcel and proposes to add approximately 198 RV sites, 50 modular sites, an amenity center and a bathhouse to the rear of the parcel. Total proposed county lot coverage within the designated campground area is 856,210 sf (33% of the designated campground area).

## Access

The development is proposed to be accessed from an existing entrance on US 168, a public right-of-way. At the entrance to the development 10 ft by 70 ft. sight triangles were previously reviewed and approved with the Waterpark Major Site plan. The proposed access will provide a minimum 20' wide drive aisle into the RV Resort area. This will allow for fire apparatus to come within 150' of all portions of all structures. Proposed fire hydrant placement has been reviewed to confirm hose length can reach within 400-ft of all parts of the proposed structures.

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

## Traffic

A Traffic Impact Analysis (TIA) was previously prepared for the site in 2022, this analysis has been analyzed using 2023 and 2034 data by a third-party traffic engineer. This review and analysis confirmed that the 2022 TIA findings were still relevant. A copy of the original TIA and updated memo review based on current data has been provided to NCDOT for their records and a copy of that memo has been included within **Appendix \_** of this Narrative for reference.

## Parking

The existing waterpark parking was previously designed per the Currituck County Ordinance Section 5.1.3.E, Use with Variable Parking Demand Characteristics. An alternative parking plan was previously prepared by Quible & Associates, P.C. which demonstrated that 1,053 spaces are required for the existing waterpark. The following narrative, calculations, and supporting information will demonstrate the parameters of the proposed parking design for the RV Park, which will illustrate adequate parking for the facility.

The project proposes the addition of 198 RV campsites, 50 modular sites, an amenity center, bath house and all associated infrastructure. The RV Park will operate seven days a week from Memorial Day through mid-September. The RV Park will be an upscale campground serving tourist visiting the Outer Banks region and will also be open to Dare and Currituck County residents.

# Stormwater Management Plan Narrative

OBX Waterpark Adventure – Currituck County, NC

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In order to determine the required number of parking spaces for the waterpark, previous parking information was collected from a similar site. Data was provided from Camelback Resort located in Pennsylvania. Camelback Resort houses a 13 ride indoor waterpark, Aquatopia, and a 37 ride outdoor waterpark, Camelbeach. The hours of operation of these facilities are typically 10AM-7PM from Memorial Day to the beginning of September. These parks are also resort style and attended by patrons staying at the resort. Based on their provided data, approximately 3.8 passengers are anticipated per car. Based on a 4,000 capacity waterpark, approximately 1,053 spaces are required.

Existing onsite parking for the waterpark includes 1,138 parking spaces within the permanent parking lot. In order to access the RV Park 8 spaces within the waterpark parking lot are proposed to be removed. The total proposed parking spaces for the waterpark after removal of 8 spaces is 1,130 spaces which is still adequate to meet the 1,053 required spaces.

The number of proposed parking spaces for the site development is 357 spaces. The proposed RV Park requires 1 space per RV/modular site plus 1 space per every 10 camp sites. There are 248 proposed RV/modular sites, equaling 273 required spaces. The proposed amenity center (club or lodge) is 4,262 sq. ft. Parking requirements are calculated by club or lodge requirements at 1 space per 300 sq ft, equaling 15 spaces for the amenity center. The RV Park proposes 357 parking spaces including 2 handicap spots therefore meeting the county parking requirements.

Signage will be provided within the parking area to notify employees and visitors that the drive aisle is a provided fire lane. Security lighting will be provided at the building and a lighting plan has been provided to address the expected footcandles at the property lines.

## Utilities

The site has an existing 8" waterline stub available within the waterpark for continuation and an existing 6" stub within Ballast Rock Road. The 8" waterline will be looped throughout the proposed RV resort to provide water to proposed buildings, park models, and fire hydrants throughout. The waterlines will be modelled to confirm the proposed watermain and associated hydrants can provide a min. of 20 psi at 1,500 gpm available fire flow. The proposed Lodge is anticipated to require 1,500 gpm needed fire flow a copy of the preliminary calculations are provided in Appendix 5. A third-party fire flow test has been scheduled.

The existing WWTP that serves the Waterpark will service the RV Park. It should be noted that the WWTP is permitted for 60,000 gpd, less than 30,000 gpd actual flows are used by the waterpark. The campground design flow is 27,200 for all RV sites and the associated amenities areas. A fast track application will be submitted the NCDEQ for permitting of the gravity system to connect into the WWTP.

# Stormwater Management Plan Narrative

OBX Waterpark Adventure – Currituck County, NC

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## Buffers and Site Vegetation

A streetscape landscape buffer is required adjacent Caratoke Highway (U.S. 168) within the area designated as waterpark and this will be maintained. All site and vehicular landscaping associated with the waterpark are to remain unchanged with this project.

The proposed RV Resort requires a 50' buffer around all property lines. A 50' wide landscape buffer has been proposed at 18 ACI canopy trees per 100 LF, 20 ACI per 100 LF understory trees, and 35 shrubs per 100 LF of frontage. Additional buffers are not required.

In accordance with Chapter 5.2 of the Currituck County Unified Development Ordinance, canopy trees are provided within 60' of all parking spaces.

## 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

### Wetpond (DA-5)

Per 15A NCAC 02H.1005 (a) (3) (B) High Density Coastal Development is required to meet particular criteria. This development is proposed to have 33% of impervious coverage over the designated RV Resort project area. The proposed wet detention basin onsite is designed in accordance with NCDEQ Requirements and is designed to store, control, and treat the stormwater runoff from all surfaces generated by the one and one-half inch of rainfall. In addition to these requirements, a minimum 50' vegetative buffer from surface waters is provided.

### Collection

Runoff from the proposed vehicular area is to be collected and conveyed to the wet detention basin via vegetated swales and a stormwater conveyance network. This storm system is provided on plan Sheet 6. Runoff draining from the proposed waterpark will be collected by an underground pipe network and will discharge into the proposed forebay of the wet detention basin. Plan Sheets 6 and 7 within the high density application package show the proposed pipe network.

# Stormwater Management Plan Narrative

OBX Waterpark Adventure – Currituck County, NC

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## Treatment

The proposed system will offer several methods of treatment prior to release.

Runoff from vehicular areas will be directed to the wet detention basin via vegetated swales and culverts. The vegetated swales will provide the first level treatment for these areas and will provide filtration of small particulates and nutrients prior to entering the wet detention basin.

Riprap will be provided at the inlet to the pond from the stormwater conveyance connections. Stormwater entering the basin will be deenergized by the riprap as to reduce inflow velocities to the basin. Larger debris and pollutants will settle on the riprap aprons as the stormwater enters the basin.

The primary treatment of runoff will be provided within the wet detention basin. Several modes of treatment are available in the wet detention basin. Runoff first entering the basin will lose velocity and large particulates and sediment will settle out primarily in the forebay. The vegetated side slopes and vegetated shelf will provide filtration of runoff and nutrient uptake through natural biological processes.

## Storage

The wet basin temporary storage is sized to accommodate a storage volume in excess of the volume of runoff produced by the 1.5 inch rainfall event over the drainage area. The storage required to completely capture the first 1.5 inch of rainfall is 71,300 cf. The proposed wet detention basin will have a temporary storage capacity of 256,724 cf above the pond's drawdown orifice located at 2.3' elevation.

The season high water table (SWHT) is at an elevation of 2.3'.

For NCDEQ calculations, the permanent pool and surface areas referenced in the application documents and attached calculations are measured at the orifice drawdown elevation of 2.3'. Utilizing permanent pool average depth equations from section 10.3.4 of the NCDEQ Stormwater BMP Manual, the average depth was calculated to be 3.7 ft. using Option 1, and 4.1 ft. using Option 2 (see NCDEQ Stormwater Calculations in **Appendix 4**). When utilizing SA/DA Table 10-4 of the NCDEQ Stormwater BMP Manual, the more conservative average depth using Option 1 and a percent impervious cover rounded to 50%, were applied to obtain a Surface Area to Drainage Area Ratio of 5.0 (see the attached Wet Detention Basin Supplement). This is the SA/DA ratio to achieve 90% TSS Pollutant Removal Efficiency in the Coastal Region. Using this SA/DA ratio, the area required for the permanent pool is 74,235 sq. ft., while the area provided for the permanent pool is 86,067 sq. ft. This basin and its previous design will remain in place and be expanded to 298,015 cf of storage to treat the additional storage requirement of 33,700 cf for the RV Resort area (DA-5).

# Stormwater Management Plan Narrative

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The basin's 10 foot wide, 10:1 vegetated shelf is specified to be constructed between the elevations of 1.8' and 2.8'; the lower half of the shelf will be approximately at the season high water table.

## Disposal

The wet detention basin's primary mode of disposal is through an overflow orifice located at the end of the detention basin. The overflow orifice will be a 5" diameter orifice and is calculated to completely drawdown the required storage volume in 4.77 days. Regular inspection of the overflow orifice for evidence of clogging, leakage, debris accumulations, etc. is recommended. Stormwater overflows will be conveyed to an existing ditch located along the western property line. As the Wet Detention Basin is designed to 90% TSS with additional storage, a vegetated filter strip is not provided.

For disposal during the 2-yr storm and greater, a principal spillway has been designed to handle the proposed flows. The structure will release flows starting at elevation 5' within the detention basin through an 18" RCP culvert. This culvert will tie into the existing ditch located adjacent to the proposed wet detention basin. An emergency spillway has been provided to release the 10-yr storm and greater. A weir will be provided at elevation 6' and will be graded to tie into the existing ditch. Rip-rap protection will be provided at both the emergency spillway and downstream of the primary spillway.

Calculations for the proposed wet detention basin have been provided in **Appendix 4**.

## Wet Detention Basin Maintenance

The proposed wet detention basin on-site requires regular maintenance. Initial inspections should take place within the first six months following construction, these should include inspecting the basin at least twice after storm events that exceed a ½-inch rainfall. After the initial inspection period, annual inspections should take place. These inspections should be used to evaluate the condition and performance of the pond, including sediment within the forebay, growth of wetland plants, trees, and shrubs, inspection of inlets and outfall channels. Based on inspection results, specific maintenance tasks will be triggered. An example maintenance inspection checklist has been provided in **Appendix F**.

## Infiltration Basin (DA-6)

This infiltration basin was previously permitted during the construction of the WWTP. The project proposes to expand this basin to allow for additional storage due to the additional impervious surface proposed within this area.

## Treatment

The proposed system will offer several methods of treatment prior to release.

Runoff from vehicular areas will be directed to the infiltration basin via swales and stormwater



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pipng. The stormwater structures will be designed to have sumps to settle out sediment prior to discharge into the infiltration basin.

The primary treatment of runoff will be provided within the infiltration basins. The infiltration basin bottom and side slopes will be grassed according to general seeding specifications. The runoff will undergo filtration of fine particulates and pollutants by the vegetation within the basin. The filtration by vegetation is considered the primary method of treatment. A secondary method of treatment is also available when the stormwater runoff infiltrates into the subsurface. The soil particles between the basin bottom and the season high water table (SHWT) will offer additional filtration and/or absorption of particulates and pollutants prior to reaching the water table. The season high water table (SWHT) is at an elevation of 3.6'. Separation of 2' between the seasonal high-water table and the bottom of the basin has been provided.

## Storage

The proposed infiltration basin has been sized to allow for the State required 1.5 inch and the County required routing. The storage required to completely capture the first 1.5 inch of rainfall is 6,200 cf. The proposed infiltration basin will have a temporary storage capacity of 16,539 cf. The temporary storage capacity has been calculated between the bottom of the basin 6.7' and the overflow spillway invert at 7.5'.

## Infiltration Basin (DA-7)

This infiltration basin is located west of the existing WWTP spray fields. A new permit will be required from NCDEQ for this basin.

## Treatment

The proposed system will offer several methods of treatment prior to release.

Runoff from vehicular areas will be directed to the infiltration basin via swales and stormwater piping. The stormwater structures will be designed to have sumps to settle out sediment prior to discharge into the infiltration basin.

The primary treatment of runoff will be provided within the infiltration basins. The infiltration basin bottom and side slopes will be grassed according to general seeding specifications. The runoff will undergo filtration of fine particulates and pollutants by the vegetation within the basin. The filtration by vegetation is considered the primary method of treatment. A secondary method of treatment is also available when the stormwater runoff infiltrates into the subsurface. The soil particles between the basin bottom and the season high water table (SHWT) will offer additional filtration and/or absorption of particulates and pollutants prior to reaching the water table. The season high water table (SWHT) is at an elevation of 3.6'. Separation of is just below 2' between the seasonal high-water table and the bottom of the basin has been provided. A soils analysis has been provided to justify the separation less than 2'.

# Stormwater Management Plan Narrative

OBX Waterpark Adventure – Currituck County, NC

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## Storage

The proposed infiltration basin has been sized to allow for the State required 1.5 inch and the County required routing. The storage required to completely capture the first 1.5 inch of rainfall is 5,300 cf. The proposed infiltration basin will have a temporary storage capacity of 17,298 cf. The temporary storage capacity has been calculated between the bottom of the basin 5.5' and the overflow spillway invert at 6.5'.

## Infiltration Basin (DA-8)

This infiltration basin is located west of the existing WWTP spray fields. A new permit will be required from NCDEQ for this basin.

### Treatment

The proposed system will offer several methods of treatment prior to release.

Runoff from vehicular areas will be directed to the infiltration basin via swales and stormwater piping. The stormwater structures will be designed to have sumps to settle out sediment prior to discharge into the infiltration basin.

The primary treatment of runoff will be provided within the infiltration basins. The infiltration basin bottom and side slopes will be grassed according to general seeding specifications. The runoff will undergo filtration of fine particulates and pollutants by the vegetation within the basin. The filtration by vegetation is considered the primary method of treatment. A secondary method of treatment is also available when the stormwater runoff infiltrates into the subsurface. The soil particles between the basin bottom and the season high water table (SHWT) will offer additional filtration and/or absorption of particulates and pollutants prior to reaching the water table. The season high water table (SWHT) is at an elevation of 3.6'. Separation of is just below 2' between the seasonal high-water table and the bottom of the basin has been provided. A soils analysis has been provided to justify the separation less than 2'.

### Storage

The proposed infiltration basin has been sized to allow for the State required 1.5 inch and the County required routing. The storage required to completely capture the first 1.5 inch of rainfall is 50,400 cf. The proposed infiltration basin will have a temporary storage capacity of 117,403 cf. The temporary storage capacity has been calculated between the bottom of the basin 5.6' and the overflow spillway invert at 7.5'.

## Soils

The USDA NRCS Soil Survey lists the soil in the vicinity of the stormwater detention basin as described below:

CnA—Conetoe loamy sand

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This soil typically has 0 to 3 percent slopes. Conetoe loamy sand typically has a very low runoff rate and is typically well drained. This soil is categorized in Hydrologic Soil Group: A

Ds—Dragston loamy fine sand

This soil typically has 0 to 2 percent slope. Dragston loamy fine sand typically has a very low runoff class and is somewhat poorly drained. This soil is categorized in Hydrologic Soil Group: A/D.

MU – Munden loamy sand

This soil typically has 0 to 2 percent slope. Munden loamy sand typically has a very low runoff class and is moderately well drained. This soil is categorized in Hydrologic Soil Group: B.

Quible and Associates conducted a soil boring test in the vicinity of the wet detention basin back during the original permitting process. The soils observed were consistent with the NRCS soil description. A recent soil boring was performed at the proposed infiltration basin. The results of these tests are available in **Appendix 3**.

## Calculations

A copy of the Drainage Calculations for State and County requirements are provided in **Appendix 4** 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.

# Stormwater Management Plan Narrative

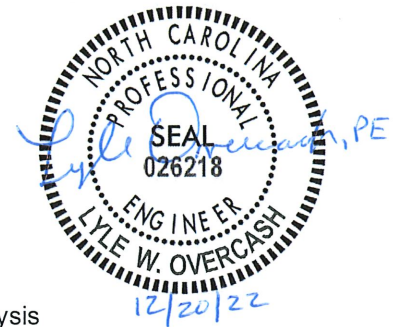
OBX Waterpark Adventure – Currituck County, NC

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## Appendix 1: Traffic Impact Analysis

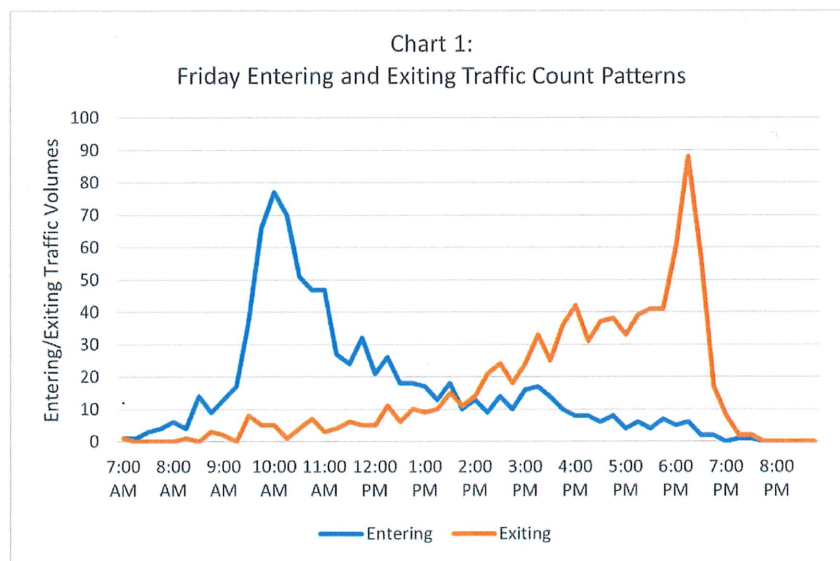
**MEMORANDUM**

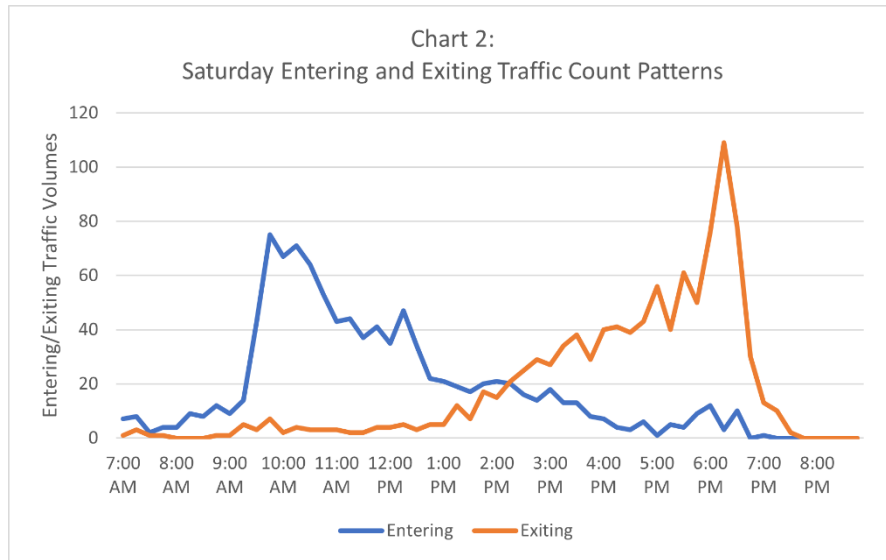
To: Warren D. Eadus, P.G., Quible & Associates, P.C.  
 From: Lyle Overcash, P.E.  
 Kimley-Horn and Associates, Inc.  
 Date: December 20, 2022  
 Subject: H2OBX Campground Traffic Capacity & Signal Warrant Analysis



Kimley-Horn has performed a traffic capacity and signal warrant analysis for the intersection of Caratoke Highway (US 158) at H2OBX Waterpark Driveway. The proposed H2OBX campground development is expected to be located along the H2OBX Waterpark Driveway and consist of approximately 214 RV campsites, 66 cabins, and 25 tent sites. This traffic analysis analyzes the existing and build traffic volumes, upon completion of the proposed H2OBX campground development.

Fourteen-hour (7 AM to 9 PM) turning movement counts were performed at this intersection on both Friday, August 5 and Saturday, August 6, 2022. Refer to the attachments for these traffic counts. It was observed that the traffic along Caratoke Highway (US 158) on a weekday is split directionally, as northbound traffic is heavier during the morning peak hours and the southbound traffic is heavier during the evening peak hours. Saturday volumes during summer months along US 158 are considerably heavier than during the week. **Chart 1** and **Chart 2** show the existing traffic patterns of the H2OBX waterpark traffic during Friday and Saturday, respectively. Based on the charts, the entering peak hour begins around 10 AM and the exiting peak begins around 6 PM.





Hourly site traffic for the proposed H2OBX campground development was determined using traffic count data collected from two similar sites: *North River Campground* and *Outer Banks West – Currituck Sound*. The traffic count data for these sites are included in the attachments. Heavy vehicle percentages for the proposed development were calculated using the traffic data collected from the two similar sites. Based on this data, it was assumed that site traffic for the proposed H2OBX campground development would consist of approximately 20 percent of heavy vehicles. This percentage was used to calculate the heavy vehicle percentage for the build traffic volumes.

Hourly entering and exiting rates, based on the total number of RV campsites and cabins, were generated for these sites. These rates were used to find the entering and exiting traffic volumes and hourly site trip distribution for the proposed development, which are both included in the attachments. The existing traffic volumes were grown to the assumed build-out year of 2024 with a 3% annual growth rate to obtain no-build traffic volumes. These calculated hourly site traffic volumes were then added to the no-build traffic volumes to determine the build traffic volumes. Refer to **Table 1**, below, for the trip generation potential for the proposed development. As shown in Table 1, the daily traffic to the campground is expected to be in the 400 vehicles per day range with the peak hour traffic ranging from 25 up to 50 vehicles per hour.

| Land Use           | Daily |     |       | AM Peak Hour |     |       | PM Peak Hour |     |       |
|--------------------|-------|-----|-------|--------------|-----|-------|--------------|-----|-------|
|                    | In    | Out | Total | In           | Out | Total | In           | Out | Total |
| RV Site (Friday)   | 193   | 237 | 430   | 9            | 16  | 26    | 23           | 26  | 49    |
| RV Site (Saturday) | 188   | 196 | 384   | 25           | 13  | 38    | 8            | 15  | 23    |

Synchro and SimTraffic software were used to observe vehicle queuing at the intersection of Caratoke Highway (US 158) at H2OBX Waterpark Driveway during the entering and exiting peak hours. It should be noted that this analysis was performed to verify observations made from traffic count videos collected at this intersection. SimTraffic shows heavy queues at the minor street approach of the intersection (H2OBX Waterpark Driveway) during the exiting peak hours under existing and future traffic conditions. Moderate to heavy queues for the northbound left-turn movement were observed during the entering peak hour under existing and future traffic conditions.

Utilizing the existing and build volumes, a traffic signal warrant analysis was performed based on the criteria contained in the Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition published by the Federal Highway Administration (FHWA) for the Caratoke Highway (US 158) at H2OBX Waterpark Driveway. According to the MUTCD, the investigation of need for a traffic control signal shall include analysis of the applicable factors contained in the traffic signal warrants as well as other factors related to the operation and safety of the study intersection. While a traffic control signal should not be installed unless one or more of the warrants are met, the satisfaction of a traffic signal warrant or warrants should not in itself require the installation of a traffic control signal.

The MUTCD establishes five volume related warrants that were evaluated in this analysis. Warrants 1, 2, and 3 are vehicular volume warrants and are based on mainline traffic volumes, side street traffic volumes, and the number of travel lanes:

- Warrant 1A – Eight Hour – Minimum Vehicular Volume
- Warrant 1B – Eight Hour – Interruption of Continuous Traffic
- Warrant 1C – Eight Hour – Combination
- Warrant 2 – Four Hour Vehicular Volume
- Warrant 3 – Peak Hour

In addition to the volume warrants, MUTCD Warrant 7, Crash Experience, is typically also evaluated. The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal. Crash data reports were obtained for the five-year period from October 2017 through September 2022 at Caratoke Highway (US 158) at H2OBX Waterpark Driveway to determine the existing safety conditions of this intersection. Crash records indicate there were zero (0) reported crashes at this intersection. See attached for the crash data report.

The results of the traffic signal warrant analysis under existing and build traffic conditions at the intersection of Caratoke Highway (US 158) at H2OBX Waterpark Driveway for Friday and Saturday are shown below in **Table 2** and **Table 3**, respectively. The posted speed limit along Caratoke Highway (US 158) is 45 mph, so volume reduction factors (30% volume reduction) were applied for this analysis. In addition, due to the delays experienced by right-turning vehicles as indicated in the Synchro/SimTraffic analysis and the traffic count videos, the right-turn volume was included in the signal warrant analysis.



| <b>Table 2 - Friday<br/>Traffic Signal Warrants Summary</b>  |                      |                     |                      |                     |
|--|----------------------|---------------------|----------------------|---------------------|
| <b>Caratoke Highway (US 158) at H2OBX Waterpark Driveway</b> |                      |                     |                      |                     |
| Warrant  | Existing (2022)      |                     | Build-out (2024)     |                     |
|  | Hours Met / Required | Criteria Satisfied? | Hours Met / Required | Criteria Satisfied? |
| 1A   | 4 / 8                | NO                  | 4 / 8                | NO                  |
| 1B   | 8 / 8                | YES                 | 8 / 8                | YES                 |
| 1C   | 2 / 8                | NO                  | 4 / 8                | NO                  |
| 2  | 6 / 4                | YES                 | 8 / 4                | YES                 |
| 3  | 4 / 1                | YES                 | 6 / 1                | YES                 |

| <b>Table 3 - Saturday<br/>Traffic Signal Warrants Summary</b> |                      |                     |                      |                     |
|---|----------------------|---------------------|----------------------|---------------------|
| <b>Caratoke Highway (US 158) at H2OBX Waterpark Driveway</b>  |                      |                     |                      |                     |
| Warrant   | Existing (2022)      |                     | Build-out (2024)     |                     |
|   | Hours Met / Required | Criteria Satisfied? | Hours Met / Required | Criteria Satisfied? |
| 1A  | 3 / 8                | NO                  | 4 / 8                | NO                  |
| 1B  | 7 / 8                | NO                  | 8 / 8                | YES                 |
| 1C  | 3 / 8                | NO                  | 4 / 8                | NO                  |
| 2   | 6 / 4                | YES                 | 7 / 4                | YES                 |
| 3   | 4 / 1                | YES                 | 6 / 1                | YES                 |

This intersection currently meets and is anticipated to meet peak, four-hour, and eight-hour MUTCD vehicular volume warrants. The traffic counts, signal warrant spreadsheets, and crash data reports are attached for reference.

**Summary**

The H2OBX Waterpark is a seasonal destination along US 158 in Powells Point. It is typically open 4-5 months out of the year. The proposed H2OBX Campground is anticipated to be open 10-11 months out of the year and utilize the same driveway along US 158. Based on this analysis, the intersection of Caratoke Highway (US 158) at H2OBX Waterpark Driveway currently meets signal warrants when the WaterPark is open, both during the week and the weekends. However, the intersection has not experienced any traffic crashes over the last five (5) years.

When the Waterpark is not operating the intersection will not meet signal warrants with just the Campground traffic. However, the Campground traffic is expected to be composed of 15-25% heavy vehicles, which would benefit from a traffic signal to access US 158. US 158 itself experiences extremely heavy traffic during the summer months and increasingly is experiencing higher daily



volumes as more people move to the Outer Banks to make it a year-around home. The Campground would also benefit from an additional point of ingress/egress to provide an alternative during peak times at the Waterpark, but also during emergency situations at either the Campground or the Waterpark. The Campground property has the ability to access Ballast Rock Road to the north. This would give the Campground an additional point of access, however it is not anticipated to divert a significant portion of the Waterpark traffic. This connection should be pursued during the development of the Campground site. Any signalization of Caratoke Highway (US 158) at H2OBX Waterpark Driveway would require the approval of NCDOT, as NCDOT would maintain the signal as well.

Feel free to contact me at (919) 678-4131 or [lyle.overcash@kimley-horn.com](mailto:lyle.overcash@kimley-horn.com) if you have any questions.

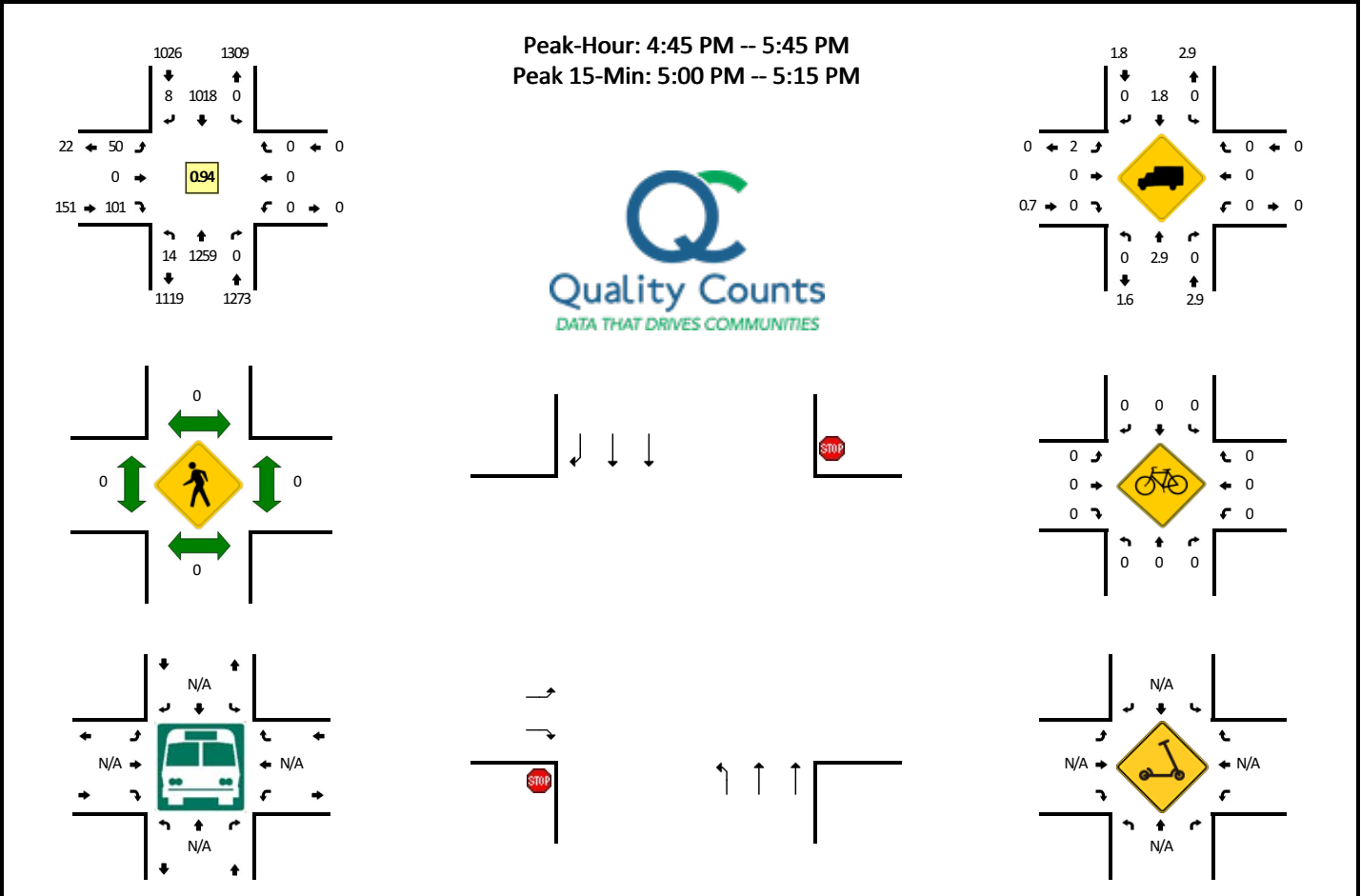
Attachments: Traffic Counts, H2OBX Campground Hourly Distribution Percentages and Entering/Exiting Volumes, Crash Data Report, Signal Warrant Spreadsheets

## **Attachments**

# Traffic Counts

**LOCATION:** Caratoke Hwy (US 158) -- H2OBX Waterpark  
**CITY/STATE:** Currituck, NC

**QC JOB #:** 15890809  
**DATE:** Fri, Aug 5 2022



| 15-Min Count Period Beginning At | Caratoke Hwy (US 158) (Northbound) |      |       |   | Caratoke Hwy (US 158) (Southbound) |      |       |   | H2OBX Waterpark (Eastbound) |      |       |   | H2OBX Waterpark (Westbound) |      |       |   | Total | Hourly Totals |
|----------------------------------|------------------------------------|------|-------|---|------------------------------------|------|-------|---|-----------------------------|------|-------|---|-----------------------------|------|-------|---|-------|---------------|
|                                  | Left                               | Thru | Right | U | Left                               | Thru | Right | U | Left                        | Thru | Right | U | Left                        | Thru | Right | U |       |               |
| 7:00 AM                          | 1                                  | 131  | 0     | 1 | 0                                  | 181  | 0     | 0 | 0                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 315   |               |
| 7:15 AM                          | 0                                  | 147  | 0     | 0 | 0                                  | 228  | 1     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 376   |               |
| 7:30 AM                          | 0                                  | 181  | 0     | 0 | 0                                  | 236  | 3     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 420   |               |
| 7:45 AM                          | 1                                  | 183  | 0     | 0 | 0                                  | 238  | 3     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 425   | 1536          |
| 8:00 AM                          | 2                                  | 192  | 0     | 0 | 0                                  | 216  | 4     | 1 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 415   | 1636          |
| 8:15 AM                          | 1                                  | 241  | 0     | 0 | 0                                  | 242  | 3     | 0 | 0                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 488   | 1748          |
| 8:30 AM                          | 2                                  | 202  | 0     | 0 | 0                                  | 254  | 12    | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 470   | 1798          |
| 8:45 AM                          | 1                                  | 252  | 0     | 0 | 0                                  | 220  | 8     | 0 | 1                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 484   | 1857          |
| 9:00 AM                          | 3                                  | 239  | 0     | 0 | 0                                  | 230  | 10    | 0 | 1                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 484   | 1926          |
| 9:15 AM                          | 4                                  | 243  | 0     | 0 | 0                                  | 219  | 13    | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 479   | 1917          |
| 9:30 AM                          | 12                                 | 296  | 0     | 0 | 0                                  | 207  | 25    | 0 | 4                           | 0    | 4     | 0 | 0                           | 0    | 0     | 0 | 548   | 1995          |
| 9:45 AM                          | 41                                 | 272  | 0     | 0 | 0                                  | 224  | 25    | 0 | 4                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 567   | 2078          |
| 10:00 AM                         | 49                                 | 316  | 0     | 0 | 0                                  | 202  | 28    | 0 | 0                           | 0    | 5     | 0 | 0                           | 0    | 0     | 0 | 600   | 2194          |
| 10:15 AM                         | 38                                 | 331  | 0     | 0 | 0                                  | 203  | 32    | 0 | 0                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 605   | 2320          |
| 10:30 AM                         | 27                                 | 311  | 0     | 0 | 0                                  | 227  | 24    | 0 | 0                           | 0    | 4     | 0 | 0                           | 0    | 0     | 0 | 593   | 2365          |
| 10:45 AM                         | 32                                 | 288  | 0     | 0 | 0                                  | 222  | 15    | 0 | 4                           | 0    | 3     | 0 | 0                           | 0    | 0     | 0 | 564   | 2362          |
| 11:00 AM                         | 25                                 | 278  | 0     | 0 | 0                                  | 206  | 22    | 0 | 0                           | 0    | 3     | 0 | 0                           | 0    | 0     | 0 | 534   | 2296          |
| 11:15 AM                         | 13                                 | 262  | 0     | 0 | 0                                  | 279  | 14    | 0 | 3                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 572   | 2263          |
| 11:30 AM                         | 12                                 | 299  | 0     | 0 | 0                                  | 234  | 12    | 0 | 1                           | 0    | 5     | 0 | 0                           | 0    | 0     | 0 | 563   | 2233          |
| 11:45 AM                         | 18                                 | 289  | 0     | 0 | 0                                  | 216  | 14    | 0 | 2                           | 0    | 3     | 0 | 0                           | 0    | 0     | 0 | 542   | 2211          |
| 12:00 PM                         | 9                                  | 238  | 0     | 1 | 0                                  | 233  | 12    | 0 | 3                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 498   | 2175          |
| 12:15 PM                         | 13                                 | 276  | 0     | 0 | 0                                  | 247  | 13    | 0 | 1                           | 0    | 10    | 0 | 0                           | 0    | 0     | 0 | 560   | 2163          |
| 12:30 PM                         | 7                                  | 261  | 0     | 0 | 0                                  | 243  | 11    | 0 | 0                           | 0    | 6     | 0 | 0                           | 0    | 0     | 0 | 528   | 2128          |
| 12:45 PM                         | 7                                  | 251  | 0     | 0 | 0                                  | 237  | 11    | 0 | 4                           | 0    | 6     | 0 | 0                           | 0    | 0     | 0 | 516   | 2102          |
| 1:00 PM                          | 10                                 | 276  | 0     | 0 | 0                                  | 233  | 7     | 0 | 4                           | 0    | 5     | 0 | 0                           | 0    | 0     | 0 | 535   | 2139          |
| 1:15 PM                          | 11                                 | 247  | 0     | 0 | 0                                  | 255  | 2     | 0 | 5                           | 0    | 5     | 0 | 0                           | 0    | 0     | 0 | 525   | 2104          |
| 1:30 PM                          | 13                                 | 272  | 0     | 0 | 0                                  | 239  | 5     | 0 | 3                           | 0    | 12    | 0 | 0                           | 0    | 0     | 0 | 544   | 2120          |
| 1:45 PM                          | 5                                  | 273  | 0     | 0 | 0                                  | 254  | 5     | 0 | 3                           | 0    | 8     | 0 | 0                           | 0    | 0     | 0 | 548   | 2152          |
| 2:00 PM                          | 7                                  | 237  | 0     | 0 | 0                                  | 295  | 6     | 0 | 10                          | 0    | 4     | 0 | 0                           | 0    | 0     | 0 | 559   | 2176          |
| 2:15 PM                          | 6                                  | 287  | 0     | 0 | 0                                  | 311  | 3     | 0 | 7                           | 0    | 14    | 0 | 0                           | 0    | 0     | 0 | 628   | 2279          |
| 2:30 PM                          | 10                                 | 219  | 0     | 0 | 0                                  | 290  | 4     | 0 | 15                          | 0    | 9     | 0 | 0                           | 0    | 0     | 0 | 547   | 2282          |
| 2:45 PM                          | 8                                  | 243  | 0     | 0 | 0                                  | 262  | 2     | 0 | 9                           | 0    | 9     | 0 | 0                           | 0    | 0     | 0 | 533   | 2267          |
| 3:00 PM                          | 8                                  | 248  | 0     | 0 | 0                                  | 268  | 8     | 0 | 11                          | 0    | 13    | 0 | 0                           | 0    | 0     | 0 | 556   | 2264          |
| 3:15 PM                          | 10                                 | 265  | 0     | 0 | 0                                  | 280  | 7     | 0 | 11                          | 0    | 22    | 0 | 0                           | 0    | 0     | 0 | 595   | 2231          |
| 3:30 PM                          | 9                                  | 236  | 0     | 0 | 0                                  | 286  | 5     | 0 | 8                           | 0    | 17    | 0 | 0                           | 0    | 0     | 0 | 561   | 2245          |
| 3:45 PM                          | 5                                  | 241  | 0     | 0 | 0                                  | 261  | 5     | 0 | 14                          | 0    | 22    | 0 | 0                           | 0    | 0     | 0 | 548   | 2260          |
| 4:00 PM                          | 4                                  | 306  | 0     | 0 | 0                                  | 257  | 4     | 0 | 21                          | 0    | 21    | 0 | 0                           | 0    | 0     | 0 | 613   | 2317          |
| 4:15 PM                          | 5                                  | 307  | 0     | 0 | 0                                  | 273  | 3     | 0 | 9                           | 0    | 22    | 0 | 0                           | 0    | 0     | 0 | 619   | 2341          |
| 4:30 PM                          | 4                                  | 288  | 0     | 0 | 0                                  | 278  | 2     | 0 | 13                          | 0    | 24    | 0 | 0                           | 0    | 0     | 0 | 609   | 2389          |

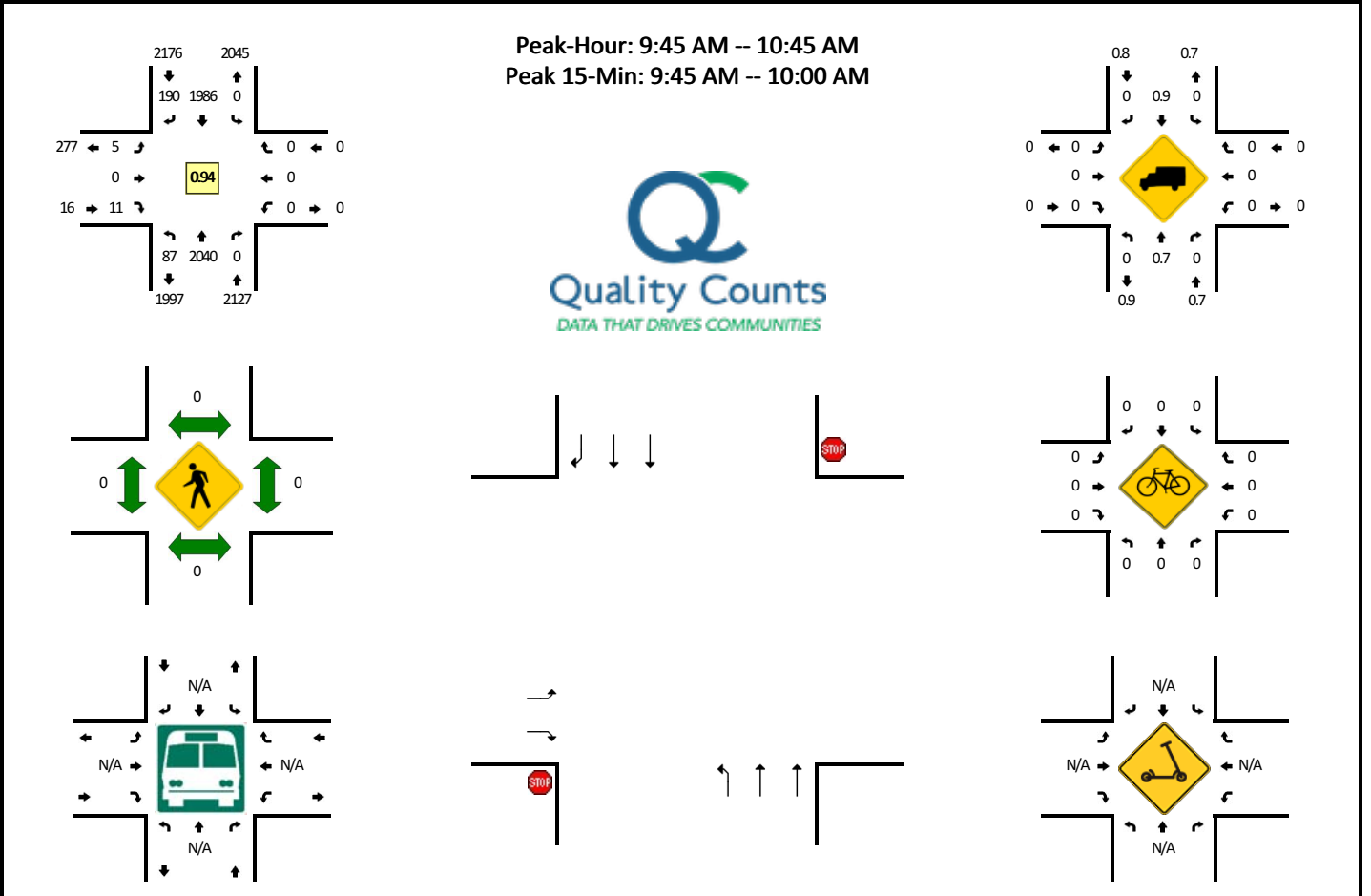
| 15-Min Count Period Beginning At | Caratoke Hwy (US 158) (Northbound) |      |       |   | Caratoke Hwy (US 158) (Southbound) |      |       |   | H2OBX Waterpark (Eastbound) |      |       |   | H2OBX Waterpark (Westbound) |      |       |   | Total | Hourly Totals |
|----------------------------------|------------------------------------|------|-------|---|------------------------------------|------|-------|---|-----------------------------|------|-------|---|-----------------------------|------|-------|---|-------|---------------|
|                                  | Left                               | Thru | Right | U | Left                               | Thru | Right | U | Left                        | Thru | Right | U | Left                        | Thru | Right | U |       |               |
| 4:45 PM                          | 6                                  | 272  | 0     | 0 | 0                                  | 232  | 2     | 0 | 16                          | 0    | 22    | 0 | 0                           | 0    | 0     | 0 | 550   | 2391          |
| 5:00 PM                          | 2                                  | 334  | 0     | 0 | 0                                  | 284  | 2     | 0 | 6                           | 0    | 27    | 0 | 0                           | 0    | 0     | 0 | 655   | 2433          |
| 5:15 PM                          | 4                                  | 329  | 0     | 0 | 0                                  | 261  | 2     | 0 | 14                          | 0    | 25    | 0 | 0                           | 0    | 0     | 0 | 635   | 2449          |
| 5:30 PM                          | 2                                  | 324  | 0     | 0 | 0                                  | 241  | 2     | 0 | 14                          | 0    | 27    | 0 | 0                           | 0    | 0     | 0 | 610   | 2450          |
| 5:45 PM                          | 4                                  | 272  | 0     | 0 | 0                                  | 227  | 3     | 0 | 16                          | 0    | 25    | 0 | 0                           | 0    | 0     | 0 | 547   | 2447          |
| 6:00 PM                          | 3                                  | 238  | 0     | 0 | 0                                  | 210  | 2     | 0 | 21                          | 0    | 39    | 0 | 0                           | 0    | 0     | 0 | 513   | 2305          |
| 6:15 PM                          | 2                                  | 225  | 0     | 0 | 0                                  | 209  | 4     | 0 | 26                          | 0    | 62    | 0 | 0                           | 0    | 0     | 0 | 528   | 2198          |
| 6:30 PM                          | 1                                  | 253  | 0     | 0 | 0                                  | 203  | 1     | 0 | 37                          | 0    | 20    | 0 | 0                           | 0    | 0     | 0 | 515   | 2103          |
| 6:45 PM                          | 1                                  | 200  | 0     | 0 | 0                                  | 197  | 1     | 0 | 13                          | 0    | 4     | 0 | 0                           | 0    | 0     | 0 | 416   | 1972          |
| 7:00 PM                          | 0                                  | 199  | 0     | 0 | 0                                  | 203  | 0     | 0 | 4                           | 0    | 4     | 0 | 0                           | 0    | 0     | 0 | 410   | 1869          |
| 7:15 PM                          | 0                                  | 161  | 0     | 0 | 0                                  | 206  | 1     | 0 | 1                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 370   | 1711          |
| 7:30 PM                          | 0                                  | 165  | 0     | 0 | 0                                  | 146  | 1     | 0 | 1                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 314   | 1510          |
| 7:45 PM                          | 0                                  | 145  | 0     | 0 | 0                                  | 152  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 297   | 1391          |
| 8:00 PM                          | 0                                  | 138  | 0     | 0 | 0                                  | 146  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 284   | 1265          |
| 8:15 PM                          | 0                                  | 142  | 0     | 0 | 0                                  | 157  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 299   | 1194          |
| 8:30 PM                          | 0                                  | 122  | 0     | 0 | 0                                  | 129  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 251   | 1131          |
| 8:45 PM                          | 0                                  | 113  | 0     | 0 | 0                                  | 109  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 222   | 1056          |
| Peak 15-Min Flowrates            | Northbound                         |      |       |   | Southbound                         |      |       |   | Eastbound                   |      |       |   | Westbound                   |      |       |   | Total |               |
|                                  | Left                               | Thru | Right | U | Left                               | Thru | Right | U | Left                        | Thru | Right | U | Left                        | Thru | Right | U |       |               |
| All Vehicles                     | 8                                  | 1336 | 0     | 0 | 0                                  | 1136 | 8     | 0 | 24                          | 0    | 108   | 0 | 0                           | 0    | 0     | 0 | 2620  |               |
| Heavy Trucks                     | 0                                  | 44   | 0     | 0 | 0                                  | 4    | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 48    |               |
| Buses                            |                                    |      |       |   |                                    |      |       |   |                             |      |       |   |                             |      |       |   |       |               |
| Pedestrians                      |                                    | 0    |       |   |                                    | 0    |       |   |                             | 0    |       |   |                             | 0    |       |   | 0     |               |
| Bicycles                         | 0                                  | 0    | 0     |   | 0                                  | 0    | 0     |   | 0                           | 0    | 0     |   | 0                           | 0    | 0     |   | 0     |               |
| Scoters                          |                                    |      |       |   |                                    |      |       |   |                             |      |       |   |                             |      |       |   |       |               |
| <i>Comments:</i>                 |                                    |      |       |   |                                    |      |       |   |                             |      |       |   |                             |      |       |   |       |               |

Report generated on 8/12/2022 7:34 AM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

**LOCATION:** Caratoke Hwy (US 158) -- H2OBX Waterpark  
**CITY/STATE:** Currituck, NC

**QC JOB #:** 15890810  
**DATE:** Sat, Aug 6 2022



| 15-Min Count Period Beginning At | Caratoke Hwy (US 158) (Northbound) |      |       |   | Caratoke Hwy (US 158) (Southbound) |      |       |   | H2OBX Waterpark (Eastbound) |      |       |   | H2OBX Waterpark (Westbound) |      |       |   | Total | Hourly Totals |
|----------------------------------|------------------------------------|------|-------|---|------------------------------------|------|-------|---|-----------------------------|------|-------|---|-----------------------------|------|-------|---|-------|---------------|
|                                  | Left                               | Thru | Right | U | Left                               | Thru | Right | U | Left                        | Thru | Right | U | Left                        | Thru | Right | U |       |               |
| 7:00 AM                          | 0                                  | 519  | 0     | 0 | 0                                  | 222  | 7     | 0 | 1                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 749   |               |
| 7:15 AM                          | 2                                  | 555  | 0     | 0 | 0                                  | 282  | 6     | 0 | 2                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 848   |               |
| 7:30 AM                          | 0                                  | 548  | 0     | 0 | 0                                  | 329  | 2     | 0 | 1                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 880   |               |
| 7:45 AM                          | 0                                  | 556  | 0     | 0 | 0                                  | 316  | 4     | 0 | 1                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 877   | 3354          |
| 8:00 AM                          | 1                                  | 597  | 0     | 0 | 0                                  | 354  | 3     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 955   | 3560          |
| 8:15 AM                          | 1                                  | 525  | 0     | 0 | 0                                  | 353  | 8     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 887   | 3599          |
| 8:30 AM                          | 1                                  | 552  | 0     | 0 | 0                                  | 370  | 7     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 930   | 3649          |
| 8:45 AM                          | 3                                  | 530  | 0     | 0 | 0                                  | 411  | 9     | 0 | 1                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 954   | 3726          |
| 9:00 AM                          | 0                                  | 557  | 0     | 0 | 0                                  | 418  | 9     | 0 | 0                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 985   | 3756          |
| 9:15 AM                          | 3                                  | 563  | 0     | 0 | 0                                  | 456  | 11    | 0 | 4                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 1038  | 3907          |
| 9:30 AM                          | 8                                  | 531  | 0     | 0 | 0                                  | 438  | 35    | 0 | 2                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 1015  | 3992          |
| 9:45 AM                          | 20                                 | 530  | 0     | 0 | 0                                  | 539  | 55    | 0 | 2                           | 0    | 5     | 0 | 0                           | 0    | 0     | 0 | 1151  | 4189          |
| 10:00 AM                         | 20                                 | 507  | 0     | 0 | 0                                  | 494  | 47    | 0 | 0                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 1070  | 4274          |
| 10:15 AM                         | 28                                 | 518  | 0     | 0 | 0                                  | 462  | 43    | 0 | 3                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 1055  | 4291          |
| 10:30 AM                         | 19                                 | 485  | 0     | 0 | 0                                  | 491  | 45    | 0 | 0                           | 0    | 3     | 0 | 0                           | 0    | 0     | 0 | 1043  | 4319          |
| 10:45 AM                         | 5                                  | 354  | 0     | 0 | 0                                  | 485  | 48    | 0 | 2                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 895   | 4063          |
| 11:00 AM                         | 15                                 | 471  | 0     | 0 | 0                                  | 482  | 28    | 0 | 1                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 999   | 3992          |
| 11:15 AM                         | 10                                 | 514  | 0     | 0 | 0                                  | 495  | 34    | 0 | 0                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 1055  | 3992          |
| 11:30 AM                         | 13                                 | 463  | 0     | 0 | 0                                  | 465  | 24    | 0 | 0                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 967   | 3916          |
| 11:45 AM                         | 16                                 | 515  | 0     | 0 | 0                                  | 523  | 25    | 0 | 3                           | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 1083  | 4104          |
| 12:00 PM                         | 17                                 | 388  | 0     | 0 | 0                                  | 489  | 18    | 0 | 2                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 916   | 4021          |
| 12:15 PM                         | 16                                 | 409  | 0     | 0 | 0                                  | 502  | 31    | 0 | 3                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 963   | 3929          |
| 12:30 PM                         | 5                                  | 247  | 0     | 0 | 0                                  | 490  | 29    | 0 | 1                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 774   | 3736          |
| 12:45 PM                         | 6                                  | 252  | 0     | 0 | 0                                  | 543  | 16    | 0 | 1                           | 0    | 4     | 0 | 0                           | 0    | 0     | 0 | 822   | 3475          |
| 1:00 PM                          | 5                                  | 239  | 0     | 0 | 0                                  | 431  | 16    | 0 | 2                           | 0    | 3     | 0 | 0                           | 0    | 0     | 0 | 696   | 3255          |
| 1:15 PM                          | 5                                  | 214  | 0     | 0 | 0                                  | 506  | 14    | 0 | 8                           | 0    | 4     | 0 | 0                           | 0    | 0     | 0 | 751   | 3043          |
| 1:30 PM                          | 4                                  | 232  | 0     | 0 | 0                                  | 402  | 13    | 0 | 2                           | 0    | 5     | 0 | 0                           | 0    | 0     | 0 | 658   | 2927          |
| 1:45 PM                          | 12                                 | 212  | 0     | 0 | 0                                  | 451  | 8     | 0 | 3                           | 0    | 14    | 0 | 0                           | 0    | 0     | 0 | 700   | 2805          |
| 2:00 PM                          | 4                                  | 198  | 0     | 0 | 0                                  | 473  | 17    | 0 | 4                           | 0    | 11    | 0 | 0                           | 0    | 0     | 0 | 707   | 2816          |
| 2:15 PM                          | 5                                  | 207  | 0     | 0 | 0                                  | 446  | 15    | 0 | 8                           | 0    | 13    | 0 | 0                           | 0    | 0     | 0 | 694   | 2759          |
| 2:30 PM                          | 10                                 | 239  | 0     | 0 | 0                                  | 522  | 6     | 1 | 9                           | 0    | 16    | 0 | 0                           | 0    | 0     | 0 | 803   | 2904          |
| 2:45 PM                          | 5                                  | 209  | 0     | 0 | 0                                  | 507  | 9     | 0 | 8                           | 0    | 21    | 0 | 0                           | 0    | 0     | 0 | 759   | 2963          |
| 3:00 PM                          | 7                                  | 265  | 0     | 0 | 0                                  | 500  | 11    | 0 | 8                           | 0    | 19    | 0 | 0                           | 0    | 0     | 0 | 810   | 3066          |
| 3:15 PM                          | 6                                  | 260  | 0     | 0 | 0                                  | 473  | 7     | 0 | 12                          | 0    | 22    | 0 | 0                           | 0    | 0     | 0 | 780   | 3152          |
| 3:30 PM                          | 6                                  | 246  | 0     | 0 | 0                                  | 509  | 7     | 0 | 18                          | 0    | 20    | 0 | 0                           | 0    | 0     | 0 | 806   | 3155          |
| 3:45 PM                          | 4                                  | 228  | 0     | 0 | 0                                  | 483  | 4     | 0 | 14                          | 0    | 15    | 0 | 0                           | 0    | 0     | 0 | 748   | 3144          |
| 4:00 PM                          | 5                                  | 306  | 0     | 0 | 0                                  | 505  | 2     | 0 | 20                          | 0    | 20    | 0 | 0                           | 0    | 0     | 0 | 858   | 3192          |
| 4:15 PM                          | 2                                  | 261  | 0     | 0 | 0                                  | 509  | 2     | 0 | 21                          | 0    | 20    | 0 | 0                           | 0    | 0     | 0 | 815   | 3227          |

| 15-Min Count Period Beginning At | Caratoke Hwy (US 158) (Northbound) |      |       |   | Caratoke Hwy (US 158) (Southbound) |      |       |   | H2OBX Waterpark (Eastbound) |      |       |   | H2OBX Waterpark (Westbound) |      |       |   | Total | Hourly Totals |
|----------------------------------|------------------------------------|------|-------|---|------------------------------------|------|-------|---|-----------------------------|------|-------|---|-----------------------------|------|-------|---|-------|---------------|
|                                  | Left                               | Thru | Right | U | Left                               | Thru | Right | U | Left                        | Thru | Right | U | Left                        | Thru | Right | U |       |               |
| 4:30 PM                          | 0                                  | 283  | 0     | 0 | 0                                  | 514  | 3     | 0 | 24                          | 0    | 15    | 0 | 0                           | 0    | 0     | 0 | 839   | 3260          |
| 4:45 PM                          | 3                                  | 264  | 0     | 0 | 0                                  | 479  | 3     | 0 | 26                          | 0    | 17    | 0 | 0                           | 0    | 0     | 0 | 792   | 3304          |
| 5:00 PM                          | 1                                  | 286  | 0     | 0 | 0                                  | 414  | 0     | 0 | 36                          | 0    | 20    | 0 | 0                           | 0    | 0     | 0 | 757   | 3203          |
| 5:15 PM                          | 1                                  | 244  | 0     | 0 | 0                                  | 360  | 4     | 0 | 29                          | 0    | 11    | 0 | 0                           | 0    | 0     | 0 | 649   | 3037          |
| 5:30 PM                          | 1                                  | 289  | 0     | 0 | 0                                  | 340  | 3     | 0 | 35                          | 0    | 26    | 0 | 0                           | 0    | 0     | 0 | 694   | 2892          |
| 5:45 PM                          | 5                                  | 272  | 0     | 0 | 0                                  | 323  | 4     | 0 | 24                          | 0    | 26    | 0 | 0                           | 0    | 0     | 0 | 654   | 2754          |
| 6:00 PM                          | 6                                  | 250  | 0     | 0 | 0                                  | 328  | 6     | 0 | 39                          | 0    | 37    | 0 | 0                           | 0    | 0     | 0 | 666   | 2663          |
| 6:15 PM                          | 1                                  | 225  | 0     | 0 | 0                                  | 291  | 2     | 0 | 56                          | 0    | 53    | 0 | 0                           | 0    | 0     | 0 | 628   | 2642          |
| 6:30 PM                          | 7                                  | 242  | 0     | 0 | 0                                  | 283  | 3     | 0 | 53                          | 0    | 25    | 0 | 0                           | 0    | 0     | 0 | 613   | 2561          |
| 6:45 PM                          | 0                                  | 172  | 0     | 0 | 0                                  | 259  | 0     | 0 | 26                          | 0    | 4     | 0 | 0                           | 0    | 0     | 0 | 461   | 2368          |
| 7:00 PM                          | 0                                  | 191  | 0     | 0 | 0                                  | 230  | 1     | 0 | 12                          | 0    | 1     | 0 | 0                           | 0    | 0     | 0 | 435   | 2137          |
| 7:15 PM                          | 0                                  | 173  | 0     | 0 | 0                                  | 190  | 0     | 0 | 8                           | 0    | 2     | 0 | 0                           | 0    | 0     | 0 | 373   | 1882          |
| 7:30 PM                          | 0                                  | 180  | 0     | 0 | 0                                  | 159  | 0     | 0 | 2                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 341   | 1610          |
| 7:45 PM                          | 0                                  | 128  | 0     | 0 | 0                                  | 144  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 272   | 1421          |
| 8:00 PM                          | 0                                  | 130  | 0     | 0 | 0                                  | 124  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 254   | 1240          |
| 8:15 PM                          | 0                                  | 141  | 0     | 0 | 0                                  | 108  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 249   | 1116          |
| 8:30 PM                          | 0                                  | 135  | 0     | 0 | 0                                  | 116  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 251   | 1026          |
| 8:45 PM                          | 0                                  | 136  | 0     | 0 | 0                                  | 117  | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 253   | 1007          |
| Peak 15-Min Flowrates            | Northbound                         |      |       |   | Southbound                         |      |       |   | Eastbound                   |      |       |   | Westbound                   |      |       |   | Total |               |
|                                  | Left                               | Thru | Right | U | Left                               | Thru | Right | U | Left                        | Thru | Right | U | Left                        | Thru | Right | U |       |               |
| All Vehicles                     | 80                                 | 2120 | 0     | 0 | 0                                  | 2156 | 220   | 0 | 8                           | 0    | 20    | 0 | 0                           | 0    | 0     | 0 | 4604  |               |
| Heavy Trucks                     | 0                                  | 12   | 0     | 0 | 0                                  | 20   | 0     | 0 | 0                           | 0    | 0     | 0 | 0                           | 0    | 0     | 0 | 32    |               |
| Buses                            |                                    |      |       |   |                                    |      |       |   |                             |      |       |   |                             |      |       |   |       |               |
| Pedestrians                      |                                    | 0    |       |   |                                    | 0    |       |   |                             | 0    |       |   |                             | 0    |       |   | 0     |               |
| Bicycles                         | 0                                  | 0    | 0     |   | 0                                  | 0    | 0     |   | 0                           | 0    | 0     |   | 0                           | 0    | 0     |   | 0     |               |
| Scoters                          |                                    |      |       |   |                                    |      |       |   |                             |      |       |   |                             |      |       |   |       |               |
| <i>Comments:</i>                 |                                    |      |       |   |                                    |      |       |   |                             |      |       |   |                             |      |       |   |       |               |

Report generated on 8/12/2022 7:34 AM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of report: Tube Count - Volume Data

| <b>LOCATION:</b> Garrington Island Rd<br><b>SPECIFIC LOCATION:</b><br><b>CITY/STATE:</b> Camden, NC |     |     |     |     |                 | <b>QC JOB #:</b> 15890805<br><b>DIRECTION:</b> EB<br><b>DATE:</b> Aug 5 2022 - Aug 6 2022 |                 |     |                                |                      |
|---|-----|-----|-----|-----|-----------------|---|-----------------|-----|--------------------------------|----------------------|
| Start Time  | Mon | Tue | Wed | Thu | Fri<br>5 Aug 22 | Average Weekday<br>Hourly Traffic   | Sat<br>6 Aug 22 | Sun | Average Week<br>Hourly Traffic | Average Week Profile |
| 12:00 AM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 01:00 AM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 02:00 AM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 03:00 AM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 04:00 AM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 05:00 AM  |     |     |     |     | 0               | 0   | 1               |     | 1                              |                      |
| 06:00 AM  |     |     |     |     | 1               | 1   | 1               |     | 1                              |                      |
| 07:00 AM  |     |     |     |     | 1               | 1   | 2               |     | 2                              |                      |
| 08:00 AM  |     |     |     |     | 0               | 0   | 4               |     | 2                              |                      |
| 09:00 AM  |     |     |     |     | 3               | 3   | 3               |     | 3                              |                      |
| 10:00 AM  |     |     |     |     | 5               | 5   | 8               |     | 7                              |                      |
| 11:00 AM  |     |     |     |     | 5               | 5   | 3               |     | 4                              |                      |
| 12:00 PM  |     |     |     |     | 7               | 7   | 5               |     | 6                              |                      |
| 01:00 PM  |     |     |     |     | 10              | 10  | 1               |     | 6                              |                      |
| 02:00 PM  |     |     |     |     | 9               | 9   | 7               |     | 8                              |                      |
| 03:00 PM  |     |     |     |     | 3               | 3   | 4               |     | 4                              |                      |
| 04:00 PM  |     |     |     |     | 12              | 12  | 6               |     | 9                              |                      |
| 05:00 PM  |     |     |     |     | 7               | 7   | 5               |     | 6                              |                      |
| 06:00 PM  |     |     |     |     | 9               | 9   | 4               |     | 7                              |                      |
| 07:00 PM  |     |     |     |     | 4               | 4   | 3               |     | 4                              |                      |
| 08:00 PM  |     |     |     |     | 6               | 6   | 4               |     | 5                              |                      |
| 09:00 PM  |     |     |     |     | 5               | 5   | 2               |     | 4                              |                      |
| 10:00 PM  |     |     |     |     | 5               | 5   | 3               |     | 4                              |                      |
| 11:00 PM  |     |     |     |     | 1               | 1   | 1               |     | 1                              |                      |
| <b>Day Total</b>  |     |     |     |     | 93              | 93  | 67              |     | 84                             |                      |
| % Weekday Average   |     |     |     |     | 100%            |   |                 |     |                                |                      |
| % Week Average  |     |     |     |     | 110.7%          | 110.7%  | 79.8%           |     |                                |                      |
| AM Peak Volume  |     |     |     |     | 10:00 AM<br>5   | 10:00 AM<br>5   | 10:00 AM<br>8   |     | 10:00 AM<br>7                  |                      |
| PM Peak Volume  |     |     |     |     | 4:00 PM<br>12   | 4:00 PM<br>12   | 2:00 PM<br>7    |     | 4:00 PM<br>9                   |                      |

Comments:



Type of report: Tube Count - Volume Data

| <b>LOCATION:</b> Garrington Island Rd<br><b>SPECIFIC LOCATION:</b><br><b>CITY/STATE:</b> Camden, NC |     |     |     |     |                 | <b>QC JOB #:</b> 15890805<br><b>DIRECTION:</b> WB<br><b>DATE:</b> Aug 5 2022 - Aug 6 2022 |                 |     |                                |                      |
|---|-----|-----|-----|-----|-----------------|---|-----------------|-----|--------------------------------|----------------------|
| Start Time  | Mon | Tue | Wed | Thu | Fri<br>5 Aug 22 | Average Weekday<br>Hourly Traffic   | Sat<br>6 Aug 22 | Sun | Average Week<br>Hourly Traffic | Average Week Profile |
| 12:00 AM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 01:00 AM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 02:00 AM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 03:00 AM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 04:00 AM  |     |     |     |     | 1               | 1   | 1               |     | 1                              |                      |
| 05:00 AM  |     |     |     |     | 2               | 2   | 0               |     | 1                              |                      |
| 06:00 AM  |     |     |     |     | 7               | 7   | 3               |     | 5                              |                      |
| 07:00 AM  |     |     |     |     | 6               | 6   | 5               |     | 6                              |                      |
| 08:00 AM  |     |     |     |     | 3               | 3   | 3               |     | 3                              |                      |
| 09:00 AM  |     |     |     |     | 6               | 6   | 8               |     | 7                              |                      |
| 10:00 AM  |     |     |     |     | 5               | 5   | 9               |     | 7                              |                      |
| 11:00 AM  |     |     |     |     | 6               | 6   | 5               |     | 6                              |                      |
| 12:00 PM  |     |     |     |     | 4               | 4   | 9               |     | 7                              |                      |
| 01:00 PM  |     |     |     |     | 7               | 7   | 7               |     | 7                              |                      |
| 02:00 PM  |     |     |     |     | 9               | 9   | 4               |     | 7                              |                      |
| 03:00 PM  |     |     |     |     | 3               | 3   | 4               |     | 4                              |                      |
| 04:00 PM  |     |     |     |     | 4               | 4   | 3               |     | 4                              |                      |
| 05:00 PM  |     |     |     |     | 4               | 4   | 3               |     | 4                              |                      |
| 06:00 PM  |     |     |     |     | 4               | 4   | 2               |     | 3                              |                      |
| 07:00 PM  |     |     |     |     | 3               | 3   | 3               |     | 3                              |                      |
| 08:00 PM  |     |     |     |     | 3               | 3   | 3               |     | 3                              |                      |
| 09:00 PM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 10:00 PM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| 11:00 PM  |     |     |     |     | 0               | 0   | 0               |     | 0                              |                      |
| <b>Day Total</b>  |     |     |     |     | 77              | 77  | 72              |     | 78                             |                      |
| % Weekday Average   |     |     |     |     | 100%            |   |                 |     |                                |                      |
| % Week Average  |     |     |     |     | 98.7%           | 98.7%   | 92.3%           |     |                                |                      |
| AM Peak Volume  |     |     |     |     | 6:00 AM<br>7    | 6:00 AM<br>7  | 10:00 AM<br>9   |     | 9:00 AM<br>7                   |                      |
| PM Peak Volume  |     |     |     |     | 2:00 PM<br>9    | 2:00 PM<br>9  | 12:00 PM<br>9   |     | 12:00 PM<br>7                  |                      |

Comments:

Report generated on 8/10/2022 1:07 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>)

| <b>LOCATION:</b> Waterlilly Rd<br><b>SPECIFIC LOCATION:</b><br><b>CITY/STATE:</b> Currituck, NC |     |     |     |     |                  | <b>QC JOB #:</b> 15890806<br><b>DIRECTION:</b> NB<br><b>DATE:</b> Aug 12 2022 - Aug 13 2022 |                  |     |                                |                      |
|---|-----|-----|-----|-----|------------------|---|------------------|-----|--------------------------------|----------------------|
| Start Time  | Mon | Tue | Wed | Thu | Fri<br>12 Aug 22 | Average Weekday<br>Hourly Traffic   | Sat<br>13 Aug 22 | Sun | Average Week<br>Hourly Traffic | Average Week Profile |
| 12:00 AM  |     |     |     |     | 2                | 2   | 1                |     | 2                              |                      |
| 01:00 AM  |     |     |     |     | 0                | 0   | 0                |     | 0                              |                      |
| 02:00 AM  |     |     |     |     | 0                | 0   | 0                |     | 0                              |                      |
| 03:00 AM  |     |     |     |     | 0                | 0   | 0                |     | 0                              |                      |
| 04:00 AM  |     |     |     |     | 0                | 0   | 0                |     | 0                              |                      |
| 05:00 AM  |     |     |     |     | 0                | 0   | 2                |     | 1                              |                      |
| 06:00 AM  |     |     |     |     | 1                | 1   | 4                |     | 3                              |                      |
| 07:00 AM  |     |     |     |     | 1                | 1   | 4                |     | 3                              |                      |
| 08:00 AM  |     |     |     |     | 3                | 3   | 11               |     | 7                              |                      |
| 09:00 AM  |     |     |     |     | 4                | 4   | 12               |     | 8                              |                      |
| 10:00 AM  |     |     |     |     | 6                | 6   | 21               |     | 14                             |                      |
| 11:00 AM  |     |     |     |     | 9                | 9   | 14               |     | 12                             |                      |
| 12:00 PM  |     |     |     |     | 7                | 7   | 10               |     | 9                              |                      |
| 01:00 PM  |     |     |     |     | 7                | 7   | 12               |     | 10                             |                      |
| 02:00 PM  |     |     |     |     | 26               | 26  | 8                |     | 17                             |                      |
| 03:00 PM  |     |     |     |     | 22               | 22  | 7                |     | 15                             |                      |
| 04:00 PM  |     |     |     |     | 10               | 10  | 7                |     | 9                              |                      |
| 05:00 PM  |     |     |     |     | 5                | 5   | 11               |     | 8                              |                      |
| 06:00 PM  |     |     |     |     | 18               | 18  | 5                |     | 12                             |                      |
| 07:00 PM  |     |     |     |     | 7                | 7   | 9                |     | 8                              |                      |
| 08:00 PM  |     |     |     |     | 3                | 3   | 9                |     | 6                              |                      |
| 09:00 PM  |     |     |     |     | 1                | 1   | 2                |     | 2                              |                      |
| 10:00 PM  |     |     |     |     | 0                | 0   | 4                |     | 2                              |                      |
| 11:00 PM  |     |     |     |     | 0                | 0   | 0                |     | 0                              |                      |
| <b>Day Total</b>  |     |     |     |     | 132              | 132   | 153              |     | 148                            |                      |
| % Weekday Average   |     |     |     |     | 100%             |   |                  |     |                                |                      |
| % Week Average  |     |     |     |     | 89.2%            | 89.2%   | 103.4%           |     |                                |                      |
| AM Peak Volume  |     |     |     |     | 11:00 AM<br>9    | 11:00 AM<br>9   | 10:00 AM<br>21   |     | 10:00 AM<br>14                 |                      |
| PM Peak Volume  |     |     |     |     | 2:00 PM<br>26    | 2:00 PM<br>26   | 1:00 PM<br>12    |     | 2:00 PM<br>17                  |                      |

Comments:

Type of report: Tube Count - Volume Data

| <b>LOCATION:</b> Waterlilly Rd<br><b>SPECIFIC LOCATION:</b><br><b>CITY/STATE:</b> Currituck, NC |     |     |     |     |                  | <b>QC JOB #:</b> 15890806<br><b>DIRECTION:</b> SB<br><b>DATE:</b> Aug 12 2022 - Aug 13 2022 |                  |     |                                |                      |
|---|-----|-----|-----|-----|------------------|---|------------------|-----|--------------------------------|----------------------|
| Start Time  | Mon | Tue | Wed | Thu | Fri<br>12 Aug 22 | Average Weekday<br>Hourly Traffic   | Sat<br>13 Aug 22 | Sun | Average Week<br>Hourly Traffic | Average Week Profile |
| 12:00 AM  |     |     |     |     | 0                | 0   | 4                |     | 2                              |                      |
| 01:00 AM  |     |     |     |     | 0                | 0   | 0                |     | 0                              |                      |
| 02:00 AM  |     |     |     |     | 0                | 0   | 0                |     | 0                              |                      |
| 03:00 AM  |     |     |     |     | 0                | 0   | 0                |     | 0                              |                      |
| 04:00 AM  |     |     |     |     | 0                | 0   | 1                |     | 1                              |                      |
| 05:00 AM  |     |     |     |     | 0                | 0   | 0                |     | 0                              |                      |
| 06:00 AM  |     |     |     |     | 10               | 10  | 0                |     | 5                              |                      |
| 07:00 AM  |     |     |     |     | 4                | 4   | 1                |     | 3                              |                      |
| 08:00 AM  |     |     |     |     | 7                | 7   | 3                |     | 5                              |                      |
| 09:00 AM  |     |     |     |     | 9                | 9   | 7                |     | 8                              |                      |
| 10:00 AM  |     |     |     |     | 14               | 14  | 6                |     | 10                             |                      |
| 11:00 AM  |     |     |     |     | 14               | 14  | 8                |     | 11                             |                      |
| 12:00 PM  |     |     |     |     | 11               | 11  | 8                |     | 10                             |                      |
| 01:00 PM  |     |     |     |     | 8                | 8   | 10               |     | 9                              |                      |
| 02:00 PM  |     |     |     |     | 13               | 13  | 20               |     | 17                             |                      |
| 03:00 PM  |     |     |     |     | 10               | 10  | 15               |     | 13                             |                      |
| 04:00 PM  |     |     |     |     | 19               | 19  | 19               |     | 19                             |                      |
| 05:00 PM  |     |     |     |     | 22               | 22  | 19               |     | 21                             |                      |
| 06:00 PM  |     |     |     |     | 26               | 26  | 16               |     | 21                             |                      |
| 07:00 PM  |     |     |     |     | 11               | 11  | 6                |     | 9                              |                      |
| 08:00 PM  |     |     |     |     | 9                | 9   | 6                |     | 8                              |                      |
| 09:00 PM  |     |     |     |     | 9                | 9   | 2                |     | 6                              |                      |
| 10:00 PM  |     |     |     |     | 3                | 3   | 3                |     | 3                              |                      |
| 11:00 PM  |     |     |     |     | 1                | 1   | 3                |     | 2                              |                      |
| <b>Day Total</b>  |     |     |     |     | 200              | 200   | 157              |     | 183                            |                      |
| % Weekday Average   |     |     |     |     | 100%             |   |                  |     |                                |                      |
| % Week Average  |     |     |     |     | 109.3%           | 109.3%  | 85.8%            |     |                                |                      |
| AM Peak Volume  |     |     |     |     | 10:00 AM<br>14   | 10:00 AM<br>14  | 11:00 AM<br>8    |     | 11:00 AM<br>11                 |                      |
| PM Peak Volume  |     |     |     |     | 6:00 PM<br>26    | 6:00 PM<br>26   | 2:00 PM<br>20    |     | 5:00 PM<br>21                  |                      |

Comments:

Report generated on 8/16/2022 2:45 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>)

**H2OBX Campground Hourly Distribution  
Percentages and Entering/Exiting Volumes**

| Time     | Friday   |         |       |             |           |         | Saturday |         |       |             |           |         |
|----------|----------|---------|-------|-------------|-----------|---------|----------|---------|-------|-------------|-----------|---------|
|          | Trips    |         |       | Percentages |           |         | Trips    |         |       | Percentages |           |         |
|          | Entering | Exiting | Total | Entering %  | Exiting % | Total % | Entering | Exiting | Total | Entering %  | Exiting % | Total % |
| 12-1 AM  | 2        | 0       | 2     | 1%          | 0%        | 0%      | 1        | 3       | 4     | 0%          | 2%        | 1%      |
| 1-2 AM   | 0        | 0       | 0     | 0%          | 0%        | 0%      | 0        | 0       | 0     | 0%          | 0%        | 0%      |
| 2-3 AM   | 0        | 0       | 0     | 0%          | 0%        | 0%      | 0        | 0       | 0     | 0%          | 0%        | 0%      |
| 3-4 AM   | 0        | 0       | 0     | 0%          | 0%        | 0%      | 0        | 0       | 0     | 0%          | 0%        | 0%      |
| 4-5 AM   | 0        | 1       | 1     | 0%          | 0%        | 0%      | 0        | 2       | 2     | 0%          | 1%        | 0%      |
| 5-6 AM   | 0        | 2       | 2     | 0%          | 1%        | 0%      | 3        | 0       | 3     | 1%          | 0%        | 1%      |
| 6-7 AM   | 2        | 15      | 16    | 1%          | 6%        | 4%      | 4        | 3       | 7     | 2%          | 1%        | 2%      |
| 7-8 AM   | 2        | 9       | 10    | 1%          | 4%        | 2%      | 5        | 5       | 10    | 3%          | 3%        | 3%      |
| 8-9 AM   | 3        | 9       | 11    | 1%          | 4%        | 3%      | 13       | 5       | 18    | 7%          | 3%        | 5%      |
| 9-10 AM  | 6        | 13      | 19    | 3%          | 5%        | 4%      | 13       | 13      | 26    | 7%          | 7%        | 7%      |
| 10-11 AM | 9        | 16      | 26    | 5%          | 7%        | 6%      | 25       | 13      | 38    | 13%         | 7%        | 10%     |
| 11-12 PM | 12       | 17      | 29    | 6%          | 7%        | 7%      | 15       | 11      | 26    | 8%          | 6%        | 7%      |
| 12-1 PM  | 12       | 13      | 25    | 6%          | 5%        | 6%      | 13       | 15      | 27    | 7%          | 7%        | 7%      |
| 1-2 PM   | 15       | 13      | 27    | 8%          | 5%        | 6%      | 11       | 15      | 26    | 6%          | 7%        | 7%      |
| 2-3 PM   | 30       | 19      | 49    | 16%         | 8%        | 11%     | 13       | 21      | 33    | 7%          | 10%       | 9%      |
| 3-4 PM   | 21       | 11      | 33    | 11%         | 5%        | 8%      | 9        | 16      | 26    | 5%          | 8%        | 7%      |
| 4-5 PM   | 19       | 20      | 39    | 10%         | 8%        | 9%      | 11       | 19      | 30    | 6%          | 10%       | 8%      |
| 5-6 PM   | 10       | 22      | 33    | 5%          | 9%        | 8%      | 14       | 19      | 33    | 7%          | 10%       | 8%      |
| 6-7 PM   | 23       | 26      | 49    | 12%         | 11%       | 11%     | 8        | 15      | 23    | 4%          | 8%        | 6%      |
| 7-8 PM   | 9        | 12      | 21    | 5%          | 5%        | 5%      | 10       | 8       | 18    | 5%          | 4%        | 5%      |
| 8-9 PM   | 8        | 10      | 18    | 4%          | 4%        | 4%      | 11       | 8       | 19    | 6%          | 4%        | 5%      |
| 9-10 PM  | 5        | 8       | 13    | 3%          | 3%        | 3%      | 3        | 2       | 5     | 2%          | 1%        | 1%      |
| 10-11 PM | 4        | 3       | 7     | 2%          | 1%        | 2%      | 6        | 3       | 9     | 3%          | 1%        | 2%      |
| 11-12 AM | 1        | 1       | 2     | 0%          | 0%        | 0%      | 1        | 3       | 3     | 0%          | 1%        | 1%      |
| Totals   | 193      | 237     | 430   | 100%        | 100%      | 100%    | 188      | 196     | 384   | 100%        | 100%      | 100%    |

# **Crash Data Report**



## **Signal Warrant Spreadsheets**



# H2OBX Campground - Friday

## TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS - Existing Conditions (No Reductions)

Based on 2009 MUTCD

INTERSECTION NAME: Caratoke Highway US 158 at H2OBX Waterpark Driveway/ (Intersection 1)

DATE: 12/20/22

INTERSECTION CONDITION: Two-Way Stop Control

MAJOR STREET: Caratoke Highway US 158  
 MINOR STREET 1: H2OBX Waterpark Driveway  
 MINOR STREET 2: -

# OF APPROACH LANES: 4  
 # OF APPROACH LANES: 2  
 # OF APPROACH LANES: 2

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): Y  
 85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

USE 56% REDUCTION (Y OR N): N

REMOVE RT (Y OR N): N    N    N  
 % RT INCLUDE: 100%    100%    100%

| THRESHOLD VALUES | TO | FROM     | Caratoke Highway US 158 | H2OBX Waterpark Driveway | - | WARRANT 1, Condition A       |                 |                 |              | WARRANT 1, Condition B       |                |          |              | WARRANT 1, Combination Warrant                           |                |          |              | WARRANT 2              | WARRANT 3 |                |                |                        |              |                |                |          |
|------------------|----|----------|-------------------------|--------------------------|---|------------------------------|-----------------|-----------------|--------------|------------------------------|----------------|----------|--------------|--|----------------|----------|--------------|------------------------|-----------|----------------|----------------|------------------------|--------------|----------------|----------------|----------|
|                  |    |          |                         |                          |   | MAJOR ST (NB+SB)             | MINOR ST 1 (EB) | MINOR ST 2 (WB) | MAJOR STREET | MINOR STREET 1               | MINOR STREET 2 | BOTH MET | MAJOR STREET | MINOR STREET 1   | MINOR STREET 2 | BOTH MET | CONDITION A  |                        |           | CONDITION B    |                |                        |              |                |                |          |
|                  |    |          |                         |                          |   |                              |                 |                 |              |                              |                |          |              |  |                |          | MAJOR STREET |                        |           | MINOR STREET 1 | MINOR STREET 2 | BOTH MET               | MAJOR STREET | MINOR STREET 1 | MINOR STREET 2 | BOTH MET |
|                  |    |          |                         |                          |   |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 12:00 AM         | TO | 01:00 AM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 01:00 AM         | TO | 02:00 AM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 02:00 AM         | TO | 03:00 AM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 03:00 AM         | TO | 04:00 AM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 04:00 AM         | TO | 05:00 AM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 05:00 AM         | TO | 06:00 AM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 06:00 AM         | TO | 07:00 AM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 07:00 AM         | TO | 08:00 AM | 1,535                   | 1                        | 0 | Y                            |                 |                 | Y            |                              |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 08:00 AM         | TO | 09:00 AM | 1,853                   | 4                        | 0 | Y                            |                 |                 | Y            |                              |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 09:00 AM         | TO | 10:00 AM | 2,063                   | 15                       | 0 | Y                            |                 |                 | Y            |                              |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 10:00 AM         | TO | 11:00 AM | 2,345                   | 17                       | 0 | Y                            |                 |                 | Y            |                              |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 11:00 AM         | TO | 12:00 PM | 2,193                   | 18                       | 0 | Y                            |                 |                 | Y            |                              |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 12:00 PM         | TO | 01:00 PM | 2,070                   | 32                       | 0 | Y                            |                 |                 | Y            |                              |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 01:00 PM         | TO | 02:00 PM | 2,107                   | 45                       | 0 | Y                            |                 |                 | Y            |                              |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 02:00 PM         | TO | 03:00 PM | 2,190                   | 77                       | 0 | Y                            |                 |                 | Y            | Y                            |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 03:00 PM         | TO | 04:00 PM | 2,142                   | 118                      | 0 | Y                            |                 |                 | Y            | Y                            |                | Y        | Y            |  | Y              | Y        |              | Y                      |           |                |                |                        |              |                |                |          |
| 04:00 PM         | TO | 05:00 PM | 2,243                   | 148                      | 0 | Y                            | Y               |                 | Y            | Y                            |                | Y        | Y            |  | Y              | Y        |              | Y                      |           |                |                |                        |              |                |                |          |
| 05:00 PM         | TO | 06:00 PM | 2,293                   | 154                      | 0 | Y                            | Y               |                 | Y            | Y                            |                | Y        | Y            |  | Y              | Y        |              | Y                      |           |                |                |                        |              |                |                |          |
| 06:00 PM         | TO | 07:00 PM | 1,750                   | 222                      | 0 | Y                            | Y               | Y               | Y            | Y                            |                | Y        | Y            | Y  | Y              | Y        | Y            | Y                      |           |                |                |                        |              |                |                |          |
| 07:00 PM         | TO | 08:00 PM | 1,379                   | 12                       | 0 | Y                            |                 |                 | Y            |                              |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 08:00 PM         | TO | 09:00 PM | 1,056                   | 0                        | 0 | Y                            |                 |                 | Y            |                              |                | Y        |              |  | Y              |          |              |                        |           |                |                |                        |              |                |                |          |
| 09:00 PM         | TO | 10:00 PM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 10:00 PM         | TO | 11:00 PM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
| 11:00 PM         | TO | 12:00 AM | 0                       | 0                        | 0 |                              |                 |                 |              |                              |                |          |              |  |                |          |              |                        |           |                |                |                        |              |                |                |          |
|                  |    |          | 27,219                  | 863                      | 0 | 3                            |                 |                 |              | 5                            |                |          |              | 1  |                |          |              | 4                      |           |                |                | 4                      | 4            |                |                |          |
|                  |    |          |                         |                          |   | 8 HOURS NEEDED NOT SATISFIED |                 |                 |              | 8 HOURS NEEDED NOT SATISFIED |                |          |              | 8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED |                |          |              | 4 HRS NEEDED SATISFIED |           |                |                | 1 HRS NEEDED SATISFIED |              |                |                |          |

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant  
 Condition A: Minimum Vehicular Volume  
 Condition B: Interruption of Continuous Traffic  
 Combination: Combination of Condition A and Condition B  
 WARRANT 2 -- Four-Hour Vehicular Volume Warrant  
 WARRANT 3 -- Peak Hour Warrant

## H2OBX Campground - Friday

### TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS - Build Conditions (No Reductions)

Based on 2009 MUTCD

INTERSECTION NAME: Caratoke Highway US 158 at H2OBX Waterpark Driveway/ (Intersection 1)

DATE: 12/20/22

INTERSECTION CONDITION: Two-Way Stop Control

MAJOR STREET: Caratoke Highway US 158  
 MINOR STREET 1: H2OBX Waterpark Driveway  
 MINOR STREET 2: -

# OF APPROACH LANES: 4  
 # OF APPROACH LANES: 2  
 # OF APPROACH LANES: 2

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): Y  
 85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

USE 56% REDUCTION (Y OR N): N

REMOVE RT (Y OR N): Y Y Y  
 % RT INCLUDE: 0% 0% 0%

| THRESHOLD VALUES     | MAJOR ST (NB+SB) | MINOR ST 1 (EB) | MINOR ST 2 (WB) | WARRANT 1, Condition A |                |                |                              | WARRANT 1, Condition B |                |                |                              | WARRANT 1, Combination Warrant |                |                |  |              |                |                |                        | WARRANT 2 | WARRANT 3              |   |
|----------------------|------------------|-----------------|-----------------|------------------------|----------------|----------------|------------------------------|------------------------|----------------|----------------|------------------------------|--------------------------------|----------------|----------------|--|--------------|----------------|----------------|------------------------|-----------|------------------------|---|
|                      |                  |                 |                 | MAJOR STREET           | MINOR STREET 1 | MINOR STREET 2 | BOTH MET                     | MAJOR STREET           | MINOR STREET 1 | MINOR STREET 2 | BOTH MET                     | CONDITION A                    |                |                |  | CONDITION B  |                |                |                        |           |                        |   |
|                      |                  |                 |                 |                        |                |                |                              |                        |                |                |                              | MAJOR STREET                   | MINOR STREET 1 | MINOR STREET 2 | BOTH MET   | MAJOR STREET | MINOR STREET 1 | MINOR STREET 2 | BOTH MET               |           |                        |   |
| 12:00 AM TO 01:00 AM | 2                | 0               | 0               | 420                    | 140            | 140            |                              | 630                    | 70             | 70             |                              | 480                            | 160            | 160            |  | 720          | 80             | 80             |                        |           |                        |   |
| 01:00 AM TO 02:00 AM | 0                | 0               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |                        |   |
| 02:00 AM TO 03:00 AM | 0                | 0               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |                        |   |
| 03:00 AM TO 04:00 AM | 0                | 0               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |                        |   |
| 04:00 AM TO 05:00 AM | 0                | 0               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |                        |   |
| 05:00 AM TO 06:00 AM | 0                | 2               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |                        |   |
| 06:00 AM TO 07:00 AM | 2                | 14              | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |                        |   |
| 07:00 AM TO 08:00 AM | 1,630            | 9               | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        |           |                        |   |
| 08:00 AM TO 09:00 AM | 1,968            | 12              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        |           |                        |   |
| 09:00 AM TO 10:00 AM | 2,195            | 28              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        |           |                        |   |
| 10:00 AM TO 11:00 AM | 2,498            | 34              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        |           |                        |   |
| 11:00 AM TO 12:00 PM | 2,339            | 37              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        |           |                        |   |
| 12:00 PM TO 01:00 PM | 2,208            | 46              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        |           |                        |   |
| 01:00 PM TO 02:00 PM | 2,249            | 60              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        |           |                        |   |
| 02:00 PM TO 03:00 PM | 2,353            | 100             | 0               | Y                      |                |                |                              | Y                      | Y              |                | Y                            | Y                              |                |                |  | Y            | Y              |                | Y                      |           | Y                      |   |
| 03:00 PM TO 04:00 PM | 2,294            | 137             | 0               | Y                      |                |                |                              | Y                      | Y              |                | Y                            | Y                              |                |                |  | Y            | Y              |                | Y                      |           | Y                      |   |
| 04:00 PM TO 05:00 PM | 2,398            | 177             | 0               | Y                      | Y              |                | Y                            | Y                      | Y              |                | Y                            | Y                              | Y              |                | Y  | Y            | Y              |                | Y                      |           | Y                      |   |
| 05:00 PM TO 06:00 PM | 2,443            | 185             | 0               | Y                      | Y              |                | Y                            | Y                      | Y              |                | Y                            | Y                              | Y              |                | Y  | Y            | Y              |                | Y                      |           | Y                      |   |
| 06:00 PM TO 07:00 PM | 1,881            | 262             | 0               | Y                      | Y              |                | Y                            | Y                      | Y              |                | Y                            | Y                              | Y              |                | Y  | Y            | Y              |                | Y                      |           | Y                      |   |
| 07:00 PM TO 08:00 PM | 1,473            | 25              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        |           |                        |   |
| 08:00 PM TO 09:00 PM | 1,128            | 10              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        |           |                        |   |
| 09:00 PM TO 10:00 PM | 6                | 8               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |                        |   |
| 10:00 PM TO 11:00 PM | 4                | 2               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |                        |   |
| 11:00 PM TO 12:00 AM | 0                | 0               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |                        |   |
|                      | 29,071           | 1,148           | 0               |                        |                |                | 3                            |                        |                |                | 5                            |                                |                |                | 3  |              |                |                | 5                      |           | 5                      | 5 |
|                      |                  |                 |                 |                        |                |                | 8 HOURS NEEDED NOT SATISFIED |                        |                |                | 8 HOURS NEEDED NOT SATISFIED |                                |                |                | 8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED |              |                |                | 4 HRS NEEDED SATISFIED |           | 1 HRS NEEDED SATISFIED |   |

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant  
 Condition A: Minimum Vehicular Volume  
 Condition B: Interruption of Continuous Traffic  
 Combination: Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

# H2OBX Campground - Friday (NBL)

## TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS - Existing Conditions (With Reductions)

Based on 2009 MUTCD

INTERSECTION NAME: Caratoke Highway US 158 - SB Only at Caratoke Highway US 158 - NBL/ - (Intersection 1)

DATE: 12/20/22

INTERSECTION CONDITION: Two-Way Stop Control

MAJOR STREET: Caratoke Highway US 158 - SB Only

# OF APPROACH LANES: 2

MINOR STREET 1: Caratoke Highway US 158 - NBL

# OF APPROACH LANES: 1

MINOR STREET 2: -

1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

USE 56% REDUCTION (Y OR N): Y

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

REMOVE RT (Y OR N): N    N    N  
 % RT INCLUDE: 100%    100%    100%

|                      |       |     |   | Caratoke Highway US 158 - SB Only<br>MAJOR ST SB BOTH APPROACHES | Caratoke Highway US 158 - NBL<br>MINOR ST 1 (NBL) | - | WARRANT 1, Condition A |                              |                |          | WARRANT 1, Condition B |  |                |          | WARRANT 1, Combination Warrant |                |                |          |              |                            |                |                            | WARRANT 2 | WARRANT 3 |
|----------------------|-------|-----|---|--|---|---|------------------------|------------------------------|----------------|----------|------------------------|--|----------------|----------|--------------------------------|----------------|----------------|----------|--------------|----------------------------|----------------|----------------------------|-----------|-----------|
|                      |       |     |   |  |   |   | CONDITION A            |                              |                |          | CONDITION B            |  |                |          | CONDITION A                    |                |                |          | CONDITION B  |                            |                |                            |           |           |
|                      |       |     |   |  |   |   | MAJOR STREET           | MINOR STREET 1               | MINOR STREET 2 | BOTH MET | MAJOR STREET           | MINOR STREET 1   | MINOR STREET 2 | BOTH MET | MAJOR STREET                   | MINOR STREET 1 | MINOR STREET 2 | BOTH MET | MAJOR STREET | MINOR STREET 1             | MINOR STREET 2 | BOTH MET                   |           |           |
|                      |       |     |   |  |   |   | THRESHOLD VALUES       | 420                          | 105            | 105      |                        | 630  | 53             | 53       |                                | 336            | 84             | 84       |              | 504                        | 42             | 42                         |           |           |
| 12:00 AM TO 01:00 AM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
| 01:00 AM TO 02:00 AM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
| 02:00 AM TO 03:00 AM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
| 03:00 AM TO 04:00 AM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
| 04:00 AM TO 05:00 AM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
| 05:00 AM TO 06:00 AM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
| 06:00 AM TO 07:00 AM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
| 07:00 AM TO 08:00 AM | 883   | 2   | 0 | Y  |   |   |                        | Y                            |                |          |                        |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 08:00 AM TO 09:00 AM | 933   | 6   | 0 | Y  | Y   |   |                        | Y                            |                |          |                        |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 09:00 AM TO 10:00 AM | 880   | 60  | 0 | Y  |   |   |                        | Y                            | Y              |          | Y                      |  | Y              | Y        |                                |                |                | Y        |              |                            |                |                            |           |           |
| 10:00 AM TO 11:00 AM | 854   | 146 | 0 | Y  | Y   |   | Y                      | Y                            | Y              | Y        | Y                      | Y  | Y              | Y        | Y                              |                |                | Y        | Y            |                            |                |                            |           |           |
| 11:00 AM TO 12:00 PM | 935   | 68  | 0 | Y  |   |   |                        | Y                            | Y              |          | Y                      |  | Y              | Y        |                                |                |                | Y        | Y            |                            |                |                            |           |           |
| 12:00 PM TO 01:00 PM | 960   | 36  | 0 | Y  | Y   |   |                        | Y                            |                |          | Y                      |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 01:00 PM TO 02:00 PM | 981   | 39  | 0 | Y  |   |   |                        | Y                            |                |          | Y                      |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 02:00 PM TO 03:00 PM | 1,158 | 31  | 0 | Y  |   |   |                        | Y                            |                |          | Y                      |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 03:00 PM TO 04:00 PM | 1,095 | 32  | 0 | Y  |   |   |                        | Y                            |                |          | Y                      |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 04:00 PM TO 05:00 PM | 1,040 | 19  | 0 | Y  |   |   |                        | Y                            |                |          | Y                      |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 05:00 PM TO 06:00 PM | 1,013 | 12  | 0 | Y  |   |   |                        | Y                            |                |          | Y                      |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 06:00 PM TO 07:00 PM | 819   | 7   | 0 | Y  |   |   |                        | Y                            |                |          | Y                      |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 07:00 PM TO 08:00 PM | 707   | 0   | 0 | Y  | Y   |   |                        | Y                            |                |          | Y                      |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 08:00 PM TO 09:00 PM | 541   | 0   | 0 | Y  |   |   |                        |                              |                |          | Y                      |  | Y              |          |                                |                |                |          |              |                            |                |                            |           |           |
| 09:00 PM TO 10:00 PM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
| 10:00 PM TO 11:00 PM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
| 11:00 PM TO 12:00 AM | 0     | 0   | 0 |  |   |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |
|                      |       |     |   | 12,799   | 458   | 0 | 1                      |                              |                |          | 3                      |  |                |          | 1                              |                |                |          | 3            |                            |                |                            | 2         | 0         |
|                      |       |     |   | 8 HOURS NEEDED NOT SATISFIED                                     |   |   |                        | 8 HOURS NEEDED NOT SATISFIED |                |          |                        | 8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED |                |          |                                |                |                |          |              | 4 HRS NEEDED NOT SATISFIED |                | 1 HRS NEEDED NOT SATISFIED |           |           |

- WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
  - Condition A: Minimum Vehicular Volume
  - Condition B: Interruption of Continuous Traffic
  - Combination: Combination of Condition A and Condition B
- WARRANT 2 -- Four-Hour Vehicular Volume Warrant
- WARRANT 3 -- Peak Hour Warrant

# H2OBX Campground - Friday (NBL)

## TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS - Build Conditions (With Reductions)

Based on 2009 MUTCD

INTERSECTION NAME: Caratoke Highway US 158 - SB Only at Caratoke Highway US 158 - NBL/ - (Intersection 1)

DATE: 12/20/22

INTERSECTION CONDITION: Two-Way Stop Control

MAJOR STREET: Caratoke Highway US 158 - SB Only  
 MINOR STREET 1: Caratoke Highway US 158 - NBL  
 MINOR STREET 2: -

# OF APPROACH LANES: 2  
 # OF APPROACH LANES: 1  
 # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N  
 85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

USE 56% REDUCTION (Y OR N): Y

REMOVE RT (Y OR N): N Y Y  
 % RT INCLUDE: 100% 0% 0%

|                              |    |          | Caratoke Highway US 158 - SB Only |     |     | WARRANT 1, Condition A |                              |                |                 | WARRANT 1, Condition B |                |                |          | WARRANT 1, Combination Warrant                           |                |                |          |              |                |                |                            | WARRANT 2 |                        | WARRANT 3 |  |                |  |
|------------------------------|----|----------|-----------------------------------|-----|-----|------------------------|------------------------------|----------------|-----------------|------------------------|----------------|----------------|----------|--|----------------|----------------|----------|--------------|----------------|----------------|----------------------------|-----------|------------------------|-----------|--|----------------|--|
|                              |    |          | MAJOR ST SB BOTH APPROACHES       |     |     | MINOR ST 1 (NBL)       |                              |                | MINOR ST 2 (WB) |                        |                | CONDITION A    |          |  |                | CONDITION B    |          |              |                |                |                            |           |                        |           |  |                |  |
|                              |    |          | S                                 |     |     |                        |                              |                |                 |                        |                | MAJOR STREET   |          | MINOR STREET 1   |                | MINOR STREET 2 |          | MAJOR STREET |                | MINOR STREET 1 |                            |           |                        |           |  | MINOR STREET 2 |  |
|                              |    |          | THRESHOLD VALUES                  |     |     | MAJOR STREET           | MINOR STREET 1               | MINOR STREET 2 | BOTH MET        | MAJOR STREET           | MINOR STREET 1 | MINOR STREET 2 | BOTH MET | MAJOR STREET   | MINOR STREET 1 | MINOR STREET 2 | BOTH MET | MAJOR STREET | MINOR STREET 1 | MINOR STREET 2 | BOTH MET                   |           |                        |           |  |                |  |
|                              |    |          | 420                               | 105 | 105 |                        | 630                          | 53             | 53              |                        | 336            | 84             | 84       |  | 504            | 42             | 42       |              |                |                |                            |           |                        |           |  |                |  |
| 12:00 AM                     | TO | 01:00 AM | 0                                 | 1   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 01:00 AM                     | TO | 02:00 AM | 0                                 | 0   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 02:00 AM                     | TO | 03:00 AM | 0                                 | 0   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 03:00 AM                     | TO | 04:00 AM | 0                                 | 0   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 04:00 AM                     | TO | 05:00 AM | 0                                 | 0   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 05:00 AM                     | TO | 06:00 AM | 0                                 | 0   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 06:00 AM                     | TO | 07:00 AM | 0                                 | 1   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 07:00 AM                     | TO | 08:00 AM | 937                               | 3   | 0   | Y                      |                              |                |                 | Y                      |                |                |          | Y  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 08:00 AM                     | TO | 09:00 AM | 990                               | 7   | 0   | Y                      |                              |                |                 | Y                      |                |                |          | Y  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 09:00 AM                     | TO | 10:00 AM | 934                               | 67  | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  |                |                |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 10:00 AM                     | TO | 11:00 AM | 906                               | 160 | 0   | Y                      | Y                            |                | Y               | Y                      |                | Y              | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 11:00 AM                     | TO | 12:00 PM | 992                               | 78  | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 12:00 PM                     | TO | 01:00 PM | 1,018                             | 44  | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 01:00 PM                     | TO | 02:00 PM | 1,041                             | 48  | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 02:00 PM                     | TO | 03:00 PM | 1,229                             | 48  | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 03:00 PM                     | TO | 04:00 PM | 1,162                             | 45  | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 04:00 PM                     | TO | 05:00 PM | 1,103                             | 29  | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 05:00 PM                     | TO | 06:00 PM | 1,075                             | 18  | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 06:00 PM                     | TO | 07:00 PM | 869                               | 19  | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 07:00 PM                     | TO | 08:00 PM | 750                               | 5   | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 08:00 PM                     | TO | 09:00 PM | 574                               | 4   | 0   | Y                      |                              |                |                 | Y                      | Y              |                | Y        | Y  | Y              | Y              |          | Y            | Y              |                | Y                          |           |                        |           |  |                |  |
| 09:00 PM                     | TO | 10:00 PM | 0                                 | 3   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 10:00 PM                     | TO | 11:00 PM | 0                                 | 2   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
| 11:00 PM                     | TO | 12:00 AM | 0                                 | 0   | 0   |                        |                              |                |                 |                        |                |                |          |  |                |                |          |              |                |                |                            |           |                        |           |  |                |  |
|                              |    |          | 13,580                            | 582 | 0   | 1                      |                              |                |                 | 3                      |                |                |          | 1  |                |                |          | 7            |                |                |                            | 3         |                        | 1         |  |                |  |
| 8 HOURS NEEDED NOT SATISFIED |    |          |                                   |     |     |                        | 8 HOURS NEEDED NOT SATISFIED |                |                 |                        |                |                |          | 8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED |                |                |          |              |                |                | 4 HRS NEEDED NOT SATISFIED |           | 1 HRS NEEDED SATISFIED |           |  |                |  |

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant  
 Condition A: Minimum Vehicular Volume  
 Condition B: Interruption of Continuous Traffic  
 Combination: Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

## H2OBX Campground - Saturday

### TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS - Existing Conditions (No Reductions)

Based on 2009 MUTCD

INTERSECTION NAME: Caratoke Highway US 158 at H2OBX Waterpark Driveway/ (Intersection 1)

DATE: 12/20/22

INTERSECTION CONDITION: Two-Way Stop Control

MAJOR STREET: Caratoke Highway US 158  
 MINOR STREET 1: H2OBX Waterpark Driveway  
 MINOR STREET 2: -

# OF APPROACH LANES: 4  
 # OF APPROACH LANES: 2  
 # OF APPROACH LANES: 2

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): Y  
 85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

USE 56% REDUCTION (Y OR N): N

REMOVE RT (Y OR N): N    N    N  
 % RT INCLUDE: 100%    100%    100%

| THRESHOLD VALUES     | Caratoke Highway US 158 | H2OBX Waterpark Driveway | - | WARRANT 1, Condition A |                 |                 |                              | WARRANT 1, Condition B |                |                |          | WARRANT 1, Combination Warrant |                |                |          |              |                |                |                              | WARRANT 2 | WARRANT 3              |
|----------------------|-------------------------|--------------------------|---|------------------------|-----------------|-----------------|------------------------------|------------------------|----------------|----------------|----------|--------------------------------|----------------|----------------|----------|--------------|----------------|----------------|------------------------------|-----------|------------------------|
|                      |                         |                          |   | MAJOR ST (NB+SB)       | MINOR ST 1 (EB) | MINOR ST 2 (WB) | BOTH MET                     | MAJOR STREET           | MINOR STREET 1 | MINOR STREET 2 | BOTH MET | CONDITION A                    |                |                |          | CONDITION B  |                |                |                              |           |                        |
|                      |                         |                          |   |                        |                 |                 |                              |                        |                |                |          | MAJOR STREET                   | MINOR STREET 1 | MINOR STREET 2 | BOTH MET | MAJOR STREET | MINOR STREET 1 | MINOR STREET 2 | BOTH MET                     |           |                        |
|                      |                         |                          |   |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 12:00 AM TO 01:00 AM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 01:00 AM TO 02:00 AM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 02:00 AM TO 03:00 AM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 03:00 AM TO 04:00 AM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 04:00 AM TO 05:00 AM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 05:00 AM TO 06:00 AM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 06:00 AM TO 07:00 AM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 07:00 AM TO 08:00 AM | 3,348                   | 6                        | 0 | Y                      |                 |                 |                              | Y                      |                |                |          | Y                              |                |                | Y        |              |                |                |                              |           |                        |
| 08:00 AM TO 09:00 AM | 3,725                   | 1                        | 0 | Y                      |                 |                 |                              | Y                      |                |                |          | Y                              |                |                | Y        |              |                |                |                              |           |                        |
| 09:00 AM TO 10:00 AM | 4,173                   | 16                       | 0 | Y                      |                 |                 |                              | Y                      |                |                |          | Y                              |                |                | Y        |              |                |                |                              |           |                        |
| 10:00 AM TO 11:00 AM | 4,051                   | 12                       | 0 | Y                      |                 |                 |                              | Y                      |                |                |          | Y                              |                |                | Y        |              |                |                |                              |           |                        |
| 11:00 AM TO 12:00 PM | 4,093                   | 11                       | 0 | Y                      |                 |                 |                              | Y                      |                |                |          | Y                              |                |                | Y        |              |                |                |                              |           |                        |
| 12:00 PM TO 01:00 PM | 3,458                   | 17                       | 0 | Y                      |                 |                 |                              | Y                      |                |                |          | Y                              |                |                | Y        |              |                |                |                              |           |                        |
| 01:00 PM TO 02:00 PM | 2,764                   | 41                       | 0 | Y                      |                 |                 |                              | Y                      |                |                |          | Y                              |                |                | Y        |              |                |                |                              |           |                        |
| 02:00 PM TO 03:00 PM | 2,873                   | 90                       | 0 | Y                      |                 |                 |                              | Y                      | Y              |                |          | Y                              |                |                | Y        | Y            |                |                | Y                            |           |                        |
| 03:00 PM TO 04:00 PM | 3,016                   | 128                      | 0 | Y                      |                 |                 |                              | Y                      | Y              |                |          | Y                              |                |                | Y        | Y            |                |                | Y                            | Y         |                        |
| 04:00 PM TO 05:00 PM | 3,141                   | 163                      | 0 | Y                      | Y               |                 | Y                            | Y                      | Y              |                |          | Y                              | Y              | Y              | Y        | Y            |                |                | Y                            | Y         |                        |
| 05:00 PM TO 06:00 PM | 2,547                   | 207                      | 0 | Y                      | Y               |                 | Y                            | Y                      | Y              |                |          | Y                              | Y              | Y              | Y        | Y            |                |                | Y                            | Y         |                        |
| 06:00 PM TO 07:00 PM | 2,075                   | 293                      | 0 | Y                      | Y               |                 | Y                            | Y                      | Y              |                |          | Y                              | Y              | Y              | Y        | Y            |                |                | Y                            | Y         |                        |
| 07:00 PM TO 08:00 PM | 1,396                   | 25                       | 0 | Y                      |                 |                 |                              | Y                      |                |                |          | Y                              |                |                | Y        |              |                |                |                              |           |                        |
| 08:00 PM TO 09:00 PM | 1,007                   | 0                        | 0 | Y                      |                 |                 |                              | Y                      |                |                |          | Y                              |                |                | Y        |              |                |                |                              |           |                        |
| 09:00 PM TO 10:00 PM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 10:00 PM TO 11:00 PM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
| 11:00 PM TO 12:00 AM | 0                       | 0                        | 0 |                        |                 |                 |                              |                        |                |                |          |                                |                |                |          |              |                |                |                              |           |                        |
|                      | 41,667                  | 1,010                    | 0 |                        |                 |                 | 3                            |                        |                |                |          |                                |                |                |          |              |                |                | 5                            |           | 4                      |
|                      |                         |                          |   |                        |                 |                 | 3 HOURS NEEDED NOT SATISFIED |                        |                |                |          |                                |                |                |          |              |                |                | 8 HOURS NEEDED NOT SATISFIED |           | 4 HRS NEEDED SATISFIED |

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant  
 Condition A: Minimum Vehicular Volume  
 Condition B: Interruption of Continuous Traffic  
 Combination: Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant  
 WARRANT 3 -- Peak Hour Warrant

## H2OBX Campground - Saturday

### TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS - Build Conditions (No Reductions)

Based on 2009 MUTCD

INTERSECTION NAME: Caratoke Highway US 158 at H2OBX Waterpark Driveway/ (Intersection 1)

DATE: 12/20/22

INTERSECTION CONDITION: Two-Way Stop Control

MAJOR STREET: Caratoke Highway US 158  
 MINOR STREET 1: H2OBX Waterpark Driveway  
 MINOR STREET 2: -

# OF APPROACH LANES: 4  
 # OF APPROACH LANES: 2  
 # OF APPROACH LANES: 2

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): Y  
 85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

USE 56% REDUCTION (Y OR N): N

REMOVE RT (Y OR N): Y Y Y  
 % RT INCLUDE: 0% 0% 0%

| THRESHOLD VALUES     | MAJOR ST (NB+SB) | MINOR ST 1 (EB) | MINOR ST 2 (WB) | WARRANT 1, Condition A |                |                |                              | WARRANT 1, Condition B |                |                |                              | WARRANT 1, Combination Warrant |                |                |  |              |                |                |                        | WARRANT 2 | WARRANT 3 |     |   |                        |    |    |   |   |   |
|----------------------|------------------|-----------------|-----------------|------------------------|----------------|----------------|------------------------------|------------------------|----------------|----------------|------------------------------|--------------------------------|----------------|----------------|--|--------------|----------------|----------------|------------------------|-----------|-----------|-----|---|------------------------|----|----|---|---|---|
|                      |                  |                 |                 | MAJOR STREET           | MINOR STREET 1 | MINOR STREET 2 | BOTH MET                     | MAJOR STREET           | MINOR STREET 1 | MINOR STREET 2 | BOTH MET                     | CONDITION A                    |                |                |  | CONDITION B  |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
|                      |                  |                 |                 |                        |                |                |                              |                        |                |                |                              | MAJOR STREET                   | MINOR STREET 1 | MINOR STREET 2 | BOTH MET   | MAJOR STREET | MINOR STREET 1 | MINOR STREET 2 | BOTH MET               |           |           |     |   |                        |    |    |   |   |   |
| 12:00 AM TO 01:00 AM | 0                | 4               | 0               |                        |                |                |                              |                        |                |                |                              | 420                            | 140            | 140            |  | 630          | 70             | 70             |                        | 480       | 160       | 160 |   | 720                    | 80 | 80 |   |   |   |
| 01:00 AM TO 02:00 AM | 0                | 0               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
| 02:00 AM TO 03:00 AM | 0                | 0               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
| 03:00 AM TO 04:00 AM | 0                | 0               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
| 04:00 AM TO 05:00 AM | 0                | 2               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
| 05:00 AM TO 06:00 AM | 2                | 0               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
| 06:00 AM TO 07:00 AM | 4                | 2               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
| 07:00 AM TO 08:00 AM | 3,558            | 12              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        | Y         |           |     |   |                        |    |    |   |   |   |
| 08:00 AM TO 09:00 AM | 3,964            | 7               | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        | Y         |           |     |   |                        |    |    |   |   |   |
| 09:00 AM TO 10:00 AM | 4,439            | 29              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        | Y         |           |     |   |                        |    |    |   |   |   |
| 10:00 AM TO 11:00 AM | 4,322            | 25              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        | Y         |           |     |   |                        |    |    |   |   |   |
| 11:00 AM TO 12:00 PM | 4,356            | 24              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        | Y         |           |     |   |                        |    |    |   |   |   |
| 12:00 PM TO 01:00 PM | 3,681            | 32              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        | Y         |           |     |   |                        |    |    |   |   |   |
| 01:00 PM TO 02:00 PM | 2,944            | 57              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        | Y         |           |     |   |                        |    |    |   |   |   |
| 02:00 PM TO 03:00 PM | 3,060            | 115             | 0               | Y                      |                |                |                              | Y                      | Y              |                | Y                            | Y                              | Y              |                | Y  | Y            | Y              |                | Y                      | Y         | Y         |     | Y | Y                      | Y  |    | Y | Y | Y |
| 03:00 PM TO 04:00 PM | 3,210            | 152             | 0               | Y                      | Y              |                | Y                            | Y                      | Y              |                | Y                            | Y                              | Y              |                | Y  | Y            | Y              |                | Y                      | Y         | Y         |     | Y | Y                      | Y  |    | Y | Y | Y |
| 04:00 PM TO 05:00 PM | 3,344            | 191             | 0               | Y                      | Y              |                | Y                            | Y                      | Y              |                | Y                            | Y                              | Y              | Y              | Y  | Y            | Y              | Y              | Y                      | Y         | Y         | Y   | Y | Y                      | Y  |    | Y | Y | Y |
| 05:00 PM TO 06:00 PM | 2,716            | 238             | 0               | Y                      | Y              |                | Y                            | Y                      | Y              | Y              | Y                            | Y                              | Y              | Y              | Y  | Y            | Y              | Y              | Y                      | Y         | Y         | Y   | Y | Y                      | Y  |    | Y | Y | Y |
| 06:00 PM TO 07:00 PM | 2,209            | 327             | 0               | Y                      | Y              |                | Y                            | Y                      | Y              | Y              | Y                            | Y                              | Y              | Y              | Y  | Y            | Y              | Y              | Y                      | Y         | Y         | Y   | Y | Y                      | Y  |    | Y | Y | Y |
| 07:00 PM TO 08:00 PM | 1,491            | 35              | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        | Y         |           |     |   |                        |    |    |   |   |   |
| 08:00 PM TO 09:00 PM | 1,080            | 8               | 0               | Y                      |                |                |                              | Y                      |                |                |                              | Y                              |                |                |  | Y            |                |                |                        | Y         |           |     |   |                        |    |    |   |   |   |
| 09:00 PM TO 10:00 PM | 4                | 2               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
| 10:00 PM TO 11:00 PM | 6                | 2               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
| 11:00 PM TO 12:00 AM | 0                | 2               | 0               |                        |                |                |                              |                        |                |                |                              |                                |                |                |  |              |                |                |                        |           |           |     |   |                        |    |    |   |   |   |
|                      | 44,390           | 1,266           | 0               |                        |                |                | 4                            |                        |                |                | 5                            |                                |                |                | 3  |              |                |                | 5                      |           |           |     |   | 5                      |    |    |   | 5 | 5 |
|                      |                  |                 |                 |                        |                |                | 8 HOURS NEEDED NOT SATISFIED |                        |                |                | 8 HOURS NEEDED NOT SATISFIED |                                |                |                | 8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED |              |                |                | 4 HRS NEEDED SATISFIED |           |           |     |   | 1 HRS NEEDED SATISFIED |    |    |   |   |   |

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant  
 Condition A: Minimum Vehicular Volume  
 Condition B: Interruption of Continuous Traffic  
 Combination: Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

# H2OBX Campground - Saturday (NBL)

## TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS - Existing Conditions (With Reductions)

Based on 2009 MUTCD

INTERSECTION NAME: Caratoke Highway US 158 - SB Only at Caratoke Highway US 158 - NBL/ (Intersection 1)

DATE: 12/20/22

INTERSECTION CONDITION: Two-Way Stop Control

MAJOR STREET: Caratoke Highway US 158 - SB Only

# OF APPROACH LANES: 2

MINOR STREET 1: Caratoke Highway US 158 - NBL

# OF APPROACH LANES: 1

MINOR STREET 2: -

# OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

USE 56% REDUCTION (Y OR N): Y

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

REMOVE RT (Y OR N): N N N  
 % RT INCLUDE: 100% 100% 100%

|                  |    |          | Caratoke Highway US 158 - SB Only | Caratoke Highway US 158 - NBL | - | WARRANT 1, Condition A |                              |                |          | WARRANT 1, Condition B |  |                |          | WARRANT 1, Combination Warrant |                |                |          |              |                            |                |                            | WARRANT 2 | WARRANT 3 |              |
|------------------|----|----------|-----------------------------------|-------------------------------|---|------------------------|------------------------------|----------------|----------|------------------------|--|----------------|----------|--------------------------------|----------------|----------------|----------|--------------|----------------------------|----------------|----------------------------|-----------|-----------|--------------|
|                  |    |          |                                   |                               |   | MAJOR STREET           | MINOR STREET 1               | MINOR STREET 2 | BOTH MET | MAJOR STREET           | MINOR STREET 1   | MINOR STREET 2 | BOTH MET | CONDITION A                    |                |                |          | CONDITION B  |                            |                |                            |           |           |              |
|                  |    |          |                                   |                               |   |                        |                              |                |          |                        |  |                |          | MAJOR STREET                   | MINOR STREET 1 | MINOR STREET 2 | BOTH MET | MAJOR STREET | MINOR STREET 1             | MINOR STREET 2 | BOTH MET                   |           |           |              |
|                  |    |          |                                   |                               |   |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           | MAJOR STREET |
| THRESHOLD VALUES |    |          |                                   |                               |   | 420                    | 105                          | 105            |          | 630                    | 53   | 53             |          | 336                            | 84             | 84             |          | 504          | 42                         | 42             |                            |           |           |              |
| 12:00 AM         | TO | 01:00 AM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
| 01:00 AM         | TO | 02:00 AM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
| 02:00 AM         | TO | 03:00 AM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
| 03:00 AM         | TO | 04:00 AM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
| 04:00 AM         | TO | 05:00 AM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
| 05:00 AM         | TO | 06:00 AM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
| 06:00 AM         | TO | 07:00 AM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
| 07:00 AM         | TO | 08:00 AM | 1,149                             | 2                             | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 08:00 AM         | TO | 09:00 AM | 1,488                             | 6                             | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 09:00 AM         | TO | 10:00 AM | 1,851                             | 31                            | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 10:00 AM         | TO | 11:00 AM | 1,932                             | 72                            | 0 | Y                      |                              |                |          | Y                      | Y  |                | Y        | Y                              | Y              |                | Y        | Y            | Y                          |                | Y                          | Y         |           |              |
| 11:00 AM         | TO | 12:00 PM | 1,965                             | 54                            | 0 | Y                      |                              |                |          | Y                      | Y  |                | Y        | Y                              | Y              |                | Y        | Y            | Y                          |                | Y                          |           |           |              |
| 12:00 PM         | TO | 01:00 PM | 2,024                             | 44                            | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            | Y                          |                | Y                          |           |           |              |
| 01:00 PM         | TO | 02:00 PM | 1,790                             | 26                            | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 02:00 PM         | TO | 03:00 PM | 1,949                             | 24                            | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 03:00 PM         | TO | 04:00 PM | 1,965                             | 23                            | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 04:00 PM         | TO | 05:00 PM | 2,007                             | 10                            | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 05:00 PM         | TO | 06:00 PM | 1,437                             | 8                             | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 06:00 PM         | TO | 07:00 PM | 1,161                             | 14                            | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 07:00 PM         | TO | 08:00 PM | 723                               | 0                             | 0 | Y                      |                              |                |          | Y                      |  |                |          | Y                              |                |                |          | Y            |                            |                |                            |           |           |              |
| 08:00 PM         | TO | 09:00 PM | 465                               | 0                             | 0 | Y                      |                              |                |          |                        |  |                |          | Y                              |                |                |          |              |                            |                |                            |           |           |              |
| 09:00 PM         | TO | 10:00 PM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
| 10:00 PM         | TO | 11:00 PM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
| 11:00 PM         | TO | 12:00 AM | 0                                 | 0                             | 0 |                        |                              |                |          |                        |  |                |          |                                |                |                |          |              |                            |                |                            |           |           |              |
|                  |    |          | 21,906                            | 314                           | 0 | 0                      |                              |                |          | 2                      |  |                |          | 0                              |                |                |          |              |                            |                |                            | 3         | 1         | 0            |
|                  |    |          | 8 HOURS NEEDED NOT SATISFIED      |                               |   |                        | 8 HOURS NEEDED NOT SATISFIED |                |          |                        | 8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED |                |          |                                |                |                |          |              | 4 HRS NEEDED NOT SATISFIED |                | 1 HRS NEEDED NOT SATISFIED |           |           |              |

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant  
 Condition A: Minimum Vehicular Volume  
 Condition B: Interruption of Continuous Traffic  
 Combination: Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

## H2OBX Campground - Saturday (NBL)

### TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS - Build Conditions (With Reductions)

Based on 2009 MUTCD

INTERSECTION NAME: Caratoke Highway US 158 - SB Only at Caratoke Highway US 158 - NBL - (Intersection 1)

DATE: 12/20/22

INTERSECTION CONDITION: Two-Way Stop Control

MAJOR STREET: Caratoke Highway US 158 - SB Only  
 MINOR STREET 1: Caratoke Highway US 158 - NBL  
 MINOR STREET 2: -

# OF APPROACH LANES: 2  
 # OF APPROACH LANES: 1  
 # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N  
 85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

USE 56% REDUCTION (Y OR N): Y

REMOVE RT (Y OR N): N Y Y  
 % RT INCLUDE: 100% 0% 0%

|                              |    |          | Caratoke Highway US 158 - SB Only | Caratoke Highway US 158 - NBL | - | WARRANT 1, Condition A       |     |      |            | WARRANT 1, Condition B |                 |  |                | WARRANT 1, Combination Warrant |          |              |                |                |          |                            |                | WARRANT 2 | WARRANT 3 |                        |          |              |                |                |          |              |                |                |          |
|------------------------------|----|----------|-----------------------------------|-------------------------------|---|------------------------------|-----|------|------------|------------------------|-----------------|--|----------------|--------------------------------|----------|--------------|----------------|----------------|----------|----------------------------|----------------|-----------|-----------|------------------------|----------|--------------|----------------|----------------|----------|--------------|----------------|----------------|----------|
|                              |    |          |                                   |                               |   | MAJOR ST                     | SB  | BOTH | APPROACHES | MINOR ST 1 (NBL)       | MINOR ST 2 (WB) | MAJOR STREET   | MINOR STREET 1 | MINOR STREET 2                 | BOTH MET | MAJOR STREET | MINOR STREET 1 | MINOR STREET 2 | BOTH MET | CONDITION A                |                |           |           | CONDITION B            |          |              |                |                |          |              |                |                |          |
|                              |    |          |                                   |                               |   |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          | MAJOR STREET               | MINOR STREET 1 |           |           | MINOR STREET 2         | BOTH MET | MAJOR STREET | MINOR STREET 1 | MINOR STREET 2 | BOTH MET | MAJOR STREET | MINOR STREET 1 | MINOR STREET 2 | BOTH MET |
|                              |    |          |                                   |                               |   |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| THRESHOLD VALUES             |    |          |                                   |                               |   | 420                          | 105 | 105  |            | 630                    | 53              | 53   |                | 336                            | 84       | 84           |                | 504            | 42       | 42                         |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 12:00 AM                     | TO | 01:00 AM | 0                                 | 0                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 01:00 AM                     | TO | 02:00 AM | 0                                 | 0                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 02:00 AM                     | TO | 03:00 AM | 0                                 | 0                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 03:00 AM                     | TO | 04:00 AM | 0                                 | 0                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 04:00 AM                     | TO | 05:00 AM | 0                                 | 0                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 05:00 AM                     | TO | 06:00 AM | 0                                 | 1                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 06:00 AM                     | TO | 07:00 AM | 0                                 | 2                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 07:00 AM                     | TO | 08:00 AM | 1,219                             | 5                             | 0 | Y                            |     |      |            | Y                      |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 08:00 AM                     | TO | 09:00 AM | 1,579                             | 12                            | 0 | Y                            |     |      |            | Y                      |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 09:00 AM                     | TO | 10:00 AM | 1,964                             | 39                            | 0 | Y                            |     |      |            | Y                      |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 10:00 AM                     | TO | 11:00 AM | 2,050                             | 88                            | 0 | Y                            |     |      | Y          | Y                      |                 | Y  | Y              | Y                              | Y        | Y            |                | Y              | Y        |                            | Y              | Y         |           | Y                      | Y        |              |                |                |          |              |                |                |          |
| 11:00 AM                     | TO | 12:00 PM | 2,085                             | 64                            | 0 | Y                            |     |      | Y          | Y                      |                 | Y  | Y              | Y                              | Y        | Y            |                | Y              | Y        |                            | Y              | Y         |           | Y                      | Y        |              |                |                |          |              |                |                |          |
| 12:00 PM                     | TO | 01:00 PM | 2,147                             | 53                            | 0 | Y                            |     |      | Y          | Y                      |                 | Y  | Y              | Y                              | Y        | Y            |                | Y              | Y        |                            | Y              | Y         |           | Y                      | Y        |              |                |                |          |              |                |                |          |
| 01:00 PM                     | TO | 02:00 PM | 1,899                             | 34                            | 0 | Y                            |     |      | Y          |                        |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 02:00 PM                     | TO | 03:00 PM | 2,068                             | 31                            | 0 | Y                            |     |      | Y          |                        |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 03:00 PM                     | TO | 04:00 PM | 2,085                             | 29                            | 0 | Y                            |     |      | Y          |                        |                 |  | Y              | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 04:00 PM                     | TO | 05:00 PM | 2,129                             | 17                            | 0 | Y                            |     |      | Y          |                        |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 05:00 PM                     | TO | 06:00 PM | 1,525                             | 15                            | 0 | Y                            |     |      | Y          |                        |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 06:00 PM                     | TO | 07:00 PM | 1,232                             | 19                            | 0 | Y                            |     |      | Y          |                        |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 07:00 PM                     | TO | 08:00 PM | 767                               | 5                             | 0 | Y                            |     |      | Y          |                        |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 08:00 PM                     | TO | 09:00 PM | 493                               | 6                             | 0 | Y                            |     |      | Y          |                        |                 |  |                | Y                              |          |              |                |                | Y        |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 09:00 PM                     | TO | 10:00 PM | 0                                 | 2                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 10:00 PM                     | TO | 11:00 PM | 0                                 | 3                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
| 11:00 PM                     | TO | 12:00 AM | 0                                 | 0                             | 0 |                              |     |      |            |                        |                 |  |                |                                |          |              |                |                |          |                            |                |           |           |                        |          |              |                |                |          |              |                |                |          |
|                              |    |          | 23,242                            | 425                           | 0 | 0                            |     |      |            | 3                      |                 |  |                | 1                              |          |              |                |                |          |                            |                | 3         |           |                        |          | 2            |                | 1              |          |              |                |                |          |
| 8 HOURS NEEDED NOT SATISFIED |    |          |                                   |                               |   | 8 HOURS NEEDED NOT SATISFIED |     |      |            |                        |                 | 8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED |                |                                |          |              |                |                |          | 4 HRS NEEDED NOT SATISFIED |                |           |           | 1 HRS NEEDED SATISFIED |          |              |                |                |          |              |                |                |          |

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant  
 Condition A: Minimum Vehicular Volume  
 Condition B: Interruption of Continuous Traffic  
 Combination: Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant



# Stormwater Management Plan Narrative

OBX Waterpark Adventure – Currituck County, NC

September 26, 2024

## Appendix 2: NOAA Precipitation Intensity (Currituck County)



**NOAA Atlas 14, Volume 2, Version 3**  
**Location name: Powells Point, North Carolina,**  
**US\***  
**Latitude: 36.1120°, Longitude: -75.8345°**  
**Elevation: 6 ft\***  
 \* source: Google Maps



**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**

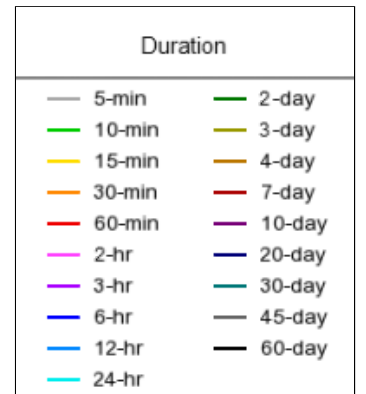
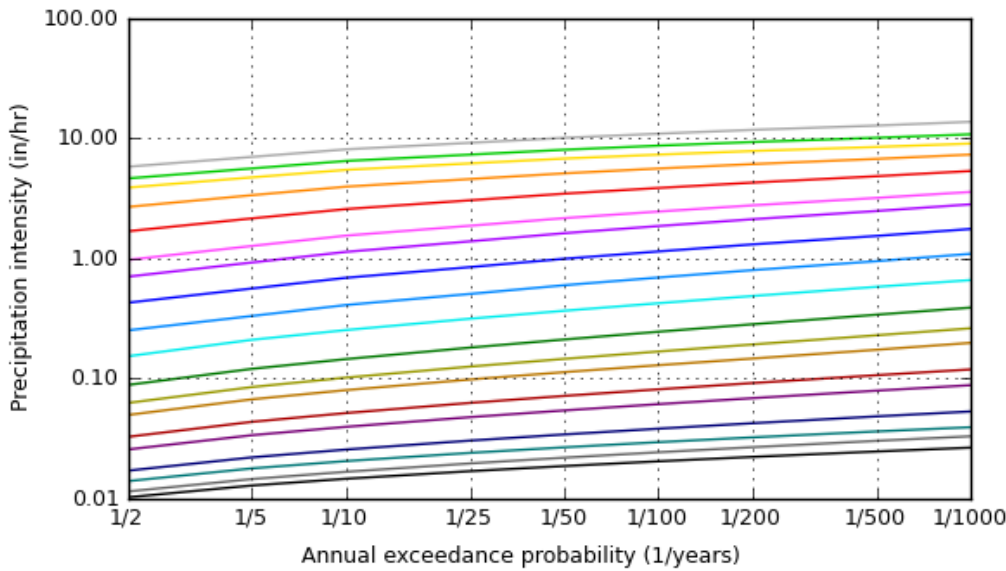
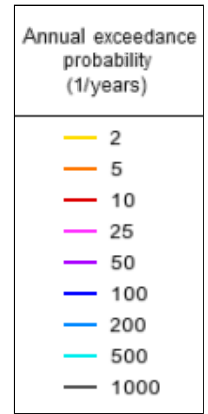
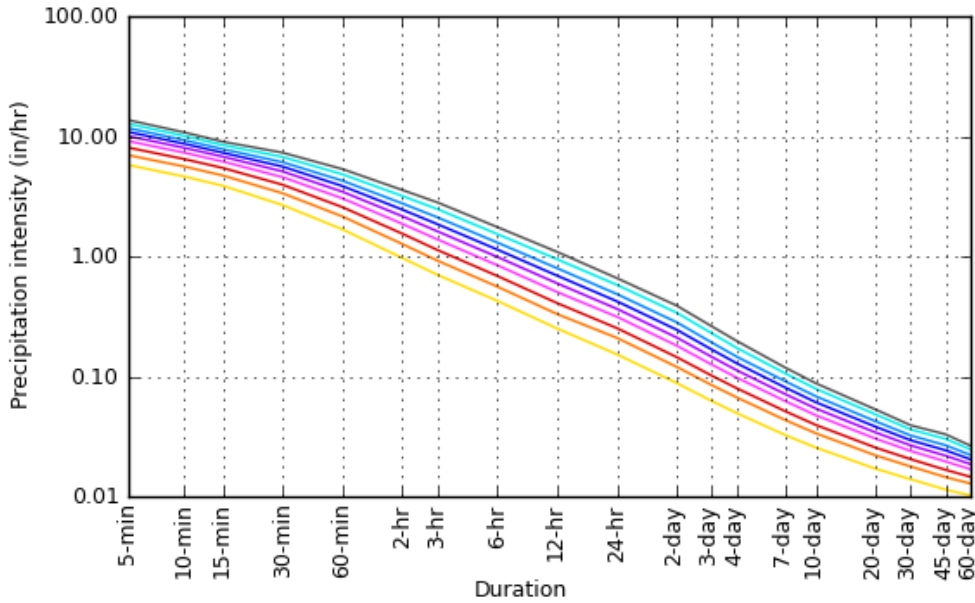
| <b>AMS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)<sup>1</sup></b> |  |                               |                               |                               |                               |                               |                               |                               |                               |
|---|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| <b>Duration</b>   | <b>Annual exceedance probability (1/years)</b> |                               |                               |                               |                               |                               |                               |                               |                               |
|   | <b>1/2</b>                                     | <b>1/5</b>                    | <b>1/10</b>                   | <b>1/25</b>                   | <b>1/50</b>                   | <b>1/100</b>                  | <b>1/200</b>                  | <b>1/500</b>                  | <b>1/1000</b>                 |
| <b>5-min</b>  | <b>5.80</b><br>(5.28-6.37)                     | <b>7.00</b><br>(6.37-7.69)    | <b>8.09</b><br>(7.34-8.88)    | <b>9.17</b><br>(8.29-10.1)    | <b>10.1</b><br>(9.07-11.1)    | <b>10.9</b><br>(9.79-12.0)    | <b>11.7</b><br>(10.5-12.9)    | <b>12.8</b><br>(11.3-14.0)    | <b>13.7</b><br>(12.0-15.1)    |
| <b>10-min</b>   | <b>4.63</b><br>(4.22-5.09)                     | <b>5.61</b><br>(5.11-6.16)    | <b>6.47</b><br>(5.87-7.11)    | <b>7.31</b><br>(6.61-8.02)    | <b>8.03</b><br>(7.23-8.80)    | <b>8.68</b><br>(7.78-9.51)    | <b>9.31</b><br>(8.30-10.2)    | <b>10.1</b><br>(8.92-11.1)    | <b>10.8</b><br>(9.47-11.9)    |
| <b>15-min</b>   | <b>3.88</b><br>(3.53-4.27)                     | <b>4.73</b><br>(4.31-5.20)    | <b>5.46</b><br>(4.95-6.00)    | <b>6.18</b><br>(5.58-6.77)    | <b>6.78</b><br>(6.10-7.42)    | <b>7.31</b><br>(6.56-8.01)    | <b>7.83</b><br>(6.98-8.58)    | <b>8.47</b><br>(7.48-9.29)    | <b>9.04</b><br>(7.92-9.93)    |
| <b>30-min</b>   | <b>2.68</b><br>(2.44-2.95)                     | <b>3.36</b><br>(3.06-3.69)    | <b>3.96</b><br>(3.59-4.34)    | <b>4.58</b><br>(4.14-5.02)    | <b>5.11</b><br>(4.59-5.59)    | <b>5.60</b><br>(5.02-6.14)    | <b>6.10</b><br>(5.44-6.68)    | <b>6.74</b><br>(5.96-7.39)    | <b>7.32</b><br>(6.42-8.04)    |
| <b>60-min</b>   | <b>1.68</b><br>(1.53-1.85)                     | <b>2.15</b><br>(1.96-2.37)    | <b>2.58</b><br>(2.34-2.83)    | <b>3.05</b><br>(2.75-3.34)    | <b>3.46</b><br>(3.11-3.79)    | <b>3.86</b><br>(3.46-4.23)    | <b>4.28</b><br>(3.81-4.68)    | <b>4.83</b><br>(4.27-5.30)    | <b>5.34</b><br>(4.68-5.87)    |
| <b>2-hr</b>   | <b>0.972</b><br>(0.880-1.07)                   | <b>1.27</b><br>(1.15-1.40)    | <b>1.55</b><br>(1.40-1.70)    | <b>1.87</b><br>(1.68-2.06)    | <b>2.17</b><br>(1.94-2.37)    | <b>2.46</b><br>(2.18-2.69)    | <b>2.77</b><br>(2.45-3.03)    | <b>3.19</b><br>(2.80-3.50)    | <b>3.58</b><br>(3.11-3.93)    |
| <b>3-hr</b>   | <b>0.705</b><br>(0.637-0.783)                  | <b>0.925</b><br>(0.835-1.03)  | <b>1.13</b><br>(1.02-1.26)    | <b>1.39</b><br>(1.24-1.53)    | <b>1.62</b><br>(1.44-1.79)    | <b>1.86</b><br>(1.65-2.05)    | <b>2.12</b><br>(1.86-2.33)    | <b>2.48</b><br>(2.16-2.73)    | <b>2.82</b><br>(2.43-3.10)    |
| <b>6-hr</b>   | <b>0.428</b><br>(0.387-0.475)                  | <b>0.562</b><br>(0.507-0.624) | <b>0.690</b><br>(0.620-0.765) | <b>0.847</b><br>(0.757-0.937) | <b>0.994</b><br>(0.883-1.09)  | <b>1.14</b><br>(1.01-1.26)    | <b>1.31</b><br>(1.14-1.44)    | <b>1.54</b><br>(1.33-1.69)    | <b>1.76</b><br>(1.50-1.93)    |
| <b>12-hr</b>  | <b>0.252</b><br>(0.227-0.282)                  | <b>0.332</b><br>(0.298-0.371) | <b>0.410</b><br>(0.367-0.457) | <b>0.507</b><br>(0.451-0.563) | <b>0.599</b><br>(0.529-0.663) | <b>0.694</b><br>(0.607-0.768) | <b>0.799</b><br>(0.692-0.884) | <b>0.949</b><br>(0.810-1.05)  | <b>1.09</b><br>(0.920-1.21)   |
| <b>24-hr</b>  | <b>0.153</b><br>(0.141-0.167)                  | <b>0.210</b><br>(0.193-0.229) | <b>0.254</b><br>(0.232-0.276) | <b>0.315</b><br>(0.287-0.342) | <b>0.367</b><br>(0.331-0.398) | <b>0.424</b><br>(0.379-0.459) | <b>0.487</b><br>(0.430-0.528) | <b>0.581</b><br>(0.504-0.633) | <b>0.661</b><br>(0.565-0.724) |
| <b>2-day</b>  | <b>0.089</b><br>(0.081-0.097)                  | <b>0.121</b><br>(0.111-0.132) | <b>0.145</b><br>(0.133-0.159) | <b>0.181</b><br>(0.164-0.198) | <b>0.212</b><br>(0.190-0.230) | <b>0.246</b><br>(0.218-0.268) | <b>0.283</b><br>(0.249-0.310) | <b>0.340</b><br>(0.293-0.374) | <b>0.390</b><br>(0.330-0.430) |
| <b>3-day</b>  | <b>0.063</b><br>(0.058-0.069)                  | <b>0.085</b><br>(0.078-0.093) | <b>0.102</b><br>(0.093-0.111) | <b>0.126</b><br>(0.115-0.137) | <b>0.146</b><br>(0.132-0.159) | <b>0.168</b><br>(0.150-0.183) | <b>0.192</b><br>(0.170-0.210) | <b>0.229</b><br>(0.199-0.252) | <b>0.262</b><br>(0.224-0.289) |
| <b>4-day</b>  | <b>0.050</b><br>(0.046-0.054)                  | <b>0.067</b><br>(0.062-0.073) | <b>0.080</b><br>(0.074-0.087) | <b>0.098</b><br>(0.090-0.107) | <b>0.113</b><br>(0.103-0.123) | <b>0.129</b><br>(0.116-0.141) | <b>0.147</b><br>(0.130-0.160) | <b>0.174</b><br>(0.152-0.190) | <b>0.198</b><br>(0.171-0.219) |
| <b>7-day</b>  | <b>0.033</b><br>(0.030-0.036)                  | <b>0.044</b><br>(0.040-0.048) | <b>0.052</b><br>(0.048-0.056) | <b>0.063</b><br>(0.057-0.068) | <b>0.072</b><br>(0.065-0.078) | <b>0.081</b><br>(0.073-0.088) | <b>0.092</b><br>(0.082-0.100) | <b>0.107</b><br>(0.094-0.117) | <b>0.119</b><br>(0.103-0.131) |
| <b>10-day</b>   | <b>0.026</b><br>(0.024-0.028)                  | <b>0.034</b><br>(0.031-0.036) | <b>0.040</b><br>(0.037-0.043) | <b>0.048</b><br>(0.044-0.051) | <b>0.054</b><br>(0.050-0.059) | <b>0.061</b><br>(0.056-0.066) | <b>0.069</b><br>(0.062-0.074) | <b>0.079</b><br>(0.070-0.086) | <b>0.088</b><br>(0.077-0.096) |
| <b>20-day</b>   | <b>0.017</b><br>(0.016-0.018)                  | <b>0.022</b><br>(0.021-0.024) | <b>0.026</b><br>(0.024-0.027) | <b>0.031</b><br>(0.028-0.033) | <b>0.034</b><br>(0.032-0.037) | <b>0.038</b><br>(0.035-0.041) | <b>0.043</b><br>(0.039-0.046) | <b>0.048</b><br>(0.044-0.052) | <b>0.053</b><br>(0.047-0.058) |
| <b>30-day</b>   | <b>0.014</b><br>(0.013-0.015)                  | <b>0.018</b><br>(0.017-0.019) | <b>0.021</b><br>(0.019-0.022) | <b>0.024</b><br>(0.023-0.026) | <b>0.027</b><br>(0.025-0.029) | <b>0.030</b><br>(0.027-0.032) | <b>0.032</b><br>(0.030-0.035) | <b>0.036</b><br>(0.033-0.039) | <b>0.039</b><br>(0.036-0.043) |
| <b>45-day</b>   | <b>0.011</b><br>(0.011-0.012)                  | <b>0.015</b><br>(0.014-0.016) | <b>0.017</b><br>(0.016-0.018) | <b>0.020</b><br>(0.018-0.021) | <b>0.022</b><br>(0.020-0.023) | <b>0.024</b><br>(0.022-0.026) | <b>0.027</b><br>(0.025-0.029) | <b>0.030</b><br>(0.027-0.033) | <b>0.033</b><br>(0.030-0.036) |
| <b>60-day</b>   | <b>0.010</b><br>(0.010-0.011)                  | <b>0.013</b><br>(0.012-0.014) | <b>0.015</b><br>(0.014-0.016) | <b>0.017</b><br>(0.016-0.018) | <b>0.019</b><br>(0.018-0.020) | <b>0.021</b><br>(0.019-0.022) | <b>0.022</b><br>(0.021-0.024) | <b>0.025</b><br>(0.023-0.026) | <b>0.027</b><br>(0.024-0.029) |

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of annual maxima series (AMS). 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 annual exceedance probability) 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

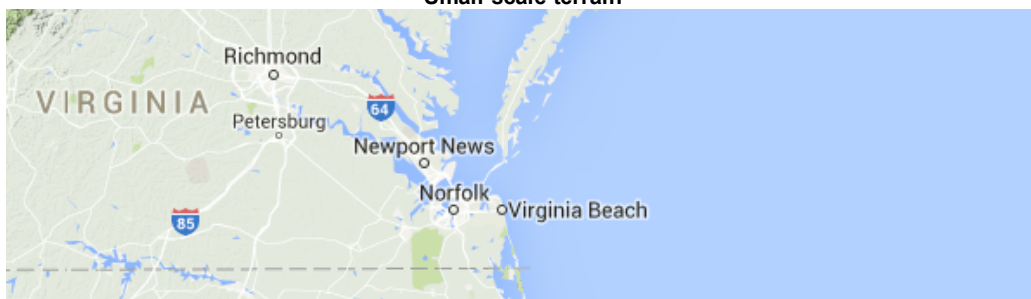
AMS-based intensity-duration-frequency (IDF) curves  
Latitude: 36.1120°, Longitude: -75.8345°

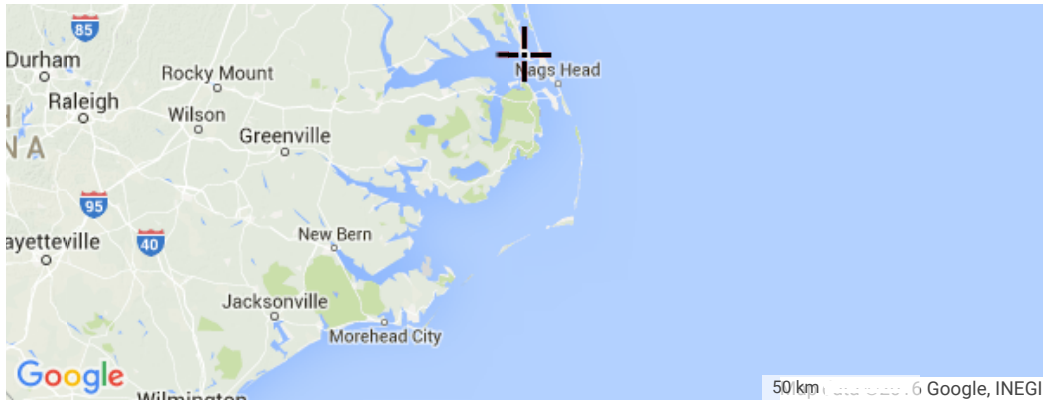


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### Maps & aerials

#### Small scale terrain

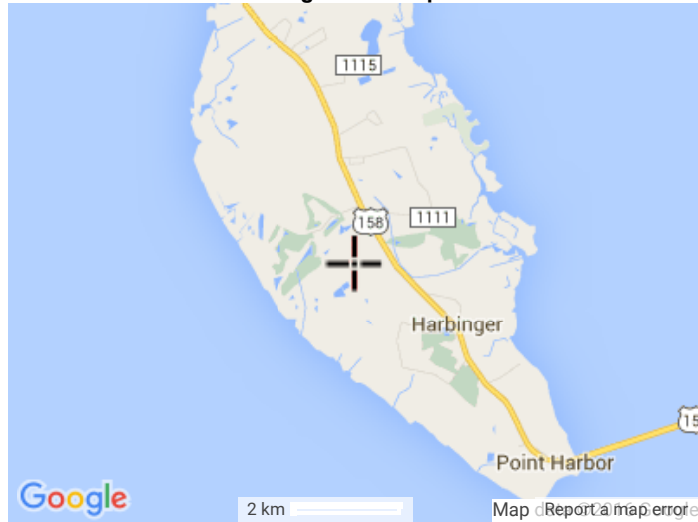




Large scale terrain



Large scale map



Large scale aerial





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**NOAA Atlas 14, Volume 2, Version 3**  
**Location name: Powells Point, North Carolina,**  
**US\***  
**Latitude: 36.1120°, Longitude: -75.8345°**  
**Elevation: 6 ft\***  
 \* source: Google Maps



**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**

| <b>AMS-based point precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b> |  |                               |                               |                               |                               |                               |                              |                             |                            |
|--|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|----------------------------|
| <b>Duration</b>  | <b>Annual exceedance probability (1/years)</b> |                               |                               |                               |                               |                               |                              |                             |                            |
|  | <b>1/2</b>                                     | <b>1/5</b>                    | <b>1/10</b>                   | <b>1/25</b>                   | <b>1/50</b>                   | <b>1/100</b>                  | <b>1/200</b>                 | <b>1/500</b>                | <b>1/1000</b>              |
| <b>5-min</b>   | <b>0.483</b><br>(0.440-0.531)                  | <b>0.583</b><br>(0.531-0.641) | <b>0.674</b><br>(0.612-0.740) | <b>0.764</b><br>(0.691-0.838) | <b>0.840</b><br>(0.756-0.921) | <b>0.910</b><br>(0.816-0.997) | <b>0.979</b><br>(0.872-1.07) | <b>1.06</b><br>(0.940-1.17) | <b>1.14</b><br>(1.00-1.25) |
| <b>10-min</b>  | <b>0.772</b><br>(0.703-0.849)                  | <b>0.935</b><br>(0.851-1.03)  | <b>1.08</b><br>(0.979-1.19)   | <b>1.22</b><br>(1.10-1.34)    | <b>1.34</b><br>(1.21-1.47)    | <b>1.45</b><br>(1.30-1.58)    | <b>1.55</b><br>(1.38-1.70)   | <b>1.68</b><br>(1.49-1.84)  | <b>1.80</b><br>(1.58-1.98) |
| <b>15-min</b>  | <b>0.971</b><br>(0.883-1.07)                   | <b>1.18</b><br>(1.08-1.30)    | <b>1.36</b><br>(1.24-1.50)    | <b>1.54</b><br>(1.40-1.69)    | <b>1.70</b><br>(1.52-1.86)    | <b>1.83</b><br>(1.64-2.00)    | <b>1.96</b><br>(1.75-2.14)   | <b>2.12</b><br>(1.87-2.32)  | <b>2.26</b><br>(1.98-2.48) |
| <b>30-min</b>  | <b>1.34</b><br>(1.22-1.48)                     | <b>1.68</b><br>(1.53-1.85)    | <b>1.98</b><br>(1.79-2.17)    | <b>2.29</b><br>(2.07-2.51)    | <b>2.55</b><br>(2.30-2.80)    | <b>2.80</b><br>(2.51-3.07)    | <b>3.05</b><br>(2.72-3.34)   | <b>3.37</b><br>(2.98-3.70)  | <b>3.66</b><br>(3.21-4.02) |
| <b>60-min</b>  | <b>1.68</b><br>(1.53-1.85)                     | <b>2.15</b><br>(1.96-2.37)    | <b>2.58</b><br>(2.34-2.83)    | <b>3.05</b><br>(2.75-3.34)    | <b>3.46</b><br>(3.11-3.79)    | <b>3.86</b><br>(3.46-4.23)    | <b>4.28</b><br>(3.81-4.68)   | <b>4.83</b><br>(4.27-5.30)  | <b>5.34</b><br>(4.68-5.87) |
| <b>2-hr</b>  | <b>1.94</b><br>(1.76-2.15)                     | <b>2.54</b><br>(2.30-2.80)    | <b>3.10</b><br>(2.79-3.41)    | <b>3.74</b><br>(3.36-4.11)    | <b>4.33</b><br>(3.87-4.75)    | <b>4.91</b><br>(4.37-5.39)    | <b>5.53</b><br>(4.89-6.07)   | <b>6.38</b><br>(5.59-7.00)  | <b>7.15</b><br>(6.22-7.85) |
| <b>3-hr</b>  | <b>2.12</b><br>(1.91-2.35)                     | <b>2.78</b><br>(2.51-3.08)    | <b>3.41</b><br>(3.07-3.77)    | <b>4.17</b><br>(3.73-4.61)    | <b>4.87</b><br>(4.33-5.37)    | <b>5.58</b><br>(4.95-6.15)    | <b>6.37</b><br>(5.59-7.00)   | <b>7.45</b><br>(6.48-8.20)  | <b>8.47</b><br>(7.29-9.32) |
| <b>6-hr</b>  | <b>2.56</b><br>(2.32-2.85)                     | <b>3.37</b><br>(3.04-3.74)    | <b>4.13</b><br>(3.71-4.58)    | <b>5.07</b><br>(4.54-5.61)    | <b>5.95</b><br>(5.29-6.55)    | <b>6.85</b><br>(6.04-7.53)    | <b>7.83</b><br>(6.85-8.60)   | <b>9.22</b><br>(7.96-10.1)  | <b>10.5</b><br>(8.99-11.6) |
| <b>12-hr</b>   | <b>3.04</b><br>(2.73-3.40)                     | <b>4.00</b><br>(3.60-4.47)    | <b>4.94</b><br>(4.42-5.51)    | <b>6.11</b><br>(5.43-6.79)    | <b>7.21</b><br>(6.37-7.99)    | <b>8.36</b><br>(7.31-9.25)    | <b>9.63</b><br>(8.34-10.7)   | <b>11.4</b><br>(9.76-12.7)  | <b>13.2</b><br>(11.1-14.6) |
| <b>24-hr</b>   | <b>3.68</b><br>(3.39-4.02)                     | <b>5.05</b><br>(4.64-5.50)    | <b>6.08</b><br>(5.58-6.62)    | <b>7.57</b><br>(6.88-8.21)    | <b>8.81</b><br>(7.94-9.55)    | <b>10.2</b><br>(9.09-11.0)    | <b>11.7</b><br>(10.3-12.7)   | <b>13.9</b><br>(12.1-15.2)  | <b>15.9</b><br>(13.6-17.4) |
| <b>2-day</b>   | <b>4.25</b><br>(3.90-4.66)                     | <b>5.79</b><br>(5.32-6.33)    | <b>6.98</b><br>(6.38-7.62)    | <b>8.70</b><br>(7.89-9.48)    | <b>10.2</b><br>(9.13-11.1)    | <b>11.8</b><br>(10.5-12.8)    | <b>13.6</b><br>(11.9-14.9)   | <b>16.3</b><br>(14.1-18.0)  | <b>18.7</b><br>(15.8-20.7) |
| <b>3-day</b>   | <b>4.51</b><br>(4.16-4.94)                     | <b>6.12</b><br>(5.64-6.69)    | <b>7.34</b><br>(6.73-8.00)    | <b>9.07</b><br>(8.25-9.87)    | <b>10.5</b><br>(9.49-11.4)    | <b>12.1</b><br>(10.8-13.2)    | <b>13.8</b><br>(12.2-15.1)   | <b>16.5</b><br>(14.3-18.1)  | <b>18.9</b><br>(16.1-20.8) |
| <b>4-day</b>   | <b>4.78</b><br>(4.42-5.22)                     | <b>6.46</b><br>(5.96-7.04)    | <b>7.70</b><br>(7.08-8.38)    | <b>9.44</b><br>(8.61-10.3)    | <b>10.9</b><br>(9.85-11.8)    | <b>12.4</b><br>(11.1-13.5)    | <b>14.1</b><br>(12.5-15.4)   | <b>16.7</b><br>(14.6-18.3)  | <b>19.0</b><br>(16.4-21.0) |
| <b>7-day</b>   | <b>5.50</b><br>(5.09-6.00)                     | <b>7.34</b><br>(6.77-7.98)    | <b>8.69</b><br>(7.98-9.43)    | <b>10.6</b><br>(9.64-11.4)    | <b>12.1</b><br>(10.9-13.1)    | <b>13.7</b><br>(12.3-14.8)    | <b>15.4</b><br>(13.7-16.8)   | <b>17.9</b><br>(15.7-19.6)  | <b>20.0</b><br>(17.3-22.0) |
| <b>10-day</b>  | <b>6.17</b><br>(5.75-6.66)                     | <b>8.12</b><br>(7.55-8.75)    | <b>9.53</b><br>(8.84-10.3)    | <b>11.5</b><br>(10.6-12.4)    | <b>13.0</b><br>(11.9-14.0)    | <b>14.7</b><br>(13.4-15.9)    | <b>16.5</b><br>(14.8-17.8)   | <b>19.1</b><br>(16.9-20.7)  | <b>21.2</b><br>(18.5-23.1) |
| <b>20-day</b>  | <b>8.22</b><br>(7.72-8.80)                     | <b>10.6</b><br>(9.96-11.3)    | <b>12.3</b><br>(11.5-13.2)    | <b>14.6</b><br>(13.6-15.6)    | <b>16.5</b><br>(15.2-17.6)    | <b>18.4</b><br>(16.9-19.7)    | <b>20.4</b><br>(18.6-21.9)   | <b>23.3</b><br>(20.9-25.1)  | <b>25.6</b><br>(22.7-27.7) |
| <b>30-day</b>  | <b>10.1</b><br>(9.51-10.7)                     | <b>12.9</b><br>(12.1-13.7)    | <b>14.8</b><br>(13.9-15.8)    | <b>17.4</b><br>(16.2-18.5)    | <b>19.3</b><br>(18.0-20.6)    | <b>21.3</b><br>(19.7-22.8)    | <b>23.4</b><br>(21.5-25.0)   | <b>26.2</b><br>(23.8-28.2)  | <b>28.4</b><br>(25.6-30.7) |
| <b>45-day</b>  | <b>12.4</b><br>(11.7-13.2)                     | <b>15.8</b><br>(14.8-16.8)    | <b>18.1</b><br>(17.0-19.3)    | <b>21.3</b><br>(19.9-22.6)    | <b>23.8</b><br>(22.1-25.3)    | <b>26.3</b><br>(24.3-28.0)    | <b>29.0</b><br>(26.6-31.0)   | <b>32.8</b><br>(29.7-35.1)  | <b>35.8</b><br>(32.1-38.5) |
| <b>60-day</b>  | <b>14.8</b><br>(14.0-15.7)                     | <b>18.6</b><br>(17.5-19.7)    | <b>21.1</b><br>(19.9-22.4)    | <b>24.5</b><br>(23.0-25.9)    | <b>27.0</b><br>(25.2-28.6)    | <b>29.5</b><br>(27.5-31.3)    | <b>32.1</b><br>(29.7-34.2)   | <b>35.7</b><br>(32.6-38.1)  | <b>38.4</b><br>(34.8-41.2) |

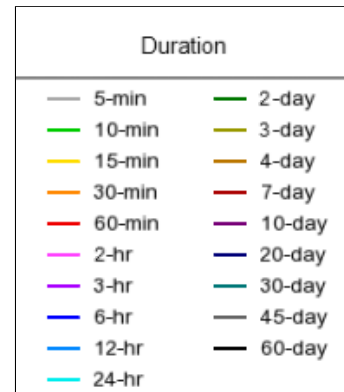
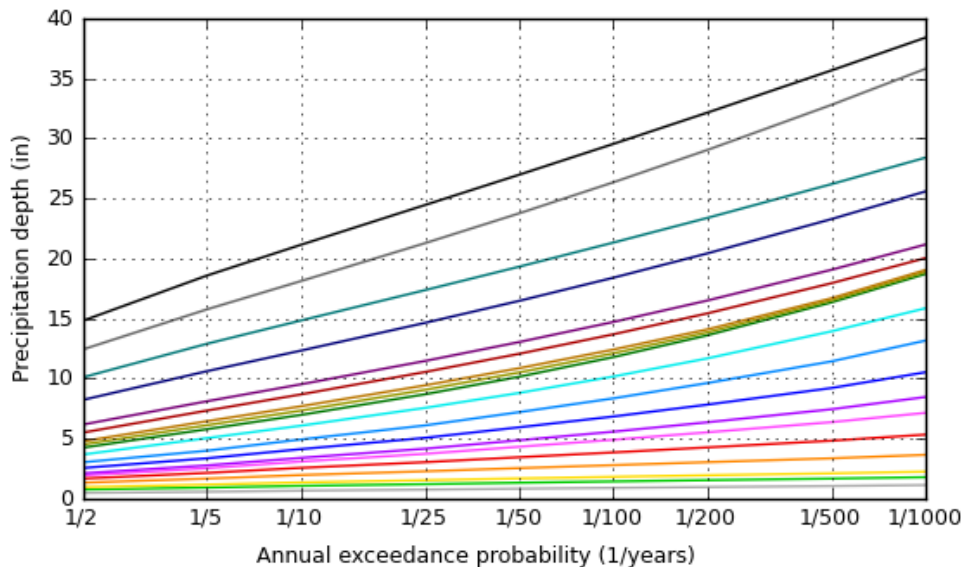
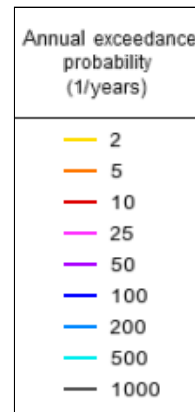
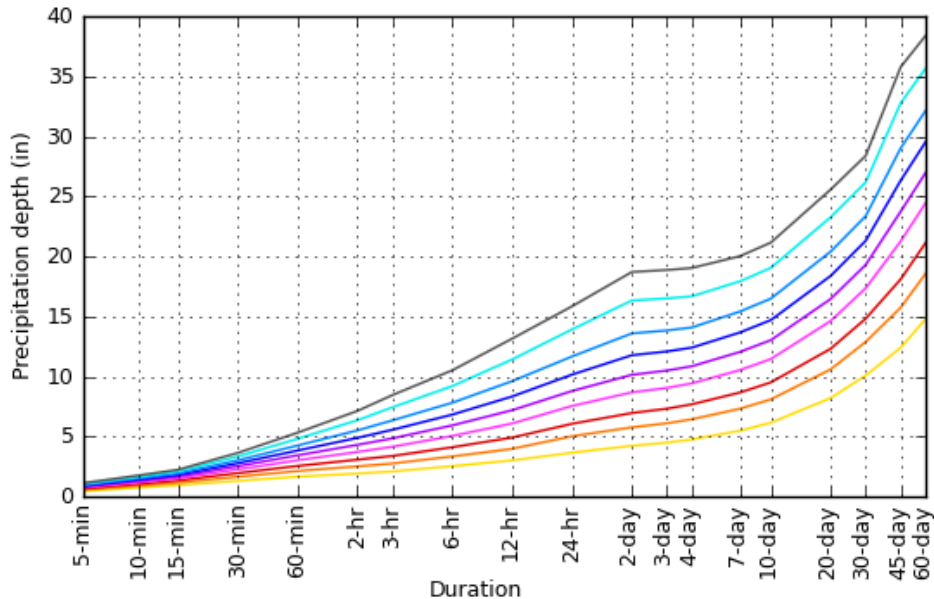
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of annual maxima series (AMS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and annual exceedance probability) 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

#### AMS-based depth-duration-frequency (DDF) curves

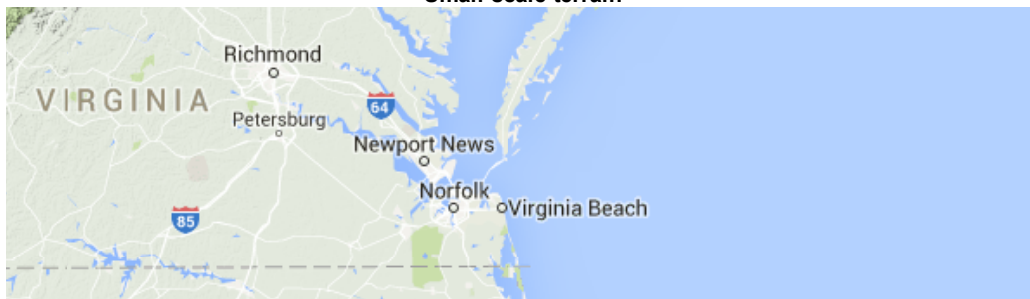
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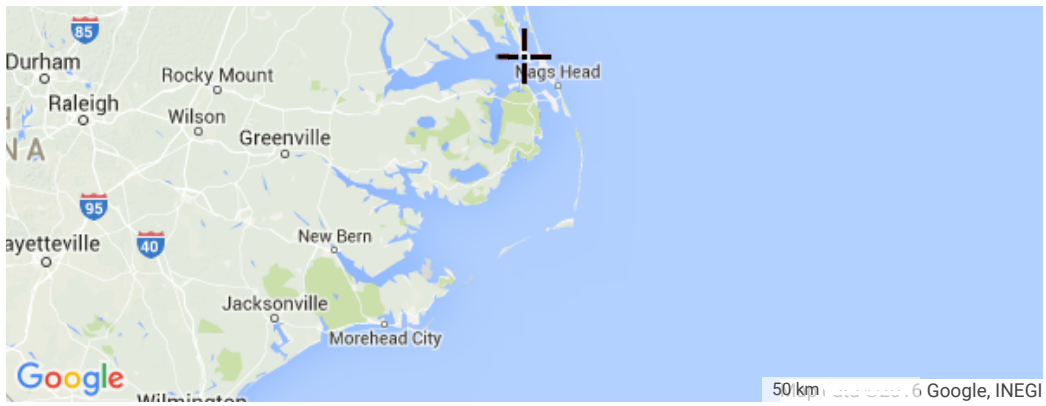
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### Maps & aerials

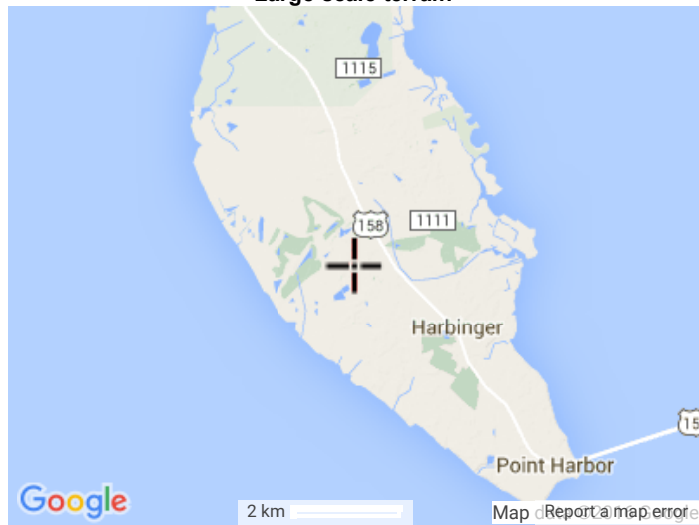
#### Small scale terrain



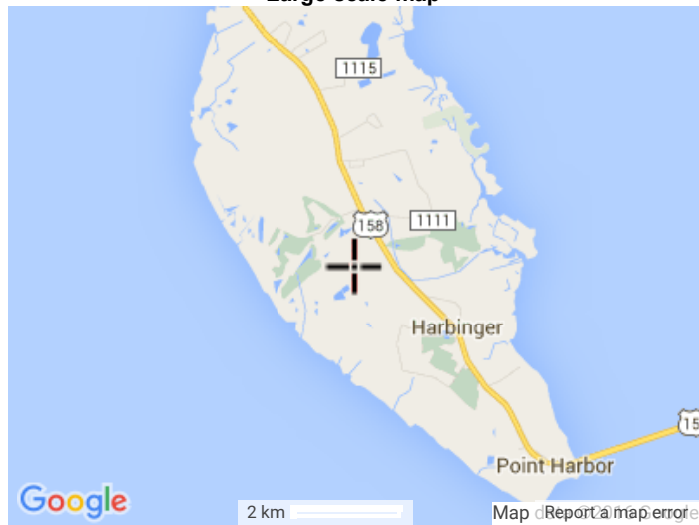




Large scale terrain



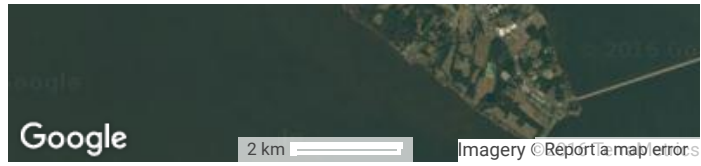
Large scale map



Large scale aerial







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# Stormwater Management Plan Narrative

OBX Waterpark Adventure – Currituck County, NC

September 26, 2024

## Appendix 3: On-site Soils Map and Data

# MEMORANDUM



**Quible** SINCE 1959  
**& Associates, P.C.**

ENGINEERING \* CONSULTING \* PLANNING  
ENVIRONMENTAL SCIENCES \* SURVEYING

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Web: [www.quible.com](http://www.quible.com)

**To:** Cathleen Saunders, P.E., Quible & Associates

**From:** Brian Rubino, P.G.

**Date:** June 15, 2022

**Re:** **P15004.1 Soil and Groundwater Investigation  
H2OBX RV Park**

Cathleen,

On Monday May 23, 2022, representatives from Quible visited the Site to conduct shallow soil borings in the location of potential a future stormwater collection basin or infiltration area. 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.

Soils consisted of:

- 0-6" bgs: organic topsoil with some mineral silt (10YR 3/3)
- 6-12" bgs: sandy clayey loam (10 YR 4/2)
- 12-28" bgs: sandy clayey loam (10 YR 5/2)
- 28"- 54" bgs: clayey sand with organic streaks (10YR 2/2)

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

| Soil Boring | Ground Elevation<br>(ft);<br>(NAVD 88) | Groundwater Elevation<br>(ft); (NAVD 88) | Approx. Elevation of<br>SHWT (ft); (NAVD 88) | Measured<br>infiltration Rates<br>(in/hr.) |
|-------------|--|--|--|--|
| SB-1        | 4.80'                                  | 3.31'                                    | 3.60'  | 1.89                                       |

Ground elevation data was collected on the date of the soil borings using an RTK GPS system. A temporary piezometer, using a two-inch .010 slot pvc well screen was 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. 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).

# Custom Soil Resource Report for Currituck County, North Carolina

## OBX Waterpark



# Preface

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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 (<http://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](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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# Soil Map

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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.


### 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: <http://websoilsurvey.nrcs.usda.gov>  
 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 14, Sep 13, 2014

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

Date(s) aerial images were photographed: Nov 27, 2010—Mar 29, 2011

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

| Currituck County, North Carolina (NC053) |   |              |                |
|--|---|--------------|----------------|
| Map Unit Symbol                          | Map Unit Name                             | Acres in AOI | Percent of AOI |
| CnA                                      | Conetoe loamy sand, 0 to 3 percent slopes | 13.8         | 19.8%          |
| Ds                                       | Dragston loamy fine sand                  | 25.8         | 37.1%          |
| Mu                                       | Munden loamy sand                         | 29.9         | 43.0%          |
| <b>Totals for Area of Interest</b>       |   | <b>69.4</b>  | <b>100.0%</b>  |

## 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

## Custom Soil Resource Report

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

### CnA—Conetoe loamy sand, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 3rnf

*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:* Farmland of statewide importance

#### Map Unit Composition

*Conetoe and similar soils:* 85 percent

*Minor components:* 5 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Conetoe

##### Setting

*Landform:* Ridges on marine terraces, ridges on stream terraces

*Landform position (two-dimensional):* Shoulder, summit

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Sandy and loamy fluviomarine deposits and/or marine deposits

##### Typical profile

*Ap - 0 to 8 inches:* loamy sand

*E - 8 to 22 inches:* loamy sand

*Bt - 22 to 40 inches:* sandy loam

*BC - 40 to 46 inches:* loamy sand

*C - 46 to 80 inches:* sand

##### Properties and qualities

*Slope:* 0 to 5 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.57 to 5.95 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Low (about 5.1 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

#### Minor Components

##### Leon

*Percent of map unit:* 5 percent

*Landform:* Flats on marine terraces

## Custom Soil Resource Report

*Down-slope shape:* Linear  
*Across-slope shape:* Concave

### **Ds—Dragston loamy fine sand**

#### **Map Unit Setting**

*National map unit symbol:* 3rnm  
*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:* Farmland of statewide importance

#### **Map Unit Composition**

*Dragston, drained, and similar soils:* 45 percent  
*Dragston, undrained, and similar soils:* 40 percent  
*Minor components:* 5 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Dragston, Drained**

##### **Setting**

*Landform:* Marine terraces  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Sandy and loamy fluviomarine deposits and/or marine deposits

##### **Typical profile**

*A - 0 to 6 inches:* loamy fine sand  
*E - 6 to 10 inches:* loamy fine sand  
*Bt - 10 to 42 inches:* sandy loam  
*2Cg - 42 to 80 inches:* loamy sand

##### **Properties and qualities**

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Somewhat poorly drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)  
*Depth to water table:* About 12 to 30 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* Moderate (about 6.3 inches)

##### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2w  
*Hydrologic Soil Group:* A/D

## Description of Dragston, Undrained

### Setting

*Landform:* Marine terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy and loamy fluviomarine deposits and/or marine deposits

### Typical profile

*A - 0 to 6 inches:* loamy fine sand

*E - 6 to 10 inches:* loamy fine sand

*Bt - 10 to 42 inches:* sandy loam

*2Cg - 42 to 80 inches:* loamy sand

### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Somewhat poorly drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)

*Depth to water table:* About 12 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Moderate (about 6.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3w

*Hydrologic Soil Group:* A/D

## Minor Components

### Portsmouth, undrained

*Percent of map unit:* 3 percent

*Landform:* Depressions on marine terraces, flats on marine terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

### Nimmo, undrained

*Percent of map unit:* 2 percent

*Landform:* Flats on marine terraces, depressions on marine terraces

*Down-slope shape:* Concave

*Across-slope shape:* Linear

## Mu—Munden loamy sand

### Map Unit Setting

*National map unit symbol:* 3rn

*Elevation:* 0 to 20 feet

*Mean annual precipitation:* 42 to 58 inches

## Custom Soil Resource Report

*Mean annual air temperature:* 61 to 64 degrees F

*Frost-free period:* 190 to 270 days

*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Munden and similar soils:* 85 percent

*Minor components:* 5 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Munden

#### Setting

*Landform:* Ridges on marine terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy and loamy fluviomarine deposits and/or marine deposits

#### Typical profile

*A - 0 to 9 inches:* loamy sand

*Bt - 9 to 37 inches:* fine sandy loam

*C - 37 to 72 inches:* loamy fine sand

#### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Moderately well drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.57 to 5.95 in/hr)

*Depth to water table:* About 18 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Low (about 5.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* B

### Minor Components

#### Nimmo, undrained

*Percent of map unit:* 5 percent

*Landform:* Depressions on marine terraces, flats on marine terraces

*Down-slope shape:* Concave

*Across-slope shape:* Linear



# References

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American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_054262](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262)

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053577](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577)

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053580](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580)

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2\\_053374](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374)

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

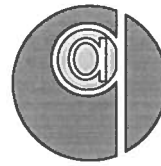
## Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2\\_054242](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242)

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_052290.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf)

# MEMORANDUM



**Quible** SINCE 1959  
**& Associates, P.C.**

ENGINEERING \* CONSULTING \* PLANNING  
ENVIRONMENTAL SCIENCES \* SURVEYING  
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**To:** Michael Strader, P.E.  
**From:** Warren D. Eadus, P.G.  
**Date:** June 15, 2016  
**Re:** SHWT and K-Stormwater Borings ADG Powells Point

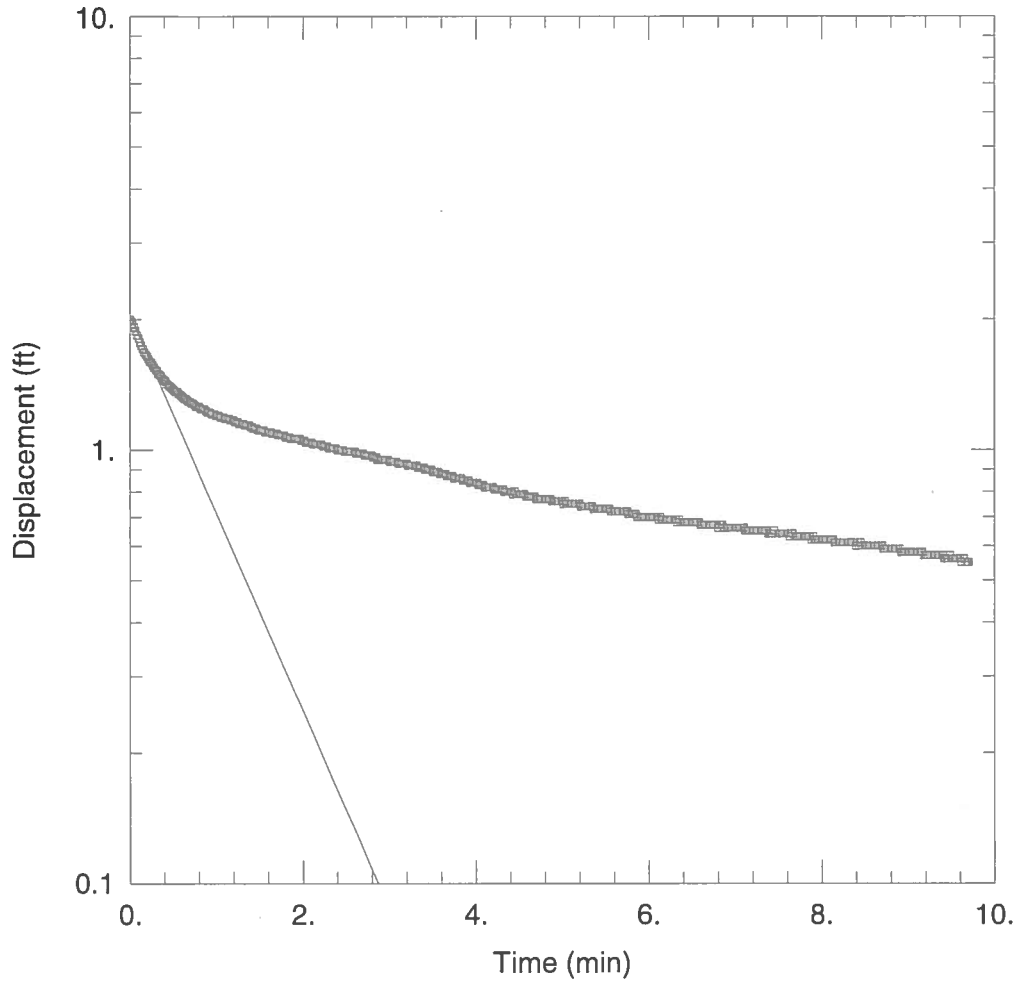
A series of shallow soil borings were advanced On June 15, 2016 in locations shown on the attached aerial Site Plan. The boring locations generally correspond with expected locations of stormwater BMPs associated with an impervious parking lot to serve the ADG Powells Point Water Park.

Seasonal High Water Table (SHWT) was determined in each of the three boring locations and found to occur at 72 inches Below Ground Surface (BGS) in location SB-1 and 58 inches BGS in location SB-2 and 60 inches BGS in location SB-3.

Soils encountered in each of the borings are best described as red brown (orange brown) fine sands with varying amounts of silt and clay to depths of about 42 inches BGS where a fine to medium sand is encountered. A light brown poorly sorted sand was encountered at approximately 56-58 inches BGS in each of the borings and oxidation was observed within this sand layer. The oxidation observed in each boring was used to determine the SHWT depth.



A slug test was conducted in SB-1 to determine hydraulic conductivity in saturated sediments. A piezometer was installed at the SHWT interface (-6.0 feet BGS) and three gallons of Distilled Water was added to the boring. A pressure transducer was installed in the bottom of the piezometer and the rate of the drawdown/infiltration was measured. The data was entered into the Aqtesolv Software and a Hydraulic Conductivity value (K) was determined to be **0.335 inches per hour (4.654 e-4 ft/min)** using the Bouwer and Rice Method for an unconfined aquifer. While loose sands were encountered at depths of five to six feet BGS, the overlying sediments are predominately loams with varying amounts of clay and therefore, these overlying sediments are expected to have a slow infiltration rate associated with them.



WELL TEST ANALYSIS

Data Set:  
Date: 06/15/16

Time: 14:32:53

PROJECT INFORMATION

Company: Quible & Associates, P.C.  
 Client: Aquatic Development Group  
 Project: P15004  
 Location: Powells Point  
 Test Well: SB-1  
 Test Date: 06/15/16

AQUIFER DATA

Saturated Thickness: 30. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 2. ft  
 Total Well Penetration Depth: 6. ft  
 Casing Radius: 0.0833 ft

Static Water Column Height: 0. ft  
 Screen Length: 6. ft  
 Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined  
 K = 0.0004654 ft/min

Solution Method: Bouwer-Rice  
 y0 = 2.047 ft



| <u>Time (min)</u> | <u>Displacement (ft)</u> | <u>Time (min)</u> | <u>Displacement (ft)</u> |
|-------------------|--------------------------|-------------------|--------------------------|
| 0.5167            | 1.37                     | 5.383             | 0.73                     |
| 0.5333            | 1.36                     | 5.4               | 0.73                     |
| 0.55              | 1.36                     | 5.417             | 0.73                     |
| 0.5667            | 1.35                     | 5.433             | 0.73                     |
| 0.5833            | 1.34                     | 5.45              | 0.73                     |
| 0.6               | 1.33                     | 5.467             | 0.73                     |
| 0.6167            | 1.32                     | 5.483             | 0.73                     |
| 0.6333            | 1.31                     | 5.5               | 0.73                     |
| 0.65              | 1.31                     | 5.517             | 0.73                     |
| 0.6667            | 1.3                      | 5.533             | 0.73                     |
| 0.6833            | 1.29                     | 5.55              | 0.73                     |
| 0.7               | 1.29                     | 5.567             | 0.72                     |
| 0.7167            | 1.28                     | 5.583             | 0.72                     |
| 0.7333            | 1.28                     | 5.6               | 0.72                     |
| 0.75              | 1.27                     | 5.617             | 0.72                     |
| 0.7667            | 1.26                     | 5.633             | 0.72                     |
| 0.7833            | 1.26                     | 5.65              | 0.72                     |
| 0.8               | 1.26                     | 5.667             | 0.72                     |
| 0.8167            | 1.25                     | 5.683             | 0.72                     |
| 0.8333            | 1.24                     | 5.7               | 0.72                     |
| 0.85              | 1.24                     | 5.717             | 0.72                     |
| 0.8667            | 1.24                     | 5.733             | 0.72                     |
| 0.8833            | 1.23                     | 5.75              | 0.72                     |
| 0.9               | 1.22                     | 5.767             | 0.71                     |
| 0.9167            | 1.22                     | 5.783             | 0.71                     |
| 0.9333            | 1.22                     | 5.8               | 0.71                     |
| 0.95              | 1.21                     | 5.817             | 0.71                     |
| 0.9667            | 1.21                     | 5.833             | 0.71                     |
| 0.9833            | 1.21                     | 5.85              | 0.71                     |
| 1.                | 1.2                      | 5.867             | 0.7                      |
| 1.017             | 1.2                      | 5.883             | 0.7                      |
| 1.033             | 1.2                      | 5.9               | 0.7                      |
| 1.05              | 1.19                     | 5.917             | 0.7                      |
| 1.067             | 1.19                     | 5.933             | 0.7                      |
| 1.083             | 1.19                     | 5.95              | 0.7                      |
| 1.1               | 1.18                     | 5.967             | 0.7                      |
| 1.117             | 1.18                     | 5.983             | 0.7                      |
| 1.133             | 1.18                     | 6.                | 0.7                      |
| 1.15              | 1.18                     | 6.017             | 0.7                      |
| 1.167             | 1.17                     | 6.033             | 0.7                      |
| 1.183             | 1.17                     | 6.05              | 0.7                      |
| 1.2               | 1.17                     | 6.067             | 0.7                      |
| 1.217             | 1.16                     | 6.083             | 0.7                      |
| 1.233             | 1.16                     | 6.1               | 0.7                      |
| 1.25              | 1.16                     | 6.117             | 0.69                     |
| 1.267             | 1.15                     | 6.133             | 0.7                      |
| 1.283             | 1.15                     | 6.15              | 0.69                     |
| 1.3               | 1.15                     | 6.167             | 0.69                     |
| 1.317             | 1.15                     | 6.183             | 0.69                     |
| 1.333             | 1.14                     | 6.2               | 0.69                     |
| 1.35              | 1.14                     | 6.217             | 0.69                     |
| 1.367             | 1.14                     | 6.233             | 0.69                     |
| 1.383             | 1.14                     | 6.25              | 0.69                     |
| 1.4               | 1.13                     | 6.267             | 0.69                     |
| 1.417             | 1.13                     | 6.283             | 0.69                     |
| 1.433             | 1.12                     | 6.3               | 0.69                     |
| 1.45              | 1.12                     | 6.317             | 0.69                     |
| 1.467             | 1.12                     | 6.333             | 0.68                     |
| 1.483             | 1.11                     | 6.35              | 0.69                     |
| 1.5               | 1.11                     | 6.367             | 0.68                     |
| 1.517             | 1.11                     | 6.383             | 0.68                     |
| 1.533             | 1.11                     | 6.4               | 0.68                     |
| 1.55              | 1.11                     | 6.417             | 0.68                     |
| 1.567             | 1.1                      | 6.433             | 0.68                     |
| 1.583             | 1.1                      | 6.45              | 0.68                     |
| 1.6               | 1.1                      | 6.467             | 0.68                     |
| 1.617             | 1.1                      | 6.483             | 0.68                     |

Data Set:  
 Date: 06/15/16  
 Time: 14:33:08

PROJECT INFORMATION

Company: Quible & Associates, P.C.  
 Client: Aquatic Development Group  
 Project: P15004  
 Location: Powells Point  
 Test Date: 06/15/16  
 Test Well: SB-1

AQUIFER DATA

Saturated Thickness: 30. ft  
 Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: New Well

X Location: 0. ft  
 Y Location: 0. ft

Initial Displacement: 2. ft  
 Static Water Column Height: 0. ft  
 Casing Radius: 0.0833 ft  
 Well Radius: 0.33 ft  
 Well Skin Radius: 0.33 ft  
 Screen Length: 6. ft  
 Total Well Penetration Depth: 6. ft

No. of Observations: 583

| <u>Time (min)</u> | <u>Observation Data</u>  |                   | <u>Displacement (ft)</u> |
|-------------------|--------------------------|-------------------|--------------------------|
|                   | <u>Displacement (ft)</u> | <u>Time (min)</u> |                          |
| 0.                | 2.                       | 4.867             | 0.77                     |
| 0.01666           | 1.98                     | 4.883             | 0.76                     |
| 0.03333           | 1.95                     | 4.9               | 0.76                     |
| 0.05              | 1.92                     | 4.917             | 0.76                     |
| 0.06666           | 1.88                     | 4.933             | 0.76                     |
| 0.08333           | 1.84                     | 4.95              | 0.76                     |
| 0.1               | 1.81                     | 4.967             | 0.76                     |
| 0.1167            | 1.77                     | 4.983             | 0.76                     |
| 0.1333            | 1.74                     | 5.                | 0.76                     |
| 0.15              | 1.71                     | 5.017             | 0.75                     |
| 0.1667            | 1.68                     | 5.033             | 0.76                     |
| 0.1833            | 1.66                     | 5.05              | 0.75                     |
| 0.2               | 1.64                     | 5.067             | 0.75                     |
| 0.2167            | 1.62                     | 5.083             | 0.75                     |
| 0.2333            | 1.6                      | 5.1               | 0.75                     |
| 0.25              | 1.59                     | 5.117             | 0.75                     |
| 0.2667            | 1.57                     | 5.133             | 0.75                     |
| 0.2833            | 1.55                     | 5.15              | 0.75                     |
| 0.3               | 1.53                     | 5.167             | 0.75                     |
| 0.3167            | 1.52                     | 5.183             | 0.75                     |
| 0.3333            | 1.5                      | 5.2               | 0.75                     |
| 0.35              | 1.49                     | 5.217             | 0.74                     |
| 0.3667            | 1.48                     | 5.233             | 0.74                     |
| 0.3833            | 1.46                     | 5.25              | 0.74                     |
| 0.4               | 1.45                     | 5.267             | 0.74                     |
| 0.4167            | 1.44                     | 5.283             | 0.74                     |
| 0.4333            | 1.42                     | 5.3               | 0.74                     |
| 0.45              | 1.41                     | 5.317             | 0.74                     |
| 0.4667            | 1.4                      | 5.333             | 0.74                     |
| 0.4833            | 1.39                     | 5.35              | 0.74                     |
| 0.5               | 1.38                     | 5.367             | 0.73                     |



| <u>Time (min)</u> | <u>Displacement (ft)</u> | <u>Time (min)</u> | <u>Displacement (ft)</u> |
|-------------------|--------------------------|-------------------|--------------------------|
| 1.633             | 1.1                      | 6.5               | 0.68                     |
| 1.65              | 1.09                     | 6.517             | 0.68                     |
| 1.667             | 1.09                     | 6.533             | 0.68                     |
| 1.683             | 1.09                     | 6.55              | 0.68                     |
| 1.7               | 1.09                     | 6.567             | 0.68                     |
| 1.717             | 1.08                     | 6.583             | 0.68                     |
| 1.733             | 1.08                     | 6.6               | 0.67                     |
| 1.75              | 1.08                     | 6.617             | 0.67                     |
| 1.767             | 1.08                     | 6.633             | 0.67                     |
| 1.783             | 1.08                     | 6.65              | 0.67                     |
| 1.8               | 1.07                     | 6.667             | 0.67                     |
| 1.817             | 1.07                     | 6.683             | 0.67                     |
| 1.833             | 1.07                     | 6.7               | 0.67                     |
| 1.85              | 1.07                     | 6.717             | 0.67                     |
| 1.867             | 1.06                     | 6.733             | 0.67                     |
| 1.883             | 1.06                     | 6.75              | 0.67                     |
| 1.9               | 1.06                     | 6.767             | 0.67                     |
| 1.917             | 1.06                     | 6.783             | 0.67                     |
| 1.933             | 1.06                     | 6.8               | 0.66                     |
| 1.95              | 1.06                     | 6.817             | 0.67                     |
| 1.967             | 1.06                     | 6.833             | 0.67                     |
| 1.983             | 1.05                     | 6.85              | 0.67                     |
| 2.                | 1.05                     | 6.867             | 0.66                     |
| 2.017             | 1.05                     | 6.883             | 0.66                     |
| 2.033             | 1.04                     | 6.9               | 0.66                     |
| 2.05              | 1.04                     | 6.917             | 0.66                     |
| 2.067             | 1.04                     | 6.933             | 0.66                     |
| 2.083             | 1.04                     | 6.95              | 0.66                     |
| 2.1               | 1.04                     | 6.967             | 0.66                     |
| 2.117             | 1.03                     | 6.983             | 0.66                     |
| 2.133             | 1.03                     | 7.                | 0.66                     |
| 2.15              | 1.03                     | 7.017             | 0.66                     |
| 2.167             | 1.03                     | 7.033             | 0.66                     |
| 2.183             | 1.03                     | 7.05              | 0.66                     |
| 2.2               | 1.03                     | 7.067             | 0.66                     |
| 2.217             | 1.03                     | 7.083             | 0.66                     |
| 2.233             | 1.02                     | 7.1               | 0.66                     |
| 2.25              | 1.02                     | 7.117             | 0.65                     |
| 2.267             | 1.02                     | 7.133             | 0.65                     |
| 2.283             | 1.02                     | 7.15              | 0.65                     |
| 2.3               | 1.01                     | 7.167             | 0.65                     |
| 2.317             | 1.01                     | 7.183             | 0.65                     |
| 2.333             | 1.01                     | 7.2               | 0.65                     |
| 2.35              | 1.01                     | 7.217             | 0.65                     |
| 2.367             | 1.01                     | 7.233             | 0.65                     |
| 2.383             | 1.01                     | 7.25              | 0.65                     |
| 2.4               | 1.                       | 7.267             | 0.65                     |
| 2.417             | 1.                       | 7.283             | 0.65                     |
| 2.433             | 1.                       | 7.3               | 0.65                     |
| 2.45              | 1.                       | 7.317             | 0.65                     |
| 2.467             | 1.                       | 7.333             | 0.65                     |
| 2.483             | 0.99                     | 7.35              | 0.65                     |
| 2.5               | 0.99                     | 7.367             | 0.65                     |
| 2.517             | 0.99                     | 7.383             | 0.64                     |
| 2.533             | 0.99                     | 7.4               | 0.64                     |
| 2.55              | 0.99                     | 7.417             | 0.64                     |
| 2.567             | 0.99                     | 7.433             | 0.64                     |
| 2.583             | 0.99                     | 7.45              | 0.65                     |
| 2.6               | 0.99                     | 7.467             | 0.64                     |
| 2.617             | 0.98                     | 7.483             | 0.64                     |
| 2.633             | 0.98                     | 7.5               | 0.64                     |
| 2.65              | 0.98                     | 7.517             | 0.64                     |
| 2.667             | 0.98                     | 7.533             | 0.64                     |
| 2.683             | 0.98                     | 7.55              | 0.64                     |
| 2.7               | 0.98                     | 7.567             | 0.64                     |
| 2.717             | 0.97                     | 7.583             | 0.64                     |
| 2.733             | 0.97                     | 7.6               | 0.64                     |

| <u>Time (min)</u> | <u>Displacement (ft)</u> | <u>Time (min)</u> | <u>Displacement (ft)</u> |
|-------------------|--------------------------|-------------------|--------------------------|
| 2.75              | 0.97                     | 7.617             | 0.64                     |
| 2.767             | 0.97                     | 7.633             | 0.63                     |
| 2.783             | 0.97                     | 7.65              | 0.64                     |
| 2.8               | 0.97                     | 7.667             | 0.64                     |
| 2.817             | 0.96                     | 7.683             | 0.63                     |
| 2.833             | 0.96                     | 7.7               | 0.63                     |
| 2.85              | 0.96                     | 7.717             | 0.63                     |
| 2.867             | 0.95                     | 7.733             | 0.63                     |
| 2.883             | 0.95                     | 7.75              | 0.63                     |
| 2.9               | 0.95                     | 7.767             | 0.63                     |
| 2.917             | 0.95                     | 7.783             | 0.63                     |
| 2.933             | 0.95                     | 7.8               | 0.63                     |
| 2.95              | 0.95                     | 7.817             | 0.63                     |
| 2.967             | 0.95                     | 7.833             | 0.63                     |
| 2.983             | 0.95                     | 7.85              | 0.63                     |
| 3.                | 0.94                     | 7.867             | 0.63                     |
| 3.017             | 0.94                     | 7.883             | 0.62                     |
| 3.033             | 0.94                     | 7.9               | 0.63                     |
| 3.05              | 0.94                     | 7.917             | 0.62                     |
| 3.067             | 0.94                     | 7.933             | 0.62                     |
| 3.083             | 0.94                     | 7.95              | 0.62                     |
| 3.1               | 0.93                     | 7.967             | 0.62                     |
| 3.117             | 0.93                     | 7.983             | 0.62                     |
| 3.133             | 0.93                     | 8.                | 0.62                     |
| 3.15              | 0.93                     | 8.017             | 0.62                     |
| 3.167             | 0.93                     | 8.033             | 0.62                     |
| 3.183             | 0.93                     | 8.05              | 0.62                     |
| 3.2               | 0.93                     | 8.067             | 0.62                     |
| 3.217             | 0.92                     | 8.083             | 0.62                     |
| 3.233             | 0.92                     | 8.1               | 0.62                     |
| 3.25              | 0.92                     | 8.117             | 0.62                     |
| 3.267             | 0.92                     | 8.133             | 0.62                     |
| 3.283             | 0.92                     | 8.15              | 0.61                     |
| 3.3               | 0.92                     | 8.167             | 0.61                     |
| 3.317             | 0.92                     | 8.183             | 0.61                     |
| 3.333             | 0.91                     | 8.2               | 0.61                     |
| 3.35              | 0.91                     | 8.217             | 0.61                     |
| 3.367             | 0.91                     | 8.233             | 0.61                     |
| 3.383             | 0.91                     | 8.25              | 0.61                     |
| 3.4               | 0.91                     | 8.267             | 0.61                     |
| 3.417             | 0.9                      | 8.283             | 0.61                     |
| 3.433             | 0.9                      | 8.3               | 0.61                     |
| 3.45              | 0.9                      | 8.317             | 0.61                     |
| 3.467             | 0.9                      | 8.333             | 0.61                     |
| 3.483             | 0.9                      | 8.35              | 0.61                     |
| 3.5               | 0.89                     | 8.367             | 0.61                     |
| 3.517             | 0.89                     | 8.383             | 0.61                     |
| 3.533             | 0.89                     | 8.4               | 0.6                      |
| 3.55              | 0.89                     | 8.417             | 0.61                     |
| 3.567             | 0.89                     | 8.433             | 0.6                      |
| 3.583             | 0.88                     | 8.45              | 0.61                     |
| 3.6               | 0.88                     | 8.467             | 0.6                      |
| 3.617             | 0.88                     | 8.483             | 0.6                      |
| 3.633             | 0.88                     | 8.5               | 0.6                      |
| 3.65              | 0.88                     | 8.517             | 0.6                      |
| 3.667             | 0.87                     | 8.533             | 0.6                      |
| 3.683             | 0.87                     | 8.55              | 0.6                      |
| 3.7               | 0.87                     | 8.567             | 0.6                      |
| 3.717             | 0.87                     | 8.583             | 0.6                      |
| 3.733             | 0.87                     | 8.6               | 0.6                      |
| 3.75              | 0.86                     | 8.617             | 0.6                      |
| 3.767             | 0.86                     | 8.633             | 0.6                      |
| 3.783             | 0.86                     | 8.65              | 0.6                      |
| 3.8               | 0.86                     | 8.667             | 0.6                      |
| 3.817             | 0.86                     | 8.683             | 0.6                      |
| 3.833             | 0.86                     | 8.7               | 0.6                      |
| 3.85              | 0.85                     | 8.717             | 0.59                     |

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| <u>Time (min)</u> | <u>Displacement (ft)</u> | <u>Time (min)</u> | <u>Displacement (ft)</u> |
|-------------------|--------------------------|-------------------|--------------------------|
| 3.867             | 0.85                     | 8.733             | 0.59                     |
| 3.883             | 0.85                     | 8.75              | 0.59                     |
| 3.9               | 0.85                     | 8.767             | 0.59                     |
| 3.917             | 0.85                     | 8.783             | 0.59                     |
| 3.933             | 0.84                     | 8.8               | 0.59                     |
| 3.95              | 0.84                     | 8.817             | 0.59                     |
| 3.967             | 0.84                     | 8.833             | 0.59                     |
| 3.983             | 0.84                     | 8.85              | 0.59                     |
| 4.                | 0.84                     | 8.867             | 0.59                     |
| 4.017             | 0.84                     | 8.883             | 0.59                     |
| 4.033             | 0.83                     | 8.9               | 0.59                     |
| 4.05              | 0.83                     | 8.917             | 0.58                     |
| 4.067             | 0.83                     | 8.933             | 0.58                     |
| 4.083             | 0.83                     | 8.95              | 0.58                     |
| 4.1               | 0.82                     | 8.967             | 0.58                     |
| 4.117             | 0.82                     | 8.983             | 0.58                     |
| 4.133             | 0.82                     | 9.                | 0.58                     |
| 4.15              | 0.82                     | 9.017             | 0.58                     |
| 4.167             | 0.82                     | 9.033             | 0.58                     |
| 4.183             | 0.82                     | 9.05              | 0.58                     |
| 4.2               | 0.82                     | 9.067             | 0.58                     |
| 4.217             | 0.81                     | 9.083             | 0.58                     |
| 4.233             | 0.81                     | 9.1               | 0.58                     |
| 4.25              | 0.81                     | 9.117             | 0.58                     |
| 4.267             | 0.81                     | 9.133             | 0.58                     |
| 4.283             | 0.81                     | 9.15              | 0.58                     |
| 4.3               | 0.81                     | 9.167             | 0.58                     |
| 4.317             | 0.81                     | 9.183             | 0.57                     |
| 4.333             | 0.8                      | 9.2               | 0.57                     |
| 4.35              | 0.8                      | 9.217             | 0.57                     |
| 4.367             | 0.8                      | 9.233             | 0.57                     |
| 4.383             | 0.8                      | 9.25              | 0.57                     |
| 4.4               | 0.8                      | 9.267             | 0.57                     |
| 4.417             | 0.8                      | 9.283             | 0.57                     |
| 4.433             | 0.79                     | 9.3               | 0.57                     |
| 4.45              | 0.8                      | 9.317             | 0.57                     |
| 4.467             | 0.79                     | 9.333             | 0.57                     |
| 4.483             | 0.79                     | 9.35              | 0.57                     |
| 4.5               | 0.79                     | 9.367             | 0.57                     |
| 4.517             | 0.79                     | 9.383             | 0.57                     |
| 4.533             | 0.79                     | 9.4               | 0.57                     |
| 4.55              | 0.79                     | 9.417             | 0.56                     |
| 4.567             | 0.79                     | 9.433             | 0.56                     |
| 4.583             | 0.78                     | 9.45              | 0.56                     |
| 4.6               | 0.78                     | 9.467             | 0.56                     |
| 4.617             | 0.78                     | 9.483             | 0.57                     |
| 4.633             | 0.78                     | 9.5               | 0.56                     |
| 4.65              | 0.78                     | 9.517             | 0.56                     |
| 4.667             | 0.78                     | 9.533             | 0.56                     |
| 4.683             | 0.78                     | 9.55              | 0.56                     |
| 4.7               | 0.77                     | 9.567             | 0.56                     |
| 4.717             | 0.77                     | 9.583             | 0.56                     |
| 4.733             | 0.77                     | 9.6               | 0.56                     |
| 4.75              | 0.77                     | 9.617             | 0.55                     |
| 4.767             | 0.77                     | 9.633             | 0.56                     |
| 4.783             | 0.77                     | 9.65              | 0.56                     |
| 4.8               | 0.77                     | 9.667             | 0.55                     |
| 4.817             | 0.77                     | 9.683             | 0.55                     |
| 4.833             | 0.77                     | 9.7               | 0.55                     |
| 4.85              | 0.77                     |                   |                          |

---

SOLUTION

Slug Test  
Aquifer Model: Unconfined  
Solution Method: Bouwer-Rice  
ln(Re/rw): 1.75

VISUAL ESTIMATION RESULTS

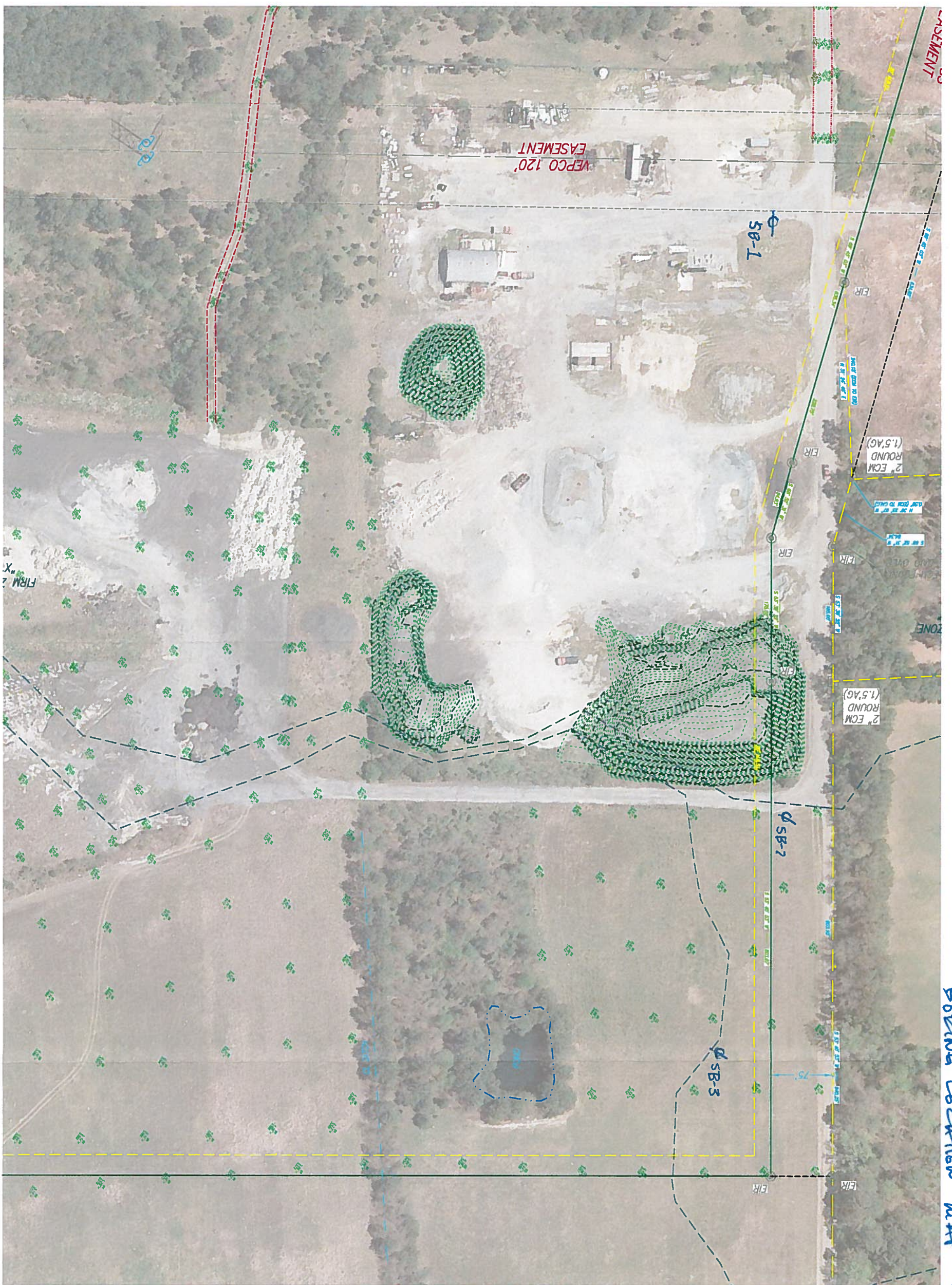
Estimated Parameters

| <u>Parameter</u> | <u>Estimate</u> |        |
|------------------|-----------------|--------|
| K                | 0.0004654       | ft/min |
| y0               | 2.047           | ft     |

K = 0.0002364 cm/sec

T = K\*b = 0.01396 ft<sup>2</sup>/min (0.2162 sq. cm/sec)





B62114 Location Map 6/15/14



# Stormwater Management Plan Narrative

OBX Waterpark Adventure – Currituck County, NC

September 26, 2024

## Appendix 4: Stormwater Calculations

NCDEQ Calculations

Currituck County Calculations

Project Name: DA-5 (Connecting to previously permitted wet detention basin)  
 Quible Project Number: P15004.1  
 Date: 9/24/2024

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

|                              |                        |
|------------------------------|------------------------|
| <b>Step 1:</b> Drainage Area | 877,932.00 square feet |
|                              | 20.15 acres            |

|   |      |
|---|------|
| <b>Step 2:</b> Determine Runoff Coefficient |      |
| C =   | 0.20 |

**Step 3: Determine Time of Concentration**

**Sheet Flow**

$$T_{c1} = \frac{0.42(nL)^{0.8}}{p^{0.5}S^{0.4}}$$

n = 0.1 (woods)  
 L = 300 feet  
 P = 4 inch  
 S = 0.026 ft/ft

Elev. Start = 15.64  
 Elev. End = 7.72

T<sub>c1</sub> = 13.7 mins

**Shallow Concentrated Flow**

L = 266.5 feet  
 S = 0.01 ft/ft

Elev. Start = 7.72  
 Elev. End = 4.93  
 1%

unpaved

V<sub>unpaved</sub> = 134.64 fpm

T<sub>c2</sub> = 2.0 mins

**Channel Flow**

(n/a)

$$T_c = T_{c1} + T_{c2}$$

T<sub>c</sub> = 15.7 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 = 3.80 in/hr

Interpolation Formula =

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

| X | Y     |
|---|-------|
| 1 | 12    |
| 2 | 15.72 |
| 3 | 30    |

y<sub>2</sub> = 3.80

**Step 5: Determine the 2-year Pre-Development peak discharge, Q**

Q = CIA

Q<sub>2</sub> = 15.32 cfs

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

|                   |            |        |           |      |
|-------------------|------------|--------|-----------|------|
| Impervious Area = | 237,455.20 | sq.ft. | C - Value | 0.95 |
| Open Area =       | 640,476.80 | sq.ft. |           | 0.25 |
| Total =           | 877,932.00 | sq.ft. |           |      |
| Cw =              |            |        |           | 0.44 |

**Step 7:** Determine Time of Concentration for post-development

**Sheet Flow**

$$T_{c1} = \frac{0.42(nL)^{0.8}}{p^{0.5}S^{0.4}}$$

|                   |        |                                      |
|-------------------|--------|--------------------------------------|
| n =               | 0.011  | (smooth pavement)                    |
| L =               | 300.00 | feet                                 |
| P =               | 5      | inch (From NOAA Rainfall Depth Data) |
| S =               | 0.010  | ft/ft                                |
| T <sub>c1</sub> = | 3.1    | mins                                 |

**Shallow Concentrated Flow**

|                   |                   |                          |       |
|-------------------|-------------------|--------------------------|-------|
| T <sub>c2</sub> = | L =               | 511.00                   | ft    |
|                   |                   | paved                    |       |
|                   | Slope =           | 0.024                    | ft/ft |
|                   | Paved Areas V =   | 1302(S <sup>0.53</sup> ) |       |
|                   | Unpaved Areas V = | 972(S <sup>0.53</sup> )  |       |
| V =               | 180.4             | ft/min                   |       |
| T <sub>c2</sub> = | 2.8               | mins                     |       |

**Channel Flow**

77' of 18" RCP, 736' of 15" RCP T<sub>c3</sub> = 43.1 mins

T<sub>c</sub> = T<sub>c1</sub> + T<sub>c2</sub>

T<sub>c</sub> = 49.0 mins \*5 min minimum T<sub>c</sub> (worst case scenario)

**Step 8:** Determine Peak Rainfall Intensity

| T (yrs) | Time of Concentration |         |         |         |      |      |       |
|---------|-----------------------|---------|---------|---------|------|------|-------|
|         | 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    | 2.10 | 1.26 | 0.897 |
| 10      | 7.82                  | 6.26    | 5.28    | 3.82    | 2.49 | 1.51 | 1.09  |

I = 2.53 in/hr

Interpolation Formula =

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

y<sub>2</sub> = 2.53

| X | Y     |
|---|-------|
| 1 | 30    |
| 2 | 48.99 |
| 3 | 60    |

3.27

2.10

2.10



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

Q = CIA

Q<sub>5</sub> =  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 | 237,455.20 |
| Open Space        | 49 | 640,476.80 |
| Total =           |    | 877,932.00 |
| CN <sub>w</sub> = |    | 62.25      |

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

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

P =  in

S =

Q =  in

**Step 12:** Determine the Runoff Volume, V<sub>r</sub>

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

Q =  in

A =  acres

V<sub>r</sub> =  ac-ft

**Step 13:** Determine the Required Storage Volume, V<sub>s</sub>

$$V_s = 1613.33 * V_r * \left(1 - \frac{Q_{2-pre}}{Q_{5-post}}\right)$$

V<sub>r</sub> =  ac-ft

Q<sub>2-pre</sub> =  cfs

Q<sub>5-post</sub> =  cfs

V<sub>s</sub> =  CY

CF

**Previously Permitted Wet Detention Basin  
 NCDEQ Stormwater Calculations**

**Drainage Area Calculations**

|  | Previously Permitted Drainage Area |        | DA-5       |        |
|--|------------------------------------|--------|------------|--------|
|  | (sq.ft.)                           | (acre) | (sq.ft.)   | (acre) |
| Drainage Area =                            | 1,789,453.00                       | 41.08  | 877,932.00 | 20.15  |
| Open Space                                 | 707,982.00                         | 16.25  | 0.00       | 0.00   |
| Pond =                                     | 153,011.00                         | 3.51   | 0.00       | 0.00   |
| Buildings =                                |                                    |        | 10,962.00  | 0.25   |
| Asphalt =                                  |                                    |        | 454,620.00 | 10.44  |
| Concrete Pads =                            |                                    |        | 23,399.70  | 0.54   |
| Ex. Impervious =                           | 928,460.00                         | 21.31  | 0.00       | 0.00   |
| Ex. Impervious (to be removed) =           | 557,077.50                         | 12.79  | 251,526.50 | 5.77   |
| Total Treated Impervious (less existing) = | 524,393.50                         | 12.04  | 237,455.20 | 5.45   |

**Runoff generated by 1.5" Rainfall Event (NCDEQ Simplified Method)**

la = Impervious Percentage = Impervious Area/Drainage Area  
 Rv= Runoff Coefficient, 0.05+0.9la  
 Rd= Rain fall depth (1.5 in.)  
 V= Runoff Volume, 3630\*Rd\*Rv\*A

|           | Existing     | Proposed     |
|-----------|--------------|--------------|
| la =      | 29.3%        | 27.1%        |
| Rv=       | 0.31         | 0.29         |
| Rd (in.)= | 1.5          | 1.5          |
| A (ac.)=  | 41.08        | 20.15        |
| V (cf.)=  | <b>70236</b> | <b>32154</b> |

|   |                      |
|---|----------------------|
| <b>Total Storage Provided NCDEQ (Existing Permit) =</b>                 | <b>70,300.00 cf</b>  |
| <b>Total County Storage Provided Per Previous Waterpark Site Plan =</b> | <b>696,530.00 cf</b> |
| <b>Storage Provided in Wet Pond Per Previous State Permit =</b>         | <b>259,724.00 cf</b> |
| <b>NCDOT Storage for RV Area (DA-5) =</b>                               | <b>32,154.26 cf</b>  |
| <b>DA-5 Storage Required by Currituck County =</b>                      | <b>33,700.00 cf</b>  |
| <b>Wet Pond Storage Required by Currituck County =</b>                  | <b>293,424.00 cf</b> |

**Permanent pool Storage Provided In Original Wet Detention Basin 1**

| Elev | Area (sf) | Avg area (sf) | Volume (cf) | Cum Vol. (cf) |
|------|-----------|---------------|-------------|---------------|
| -2   | 54157     |               |             | 0             |
|      |           | 55690         | 55690       |               |
| -1   | 57223     |               |             | 55690         |
|      |           | 58792.5       | 58793       |               |
| 0    | 60362     |               |             | 114483        |
|      |           | 61968.5       | 61969       |               |
| 1    | 63575     |               |             | 176452        |
|      |           | 65996.5       | 65997       |               |
| 2    | 68418     |               |             | 242449        |
|      |           | 70113         | 21034       |               |
| 2.3  | 71808     |               |             | 263483        |

Total Storage (cf.) Provided in Basin 1: **263483**

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 OBX Waterpark Adventure  
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**Above Permanent Pool Storage Provided In Original Wet Detention Basin 1**

| Elev | Area (sf) | Avg area (sf) | Volume (cf) | Cum Vol. (cf) |
|------|-----------|---------------|-------------|---------------|
| 2.3  | 71808     |               |             | 0             |
|      |           | 83231         | 58262       |               |
| 3    | 94654     |               |             | 58262         |
|      |           | 96963.5       | 96964       |               |
| 4    | 99273     |               |             | 155226        |
|      |           | 101498        | 101498      |               |
| 5    | 103723    |               |             | 256724        |

Total Storage (cf.) Provided in Basin 1: **256724**

**Volume in Forebay for Original Basin 1**

| Elev | Area (sf) | Avg area (sf) | Volume (cf) | Cum Vol. (cf) |
|------|-----------|---------------|-------------|---------------|
| -2   | 10133     |               |             | 0             |
|      |           | 10551.5       | 10552       |               |
| -1   | 10970     |               |             | 10552         |
|      |           | 11405.5       | 11406       |               |
| 0    | 11841     |               |             | 21958         |
|      |           | 12293         | 12293       |               |
| 1    | 12745     |               |             | 34251         |
|      |           | 13213         | 13213       |               |
| 2    | 13681     |               |             | 47464         |
|      |           | 13970         | 4191        |               |
| 2.3  | 14259     |               |             | 51655         |

Total Storage (cf.) Provided in Basin 1 Forebay: **51655**

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OBX Waterpark Adventure  
9/26/2024

|                           |        |    |                 |
|---------------------------|--------|----|-----------------|
| $A_{\text{bot\_shelf}} =$ | 79688  | sf | (1.8')          |
| $A_{\text{perm\_pool}} =$ | 86067  | sf | (2.3')          |
| $A_{\text{bot\_pond}} =$  | 54157  | sf | (-2' Main only) |
| $V_{\text{perm\_pool}} =$ | 315138 | cf | (2.3')          |
| Depth =                   | 4.3    |    |                 |

Option 1                       $D_{\text{av}} =$               3.7                      feet

Option 2                       $D_{\text{av}} =$               4.1                      feet

### Wet Detention Basin Supplement Calculations

#### Orifice Draw Down Calculations Basin 1

$$Q = CA(2gH)^{0.5}$$

$$H = \text{Driving Head} = D/3 = 0.90 \text{ ft.}$$

$$C = \text{orific coefficient} = 0.6$$

$$\text{Try orifice diameter} = 5 \text{ in}$$

$$A = \text{Area} = 3.14 \cdot (d^2)/4 = 0.136 \text{ sf}$$

$$Q = CA(2gH)^{0.5} = 0.623 \text{ cfs}$$

$$\text{Required Storage Volume} = 70300.0 \text{ cf}$$

$$\text{Drawdown} = \text{Storage Volume} / Q = \mathbf{4.77 \text{ days}}$$

P15004

OBX Waterpark Adventure

9/26/2024

**Permanent pool Storage Provided In Expanded Wet Detention Basin 1**

| Elev | Area (sf) | Avg area (sf) | Volume (cf) | Cum Vol. (cf) |
|------|-----------|---------------|-------------|---------------|
| -2   | 67001     |               |             | 0             |
|      |           | 68716         | 68716       |               |
| -1   | 70431     |               |             | 68716         |
|      |           | 72181.45      | 72181       |               |
| 0    | 73931.9   |               |             | 140897        |
|      |           | 75716.95      | 75717       |               |
| 1    | 77502     |               |             | 216614        |
|      |           | 81490.5       | 81491       |               |
| 2    | 85479     |               |             | 298105        |
|      |           | 86044         | 25813       |               |
| 2.3  | 86609     |               |             | 323918        |

Total Storage (cf.) Provided in Basin 1: **323918**

**Above Permanent Pool Storage Provided In Expanded Wet Detention Basin 1**

| Elev | Area (sf) | Avg area (sf) | Volume (cf) | Cum Vol. (cf) |
|------|-----------|---------------|-------------|---------------|
| 2.3  | 86609     |               |             | 0             |
|      |           | 97521.8       | 68265       |               |
| 3    | 108434.6  |               |             | 68265         |
|      |           | 112432.25     | 112432      |               |
| 4    | 116429.9  |               |             | 180697        |
|      |           | 117317.95     | 117318      |               |
| 5    | 118206    |               |             | 298015        |

Total Storage (cf.) Provided in Basin 1: **298015**

**Volume in Forebay for RV Area**

| Elev | Area (sf) | Avg area (sf) | Volume (cf) | Cum Vol. (cf) |
|------|-----------|---------------|-------------|---------------|
|      |           |               |             |               |
|      |           |               |             |               |
| -0.5 | 1704      |               |             | 0             |
|      |           | 2936          | 1468        |               |
| 0    | 4168      |               |             | 1468          |
|      |           | 6216          | 6216        |               |
| 1    | 8264      |               |             | 7684          |
|      |           | 10370.35      | 10370       |               |
| 2    | 12476.7   |               |             | 18054         |
|      |           | 13116.35      | 3935        |               |
| 2.3  | 13756     |               |             | 21989         |

Total Storage (cf.) Provided in Basin 1 Forebay: **21989**

**23%**

Project Name: DA-6 (prev. permitted basin at WWTP)  
 Quible Project Number: P15004.1  
 Date: 9/24/2024

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

**Step 1:** Drainage Area 124,547.00 square feet  
2.86 acres

**Step 2:** Determine Runoff Coefficient  
 C = 0.20

**Step 3:** Determine Time of Concentration

**Sheet Flow**

$$T_{c1} = \frac{0.42(nL)^{0.8}}{p^{0.5}S^{0.4}}$$

n = 0.1 (woods)  
 L = 300 feet  
 P = 4 inch  
 S = 0.010 ft/ft  
 T<sub>c1</sub> = 20.1 mins

Elev. Start = 10.12  
 Elev. End = 7.5

**Shallow Concentrated Flow**

L = 51 feet  
 S = 0.01 ft/ft  
 unpaved  
 V<sub>unpaved</sub> = 134.64 fpm  
 T<sub>c2</sub> = 0.4 mins

**Channel Flow**

(n/a)

$$T_c = T_{c1} + T_{c2}$$

T<sub>c</sub> = 20.5 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 = 3.46 in/hr

Interpolation Formula =

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

y<sub>2</sub> = 3.46

| X | Y     |
|---|-------|
| 1 | 12    |
| 2 | 20.51 |
| 3 | 30    |

4.06  
 2.80

**Step 5:** Determine the 2-year Pre-Development peak discharge, Q

Q = CIA

Q<sub>2</sub> = 1.98 cfs

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

|                   |            |        |           |      |
|-------------------|------------|--------|-----------|------|
| Impervious Area = | 47,319.00  | sq.ft. | C - Value | 0.95 |
| Open Area =       | 77,228.00  | sq.ft. |           | 0.25 |
| Total =           | 124,547.00 | sq.ft. |           |      |
| Cw =              | 0.52       |        |           |      |

**Step 7:** Determine Time of Concentration for post-development

**Sheet Flow**

$$T_{c1} = \frac{0.42(nL)^{0.8}}{p^{0.5}S^{0.4}}$$

|                   |        |                                      |
|-------------------|--------|--------------------------------------|
| n =               | 0.011  | (smooth pavement)                    |
| L =               | 300.00 | feet                                 |
| P =               | 5      | inch (From NOAA Rainfall Depth Data) |
| S =               | 0.010  | ft/ft                                |
| Tc <sub>1</sub> = | 3.1    | mins                                 |

**Shallow Concentrated Flow**

|                   |                   |                          |       |
|-------------------|-------------------|--------------------------|-------|
| Tc <sub>2</sub> = | L =               | 10.00                    | ft    |
|                   |                   | paved                    |       |
|                   | Slope =           | 0.024                    | ft/ft |
|                   | Paved Areas V =   | 1302(S <sup>0.53</sup> ) |       |
|                   | Unpaved Areas V = | 972(S <sup>0.53</sup> )  |       |
| V =               | 180.4             | ft/min                   |       |
| Tc <sub>2</sub> = | 0.1               | mins                     |       |

**Channel Flow**

(n/a)

$$T_c = T_{c1} + T_{c2}$$

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

**Step 8:** Determine Peak Rainfall Intensity

| T (yrs) | Time of Concentration |         |         |         |      |      |       |
|---------|-----------------------|---------|---------|---------|------|------|-------|
|         | 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<sub>5</sub> = 6.82

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

$$Q = CIA$$

Q<sub>5</sub> = 10.06 cfs

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

Hydrologic Soil Type: A/D (From NRCS Soils Report)

| Land Use          | CN | Area       |
|-------------------|----|------------|
| Impervious Area   | 98 | 47,319.00  |
| Open Space        | 49 | 77,228.00  |
| Total =           |    | 124,547.00 |
| CN <sub>w</sub> = |    | 67.62      |

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

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

|     |         |
|-----|---------|
| P = | 5 in    |
| S = | 4.79    |
| Q = | 1.85 in |
|     |         |

**Step 12:** Determine the Runoff Volume, V<sub>r</sub>

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

|                  |            |
|------------------|------------|
| Q =              | 1.85 in    |
| A =              | 2.86 acres |
| V <sub>r</sub> = | 0.44 ac-ft |

**Step 13:** Determine the Required Storage Volume, V<sub>s</sub>

$$V_s = 1613.33 * V_r * \left(1 - \frac{Q_{2\_pre}}{Q_{5\_post}}\right)$$

|                       |              |
|-----------------------|--------------|
| V <sub>r</sub> =      | 0.44 ac-ft   |
| Q <sub>2-pre</sub> =  | 1.98 cfs     |
| Q <sub>5-post</sub> = | 10.06 cfs    |
| V <sub>s</sub> =      | 571.15 CY    |
|                       | 15,421.12 CF |



**Storage Calculations**

|  | Infiltration Basin (A) |        |
|--|------------------------|--------|
|  | (sq.ft.)               | (acre) |
| Drainage Area =                          | 124,547                | 2.86   |
| Open Space                               | 77,228                 | 1.77   |
| Gravel =                                 | 0                      | 0.00   |
| Building =                               | 5,701                  | 0.13   |
| Asphalt/concrete =                       | 41,618                 | 0.96   |
| Impervious =                             | 47,319                 | 1.09   |
| Existing to be removed (State Credit) =  | 0                      | 0.00   |
| Total Impervious (including permeable) = | 47,319                 | 1.09   |

**Runoff generated by Rainfall Event (NCDEQ Simplified Method)**

la = Impervious Percentage = Impervious Area/Drainage Area

Rv= Runoff Coefficient, 0.05+0.9la

Rd= Rain fall depth

V= Runoff Volume, 3630\*Rd\*Rv\*A

|           |             |
|-----------|-------------|
|           | A (1.5")    |
| la =      | 38.0%       |
| Rv=       | 0.39        |
| Rd (in.)= | 1.5         |
| A (ac.) = | 2.86        |
| V (cf.)=  | <b>6103</b> |

**Total Storage Required by NCDEQ =**

**6200 cf**

**Total Storage Required by Currituck County =**

**15,421.12 cf**

**Infiltration Basin Stormwater Calculations for State**

**Above Grade Storage Provided In Infiltration Basin (SHWT +/- 3.6')**

| A - Above Grade Storage |           |               |             |               |
|-------------------------|-----------|---------------|-------------|---------------|
| Elev                    | Area (sf) | Avg area (sf) | Volume (cf) | Cum Vol. (cf) |
|                         |           |               |             |               |
| 6.70                    | 19649     |               |             | 0             |
|                         |           | 20032         | 6010        |               |
| 7.00                    | 20415     |               |             | 6010          |
|                         |           | 21059         | 10530       |               |
| 7.50                    | 21703     |               |             | 16539 (Vg)    |

**Above Grade Storage Provided =**

**16539 cf**

**4.1 in**

**Front Infiltration Basin Drawdown Calculations**

Hydraulic Conductivity = 1.6 in/hr

Max Stored Depth = 9.6 in

Drawdown Time = Stored Depth / Hydraulic Conductivity

**Drawdown Time = 6.00 hrs or 0.25 days**

Project Name: DA-7 (Area inbetween Wetlands)  
 Quible Project Number: P15004.1  
 Date: 9/24/2024

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

|                              |           |             |
|------------------------------|-----------|-------------|
| <b>Step 1:</b> Drainage Area | 83,688.00 | square feet |
|                              | 1.92      | acres       |

|   |          |
|---|----------|
| <b>Step 2:</b> 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 = | 4.5 |
| L =               | 300   | feet    | Elev. End =   | 3.9 |
| P =               | 4     | inch    |               |     |
| S =               | 0.010 | ft/ft   |               |     |
| Tc <sub>1</sub> = | 20.1  | mins    |               |     |

**Shallow Concentrated Flow**

|                        |        |         |
|------------------------|--------|---------|
| L =                    | 98     | feet    |
| S =                    | 0.01   | ft/ft   |
|                        |        | unpaved |
| V <sub>unpaved</sub> = | 134.64 | fpm     |
| Tc <sub>2</sub> =      | 0.7    | mins    |

**Channel Flow**

(n/a)

Tc = Tc<sub>1</sub> + Tc<sub>2</sub>  
 Tc = 20.9 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 = 3.44 in/hr

Interpolation Formula =

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

| X | Y     |
|---|-------|
| 1 | 12    |
| 2 | 20.86 |
| 3 | 30    |

y<sub>2</sub> = 3.44

**Step 5:** Determine the 2-year Pre-Development peak discharge, Q

Q = CIA  
 Q<sub>2</sub> = 1.32 cfs

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

|                   |                  | C - Value |
|-------------------|------------------|-----------|
| Impervious Area = | 41,645.00 sq.ft. | 0.95      |
| Open Area =       | 42,043.00 sq.ft. | 0.25      |
| Total =           | 83,688.00 sq.ft. |           |
| Cw =              | 0.60             |           |

**Step 7:** Determine Time of Concentration for post-development

**Sheet Flow**

$$T_{c1} = \frac{0.42(nL)^{0.8}}{p^{0.5}S^{0.4}}$$

|                   |        |                                      |
|-------------------|--------|--------------------------------------|
| n =               | 0.011  | (smooth pavement)                    |
| L =               | 300.00 | feet                                 |
| P =               | 5      | inch (From NOAA Rainfall Depth Data) |
| S =               | 0.010  | ft/ft                                |
| T <sub>c1</sub> = | 3.1    | mins                                 |

**Shallow Concentrated Flow**

|                   |               |          |                      |
|-------------------|---------------|----------|----------------------|
| T <sub>c2</sub> = | L =           | 10.00    | ft                   |
|                   |               | paved    |                      |
|                   | Slope =       | 0.024    | ft/ft                |
|                   | Paved Areas   | V = 1302 | (S <sup>0.53</sup> ) |
|                   | Unpaved Areas | V = 972  | (S <sup>0.53</sup> ) |
| V =               | 180.4         | ft/min   |                      |
| T <sub>c2</sub> = | 0.1           | mins     |                      |

**Channel Flow**

(n/a)

$$T_c = T_{c1} + T_{c2}$$

|                  |     |      |   |
|------------------|-----|------|---|
| T <sub>c</sub> = | 5.0 | mins | *5 min minimum T <sub>c</sub> (worst case scenario) |
|------------------|-----|------|---|

**Step 8:** Determine Peak Rainfall Intensity

| T (yrs) | Time of Concentration |         |         |         |      |      |       |
|---------|-----------------------|---------|---------|---------|------|------|-------|
|         | 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<sub>5</sub> = 6.82

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

$$Q = CIA$$

Q<sub>5</sub> = 7.84 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 | 41,645.00 |
| Open Space        | 49 | 42,043.00 |
| Total =           |    | 83,688.00 |
| CN <sub>w</sub> = |    | 73.38     |

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

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

|     |      |    |
|-----|------|----|
| P = | 5    | in |
| S = | 3.63 |    |
| Q = | 2.31 | in |
|     |      |    |

**Step 12:** Determine the Runoff Volume, V<sub>r</sub>

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

|                  |      |       |
|------------------|------|-------|
| Q =              | 2.31 | in    |
| A =              | 1.92 | acres |
| V <sub>r</sub> = | 0.37 | ac-ft |

**Step 13:** Determine the Required Storage Volume, V<sub>s</sub>

$$V_s = 1613.33 * V_r * \left(1 - \frac{Q_{2-pre}}{Q_{5-post}}\right)$$

|                       |           |       |
|-----------------------|-----------|-------|
| V <sub>r</sub> =      | 0.37      | ac-ft |
| Q <sub>2-pre</sub> =  | 1.32      | cfs   |
| Q <sub>5-post</sub> = | 7.84      | cfs   |
| V <sub>s</sub> =      | 496.60    | CY    |
|                       | 13,408.19 | CF    |

**Storage Calculations**

|  | Infiltration Basin (A) |        |
|--|------------------------|--------|
|  | (sq.ft.)               | (acre) |
| Drainage Area =                          | 83,688                 | 1.92   |
| Open Space                               | 42,043                 | 0.97   |
| Gravel =                                 | 0                      | 0.00   |
| Building =                               | 0                      | 0.00   |
| Asphalt/concrete =                       | 41,645                 | 0.96   |
| Impervious =                             | 41,645                 | 0.96   |
| Existing to be removed (State Credit) =  | 0                      | 0.00   |
| Total Impervious (including permeable) = | 41,645                 | 0.96   |

**Runoff generated by Rainfall Event (NCDEQ Simplified Method)**

la = Impervious Percentage = Impervious Area/Drainage Area

Rv= Runoff Coefficient, 0.05+0.9la

Rd= Rain fall depth

V= Runoff Volume, 3630\*Rd\*Rv\*A

|           |             |
|-----------|-------------|
|           | A (1.5")    |
| la =      | 49.8%       |
| Rv=       | 0.50        |
| Rd (in.)= | 1.5         |
| A (ac.) = | 1.92        |
| V (cf.)=  | <b>5210</b> |

Total Storage Required by NCDEQ = **5300 cf**

Total Storage Required by Currituck County = **13,408.19 cf**

**Infiltration Basin Stormwater Calculations for State**

**Above Grade Storage Provided In Infiltration Basin (SHWT +/- 3.6')**

| A - Above Grade Storage |           |               |             |               |
|-------------------------|-----------|---------------|-------------|---------------|
| Elev                    | Area (sf) | Avg area (sf) | Volume (cf) | Cum Vol. (cf) |
|                         |           |               |             | 0             |
| 5.50                    | 15810     |               |             |               |
|                         |           | 16552         | 8276        |               |
| 6.00                    | 17294     |               |             | 8276          |
|                         |           | 18043         | 9022        |               |
| 6.50                    | 18792     |               |             | 17298 (Vg)    |

Above Grade Storage Provided = **17298 cf**  
**5.0 in**

**Front Infiltration Basin Drawdown Calculations**

Hydraulic Conductivity = 1.6 in/hr

Max Stored Depth = 12 in

Drawdown Time = Stored Depth / Hydraulic Conductivity

**Drawdown Time = 7.50 hrs or 0.31 days**

Project Name: DA-8  
 Quible Project Number: P15004.1  
 Date: 9/24/2024

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

|                              |            |             |
|------------------------------|------------|-------------|
| <b>Step 1:</b> Drainage Area | 718,600.20 | square feet |
|                              | 16.50      | acres       |

|   |     |      |
|---|-----|------|
| <b>Step 2:</b> Determine Runoff Coefficient | C = | 0.20 |
|---|-----|------|

**Step 3:** Determine Time of Concentration

**Sheet Flow**

$$T_{c1} = \frac{0.42(nL)^{0.8}}{p^{0.5}S^{0.4}}$$

|                   |       |         |               |      |
|-------------------|-------|---------|---------------|------|
| n =               | 0.1   | (woods) | Elev. Start = | 10.5 |
| L =               | 300   | feet    | Elev. End =   | 4.5  |
| P =               | 4     | inch    | Length =      | 915  |
| S =               | 0.006 | ft/ft   |               |      |
| T <sub>c1</sub> = | 24.7  | mins    |               |      |

**Shallow Concentrated Flow**

|                        |       |         |
|------------------------|-------|---------|
| L =                    | 615   | feet    |
| S =                    | 0.006 | ft/ft   |
|                        |       | unpaved |
| V <sub>unpaved</sub> = | 24.98 | fpm     |
| T <sub>c2</sub> =      | 24.6  | mins    |

**Channel Flow**

(n/a)

T<sub>c</sub> = T<sub>c1</sub> + T<sub>c2</sub>  
 T<sub>c</sub> = 49.3 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 = 1.45 in/hr

Interpolation Formula =

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

| X | Y     |
|---|-------|
| 1 | 12    |
| 2 | 49.31 |
| 3 | 30    |

y<sub>2</sub> = 1.45

**Step 5:** Determine the 2-year Pre-Development peak discharge, Q

Q = CIA  
 Q<sub>2</sub> = 4.78 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 | 407,844.30 |
| Open Space        | 49 | 310,755.90 |
| Total =           |    | 718,600.20 |
| CN <sub>w</sub> = |    | 76.81      |

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

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

|     |      |    |
|-----|------|----|
| P = | 5    | in |
| S = | 3.02 |    |
| Q = | 2.61 | in |
|     |      |    |

**Step 12:** Determine the Runoff Volume, V<sub>r</sub>

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

|                  |       |       |
|------------------|-------|-------|
| Q =              | 2.61  | in    |
| A =              | 16.50 | acres |
| V <sub>r</sub> = | 3.58  | ac-ft |

**Step 13:** Determine the Required Storage Volume, V<sub>s</sub>

$$V_s = 1613.33 * V_r * \left(1 - \frac{Q_{2-pre}}{Q_{5-post}}\right)$$

|                       |            |       |
|-----------------------|------------|-------|
| V <sub>r</sub> =      | 3.58       | ac-ft |
| Q <sub>2-pre</sub> =  | 4.78       | cfs   |
| Q <sub>5-post</sub> = | 18.99      | cfs   |
| V <sub>s</sub> =      | 4326.00    | CY    |
|                       | 116,802.02 | CF    |

**Storage Calculations**

|  | Infiltration Basin (A) |        |
|--|------------------------|--------|
|  | (sq.ft.)               | (acre) |
| Drainage Area =                          | 718,600                | 16.50  |
| Open Space                               | 310,756                | 7.13   |
| Concrete pads =                          | 21,500                 | 0.49   |
| Building =                               | 11,231                 | 0.26   |
| Asphalt/concrete =                       | 371,216                | 8.52   |
| Impervious =                             | 403,947                | 9.27   |
| Existing =                               | 3,897                  | 0.09   |
| Total Impervious (including permeable) = | 407,844                | 9.36   |

**Runoff generated by Rainfall Event (NCDEQ Simplified Method)**

la = Impervious Percentage = Impervious Area/Drainage Area

Rv= Runoff Coefficient, 0.05+0.9la

Rd= Rain fall depth

V= Runoff Volume, 3630\*Rd\*Rv\*A

|           |              |
|-----------|--------------|
|           | A (1.5")     |
| la =      | 56.8%        |
| Rv=       | 0.56         |
| Rd (in.)= | 1.5          |
| A (ac.) = | 16.50        |
| V (cf.)=  | <b>50392</b> |

**Total Storage Required by NCDEQ =**

**50400 cf**

**Total Storage Required by Currituck County =**

**116,802.02 cf**

**Infiltration Basin Stormwater Calculations for State**

**Above Grade Storage Provided In Infiltration Basin (SHWT +/- 3.6')**

| A - Above Grade Storage |           |               |             |               |
|-------------------------|-----------|---------------|-------------|---------------|
| Elev                    | Area (sf) | Avg area (sf) | Volume (cf) | Cum Vol. (cf) |
| 5.6                     | 48575.7   |               |             | 0             |
|                         |           | 54033         | 21613       |               |
| 6.00                    | 59491     |               |             | 21613         |
|                         |           | 62396         | 62396       |               |
| 7.00                    | 65302     |               |             | 84010         |
|                         |           | 66787         | 33393       |               |
| 7.50                    | 68272     |               |             | 117403 (Vg)   |

**Above Grade Storage Provided =**

**117403 cf**

**3.5 in**

**Front Infiltration Basin Drawdown Calculations**

Hydraulic Conductivity = 1.6 in/hr

Max Stored Depth = 18 in

Drawdown Time = Stored Depth / Hydraulic Conductivity

**Drawdown Time = 11.25 hrs or 0.47 days**

# Stormwater Management Plan Narrative

OBX Waterpark Adventure – Currituck County, NC

September 26, 2024

## Appendix 5: NFF Calculations

**Retail**  
**ISO Fire Flow Worksheet**  
**Sample**

|   |   |                    |            |  |
|---|---|--------------------|------------|--|
| <b>Needed Fire Flow Work Sheet (ISO formulas)</b> |   |                    |            | NFF = (Ci)(Oi)(Xi+Pi)<br>C=18F(Ai)^0.5 |
| Address:  | <b>8528 Caratoke Highway Currituck County, NC</b> |                    |            |  |
| Project Name:                                     | <b>H2OBX RV Resort</b>                            | Occupancy Type:    | <b>C-2</b> |  |
| Construction Type:                                | <b>Typical wood construction</b>                  | Number of Stories: | <b>1</b>   |  |

|               |  |
|---------------|--|
| <b>STEP 1</b> | <p>Take the area, which is 100% sq. ft. of the first floor plus the following percentage of the total area of the other floors.</p> <p><b>First Floor</b> <span style="float: right; border: 1px solid black; padding: 2px;">3870</span> Sq. Ft. @ 100%</p> <p>Buildings classified as construction classes I-IV: 25% of all other floors<br/>         Buildings classified as construction classes V-VI: 50% of all other floors</p> <p><b>Total other floors</b> <span style="float: right; border: 1px solid black; padding: 2px;">0</span></p> <p><b>Total Area All</b> <span style="float: right; border: 1px solid black; padding: 2px;">3870</span></p> |
|---------------|--|

| <b>STEP 2</b>            | <p>Take the Square Root of the Area <span style="float: right; border: 1px solid black; padding: 2px;">62</span></p> <p>Now multiply by "F", which is the coefficient for the construction type:</p> <p>F = Coefficient related to the class of construction as determined by using the construction type found in SBCCI</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th>Construction Type</th> <th>Class</th> <th>F Value</th> </tr> </thead> <tbody> <tr><td>Frame</td><td>VI</td><td>1.5</td></tr> <tr><td>Joist Masonry</td><td>VI</td><td>1</td></tr> <tr><td>Non-combustible</td><td>IV</td><td>0.8</td></tr> <tr><td>Heavy Timber</td><td>III</td><td>0.8</td></tr> <tr><td>Modified fire resistance</td><td>II</td><td>0.6</td></tr> <tr><td>Fire resistive</td><td>I</td><td>0.6</td></tr> </tbody> </table> <p><b>F Value Selected</b> <span style="float: right; border: 1px solid black; padding: 2px;">1.5</span></p> <p><b>Square Root of the Area x F</b> <span style="float: right; border: 1px solid black; padding: 2px;">93</span></p> <p><b>Square Root of the Area x F x 18</b> <span style="float: right; border: 1px solid black; padding: 2px;">1680</span> = C Value</p> | Construction Type | Class | F Value | Frame | VI | 1.5 | Joist Masonry | VI | 1 | Non-combustible | IV | 0.8 | Heavy Timber | III | 0.8 | Modified fire resistance | II | 0.6 | Fire resistive | I | 0.6 |
|--------------------------|---|-------------------|-------|---------|-------|----|-----|---------------|----|---|-----------------|----|-----|--------------|-----|-----|--------------------------|----|-----|----------------|---|-----|
| Construction Type        | Class   | F Value           |       |         |       |    |     |               |    |   |                 |    |     |              |     |     |                          |    |     |                |   |     |
| Frame                    | VI  | 1.5               |       |         |       |    |     |               |    |   |                 |    |     |              |     |     |                          |    |     |                |   |     |
| Joist Masonry            | VI  | 1                 |       |         |       |    |     |               |    |   |                 |    |     |              |     |     |                          |    |     |                |   |     |
| Non-combustible          | IV  | 0.8               |       |         |       |    |     |               |    |   |                 |    |     |              |     |     |                          |    |     |                |   |     |
| Heavy Timber             | III   | 0.8               |       |         |       |    |     |               |    |   |                 |    |     |              |     |     |                          |    |     |                |   |     |
| Modified fire resistance | II  | 0.6               |       |         |       |    |     |               |    |   |                 |    |     |              |     |     |                          |    |     |                |   |     |
| Fire resistive           | I   | 0.6               |       |         |       |    |     |               |    |   |                 |    |     |              |     |     |                          |    |     |                |   |     |

| <b>STEP 3</b>                         | <p>Round off the C value to the nearest 250 GPM (round up or down)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>C values ranging from</th> <th>Use</th> </tr> </thead> <tbody> <tr><td>500 to 625</td><td>500</td></tr> <tr><td>626 to 875</td><td>750</td></tr> <tr><td>876 to 1125</td><td>1000</td></tr> <tr><td>1126 to 1375</td><td>1250</td></tr> <tr><td>1376 to 1625</td><td>1500</td></tr> <tr><td>1626 to 1875</td><td>1750</td></tr> <tr><td>1876 to 2125</td><td>2000</td></tr> <tr><td>2126 to 2375</td><td>2250</td></tr> <tr><td>2376 to 2625</td><td>2500</td></tr> <tr><td>2626 to 2876</td><td>2750</td></tr> <tr><td>2876 to 3125</td><td>3000</td></tr> <tr><td>3126 to 3375</td><td>3250</td></tr> <tr> <td style="text-align: center;"><b>Rounded to the nearest 250 GPM</b></td> <td style="text-align: center;"><b>1750</b></td> </tr> </tbody> </table> | C values ranging from | Use | 500 to 625 | 500 | 626 to 875 | 750 | 876 to 1125 | 1000 | 1126 to 1375 | 1250 | 1376 to 1625 | 1500 | 1626 to 1875 | 1750 | 1876 to 2125 | 2000 | 2126 to 2375 | 2250 | 2376 to 2625 | 2500 | 2626 to 2876 | 2750 | 2876 to 3125 | 3000 | 3126 to 3375 | 3250 | <b>Rounded to the nearest 250 GPM</b> | <b>1750</b> |
|---------------------------------------|---|-----------------------|-----|------------|-----|------------|-----|-------------|------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|---------------------------------------|-------------|
| C values ranging from                 | Use   |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 500 to 625                            | 500   |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 626 to 875                            | 750   |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 876 to 1125                           | 1000  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 1126 to 1375                          | 1250  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 1376 to 1625                          | 1500  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 1626 to 1875                          | 1750  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 1876 to 2125                          | 2000  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 2126 to 2375                          | 2250  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 2376 to 2625                          | 2500  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 2626 to 2876                          | 2750  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 2876 to 3125                          | 3000  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| 3126 to 3375                          | 3250  |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |
| <b>Rounded to the nearest 250 GPM</b> | <b>1750</b>   |                       |     |            |     |            |     |             |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |              |      |                                       |             |

**ISO Fire Flow Worksheet  
Sample Continued**

| STEP 4 | Multiply result of rounded off GPM by the Occupancy Factor (Oi)  | Occupancy Factor |
|--------|--|------------------|
|        | <p><b>Noncombustible (C-1)</b> = No active fuel loads such as storage of asbestos, clay, glass, marble, stone, or metal products.</p>  | 0.75             |
|        | <p><b>Limited - Combustible (C-2)</b> = Limited fuel loads such as airports, apartments, art studios, auto repair, auto showroom, aviaries, banks, barber shops, beauty shops, churches, clubs, cold storage warehouses, day care center, educational occupancies, gas stations, green houses, health clubs, hospitals, jails, libraries, medical labs, motels, museums, nursing homes, offices, radio stations, recreation centers, and rooming houses.</p>   | 0.85             |
|        | <p><b>Combustible (C-3)</b> = Moderate fuel loads such as auto part stores, auto repair training center, bakery, bookstores, bowling centers, casinos, commercial laundries, contractor equipment storage, dry cleaners with no flammable fluids, leather processing, municipal storage buildings, nursery sales stores, pavilions, pet shops, photographic supplies, printers, restaurants, shoe repair, supermarkets, theaters, vacant buildings, and most wholesale &amp; retail sales occupancies.</p> | 1.0              |
|        | <p><b>Free-Burning (C-4)</b> = Active fuel loads such as aircraft hangers, cabinet making, combustible metals, dry cleaners using flammable fluids, feed stores, furniture stores, kennels, lumber, packaging and crating, paper products manufacturing, petroleum bulk distribution centers, tire manufacturers, tire recapping or retreading, wax products, and wood working shops.</p>  | 1.15             |
|        | <p><b>Rapid-Burning (C-5)</b> = Contents that burn with great intensity, spontaneously ignite, have flammable or explosive vapors, or large quantities of dust such as ammunition, feed mills, fireworks, flammable compressed gases, flammable liquids, flour mills, highly flammable solids, matches, mattress factories, nitrocellulose-based products, rag storage, upholstery shops, &amp; waste paper storage.</p>   | 1.25             |
|        | <p><b>Occupancy Factor Selected</b> <span style="border: 1px solid black; padding: 2px;">0.85</span></p> <p><b>Rounded GPM x Oi</b> <span style="border: 1px solid black; padding: 2px;">1487.5</span></p>   |                  |

### ISO Fire Flow Worksheet Sample Continued

| <b>STEP 5</b>  |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |
|--|---------------------------------------|----------------------|------------------------------------|-----------------------------------|-----------------|-------|-----------------|-----|-------------------|-----|
| Now consider the exposure factor (Xi) - (Separation between buildings)   |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <b>Distance (feet to the exposed building)</b>   | <b>Xi</b>                             | <b>&gt;3 stories</b> |                                    |                                   |                 |       |                 |     |                   |     |
| 0-10   | 0.22                                  | 0.47                 |                                    |                                   |                 |       |                 |     |                   |     |
| 11-30  | 0.18                                  | 0.43                 |                                    |                                   |                 |       |                 |     |                   |     |
| 31-60  | 0.13                                  | 0.38                 |                                    |                                   |                 |       |                 |     |                   |     |
| 61-100   | 0.09                                  | 0.34                 |                                    |                                   |                 |       |                 |     |                   |     |
| <b>Distance Selected</b>   | <input type="text" value="100"/>      |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <b>Xi (from table)</b>   | <input type="text" value="0.09"/>     |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <b>Multiply GPM from step 4 by (1+Xi)</b><br>1487.5 x (1+0.09)   |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <b>Fire flow required</b>  | <input type="text" value="1621"/>     |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <b>STEP 6</b>  |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <i>Approved Fire Sprinkler System Credit</i>   | <input type="text" value="25%"/>      |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <i>Take fire flow from step 5 and multiply by sprinkler credit of 0.25</i>   |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <i>Sprinkler credit = 3,673 x 0.25</i>   |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |
|  | <input type="text" value="405"/>      |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <i>Now subtract sprinkler credit from fire flow in step 5</i>  |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <i><del>Fire Flow Required</del></i>   | <input type="text" value="1216.031"/> | <i>N/A</i>           |                                    |                                   |                 |       |                 |     |                   |     |
| <b>STEP 7</b>  |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |
| Take value from step 6 and<br>Round to nearest 250 gpm under 2,500 gpm<br>Round to nearest 500 gpm over 2,500 gpm  |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <b>Needed Fire Flow</b>  | <input type="text" value="1500"/>     |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <p>Notice: Fire hydrant distribution requirements are based on distance from fire hydrant to the structure. The following restrictions for fire flow apply:</p> <table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left;">Distance from hydrant to structure</th> <th style="text-align: left;">Max Flow Credit (gpm per hydrant)</th> </tr> </thead> <tbody> <tr> <td style="padding-left: 20px;">Within 300 feet</td> <td>1,000</td> </tr> <tr> <td style="padding-left: 20px;">301 to 600 feet</td> <td>670</td> </tr> <tr> <td style="padding-left: 20px;">601 to 1,000 feet</td> <td>250</td> </tr> </tbody> </table> |                                       |                      | Distance from hydrant to structure | Max Flow Credit (gpm per hydrant) | Within 300 feet | 1,000 | 301 to 600 feet | 670 | 601 to 1,000 feet | 250 |
| Distance from hydrant to structure   | Max Flow Credit (gpm per hydrant)     |                      |                                    |                                   |                 |       |                 |     |                   |     |
| Within 300 feet  | 1,000                                 |                      |                                    |                                   |                 |       |                 |     |                   |     |
| 301 to 600 feet  | 670                                   |                      |                                    |                                   |                 |       |                 |     |                   |     |
| 601 to 1,000 feet  | 250                                   |                      |                                    |                                   |                 |       |                 |     |                   |     |
| <p><i>per LDC 6.4.4 Fire hydrant &amp; flow requirements: Central water systems shall be designed and constructed for an economic service life of not less than 20 years and in accordance with the fire protection requirements of the Insurance Services Office.</i></p>   |                                       |                      |                                    |                                   |                 |       |                 |     |                   |     |





TO: Warren Eadus, P.G.  
Director of Environmental Services  
West Region

FROM: Kenneth Ellis  
Owner  
H2OBX LLC

DATE: September 25, 2024

RE: H2OBX LLC Willingness to serve related to H2OBX RV Resort

---

As you are aware, H2OBX LLC owns the wastewater treatment facility on its property and provides wastewater treatment service to the H2OBX waterpark.

The existing facility has additional unused capacity. H2OBX LLC is willing and able, and hereby agrees, to accommodate the wastewater needs for the H2OBX RV Resort.

If you have any questions, please do not hesitate to reach out to me.

A handwritten signature in black ink, appearing to read 'Kenneth Ellis'.

## Saunders, Cathleen

---

**From:** May, David <david.may@deq.nc.gov>  
**Sent:** Wednesday, September 25, 2024 10:05 AM  
**To:** Saunders, Cathleen  
**Cc:** Toppen, Sarah A; Tankard, Robert; Strader, Mike  
**Subject:** [EXTERNAL] RE: [External] H2OBX WWTP

**CAUTION: This email originated from outside of WithersRavenel. Do not click links or open attachments unless you recognize the sender and know the content is safe.**

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Hi Cathleen,

Thanks for the inquiry.

Our office will plan to provide a document back to you soon (related to capacity for the referenced project).

Thanks

**David May, L.G.**

Supervisor, Water Quality Regional Operations Section, Washington Regional Office  
Division of Water Resources | North Carolina Department of Environmental Quality  
Office: (252) 948-3939 | Cell: (252) 402-8985  
[david.may@deq.nc.gov](mailto:david.may@deq.nc.gov)



*Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.*

---

**From:** Saunders, Cathleen <[csaunders@withersravenel.com](mailto:csaunders@withersravenel.com)>  
**Sent:** Wednesday, September 25, 2024 7:31 AM  
**To:** Tankard, Robert <[robert.tankard@deq.nc.gov](mailto:robert.tankard@deq.nc.gov)>; Toppen, Sarah A <[Sarah.Toppen@deq.nc.gov](mailto:Sarah.Toppen@deq.nc.gov)>; Bullock, Robert <[robert.e.bullock@deq.nc.gov](mailto:robert.e.bullock@deq.nc.gov)>  
**Cc:** Strader, Mike <[mstrader@withersravenel.com](mailto:mstrader@withersravenel.com)>  
**Subject:** [External] H2OBX WWTP

You don't often get email from [csaunders@withersravenel.com](mailto:csaunders@withersravenel.com). [Learn why this is important](#)

**CAUTION:** External email. Do not click links or open attachments unless verified. Report suspicious emails with the Report Message button located on your Outlook menu bar on the Home tab.

All,

I have a unique request from Currituck County I'm hoping you can provide some assistance with. We are currently working on an RV Park to be built behind the Waterpark on Caratoke Hwy. These facilities are proposed to be connected and treated through the downstream WWTP (WQ0038695 attached for reference). We acknowledge that a fast-track application, including a flow tracking form, from the applicant (ie. WWTP owner) will be required for the gravity sewer installation and associated pump station. However, the County is requiring that we provide an email/letter from NCDEQ prior to our Thursday submittal stating that the plant has sufficient capacity. Please note the existing permit is for a 60,000 gpd WWTP; actual and peak flow for the waterpark connection is anticipated below 30,000 gpd and the proposed flows from the RV Park are 27,200 gpd. Is this something your group could provide some guidance/documentation on?

Thank you,



**Cathleen Saunders, P.E.**

SENIOR PROJECT MANAGER

t: 919.469.3340

d: 252.202.7112

Cary, NC

WITHERSRAVENEL.COM



---

Email correspondence to and from this address may be subject to the North Carolina Public Records Law and may be disclosed to third parties by an authorized state official.



TO: Warren Eadus, P.G.  
Director of Environmental Services  
West Region

FROM: Kenneth Ellis  
Owner  
H2OBX LLC

DATE: September 25, 2024

RE: H2OBX RV PARK OPERATIONAL PLAN

---

The following plan addresses the minimum requirements of Currituck County UDO 4.2.4 J(3)(h) "Operational Plan". This plan may be adjusted as required by the owner or operator and with coordination and approval by Currituck County.

At all times the H2OBX RV Park will operate as follows:

1. RV Park Closure(s)
  - a. The RV Park will be closed annually from January 1-February 1. Additional closure times may occur at the owners' discretion.
2. Employees and related persons residing at the RV Park during Seasonal Operation
  - a. No more than 15 employees (not related persons) may reside at the RV Park during Seasonal Operation.
3. Employees and related persons residing at the RV Park during RV Park Closure
  - a. No employees may reside at the RV Park during RV Park Closure.

As stated above, this is a preliminary operating guideline. As we move closer to opening, if more information or detail is needed, we would be happy to provide.

September 25, 2024

Carl Dunn, P.E.  
Environmental Engineer  
Division of Energy, Mineral, and Land Resources  
Land Quality Section – Washington Regional Office  
North Carolina Department of Environmental Quality  
943 Washington Square Mall  
Washington, North Carolina 27889

**RE: Stormwater Management Plan (High Density Application)**  
**H2OBX RV Park & Waterpark Resort**  
Powells Point, Currituck County, NC

Mr. Dunn,

On behalf of H2OBX, LLC, WithersRavenel hereby submits for your review and approval a High-Density Stormwater Management Permit package for the above referenced project located in Powells Point, Currituck County.

Concurrently, we respectfully request to modify SW7160706. the existing stormwater permit needs to be updated to reflect the current project information as well as expansion of the existing wet pond and infiltration basin (swale #3). A copy of the existing permit has been included.

The following items are included and shall be considered part of this submittal package:

1. A Review Fee Check in the amount of \$2,250.00 made payable to “NCDEQ” (for 4 SCMS or more);
2. A Permit Renewal Fee Check in the amount of \$750.00 made payable to “NCDEQ”;
3. One (1) original and one (1) copy of the Stormwater Management Permit Application Form (SWU-101);
4. One (1) original of the Wet Detention Basin and Infiltration Basins Operation & Maintenance Agreement;
5. One (1) original of the Wet Detention Basin and Infiltration Basins Supplement Form;
6. One (1) original and one (1) copy of the Stormwater Management Permit Application Form (SWU-101) Modification Request, and Permit Renewal form;
7. One (1) original and one (1) copy of the Permit Information Update form;
8. One (1) copy of existing stormwater permit SW7160706;

9. One (1) copy of Property Deed 1512 Page 459, Plat R Page 207;
10. One (1) USGS map with site location identified;
11. One (1) copy of the NC SOS Documentation;
12. One (1) copy of the Stormwater Narrative and associated soils data for the Wet Pond and associated Infiltration Basins;
13. Two (2) full size copies of the Plan Set pages 1, 4, 6, & 7.

Please do not hesitate to contact me at (252) 491-8147 or [csaunders@withersravenel.com](mailto:csaunders@withersravenel.com) should you have any questions or require any additional information.

Thank you for your attention to this project.

Sincerely,  
WithersRavenel

Nadeen Dashti, E.I.

| DEMLR USE ONLY  |          |               |
|---|----------|---------------|
| Date Received   | Fee Paid | Permit Number |
| Applicable Rules: <input type="checkbox"/> Coastal SW – 1995 <input type="checkbox"/> Coastal SW – 2008 <input type="checkbox"/> Ph II - Post Construction<br>(select all that apply) <input type="checkbox"/> Non-Coastal SW- HQW/ORW Waters <input type="checkbox"/> Universal Stormwater Management Plan<br><input type="checkbox"/> Other WQ Mgmt Plan: _____ |          |               |

**State of North Carolina**  
**Department of Environmental Quality**  
**Division of Energy, Mineral and Land Resources**

**POST-CONSTRUCTION STORMWATER MANAGEMENT PERMIT APPLICATION FORM**

*This form may be photocopied for use as an original.*

**I. GENERAL INFORMATION**

- Project Name (subdivision, facility, or establishment name - should be consistent with project name on plans, specifications, letters, operation and maintenance agreements, etc.):  
H2OBX RV & Waterpark Resort
- Location of Project (street address):  
8526 Caratoke Hwy  
 City: Powells Point County: Currituck Zip: 27966
- Directions to project (from nearest major intersection):  
From the intersection of US 158 and SR 1111 (Spot Road) head southeast on US 158 for approximately .7 miles. The site is located on the right side of US 158.
- Latitude: 36° 06' 44" N Longitude: 75° 50' 04" W of the main entrance to the project.

**II. PERMIT INFORMATION:**

- Specify whether project is (check one):     New     Modification     Renewal w/ Modification<sup>†</sup>  
<sup>†</sup>Renewals with modifications also requires SWU-102 – Renewal Application Form
  - If this application is being submitted as the result of a **modification** to an existing permit, list the existing permit number \_\_\_\_\_, its issue date (if known) \_\_\_\_\_, and the status of construction:     Not Started     Partially Completed\*     Completed\*    *\*provide a designer's certification*
- Specify the type of project:  
 Low Density     High Density     Drains to an Offsite Stormwater System     Other
- If this application is being submitted as the result of a **previously returned application** or a **letter from DEMLR requesting a state stormwater management permit application**, list the stormwater project number, if assigned, \_\_\_\_\_ and the previous name of the project, if different than currently proposed, \_\_\_\_\_.
- Additional Project Requirements (check applicable blanks; information on required state permits can be obtained by contacting the Customer Service Center at 1-877-623-6748):
  - CAMA Major     Sedimentation/Erosion Control: 60.5 ac of Disturbed Area  
 NPDES Industrial Stormwater     404/401 Permit: Proposed Impacts \_\_\_\_\_
  - If any of these permits have already been acquired please provide the Project Name, Project/Permit Number, issue date and the type of each permit: \_\_\_\_\_
- Is the project located within 5 miles of a public airport?     No     Yes  
*If yes, see S.L. 2012-200, Part VI: <http://portal.ncdenr.org/web/lr/rules-and-regulations>*

**III. CONTACT INFORMATION**

1. a. Print Applicant / Signing Official's name and title (specifically the developer, property owner, lessee, designated government official, individual, etc. who owns the project):

Applicant/Organization: H2OBX, LLC

Signing Official & Title: Jeffrey Malarney

b. Contact information for person listed in item 1a above:

Street Address: 13 Green Mountain Drive

City: Cohoes State: NY Zip: 12047

Mailing Address (if applicable): 13 Green Mountain Drive

City: Cohoes State: NY Zip: 12047

Phone: ( 518 ) 369-2422 Fax: ( )

Email: kene@aquaticgroup.com

c. Please check (one) the appropriate box. The applicant listed above is:

- The property owner (Skip to Contact Information, item 3a)
- Lessee\* (Attach a copy of the lease agreement and complete Contact Information, item 2a and 2b below)
- Purchaser\* (Attach a copy of the pending sales agreement and complete Contact Information, item 2a and 2b below)
- Developer\* (Complete Contact Information, item 2a and 2b below.)

2. a. Print Property Owner's name and title below, if you are the lessee, purchaser or developer. (This is the person who owns the property that the project is located on):

Property Owner/Organization: \_\_\_\_\_

Signing Official & Title: \_\_\_\_\_

b. Contact information for person listed in item 2a above:

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Mailing Address (if applicable): \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: ( ) Fax: ( )

Email: \_\_\_\_\_

3. a. (Optional) Print the name and title of another contact such as the project's construction supervisor or other person who can answer questions about the project:

Other Contact Person/Organization: Kenneth Ellis

Signing Official & Title: Managing Member

b. Contact information for person listed in item 3a above:

Mailing Address: 1 E Ridge Rd

City: Loudonville State: NY Zip: 12211

Phone: ( 518 ) 369-2422 Fax: ( )

Email: kene@aquaticgroup.com

4. Local jurisdiction for building permits: Currituck County

Point of Contact: Bill News Phone #: ( 252 ) 202-5398

Email: \_\_\_\_\_



**IV. PROJECT INFORMATION**

1. In the space provided below, briefly summarize how the stormwater runoff will be treated.  
Stormwater will be conveyed to multiple bmp's including a wet detention basin and infiltration basins.
  
2. a. **If claiming vested rights**, identify the supporting documents provided and the date they were approved:
 

|  |                      |
|--|----------------------|
| <input type="checkbox"/> Approval of a Site Specific Development Plan or PUD | Approval Date: _____ |
| <input type="checkbox"/> Valid Building Permit                               | Issued Date: _____   |
| <input type="checkbox"/> Other: _____  | Date: _____          |
- b. **If claiming vested rights**, identify the regulation(s) the project has been designed in accordance with:
 

|  |  |
|--|--|
| <input type="checkbox"/> Coastal SW – 1995 | <input type="checkbox"/> Ph II – Post Construction |
|--|--|
3. Stormwater runoff from this project drains to the Pasquotank River basin.
4. Total Property Area: 96.77 acres
5. Total Coastal Wetlands Area: 1.82 acres
6. Total Surface Water Area: \_\_\_\_\_ acres
7. Total Property Area (4) – Total Coastal Wetlands Area (5) – Total Surface Water Area (6) = Total Project Area\*: 94.95 acres
 

\* Total project area shall be calculated to exclude the following: the normal pool of impounded structures, the area between the banks of streams and rivers, the area below the Normal High Water (NHW) line or Mean High Water (MHW) line, and coastal wetlands landward from the NHW (or MHW) line. The resultant project area is used to calculate overall percent built upon area (BUA). Non-coastal wetlands landward of the NHW (or MHW) line may be included in the total project area.
8. Project percent of impervious area: (Total Impervious Area / Total Project Area) X 100 = \_\_\_\_\_%
9. How many drainage areas does the project have? 4 (For high density, count 1 for each proposed SCM. For low density and other projects, use 1 for the whole property area. If there are multiple receiving streams, provide the drainage areas within the project area to each stream.)
10. Complete the following information for each drainage area directed to an SCM or low density area identified in Project Information item 9. If there are more than four drainage areas in the project, attach an additional sheet with the information for each area provided in the same format as below.

| Basin Information               | Drainage Area <u>5</u> | Drainage Area <u>6</u> | Drainage Area <u>7</u> | Drainage Area <u>8</u> |
|---------------------------------|------------------------|------------------------|------------------------|------------------------|
| Receiving Stream Name           | Albemarle Sound        | Albemarle Sound        | Albemarle Sound        | Albemarle Sound        |
| Stream Class *                  | SB                     | SB                     | SB                     | SB                     |
| Stream Index Number *           | 30                     | 30                     | 30                     | 30                     |
| Total Drainage Area (sf)        |                        | 124,547                | 83,688                 |                        |
| On-site Drainage Area (sf)      |                        | 124,547                | 83,688                 |                        |
| Off-site Drainage Area (sf)     | 0                      | 0                      | 0                      |                        |
| Proposed Impervious Area** (sf) |                        | 47,319                 | 47,319                 |                        |
| % Impervious Area ** (total)    |                        | 38%                    | 49.8%                  |                        |

| Impervious** Surface Area   | Drainage Area <u>5</u> | Drainage Area <u>6</u> | Drainage Area <u>7</u> | Drainage Area <u>8</u> |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|
| On-site Buildings/Lots (sf) |                        | 5,701                  |                        |                        |
| On-site Streets (sf)        |                        |                        |                        |                        |
| On-site Parking (sf)        |                        | 41,618                 | 41,645                 |                        |
| On-site Sidewalks (sf)      |                        |                        |                        |                        |
| Other on-site (sf)          |                        |                        |                        |                        |
| Future (sf)                 |                        |                        |                        |                        |
| Off-site (sf)               |                        |                        |                        |                        |
| Existing BUA*** (sf)        |                        |                        |                        |                        |
| Total (sf):                 |                        | 47,319                 | 41,645                 |                        |

\* Stream Class and Index Number can be determined at: <https://www.deq.nc.gov/about/divisions/water-resources/water-planning/classification-standards/classifications>

\*\* Impervious area is defined as the built upon area including, but not limited to, buildings, roads, parking areas, sidewalks, gravel areas, etc.

\*\*\* Report only that amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA. See definition 15A NCAC 02H .1002(17).

11. How was the off-site impervious area listed the Section IV, 10 Tables determined? Provide documentation.  
The site has been surveyed by Quible & Associates, P.C.

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**Projects in Union County:** Contact DEMLR Central Office staff to check if the project is located within a Threatened & Endangered Species watershed that may be subject to more stringent stormwater requirements as per 15A NCAC 02B .0600.

## V. SUPPLEMENT AND O&M FORMS

The applicable state stormwater management permit supplement and operation and maintenance (O&M) forms must be submitted for each SCM specified for this project. The latest versions of the forms can be downloaded from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/stormwater-design-manual>. For SCMs subject to older design standards or offsite projects, the archived supplement can be found from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/stormwater-design-manual/archived-stormwater-design-manual-supplemental-forms>

## VI. CHECKLIST OF SUBMITTAL REQUIREMENTS FOR AN ADMINISTRATIVELY COMPLETE APPLICATION PACKAGE PER 15A NCAC 02H .1042(2)

**Only complete application packages will be accepted and reviewed by the Division of Energy, Mineral and Land Resources (DEMLR). An administratively complete application package includes all of the items listed below. A detailed application instruction sheet and SCM checklists are available from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/post-construction-program/new-permits-permit-modifications>. The complete application package should be submitted to the appropriate DEMLR Office.** (The appropriate office may be found by locating project on the interactive online map at <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/post-construction-program>.)

Please **indicate that the following required information have been provided by initialing** in the space provided for each item. All original documents **MUST** be signed and initialed in **blue ink**. **Download the latest versions for each submitted application package** from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program>.

**Initials**

1. *Original and one copy* of the Stormwater Management Permit Application Form. \_\_\_\_\_
2. *Original and one copy* of the signed and notarized Deed Restrictions & Protective Covenants Form or, for major modifications, a copy of the recorded deed restrictions and protective covenants limiting the built-upon area so that it does not exceed the capacity of the SCM(s) or the BUA thresholds. *(if required as per Part VII below)*  
Deed book: \_\_\_\_\_ Page No: \_\_\_\_\_ Relevant section: \_\_\_\_\_
3. *Original* of the applicable Supplement Form(s) (sealed, signed and dated) **and** O&M agreement(s) for each SCM. *(please refer to Section V for more information)* \_\_\_\_\_
4. Appropriate permit application processing fee per NCGS 143-215.3D(e)(2) *payable to NCDEQ*.  
A full list of fee adjustments is available on the DEQ website:  
<https://www.deq.nc.gov/accessdeq/permit-fees-2023-updates>  
(For an Express review, refer to: <https://www.deq.nc.gov/accessdeq/express-permitting> for information on the Express program and the associated fees. Contact the appropriate Coastal regional office Express Permit Coordinator for additional information and to schedule the required application meeting.) \_\_\_\_\_
5. A detailed narrative (one to two pages) describing the stormwater treatment/management for the project. This is required in addition to the brief summary provided in the Project Information, item 1. \_\_\_\_\_
6. A USGS map identifying the site location. If the receiving stream is reported as class SA or the receiving stream drains to class SA waters within ½ mile of the site boundary, include the ½ mile radius on the map. \_\_\_\_\_
7. Sealed, signed, and dated calculations (one copy). \_\_\_\_\_

8. Two sets of plans folded to 8.5" x 14" (sealed, signed, & dated), including:
  - a. Development/Project name. \_\_\_\_\_
  - b. Engineer and firm. \_\_\_\_\_
  - c. Location map with named streets and NCSR numbers. \_\_\_\_\_
  - d. Legend. \_\_\_\_\_
  - e. North arrow. \_\_\_\_\_
  - f. Scale. \_\_\_\_\_
  - g. Revision number and dates. \_\_\_\_\_
  - h. Identify all surface waters on the plans by delineating the normal pool elevation of impounded structures, the banks of streams and rivers, the MHW or NHW line of tidal waters, and any coastal wetlands landward of the MHW or NHW lines.
    - Delineate the vegetated setback landward from the normal pool elevation of impounded structures, the banks of streams or rivers, and the MHW (or NHW) of tidal waters. \_\_\_\_\_
  - i. Dimensioned property/project boundary with bearings & distances. \_\_\_\_\_
  - j. Site Layout with all BUA identified and dimensioned. \_\_\_\_\_
  - k. Existing contours, proposed contours, spot elevations, finished floor elevations. \_\_\_\_\_
  - l. Details of roads, drainage features, collection systems, and stormwater control measures (including any applicable SCM planting plans). \_\_\_\_\_
  - m. Wetlands delineated, or a note on the plans that none exist. (Must be delineated by a qualified person; identify the person who made the determination on the plans. \_\_\_\_\_
  - n. Existing drainage (including off-site), drainage easements, pipe sizes, runoff calculations. \_\_\_\_\_
  - o. Drainage areas delineated (included in the main set of plans, not as a separate document). \_\_\_\_\_
9. Copy of any applicable soils report with the associated SHWT elevations (Please identify elevations in addition to depths) as well as a map of the boring locations with the existing elevations and boring logs. Include an 8.5"x11" copy of the NRCS County Soils map with the project area clearly delineated. For projects with infiltration SCMs, the report should also include the soil type, expected infiltration rate, and the method of determining the infiltration rate. **(Infiltration Devices submitted to WiRO: Schedule a site visit for DEMLR to verify the SHWT Prior to submittal, (910) 796-7378.)** \_\_\_\_\_
10. A copy of the most current property deed. Deed book: 1512 Page No: 459 \_\_\_\_\_
11. For corporations and limited liability corporations (LLC): Provide documentation from the NC Secretary of State or other official documentation, which supports the titles and positions held by the persons listed in Contact Information, item 1a, 2a, and/or 3a per 15A NCAC 2H.1040(1). The corporation or LLC must be listed as an active corporation in good standing with the NC Secretary of State, otherwise the application will be returned.  
<http://www.secretary.state.nc.us/Corporations/CSearch.aspx> \_\_\_\_\_
12. If the applicant is not the property owner, a copy of a lease agreement, affidavit, or other document showing that the applicant has obtained legal rights to submit a stormwater permit application within the proposed project area; \_\_\_\_\_
13. If applicable, a copy of any recorded drainage, maintenance, or operation and maintenance easements demonstrating ownership interest sufficient to operate the SW system.  
Deed book: \_\_\_\_\_ Page No: \_\_\_\_\_ Relevant section: \_\_\_\_\_
14. If a modification to an existing permit:
  - a. The applicant / permit holder will remain the same and permit has not and will not expire within the next 180 days. \_\_\_\_\_
  - b. Signed, sealed & dated Designer Certification Forms \_\_\_\_\_
  - c. Copies of the following documents recorded with the County Register of Deeds
    - i. Deed restrictions and protective covenants limiting the BUA so that it does not exceed the capacity of the SCM(s) or the BUA thresholds. \_\_\_\_\_
    - ii. Drainage easements, when applicable. \_\_\_\_\_
    - iii. Operation & Maintenance Agreement \_\_\_\_\_
    - iv. Final subdivision plat referencing the Operation & Maintenance Agreement \_\_\_\_\_

**VII. DEED RESTRICTIONS AND PROTECTIVE COVENANTS**

For all subdivisions, outparcels, and future development, the appropriate property restrictions and protective covenants are required to be recorded prior to the sale of any lot. If lot sizes vary significantly or the proposed BUA allocations vary, a table listing each lot number, lot size, and the allowable built-upon area must be provided as an attachment to the completed and notarized deed restriction form. The appropriate deed restrictions and protective covenants forms can be downloaded from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/post-construction-program/post-construction-forms>. Download the latest versions for each submittal.

In the instances where the applicant is different than the property owner, it is the responsibility of the property owner to sign the deed restrictions and protective covenants form while the applicant is responsible for ensuring that the deed restrictions are recorded.

**By the notarized signature(s) below, the permit holder(s) certify that the recorded property restrictions and protective covenants for this project, if required, shall include all the items required in the permit and listed on the forms available on the website, that the covenants will be binding on all parties and persons claiming under them, that they will run with the land, that the required covenants cannot be changed or deleted without concurrence from the NC DEMLR, and that they will be recorded prior to the sale of any lot.**

**VIII. CONSULTANT INFORMATION AND AUTHORIZATION**

Applicant: Complete this section if you wish to designate authority to another individual and/or firm (such as a consulting engineer and/or firm) so that they may provide information on your behalf for this project (such as addressing requests for additional information).

Consulting Engineer: Cathleen M. Saunders

Consulting Firm: Quible & Associates, P.C.

Mailing Address: PO Drawer 870

City: Kitty Hawk State: NC Zip: 27949

Phone: ( 252 ) 202-7112 Fax: (            )           

Email: csaunders@withersravenel.com

**IX. PROPERTY OWNER AUTHORIZATION** (if Contact Information, item 2 has been filled out, complete this section)

I, (print or type name of person listed in Contact Information, item 2a) \_\_\_\_\_, certify that I own the property identified in this permit application, and thus give permission to (print or type name of person listed in Contact Information, item 1a) \_\_\_\_\_ with (print or type name of organization listed in Contact Information, item 1a) \_\_\_\_\_ to develop the project as currently proposed. A copy of the lease agreement or pending property sales contract has been provided with the submittal, which indicates the party responsible for the operation and maintenance of the stormwater system.

As the legal property owner I acknowledge, understand, and agree by my signature below, that if my designated agent (entity listed in Contact Information, item 1) dissolves their company and/or cancels or defaults on their lease agreement, or pending sale, responsibility for compliance with the DEMLR Stormwater permit reverts back to me, the property owner. As the property owner, it is my responsibility to notify DEMLR immediately and submit a completed Name/Ownership Change Form within 30 days; otherwise I will be operating a stormwater treatment facility without a valid permit. I understand that the operation of a stormwater treatment facility without a valid permit is a violation of NC General Statute 143-215.1 and may result in appropriate enforcement action including the assessment of civil penalties of up to \$25,000 per day, pursuant to NCGS 143-215.6.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

I, \_\_\_\_\_, a Notary Public for the State of \_\_\_\_\_, County of \_\_\_\_\_, do hereby certify that \_\_\_\_\_ personally appeared before me this \_\_\_\_\_ day of \_\_\_\_\_, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,



SEAL

My commission expires \_\_\_\_\_

**X. APPLICANT'S CERTIFICATION**

I, *(print or type name of person listed in Contact Information, item 1a)* \_\_\_\_\_, certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans, that the required deed restrictions and protective covenants will be recorded, and that the proposed project complies with the requirements of the applicable stormwater rules under 15A NCAC 2H .1000 and any other applicable state stormwater requirements.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

I, \_\_\_\_\_, a Notary Public for the State of \_\_\_\_\_, County of \_\_\_\_\_, do hereby certify that \_\_\_\_\_ personally appeared before me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,



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SEAL

My commission expires \_\_\_\_\_

# Operation & Maintenance Agreement

**Project Name:** H2OBX RV & Waterpark Resort  
**Project Location:** 8526 Caratoke Hwy, Powells Point, NC 27966

## Cover Page

Maintenance records shall be kept on the following SCM(s). This maintenance record shall be kept in a log in a known set location. Any deficient SCM elements noted in the inspection will be corrected, repaired, or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the pollutant removal efficiency of the SCM(s).

The SCM(s) on this project include (check all that apply & corresponding O&M sheets will be added automatically):

|                                 |             |   |
|---------------------------------|-------------|---|
| Infiltration Basin              | Quantity: 3 | Location(s): proposed basin southwest (DA8), proposed   |
| Infiltration Trench             | Quantity:   | Location(s): basin southeast (DA7), expanded basin east |
| Bioretention Cell               | Quantity:   | Location(s): (DA6)                                      |
| Wet Pond                        | Quantity: 1 | Location(s): expanded wetpond south of property (DA5)   |
| Stormwater Wetland              | Quantity:   | Location(s):  |
| Permeable Pavement              | Quantity:   | Location(s):  |
| Sand Filter                     | Quantity:   | Location(s):  |
| Rainwater Harvesting            | Quantity:   | Location(s):  |
| Green Roof                      | Quantity:   | Location(s):  |
| Level Spreader - Filter Strip   | Quantity:   | Location(s):  |
| Proprietary System              | Quantity:   | Location(s):  |
| Treatment Swale                 | Quantity:   | Location(s):  |
| Dry Pond                        | Quantity:   | Location(s):  |
| Disconnected Impervious Surface | Present: No | Location(s):  |
| User Defined SCM                | Present: No | Location(s):  |
| Low Density                     | Present: No | Type:   |

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I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed for each SCM above, and attached O&M tables. I agree to notify NCDEQ of any problems with the system or prior to any changes to the system or responsible party.

|                       |  |
|-----------------------|--|
| Responsible Party:    | Jeffrey Malarney                       |
| Title & Organization: | Authorised Representative - H2OBX, LLC |
| Street address:       | 4112 N. Croatan Highway                |
| City, state, zip:     | Kitty Hawk, NC 27949                   |
| Phone number(s):      | 518-369-2422                           |
| Email:                | kene@aquaticgroup.com                  |

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

I, \_\_\_\_\_, a Notary Public for the State of \_\_\_\_\_

County of \_\_\_\_\_, do hereby certify that \_\_\_\_\_

personally appeared before me this \_\_\_\_\_ day of \_\_\_\_\_ and

acknowledge the due execution of the Operations and Maintenance Agreement .

Witness my hand and official seal, \_\_\_\_\_.



Seal My commission expires \_\_\_\_\_

## Infiltration Basin Maintenance Requirements

Important operation and maintenance procedures:

- The drainage area will be carefully managed to reduce the sediment load to the infiltration basin.
- No portion of the infiltration basin will be fertilized after the initial fertilization that is required to establish the vegetation. Lime may be allowed if vegetation is planted on the surface of the infiltration basin and a soil test shows that it is needed.
- The vegetation in and around the basin will be maintained at a height of four to six inches.

After the infiltration basin is established, it will be inspected **quarterly and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County)**. Records of operation and maintenance shall be kept in a known set location and shall be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

| SCM element:   | Potential problem:  | How to remediate the problem:  |
|--|---|--|
| <b>The entire infiltration basin</b>                     | Trash/debris is present.  | Remove the trash/debris.   |
| <b>The grass filter strip or other pretreatment area</b> | Areas of bare soil and/or erosive gullies have formed.            | Regrade the soil if necessary to remove the gully, plant ground cover and water until it is established. Provide lime and a one-time fertilizer application.                         |
|  | Sediment has accumulated to a depth of greater than three inches. | Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the SCM. |
| <b>The flow diversion structure (if applicable)</b>      | The structure is clogged.   | Unclog the conveyance and dispose of any sediment in a location where it will not cause impacts to streams or the SCM.   |
|  | The structure is damaged.   | Make any necessary repairs or replace if damage is too much for repair.  |
| <b>The inlet device</b>                                  | The inlet pipe is clogged (if applicable).                        | Unclog the pipe and dispose of any sediment in a location where it will not cause impacts to streams or the SCM.   |
|  | The inlet pipe is cracked or otherwise damaged (if applicable).   | Repair or replace the pipe.  |
|  | Erosion is occurring in the swale (if applicable).                | Regrade the swale if necessary and provide erosion control devices such as reinforced turf matting or riprap to avoid future erosion problems.                                       |
|  | Stone verge is clogged or covered in sediment (if applicable).    | Remove sediment and clogged stone and replace with clean stone.  |
| <b>The basin</b>   | More than four inches of sediment has accumulated.                | Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the SCM. |
|  | Erosion of the basin surface has occurred or riprap is displaced. | Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.  |
|  | Water is standing more than three days after a storm event.       | Replace the top few inches of soil to see if this corrects the standing water problem. If not, consult an appropriate professional for a more extensive repair.                      |



**Infiltration Basin Maintenance Requirements (continued)**

| <b>SCM element:</b>        | <b>Potential problem:</b>   | <b>How to remediate the problem:</b>   |
|----------------------------|---|--|
| <b>The embankment</b>      | Shrubs or trees are growing on the embankment.  | Remove shrubs and trees immediately.   |
|                            | An annual inspection by an appropriate professional shows that the embankment needs repair.         | Make needed repairs immediately.   |
| <b>The outlet device</b>   | Clogging has occurred.  | Clean out the outlet device and dispose of sediment in a location where it will not cause impacts to streams or the SCM. |
|                            | The outlet device is damaged  | Repair or replace the outlet device.   |
| <b>The receiving water</b> | Erosion or other signs of damage have occurred at the outlet.                                       | Repair the damage and improve the flow dissipation structure.  |
|                            | Discharges from the infiltration basin are causing erosion or sedimentation in the receiving water. | Contact the local NCDEQ Regional Office.   |

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## Wet Pond Maintenance Requirements

### Important operation and maintenance procedures:

- Immediately after the wet detention basin is established, the plants on the vegetated shelf and perimeter of the basin should be watered twice weekly if needed, until the plants become established (commonly six weeks).
- No portion of the wet pond should be fertilized after the initial fertilization that is required to establish the plants on the vegetated shelf.
- Stable groundcover will be maintained in the drainage area to reduce the sediment load to the wet pond.
- If the pond must be drained for an emergency or to perform maintenance, the flushing of sediment through the emergency drain will be minimized as much as possible.
- At least once annually, a dam safety expert will inspect the embankment. Any problems that are found will be repaired immediately.
- The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

After the wet pond is established, it will be inspected **quarterly and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County)**. Records of operation and maintenance shall be kept in a known set location and shall be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

| SCM element:                         | Potential problem:   | How to remediate the problem:  |
|--------------------------------------|--|--|
| <b>The entire wet pond</b>           | Trash/debris is present.   | Remove the trash/debris.   |
| <b>The perimeter of the wet pond</b> | Areas of bare soil and/or erosive gullies have formed.   | Regrade the soil if necessary to remove the gully, plant ground cover and water until it is established. Provide lime and a one-time fertilizer application.                         |
| <b>The inlet device</b>              | The inlet pipe is clogged (if applicable).   | Unclog the pipe. Dispose of the sediment off-site.   |
|                                      | The inlet pipe is cracked or otherwise damaged (if applicable).                                  | Repair or replace the pipe.  |
|                                      | Erosion is occurring in the swale (if applicable).   | Regrade the swale if necessary and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.                                  |
| <b>The forebay</b>                   | Sediment has accumulated to a depth greater than the original design depth for sediment storage. | Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the SCM. |
|                                      | Erosion has occurred.  | Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.  |
|                                      | Weeds are present.   | Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.  |

**Wet Pond Maintenance Requirements (Continued)**

| <b>SCM element:</b>                            | <b>Potential problem:</b>  | <b>How to remediate the problem:</b>  |
|--|--|---|
| <b>The main treatment area</b>                 | Sediment has accumulated to a depth greater than the original design sediment storage depth. | Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the SCM.  |
|  | Algal growth covers over 50% of the area.  | Consult a professional to remove and control the algal growth.  |
|  | Cattails, phragmites or other invasive plants cover 50% of the basin surface.                | Remove the plants by wiping them with pesticide (do not spray).   |
| <b>The vegetated shelf</b>                     | Best professional practices show that pruning is needed to maintain optimal plant health.    | Prune according to best professional practices.   |
|  | Plants are dead, diseased or dying.  | Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary. |
|  | Weeds are present.   | Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.   |
| <b>The embankment</b>                          | Shrubs have started to grow on the embankment.   | Remove shrubs immediately.  |
|  | Evidence of muskrat or beaver activity is present.   | Consult a professional to remove muskrats or beavers and repair any holes or erosion.   |
|  | A tree has started to grow on the embankment.  | Consult a dam safety specialist to remove the tree.   |
|  | An annual inspection by an appropriate professional shows that the embankment needs repair.  | Make all needed repairs immediately.  |
| <b>The outlet device</b>                       | Clogging has occurred.   | Clean out the outlet device and dispose of any sediment in a location where it will not cause impacts to streams or the SCM.  |
|  | The outlet device is damaged.  | Repair or replace the outlet device.  |
| <b>Floating wetland island (if applicable)</b> | Weeds or volunteer trees are growing on the mat.   | Remove the weeds or trees.  |
|  | The anchor cable is damaged, disconnected or missing.  | Restore the anchor cable to its design state.   |

### Wet Pond Maintenance Requirements (Continued)

| SCM element:               | Potential problem:  | How to remediate the problem:                                 |
|----------------------------|---|---|
| <b>The receiving water</b> | Erosion or other signs of damage have occurred at the outlet.                             | Repair the damage and improve the flow dissipation structure. |
|                            | Discharges from the wet pond are causing erosion or sedimentation in the receiving water. | Contact the local NCDEQ Regional Office.                      |

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# Wet Detention Pond Design Summary

## Wet Pond Diagram

### WET POND ID

Pond 1

Pretreatment other than forebay?

Yes

Has Veg. Filter?

Yes

### FOREBAY

Permanent Pool El.

2.3

Temporary Pool El:

5

Clean Out Depth:

0.8

Sediment Removal El

1.5

Bottom Elevation:

1

### MAIN POND

Permanent Pool El.

2.3

Temporary Pool El:

5

Clean Out Depth:

4.8

Sediment Removal El

-2.5

Bottom Elevation:

-3

ATTACH ADDITIONAL SHEETS IF NECESSARY

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# SUPPLEMENT-EZ COVER PAGE

FORMS LOADED

## PROJECT INFORMATION

|   |  |                                  |
|---|--|----------------------------------|
| 1 | Project Name                           | H2OBX RV Park & Waterpark Resort |
| 2 | Project Area (ac)                      | 96.77                            |
| 3 | Coastal Wetland Area (ac)              | 1.82                             |
| 4 | Surface Water Area (ac)                | 0                                |
| 5 | Is this project High or Low Density?   | High                             |
| 6 | Does this project use an off-site SCM? | No                               |

## COMPLIANCE WITH 02H .1003(4)

|    |  |      |
|----|--|------|
| 7  | Width of vegetated setbacks provided (feet)                            | >50' |
| 8  | Will the vegetated setback remain vegetated?                           | Yes  |
| 9  | If BUA is proposed in the setback, does it meet NCAC 02H.1003(4)(c-d)? | N/A  |
| 10 | Is streambank stabilization proposed on this project?                  | No   |

## NUMBER AND TYPE OF SCMs:

|    |                                       |   |
|----|---------------------------------------|---|
| 11 | Infiltration System                   | 3 |
| 12 | Bioretention Cell                     |   |
| 13 | Wet Pond                              | 1 |
| 14 | Stormwater Wetland                    |   |
| 15 | Permeable Pavement                    |   |
| 16 | Sand Filter                           |   |
| 17 | Rainwater Harvesting (RWH)            |   |
| 18 | Green Roof                            |   |
| 19 | Level Spreader-Filter Strip (LS-FS)   |   |
| 20 | Disconnected Impervious Surface (DIS) |   |
| 21 | Treatment Swale                       |   |
| 22 | Dry Pond                              |   |
| 23 | StormFilter                           |   |
| 24 | Silva Cell                            |   |
| 25 | Bayfilter                             |   |
| 26 | Filterra                              |   |

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FORMS LOADED

## DESIGNER CERTIFICATION

|    |                   |                                 |
|----|-------------------|---------------------------------|
| 27 | Name and Title:   | Cathleen M. Saunders            |
| 28 | Organization:     | Quible & Associates, PC.        |
| 29 | Street address:   | 8466 Caratoke Highway, Bldg 400 |
| 30 | City, State, Zip: | Powells Point, NC 27966         |
| 31 | Phone number(s):  | 252-202-7112                    |
| 32 | Email:            | csaunders@quible.com            |

### Certification Statement:

I certify, under penalty of law that this Supplement-EZ form and all supporting information were prepared under my direction or supervision; that the information provided in the form is, to the best of my knowledge and belief, true, accurate, and complete; and that the engineering plans, specifications, operation and maintenance agreements and other supporting information are consistent with the information provided here.

### Designer

Seal

\_\_\_\_\_  
Signature of Designer

\_\_\_\_\_  
Date

# DRAINAGE AREAS

|   |  |     |
|---|--|-----|
| 1 | Is this a high density project?                                | Yes |
| 2 | If so, number of drainage areas/SCMs                           | 4   |
| 3 | Does this project have low density areas?                      | No  |
| 4 | If so, number of low density drainage areas                    | 0   |
| 5 | Is all/part of this project subject to previous rule versions? | No  |

[FORMS LOADED](#)

| DRAINAGE AREA INFORMATION |  | Entire Site | 1              | 2                        | 3                        | 4                        |
|---------------------------|--|-------------|----------------|--------------------------|--------------------------|--------------------------|
| 4                         | Type of SCM  |             | Wet Pond (DA5) | Infiltration Basin (DA6) | Infiltration Basin (DA7) | Infiltration Basin (DA8) |
| 5                         | Total drainage area (sq ft)  |             |                | 124,547                  | 83,688                   |                          |
| 6                         | Onsite drainage area (sq ft)                                       |             | 0              | 124,547                  | 83,688                   |                          |
| 7                         | Offsite drainage area (sq ft)                                      |             | 0              |                          |                          |                          |
| 8                         | Total BUA in project (sq ft)                                       |             |                | 47319 sf                 | 41645 sf                 |                          |
| 9                         | New BUA on subdivided lots (subject to permitting) (sq ft)         |             | sf             |                          |                          |                          |
| 10                        | New BUA not on subdivided lots (subject to permitting) (sf)        |             |                | 47319 sf                 | 41645 sf                 |                          |
| 11                        | Offsite BUA (sq ft)  |             | sf             |                          |                          |                          |
| 12                        | Breakdown of new BUA not on subdivided lots:                       |             |                |                          |                          |                          |
|                           | - Parking (sq ft)  |             |                | 41618 sf                 | 41645 sf                 |                          |
|                           | - Sidewalk (sq ft)   |             |                |                          |                          |                          |
|                           | - Roof (sq ft)   |             |                | 5701 sf                  |                          |                          |
|                           | - Roadway (sq ft)  |             |                |                          |                          |                          |
|                           | - Future (sq ft)   |             |                |                          |                          |                          |
|                           | - Other, please specify in the comment box below (sq ft)           |             |                |                          |                          |                          |
| 13                        | New infiltrating permeable pavement on subdivided lots (sq ft)     |             | sf             |                          |                          |                          |
| 14                        | New infiltrating permeable pavement not on subdivided lots (sq ft) |             | sf             |                          |                          |                          |
| 15                        | Existing BUA that will remain (not subject to permitting) (sq ft)  |             | sf             |                          |                          |                          |
| 16                        | Existing BUA that is already permitted (sq ft)                     |             | sf             |                          |                          |                          |
| 17                        | Existing BUA that will be removed (sq ft)                          |             | sf             |                          |                          |                          |
| 18                        | Percent BUA  |             | #DIV/0!        | 38%                      | 50%                      |                          |
| 19                        | Design storm (inches)  |             | 1.5 in         | 1.5 in                   | 1.5 in                   |                          |
| 20                        | Design volume of SCM (cu ft)                                       |             |                | 6103 cf                  | 5210 cf                  |                          |
| 21                        | Calculation method for design volume                               |             | SA/DA          | SA/DA                    | SA/DA                    | SA/DA                    |

| ADDITIONAL INFORMATION |   |
|------------------------|---|
| 22                     | Please use this space to provide any additional information about the drainage area(s): |
|                        |   |

# INFILTRATION SYSTEM

|                                   |   |                  |                  |                  |
|-----------------------------------|---|------------------|------------------|------------------|
| 1                                 | Drainage area number  | DA6              | DA7              | DA8              |
| 2                                 | Minimum required treatment volume (cu ft)   | 15421 cf         | 13408 cf         |                  |
| <b>GENERAL MDC FROM 02H .1050</b> |   |                  |                  |                  |
| 3                                 | Is the SCM sized to treat the SW from all surfaces at build-out?                          | Yes              | Yes              | Yes              |
| 4                                 | Is the SCM located away from contaminated soils?  | Yes              | Yes              | No               |
| 5                                 | What are the side slopes of the SCM (H:V or enter "Vertical" for trenches)?               | 3:1              | 3:1              | 3:1              |
| 6                                 | Does the SCM have retaining walls, gabion walls or other engineered side slopes?          | No               | No               | No               |
| 7                                 | Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?     | Yes              | Yes              | Yes              |
| 8                                 | Is there an overflow or bypass for inflow volume in excess of the design volume?          | Yes              | Yes              | Yes              |
| 9                                 | What is the method for dewatering the SCM for maintenance?                                | Pump (preferred) | Pump (preferred) | Pump (preferred) |
| 10                                | If applicable, will the SCM be cleaned out after construction?                            | Yes              | Yes              | Yes              |
| 11                                | Does the maintenance access comply with General MDC (8)?                                  | Yes              | Yes              | Yes              |
| 12                                | Does the drainage easement comply with General MDC (9)?                                   | Yes              | Yes              | Yes              |
| 13                                | If the SCM is on a single family lot, does (will?) the plat comply with General MDC (10)? | N/A              | N/A              | N/A              |
| 14                                | Is there an O&M Agreement that complies with General MDC (11)?                            | Yes              | Yes              | Yes              |
| 15                                | Is there an O&M Plan that complies with General MDC (12)?                                 | Yes              | Yes              | Yes              |
| 16                                | Does the SCM follow the device specific MDC?  | Yes              | Yes              | Yes              |
| 17                                | Was the SCM designed by an NC licensed professional?                                      | Yes              | Yes              | Yes              |

## INFILTRATION SYSTEM MDC FROM 02H .1051

|    |  |       |       |       |
|----|--|-------|-------|-------|
| 18 | Proposed slope of the subgrade surface (%) | 0%    | 0%    | 0%    |
| 19 | Are terraces or baffles provided?          | No    | No    | No    |
| 20 | Type of pretreatment:                      | Other | Other | Other |

## Soils Data

|    |   |      |       |      |
|----|---|------|-------|------|
| 21 | Was the soil investigated in the footprint and at the elevation of the infiltration system? | Yes  | Yes   | Yes  |
| 22 | SHWT elevation (fmsl)   | 4.00 | 3.60  | 4.00 |
| 23 | Depth to SHWT per soils report (in)   | 9.60 | 14.40 | 9.60 |
| 24 | Ground elevation at boring in soils report (fmsl)   | 4.80 | 4.80  | 4.80 |
| 25 | Is a detailed hydrogeologic study attached if the separation is between 1 and 2 feet?       | Yes  | Yes   | Yes  |
| 26 | Soil infiltration rate (in/hr)  | 1.89 | 1.89  | 1.89 |
| 27 | Factor of safety (FS) (2 is recommended):   | 1.07 |       |      |

## Elevations

|    |                          |        |        |      |
|----|--------------------------|--------|--------|------|
| 29 | Bottom elevation (fmsl)  | 7 ft   | 6 ft   | 6 ft |
| 30 | Storage elevation (fmsl) | 7.5 ft | 6.5 ft |      |
| 31 | Bypass elevation (fmsl)  |        |        |      |

## For Basins Only

|    |   |           |           |  |
|----|---|-----------|-----------|--|
| 32 | Bottom surface area (ft <sup>2</sup> )            | 19649 ft  | 15810 ft  |  |
| 33 | Storage elevation surface area (ft <sup>2</sup> ) | 21703. ft | 18792. ft |  |

## For Trenches Only

|    |  |  |  |  |
|----|--|--|--|--|
| 34 | Length (ft)                                      |  |  |  |
| 35 | Width (ft)                                       |  |  |  |
| 36 | Perforated pipe diameter, if applicable (inches) |  |  |  |
| 37 | Number of laterals                               |  |  |  |
| 38 | Total length of perforated piping                |  |  |  |
| 39 | Stone type, if applicable                        |  |  |  |
| 40 | Stone porosity (%)                               |  |  |  |
| 41 | Is stone free of fines?                          |  |  |  |
| 42 | Is the stone wrapped in geotextile fabric?       |  |  |  |
| 43 | Has at least one inspection port been provided?  |  |  |  |

## Volumes/Drawdown

|    |                              |          |          |  |
|----|------------------------------|----------|----------|--|
| 44 | Design volume of SCM (cu ft) | 16539 cf | 13408 cf |  |
| 45 | Time to draw down (hours)    | 6 hrs    | 8 hrs    |  |

## ADDITIONAL INFORMATION

46 Please use this space to provide any additional information about the infiltration system(s):

20. SUMPS IN STORMWATER NETWORK



# WET POND

|                                   |   |                  |
|-----------------------------------|---|------------------|
| 1                                 | Drainage area number  | 1                |
| 2                                 | Minimum required treatment volume (cu ft)   | 13500 cf         |
| <b>GENERAL MDC FROM 02H .1050</b> |   |                  |
| 3                                 | Is the SCM sized to treat the SW from all surfaces at build-out?                          | Yes              |
| 4                                 | Is the SCM located away from contaminated soils?  | Yes              |
| 5                                 | What are the side slopes of the SCM (H:V)?  | 3:1              |
| 6                                 | Does the SCM have retaining walls, gabion walls or other engineered side slopes?          | No               |
| 7                                 | Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?     | Yes              |
| 8                                 | Is there an overflow or bypass for inflow volume in excess of the design volume?          | Yes              |
| 9                                 | What is the method for dewatering the SCM for maintenance?                                | Pump (preferred) |
| 10                                | If applicable, will the SCM be cleaned out after construction?                            | Yes              |
| 11                                | Does the maintenance access comply with General MDC (8)?                                  | Yes              |
| 12                                | Does the drainage easement comply with General MDC (9)?                                   | N/A              |
| 13                                | If the SCM is on a single family lot, does (will?) the plat comply with General MDC (10)? | N/A              |
| 14                                | Is there an O&M Agreement that complies with General MDC (11)?                            | Yes              |
| 15                                | Is there an O&M Plan that complies with General MDC (12)?                                 | Yes              |
| 16                                | Does the SCM follow the device specific MDC?  | Yes              |
| 17                                | Was the SCM designed by an NC licensed professional?                                      | Yes              |

|                                    |   |            |
|------------------------------------|---|------------|
| <b>WET POND MDC FROM 02H .1053</b> |   |            |
| 18                                 | Sizing method used  | SA/DA      |
| 19                                 | Has a stage/storage table been provided in the calculations?                        | Yes        |
| 20                                 | Elevation of the excavated main pool depth (bottom of sediment removal) (fmsl)      | -3.00      |
| 21                                 | Elevation of the main pool bottom (top of sediment removal) (fmsl)                  | -2.50      |
| 22                                 | Elevation of the bottom of the vegetated shelf (fmsl)                               | 3.00       |
| 23                                 | Elevation of the permanent pool (fmsl)  | 3.50       |
| 24                                 | Elevation of the top of the vegetated shelf (fmsl)                                  | 4.00       |
| 25                                 | Elevation of the temporary pool (fmsl)  | 5.00       |
| 26                                 | Surface area of the main permanent pool (square feet)                               | 13084      |
| 27                                 | Volume of the main permanent pool (cubic feet)                                      | 60226 cf   |
| 28                                 | Average depth of the main pool (feet)   | 4.60 ft    |
| 29                                 | Average depth equation used   | Equation 2 |
| 30                                 | If using equation 3, main pool perimeter (feet)                                     |            |
| 31                                 | If using equation 3, width of submerged veg. shelf (feet)                           |            |
| 32                                 | Volume of the forebay (cubic feet)  | 9251 cf    |
| 33                                 | Is this 15-20% of the volume in the main pool?                                      | Yes        |
| 34                                 | Clean-out depth for forebay (inches)  | 84 in      |
| 35                                 | Design volume of SCM (cu ft)  | 78452 cf   |
| 36                                 | Is the outlet an orifice or a weir?   | Orifice    |
| 37                                 | If orifice, orifice diameter (inches)   | 3 in       |
| 38                                 | If weir, weir height (inches)   | n/a        |
| 39                                 | If weir, weir length (inches)   | n/a        |
| 40                                 | Drawdown time for the temporary pool (days)   | 4          |
| 41                                 | Are the inlet(s) and outlet located in a manner that avoids short-circuiting?       | Yes        |
| 42                                 | Are berms or baffles provided to improve the flow path?                             | No         |
| 43                                 | Depth of forebay at entrance (inches)   | 32 in      |
| 44                                 | Depth of forebay at exit (inches)   | 12 in      |
| 45                                 | Does water flow out of the forebay in a non-erosive manner?                         | Yes        |
| 46                                 | Width of the vegetated shelf (feet)   | 6 ft       |
| 47                                 | Slope of vegetated shelf (H:V)  | 3:1        |
| 48                                 | Does the orifice drawdown from below the top surface of the permanent pool?         | Yes        |
| 49                                 | Does the pond minimize impacts to the receiving channel from the 1-yr, 24-hr storm? | Yes        |
| 50                                 | Are fountains proposed? (If Y, please provide documentation that MDC(9) is met.)    | No         |
| 51                                 | Is a trash rack or other device provided to protect the outlet system?              | Yes        |
| 52                                 | Are the dam and embankment planted in non-clumping turf grass?                      | Yes        |
| 53                                 | Species of turf that will be used on the dam and embankment                         | Bermuda    |
| 54                                 | Has a planting plan been provided for the vegetated shelf?                          | Yes        |

|                               |  |  |
|-------------------------------|--|--|
| <b>ADDITIONAL INFORMATION</b> |  |  |
| 55                            | Please use this space to provide any additional information about the wet pond(s): |  |
|                               |  |  |

DRAFT

| DEMLR USE ONLY |          |               |
|----------------|----------|---------------|
| Date Received  | Fee Paid | Permit Number |
|                |          |               |
|                |          |               |

**NC DEQ Division of Energy, Mineral and Land Resources**

**STATE STORMWATER:  
PERMIT RENEWAL APPLICATION FORM**

*In accordance with [15A NCAC 2H.1045\(3\)](#), the current permit holder shall renew their high density permit 180 days prior to its expiration. Renewed permits are valid for a period of 8 years per Session Law 2011-398 (SB 781) Section 60.(c). This application form is for permit renewals only.*

**A. PROJECT INFORMATION**

1. State Stormwater Permit Number: SW7160706
2. Project name: OBX Waterpark Adventure
3. Project street address: 8528 Caratoke Hwy

City: Powells Point County: Currituck  
 ZIP : 27966

4. What, if any, changes have been made to the project as permitted? Existing wet pond expansion, existing infiltration basin expansion, removal of two existing basins, two proposed infiltration basins

*If the project has changed from the original approved plans, please complete SWU-101 for a Major Modification or Minor Modification Application form available at: <https://deq.nc.gov/about/divisions/energy-mineral-land-resources/energy-mineral-land-rules/stormwater-program/post-construction>.*

**B. PERMITTEE INFORMATION**

*If changes to the permittee or project name have been made, please complete either the Permit Update form or the Permit Transfer form available at: <https://deq.nc.gov/about/divisions/energy-mineral-land-resources/energy-mineral-land-rules/stormwater-program/post-construction>. State Stormwater Permits do not automatically transfer with the sale of the property.*

1. Current Permit Holder's Company Name/Organization: O B X Waterpark Adventure
2. Signing Official's Name: Jeff Malarney
3. Signing Official's Title: Authorised Representative
4. Mailing Address: 115 Garden Dr  
 City: Manteo State: NC ZIP : 27954
5. Street Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP : \_\_\_\_\_
6. Phone: (252) 457-1177 Email: \_\_\_\_\_

## C. SUBMITTAL REQUIREMENTS

Submit the application package to the appropriate [DEMLR Regional Office](#) (Coastal, SA Waters) or DEMLR Central Office (Urbanizing Areas Ph 2, USMP, Non-Coastal HQW/ORW). Only applications packages that include all required items listed below will be accepted and reviewed.

**Initial each item below to indicate that the required information is provided in the application package:**

- ND 1. A permit application processing fee of \$505.00 payable to NCDEQ.
- ND 2. One original signed hard copy and one electronic copy of this completed form. The signing official named on this application to represent the current permittee must meet one of the following:
- Corporation – a principle executive officer of at least the level of vice-president;
  - Limited Liability Company (LLC) – a manager or company official as those terms are defined in G.S. 57D “North Carolina Limited Liability Company Act;”
  - Public Entity – a principal executive officer, ranking official, or other duly authorized employee;
  - Partnership or limited partnership – the general partner;
  - Sole proprietor; or
  - Letter of authorization signed by one of the signatories noted in a – e above authorizing the signature of another entity.
- ND 3. One hard copy and one electronic copy of recorded documents required by the original permit that have not yet been received by DEMLR, including: deed restrictions, protective covenants, condominium/planned community declaration and easements. If the project has been built, include documentation that the maximum BUA per lot or maximum total BUA has not been exceeded. If the project has not been built, include a signed agreement that the final recorded deed restrictions and protective covenants will be submitted at a later date.
- ND 4. O&M Agreements, *Please select one:*
- I have a copy of the current recorded O&M Agreement for all SCMs, and I will continue to keep this on file with the permit; or
- I do not have a copy of the current recorded O&M Agreement for all SCMs and am requesting a copy be sent to me. I agree to keep this on file with the permit.
- ND 5. Designer Certifications, *Please select one:*
- A copy of the certification(s) confirming that the project was built in accordance with the approved plans have been previously provided to the Division; or
- A copy of the certification(s) confirming that the project was built in accordance with the approved plans are enclosed; or
- The project has not yet been built.
- N/A 6. [IF APPLICABLE] If the project has been built, one original hard copy and one electronic copy of a signed, sealed, and dated letter from a licensed professional stating that the SCMs have been inspected, and that they have been built and maintained in accordance with the permit.
- N/A 7. [IF APPLICABLE] When the permittee is a corporation or a limited liability corporation (LLC): Provide one hard copy and one electronic copy of documentation from the NC Secretary of State, or other official documentation, which supports the titles and positions held by the persons listed in Section C.2 per 15A NCAC 2H. 1043(3)(b).  
[https://www.sosnc.gov/online\\_services/search/by\\_title/Business\\_Registration](https://www.sosnc.gov/online_services/search/by_title/Business_Registration)

**D. PERMITTEE'S CERTIFICATION**

I, \_\_\_\_\_, the person legally responsible for the permit, certify that I have a copy of the Permit and O&M Agreement on site (or I will obtain a copy and it will be kept on site), that I am responsible for the performance of the maintenance procedures, and the site has been and will be maintained according to the O&M Agreement and approved plans. I agree to notify DEMLR of any problems with the SCMs or built-upon area and to submit the proper forms to modify or transfer the permit prior to any changes to the project, SCMs, or ownership. All information provided on this permit renewal application is, to the best of my knowledge, correct and complete.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**NOTARIZATION:**

I, \_\_\_\_\_, a Notary Public for the State of \_\_\_\_\_, County of \_\_\_\_\_, do hereby certify that \_\_\_\_\_ personally appeared before me this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, and acknowledge the due execution of the forgoing instrument. Witness my hand and official seal,

(Notary Seal)

**DRAFT**

Notary Signature: \_\_\_\_\_

My commission expires \_\_\_\_\_

| DEMLR USE ONLY  |          |               |
|---|----------|---------------|
| Date Received   | Fee Paid | Permit Number |
| Applicable Rules: <input type="checkbox"/> Coastal SW – 1995 <input type="checkbox"/> Coastal SW – 2008 <input type="checkbox"/> Ph II - Post Construction<br>(select all that apply) <input type="checkbox"/> Non-Coastal SW- HQW/ORW Waters <input type="checkbox"/> Universal Stormwater Management Plan<br><input type="checkbox"/> Other WQ Mgmt Plan: _____ |          |               |

**State of North Carolina**  
**Department of Environmental Quality**  
**Division of Energy, Mineral and Land Resources**

**POST-CONSTRUCTION STORMWATER MANAGEMENT PERMIT APPLICATION FORM**

*This form may be photocopied for use as an original.*

**I. GENERAL INFORMATION**

- Project Name (subdivision, facility, or establishment name - should be consistent with project name on plans, specifications, letters, operation and maintenance agreements, etc.):  
H2OBX RV & Waterpark Resort
- Location of Project (street address):  
8526 Caratoke Hwy  
 City: Powells Point County: Currituck Zip: 27966
- Directions to project (from nearest major intersection):  
From the intersection of US 158 and SR 1111 (Spot Road) head southeast on US 158 for approximately .7 miles. The site is located on the right side of US 158.
- Latitude: 36° 06' 44" N Longitude: 75° 50' 04" W of the main entrance to the project.

**II. PERMIT INFORMATION:**

- Specify whether project is (check one):  New     Modification     Renewal w/ Modification<sup>†</sup>  
<sup>†</sup>Renewals with modifications also requires SWU-102 – Renewal Application Form
- If this application is being submitted as the result of a **modification** to an existing permit, list the existing permit number SW7160706 MOD, its issue date (if known) May 26 2017, and the status of construction:  Not Started     Partially Completed\*     Completed\*    *\*provide a designer's certification*
- Specify the type of project:  
 Low Density     High Density     Drains to an Offsite Stormwater System     Other
- If this application is being submitted as the result of a **previously returned application** or a **letter from DEMLR requesting a state stormwater management permit application**, list the stormwater project number, if assigned, \_\_\_\_\_ and the previous name of the project, if different than currently proposed, \_\_\_\_\_.
- Additional Project Requirements (check applicable blanks; information on required state permits can be obtained by contacting the Customer Service Center at 1-877-623-6748):  
 CAMA Major     Sedimentation/Erosion Control: 60.5 ac of Disturbed Area  
 NPDES Industrial Stormwater     404/401 Permit: Proposed Impacts \_\_\_\_\_
- If any of these permits have already been acquired please provide the Project Name, Project/Permit Number, issue date and the type of each permit: \_\_\_\_\_
- Is the project located within 5 miles of a public airport?     No     Yes  
 If yes, see S.L. 2012-200, Part VI: <http://portal.ncdenr.org/web/lr/rules-and-regulations>

**III. CONTACT INFORMATION**

1. a. Print Applicant / Signing Official's name and title (specifically the developer, property owner, lessee, designated government official, individual, etc. who owns the project):

Applicant/Organization: H2OBX, LLC

Signing Official & Title: Jeffrey Malarney

b. Contact information for person listed in item 1a above:

Street Address: 13 Green Mountain Drive

City: Cohoes State: NY Zip: 12047

Mailing Address (if applicable): 13 Green Mountain Drive

City: Cohoes State: NY Zip: 12047

Phone: (518 ) 369-2422 Fax: ( )

Email: kene@aquaticgroup.com

c. Please check **(one)** the appropriate box. The applicant listed above is:

- The property owner (Skip to Contact Information, item 3a)
- Lessee\* (Attach a copy of the lease agreement and complete Contact Information, item 2a and 2b below)
- Purchaser\* (Attach a copy of the pending sales agreement and complete Contact Information, item 2a and 2b below)
- Developer\* (Complete Contact Information, item 2a and 2b below.)

2. a. Print Property Owner's name and title below, if you are the lessee, purchaser or developer. (This is the person who owns the property that the project is located on):

Property Owner/Organization: \_\_\_\_\_

Signing Official & Title: \_\_\_\_\_

b. Contact information for person listed in item 2a above:

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Mailing Address (if applicable): \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: ( ) Fax: ( )

Email: \_\_\_\_\_

3. a. (Optional) Print the name and title of another contact such as the project's construction supervisor or other person who can answer questions about the project:

Other Contact Person/Organization: Kenneth Ellis

Signing Official & Title: Managing Member

b. Contact information for person listed in item 3a above:

Mailing Address: 1 E Ridge Rd

City: Loudonville State: NY Zip: 12211

Phone: (518 ) 369-2422 Fax: ( )

Email: kene@aquaticgroup.com

4. Local jurisdiction for building permits: Currituck County

Point of Contact: Bill News Phone #: (252 ) 202-5398

Email: \_\_\_\_\_

**IV. PROJECT INFORMATION**

1. In the space provided below, briefly summarize how the stormwater runoff will be treated.  
Stormwater will be conveyed to multiple bmp's including a wet detention basin and infiltration basins.


---



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2. a. **If claiming vested rights**, identify the supporting documents provided and the date they were approved:
 

|  |                      |
|--|----------------------|
| <input type="checkbox"/> Approval of a Site Specific Development Plan or PUD | Approval Date: _____ |
| <input type="checkbox"/> Valid Building Permit                               | Issued Date: _____   |
| <input type="checkbox"/> Other: _____  | Date: _____          |
- b. **If claiming vested rights**, identify the regulation(s) the project has been designed in accordance with:
 

|  |  |
|--|--|
| <input type="checkbox"/> Coastal SW – 1995 | <input type="checkbox"/> Ph II – Post Construction |
|--|--|
3. Stormwater runoff from this project drains to the Pasquotank River basin.
4. Total Property Area: 96,77 acres
5. Total Coastal Wetlands Area: 1.82 acres
6. Total Surface Water Area: \_\_\_\_\_ acres
7. Total Property Area (4) – Total Coastal Wetlands Area (5) – Total Surface Water Area (6) = Total Project Area\*: 94.95 acres
 

+ Total project area shall be calculated to exclude the following: the normal pool of impounded structures, the area between the banks of streams and rivers, the area below the Normal High Water (NHW) line or Mean High Water (MHW) line, and coastal wetlands landward from the NHW (or MHW) line. The resultant project area is used to calculate overall percent built upon area (BUA). Non-coastal wetlands landward of the NHW (or MHW) line may be included in the total project area.
8. Project percent of impervious area: (Total Impervious Area / Total Project Area) X 100 = \_\_\_\_\_%
9. How many drainage areas does the project have? 4 (For high density, count 1 for each proposed SCM. For low density and other projects, use 1 for the whole property area. If there are multiple receiving streams, provide the drainage areas within the project area to each stream.)
10. Complete the following information for each drainage area directed to an SCM or low density area identified in Project Information item 9. If there are more than four drainage areas in the project, attach an additional sheet with the information for each area provided in the same format as below.

| Basin Information               | Drainage Area <u>5</u> | Drainage Area <u>6</u> | Drainage Area <u>7</u> | Drainage Area <u>8</u> |
|---------------------------------|------------------------|------------------------|------------------------|------------------------|
| Receiving Stream Name           | Albemarle Sound        | Albemarle Sound        | Albemarle Sound        | Albemarle Sound        |
| Stream Class *                  | SB                     | SB                     | SB                     | SB                     |
| Stream Index Number *           | 30                     | 30                     | 30                     | 30                     |
| Total Drainage Area (sf)        |                        | 124,547                | 83,688                 |                        |
| On-site Drainage Area (sf)      |                        | 124,547                | 83,688                 |                        |
| Off-site Drainage Area (sf)     | 0                      | 0                      | 0                      |                        |
| Proposed Impervious Area** (sf) |                        | 47,319                 | 47,319                 |                        |
| % Impervious Area** (total)     |                        | 38%                    | 49.8%                  |                        |

| Impervious** Surface Area   | Drainage Area <u>5</u> | Drainage Area <u>6</u> | Drainage Area <u>7</u> | Drainage Area <u>8</u> |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|
| On-site Buildings/Lots (sf) |                        | 5,701                  |                        |                        |
| On-site Streets (sf)        |                        |                        |                        |                        |
| On-site Parking (sf)        |                        | 41,618                 | 41,645                 |                        |
| On-site Sidewalks (sf)      |                        |                        |                        |                        |
| Other on-site (sf)          |                        |                        |                        |                        |
| Future (sf)                 |                        |                        |                        |                        |
| Off-site (sf)               |                        |                        |                        |                        |
| Existing BUA*** (sf)        |                        |                        |                        |                        |
| Total (sf):                 |                        | 47,319                 | 41,645                 |                        |

\* Stream Class and Index Number can be determined at: <https://www.deq.nc.gov/about/divisions/water-resources/water-planning/classification-standards/classifications>

\*\* Impervious area is defined as the built upon area including, but not limited to, buildings, roads, parking areas, sidewalks, gravel areas, etc.

\*\*\* Report only that amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA. See definition 15A NCAC 02H .1002(17).



11. How was the off-site impervious area listed the Section IV, 10 Tables determined? Provide documentation.  
The site has been surveyed by Quible & Associates, P.C.

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**Projects in Union County:** Contact DEMLR Central Office staff to check if the project is located within a Threatened & Endangered Species watershed that may be subject to more stringent stormwater requirements as per 15A NCAC 02B .0600.

## V. SUPPLEMENT AND O&M FORMS

The applicable state stormwater management permit supplement and operation and maintenance (O&M) forms must be submitted for each SCM specified for this project. The latest versions of the forms can be downloaded from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/stormwater-design-manual>. For SCMs subject to older design standards or offsite projects, the archived supplement can be found from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/stormwater-design-manual/archived-stormwater-design-manual-supplemental-forms>

## VI. CHECKLIST OF SUBMITTAL REQUIREMENTS FOR AN ADMINISTRATIVELY COMPLETE APPLICATION PACKAGE PER 15A NCAC 02H .1042(2)

**Only complete application packages will be accepted and reviewed by the Division of Energy, Mineral and Land Resources (DEMLR). An administratively complete application package includes all of the items listed below. A detailed application instruction sheet and SCM checklists are available from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/post-construction-program/new-permits-permit-modifications>. The complete application package should be submitted to the appropriate DEMLR Office.** (The appropriate office may be found by locating project on the interactive online map at <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/post-construction-program>.)

Please **indicate that the following required information have been provided by initialing** in the space provided for each item. All original documents **MUST** be signed and initialed in **blue ink**. **Download the latest versions for each submitted application package** from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program>.

- |  | <b>Initials</b> |
|--|-----------------|
| 1. <i>Original and one copy</i> of the Stormwater Management Permit Application Form.  | _____           |
| 2. <i>Original and one copy</i> of the signed and notarized Deed Restrictions & Protective Covenants Form or, for major modifications, a copy of the recorded deed restrictions and protective covenants limiting the built-upon area so that it does not exceed the capacity of the SCM(s) or the BUA thresholds. <i>(if required as per Part VII below)</i><br>Deed book: _____ Page No: _____ Relevant section: _____   | _____<br>_____  |
| 3. <i>Original</i> of the applicable Supplement Form(s) ( <i>sealed, signed and dated</i> ) <b>and</b> O&M agreement(s) for <u>each</u> SCM. <i>(please refer to Section V for more information)</i>   | _____           |
| 4. Appropriate permit application processing fee per NCGS 143-215.3D(e)(2) <i>payable to NCDEQ</i> .<br>A full list of fee adjustments is available on the DEQ website:<br><a href="https://www.deq.nc.gov/accessdeq/permit-fees-2023-updates">https://www.deq.nc.gov/accessdeq/permit-fees-2023-updates</a><br>(For an Express review, refer to: <a href="https://www.deq.nc.gov/accessdeq/express-permitting">https://www.deq.nc.gov/accessdeq/express-permitting</a> for information on the Express program and the associated fees. Contact the appropriate Coastal regional office Express Permit Coordinator for additional information and to schedule the required application meeting.) | _____           |
| 5. A detailed narrative (one to two pages) describing the stormwater treatment/management for the project. This is required in addition to the brief summary provided in the Project Information, item 1.  | _____           |
| 6. A USGS map identifying the site location. If the receiving stream is reported as class SA or the receiving stream drains to class SA waters within ½ mile of the site boundary, include the ½ mile radius on the map.   | _____           |
| 7. Sealed, signed, and dated calculations (one copy).  | _____           |



8. Two sets of plans folded to 8.5" x 14" (sealed, signed, & dated), including:
  - a. Development/Project name. \_\_\_\_\_
  - b. Engineer and firm. \_\_\_\_\_
  - c. Location map with named streets and NCSR numbers. \_\_\_\_\_
  - d. Legend. \_\_\_\_\_
  - e. North arrow. \_\_\_\_\_
  - f. Scale. \_\_\_\_\_
  - g. Revision number and dates. \_\_\_\_\_
  - h. Identify all surface waters on the plans by delineating the normal pool elevation of impounded structures, the banks of streams and rivers, the MHW or NHW line of tidal waters, and any coastal wetlands landward of the MHW or NHW lines.
    - Delineate the vegetated setback landward from the normal pool elevation of impounded structures, the banks of streams or rivers, and the MHW (or NHW) of tidal waters. \_\_\_\_\_
  - i. Dimensioned property/project boundary with bearings & distances. \_\_\_\_\_
  - j. Site Layout with all BUA identified and dimensioned. \_\_\_\_\_
  - k. Existing contours, proposed contours, spot elevations, finished floor elevations. \_\_\_\_\_
  - l. Details of roads, drainage features, collection systems, and stormwater control measures (including any applicable SCM planting plans). \_\_\_\_\_
  - m. Wetlands delineated, or a note on the plans that none exist. (Must be delineated by a qualified person; identify the person who made the determination on the plans. \_\_\_\_\_
  - n. Existing drainage (including off-site), drainage easements, pipe sizes, runoff calculations. \_\_\_\_\_
  - o. Drainage areas delineated (included in the main set of plans, not as a separate document). \_\_\_\_\_
9. Copy of any applicable soils report with the associated SHWT elevations (Please identify elevations in addition to depths) as well as a map of the boring locations with the existing elevations and boring logs. Include an 8.5"x11" copy of the NRCS County Soils map with the project area clearly delineated. For projects with infiltration SCMs, the report should also include the soil type, expected infiltration rate, and the method of determining the infiltration rate. **(Infiltration Devices submitted to WiRO: Schedule a site visit for DEMLR to verify the SHWT Prior to submittal, (910) 796-7378.)** \_\_\_\_\_
10. A copy of the most current property deed. Deed book: 1512 Page No: 459 \_\_\_\_\_
11. For corporations and limited liability corporations (LLC): Provide documentation from the NC Secretary of State or other official documentation, which supports the titles and positions held by the persons listed in Contact Information, item 1a, 2a, and/or 3a per 15A NCAC 2H.1040(1). The corporation or LLC must be listed as an active corporation in good standing with the NC Secretary of State, otherwise the application will be returned.  
<http://www.secretary.state.nc.us/Corporations/CSearch.aspx> \_\_\_\_\_
12. If the applicant is not the property owner, a copy of a lease agreement, affidavit, or other document showing that the applicant has obtained legal rights to submit a stormwater permit application within the proposed project area; \_\_\_\_\_
13. If applicable, a copy of any recorded drainage, maintenance, or operation and maintenance easements demonstrating ownership interest sufficient to operate the SW system.  
Deed book: \_\_\_\_\_ Page No: \_\_\_\_\_ Relevant section: \_\_\_\_\_
14. If a modification to an existing permit:
  - a. The applicant / permit holder will remain the same and permit has not and will not expire within the next 180 days. \_\_\_\_\_
  - b. Signed, sealed & dated Designer Certification Forms \_\_\_\_\_
  - c. Copies of the following documents recorded with the County Register of Deeds
    - i. Deed restrictions and protective covenants limiting the BUA so that it does not exceed the capacity of the SCM(s) or the BUA thresholds. \_\_\_\_\_
    - ii. Drainage easements, when applicable. \_\_\_\_\_
    - iii. Operation & Maintenance Agreement \_\_\_\_\_
    - iv. Final subdivision plat referencing the Operation & Maintenance Agreement \_\_\_\_\_

**VII. DEED RESTRICTIONS AND PROTECTIVE COVENANTS**

For all subdivisions, outparcels, and future development, the appropriate property restrictions and protective covenants are required to be recorded prior to the sale of any lot. If lot sizes vary significantly or the proposed BUA allocations vary, a table listing each lot number, lot size, and the allowable built-upon area must be provided as an attachment to the completed and notarized deed restriction form. The appropriate deed restrictions and protective covenants forms can be downloaded from <https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/post-construction-program/post-construction-forms>. Download the latest versions for each submittal.

In the instances where the applicant is different than the property owner, it is the responsibility of the property owner to sign the deed restrictions and protective covenants form while the applicant is responsible for ensuring that the deed restrictions are recorded.

**By the notarized signature(s) below, the permit holder(s) certify that the recorded property restrictions and protective covenants for this project, if required, shall include all the items required in the permit and listed on the forms available on the website, that the covenants will be binding on all parties and persons claiming under them, that they will run with the land, that the required covenants cannot be changed or deleted without concurrence from the NC DEMLR, and that they will be recorded prior to the sale of any lot.**

**VIII. CONSULTANT INFORMATION AND AUTHORIZATION**

Applicant: Complete this section if you wish to designate authority to another individual and/or firm (such as a consulting engineer and/or firm) so that they may provide information on your behalf for this project (such as addressing requests for additional information).

Consulting Engineer: Cathleen M. Saunders

Consulting Firm: Quible & Associates, P.C.

Mailing Address: PO Drawer 870

City: Kitty Hawk State: NC Zip: 27949

Phone: ( 252 ) 202-7112 Fax: (            )           

Email: csaunders@withersravenel.com

**IX. PROPERTY OWNER AUTHORIZATION** (if Contact Information, item 2 has been filled out, complete this section)

I, (print or type name of person listed in Contact Information, item 2a) \_\_\_\_\_, certify that I own the property identified in this permit application, and thus give permission to (print or type name of person listed in Contact Information, item 1a) \_\_\_\_\_ with (print or type name of organization listed in Contact Information, item 1a) \_\_\_\_\_ to develop the project as currently proposed. A copy of the lease agreement or pending property sales contract has been provided with the submittal, which indicates the party responsible for the operation and maintenance of the stormwater system.

As the legal property owner I acknowledge, understand, and agree by my signature below, that if my designated agent (entity listed in Contact Information, item 1) dissolves their company and/or cancels or defaults on their lease agreement, or pending sale, responsibility for compliance with the DEMLR Stormwater permit reverts back to me, the property owner. As the property owner, it is my responsibility to notify DEMLR immediately and submit a completed Name/Ownership Change Form within 30 days; otherwise I will be operating a stormwater treatment facility without a valid permit. I understand that the operation of a stormwater treatment facility without a valid permit is a violation of NC General Statute 143-215.1 and may result in appropriate enforcement action including the assessment of civil penalties of up to \$25,000 per day, pursuant to NCGS 143-215.6.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

I, \_\_\_\_\_, a Notary Public for the State of \_\_\_\_\_, County of \_\_\_\_\_, do hereby certify that \_\_\_\_\_

personally appeared before me this \_\_\_\_\_ day of \_\_\_\_\_, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,



SEAL

My commission expires \_\_\_\_\_

**X. APPLICANT'S CERTIFICATION**

I, *(print or type name of person listed in Contact Information, item 1a)* \_\_\_\_\_, certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans, that the required deed restrictions and protective covenants will be recorded, and that the proposed project complies with the requirements of the applicable stormwater rules under 15A NCAC 2H .1000 and any other applicable state stormwater requirements.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

I, \_\_\_\_\_, a Notary Public for the State of \_\_\_\_\_, County of \_\_\_\_\_, do hereby certify that \_\_\_\_\_ personally appeared before me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,



SEAL

My commission expires \_\_\_\_\_

| DEMLR USE ONLY |          |               |
|----------------|----------|---------------|
| Date Received  | Fee Paid | Permit Number |
|                |          |               |

## STATE STORMWATER: PERMIT INFORMATION UPDATE APPLICATION FORM

**There is NO FEE for updating project name or permittee information.**

This form is to only to be used by the current permittee to notify the Division of:

- 1) changes to the Point of Contact (signing official) for the current permittee (LLC, Corporation, HOA or POA);
- 2) changes to the mailing address, phone number or email address of the current permittee;
- 3) changes to the name of the project; and
- 4) changes to the legal corporate name as documented by a Name Change or Merger filed with the NCSOS.

### A. NEW PERMIT INFORMATION

State Stormwater Permit Number: SW7160706

| Are you updating (check all that apply):                          | If so, please provide the updated information:    |
|---|---|
| <input checked="" type="checkbox"/> Project name                  | <u>H2OBX RV Park &amp; Waterpark Resort</u>       |
| <input checked="" type="checkbox"/> Corporation Name <sup>1</sup> | <u>H2OBX, LLC</u>                                 |
| <input type="checkbox"/> Permit Contact Name <sup>2,3</sup>       | _____   |
| <input type="checkbox"/> Permit Contact Title                     | _____   |
| <input checked="" type="checkbox"/> Mailing Address <sup>3</sup>  | <u>4112 N. Croatan Highway, Kitty Hawk, 27949</u> |
| <input type="checkbox"/> Phone number                             | _____   |
| <input type="checkbox"/> Email address                            | _____   |

<sup>1</sup> Provide documentation such as a Name Change / Merger filed with the NCSOS.

<sup>2</sup> Provide supporting documentation such as NCSOS filing. The permit contact's position must be in accordance with [15A NCAC 02H .1040\(1\)](#).

<sup>3</sup> If more than one point of contact or mailing address is being changed, please attach a separate sheet.

### B. CERTIFICATION OF PERMITTEE

I, Jeff Malarney, the current permittee, hereby notify DEMLR that I am making the changes as listed in Section A above. I further attest that this application for an update to the permit information currently on file is accurate and complete to the best of my knowledge.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

I, \_\_\_\_\_, a Notary Public for the State of \_\_\_\_\_,

County of \_\_\_\_\_, do hereby certify that \_\_\_\_\_

personally appeared before me this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, and acknowledge the due execution of the forgoing instrument. Witness my hand and official seal,

(Notary Seal)

Notary Signature \_\_\_\_\_

My commission expires \_\_\_\_\_



Energy, Mineral &  
Land Resources  
ENVIRONMENTAL QUALITY

ROY COOPER  
Governor

MICHAEL S. REGAN  
Secretary

TRACY DAVIS  
Director

May 26, 2017

OBX Waterpark Adventure, LLC  
Mr. Jeff Malarney  
218 Thicket Lump Drive  
Wanchese, NC 27981

**Subject: Stormwater Permit No. SW7160706 MOD  
OBX Waterpark Adventure  
High Density Wet Pond/Infiltration Project  
Currituck County**

Dear Mr. Malarney:

The Washington Regional Office received a complete Stormwater Management Permit Modification Application for the OBX Waterpark Adventure project on May 22, 2017. Staff review of the plans and specifications has determined that the project, as proposed, will comply with the Stormwater Regulations set forth in Title 15A NCAC 2H.1000. We are forwarding Permit No. SW7160706 MOD dated May 26, 2017, for the construction of the subject project. The modification adds one infiltration basin and the associated allowable built upon and drainage area.

This permit shall be effective from the date of issuance until August 1, 2024, shall void permit SW7160706 issued on October 28, 2016 and shall be subject to the conditions and limitations as specified therein. Please pay special attention to the Operation and Maintenance requirements in this permit. Failure to establish an adequate system for operation and maintenance of the stormwater management system will result in future compliance problems.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within thirty (30) days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made this permit shall be final and binding.

If you have any questions, or need additional information concerning this matter, please contact me at (252) 946-6481.

Sincerely,

William Carl Dunn, PE  
Environmental Engineer

cc: Currituck County Planning Division  
Cathleen Saunders, PE, Quible & Associates, P.C.  
Washington Regional Office

**DRAFT**

**STATE OF NORTH CAROLINA**  
**DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES**

**STATE STORMWATER MANAGEMENT PERMIT**  
**HIGH DENSITY DEVELOPMENT**

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations

PERMISSION IS HEREBY GRANTED TO

*OBX Waterpark Adventure, LLC*

*OBX Waterpark Adventure*

*8528 Caratoke Highway, Currituck County*

FOR THE

construction, operation and maintenance of one wet detention pond and two infiltration basins in compliance with the provisions of 15A NCAC 2H .1000 (hereafter referred to as the "*stormwater rules*") and the approved stormwater management plans and specifications and other supporting data as attached and on file with and approved by the Division of Energy, Mineral, and Land Resources and considered a part of this permit.

This permit shall be effective from the date of issuance until August 1, 2024, and shall be subject to the following specified conditions and limitations:

**I. DESIGN STANDARDS**

1. This permit is effective only with respect to the nature and volume of stormwater described in the application and other supporting data.
2. This stormwater system has been approved for the management of stormwater runoff as described in Section I.7 of this permit.
3. The tract will be limited to the amount of built-upon area indicated in Section I. of this permit, and per approved plans.
4. All stormwater collection and treatment systems must be located in either dedicated common areas or recorded easements. The final plats for the project will be recorded showing all such required easements, in accordance with the approved plans.
5. The runoff from all built-upon area within the permitted drainage area of this project must be directed into the permitted stormwater control system.
6. The built-upon areas associated with this project shall be located at least 50 feet landward of all perennial and intermittent surface waters.



7. The following design criteria have been provided in the wet detention pond and must be maintained at design condition:

|    |   |                                  |
|----|---|----------------------------------|
| a. | Drainage Area, ft <sup>2</sup> :                        | 1,548,233                        |
| b. | Total Impervious Surfaces, ft <sup>2</sup> :            | 725,875                          |
| c. | Design Storm, inches:                                   | 1.5                              |
| d. | Pond Depth - average, feet:                             | 4.1                              |
| e. | TSS removal efficiency:                                 | 90%                              |
| f. | Permanent Pool Elevation, FMSL:                         | 2.30                             |
| g. | Permanent Pool Surface Area required, ft <sup>2</sup> : | 78,186                           |
| h. | Permanent Pool Surface Area, ft <sup>2</sup> :          | 86,067                           |
| i. | Min. Volume required, ft <sup>3</sup> :                 | 90,400                           |
| j. | Permitted Storage Volume, ft <sup>3</sup> :             | 256,724                          |
| k. | Temporary Storage Elevation, FMSL:                      | 5.00                             |
| l. | Controlling Orifice:                                    | 5.0"Ø pipe                       |
| m. | Receiving Stream/River Basin:                           | Albemarle Sound/Pasquotank Basin |
| n. | Stream Index Number:                                    | 30                               |
| o. | Classification of Water Body:                           | "SB"                             |

The following design criteria have been provided in the three infiltration basins and must be maintained at design condition:

|    | Infiltration Basin Number           | Swale #1                         | Swale #2 | Swale #3 |
|----|-------------------------------------|----------------------------------|----------|----------|
| a. | Drainage Area, ft <sup>2</sup> :    | 48,784                           | 20,165   | 28,893   |
| b. | Impervious Area, ft <sup>2</sup> :  | 17,306                           | 5,184    | 7,564    |
| c. | Basin Depth ft:                     | 1.3                              | 2.25     | 1.25     |
| d. | Required Storage, ft <sup>3</sup> : | 2,300                            | 800      | 1,100    |
| e. | Provided Storage, ft <sup>3</sup> : | 5,423                            | 1,968    | 2,080    |
| f. | Bottom Length, ft:                  | 453                              | 180      | 320      |
| g. | Bottom Width, ft:                   | 12.5                             | 5        | 3.5      |
| h. | Receiving Stream/River Basin:       | Albemarle Sound/Pasquotank Basin |          |          |
| i. | Stream Index Number:                | 30                               |          |          |
| j. | Classification of Water Body:       | "SB"                             |          |          |

## II. SCHEDULE OF COMPLIANCE

1. The stormwater management system shall be constructed in its entirety, vegetated and operational for its intended use prior to the construction of any built-upon surface.
2. During construction, erosion shall be kept to a minimum and any eroded areas of the system will be repaired immediately.
3. The permittee shall at all time provide the operation and maintenance necessary to assure the permitted stormwater system functions at optimum efficiency. The

approved Operation and Maintenance Plan must be followed in its entirety and maintenance must occur at the scheduled intervals including, but not limited to:

- a. Semiannual scheduled inspections (every 6 months).
  - b. Sediment removal.
  - c. Mowing and re-vegetation of slopes and the vegetated filter strip.
  - d. Immediate repair of eroded areas.
  - e. Maintenance of all slopes in accordance with approved plans and specifications.
  - f. Debris removal and unclogging of outlet structure, orifice device, level spreader, filter strip, catch basins and piping.
  - g. Access to the outlet structure must be available at all times.
4. Records of maintenance activities must be kept for each permitted SCM. The records will indicate the date, activity, name of person performing the work and what actions were taken.
  5. The permittee shall submit to the Division of Energy, Mineral, and Land Resources an annual summary report of the maintenance inspection records for each SCM. The report shall summarize the inspection dates, results of the inspections, and the maintenance work performed at each inspection.
  6. Access to the stormwater facilities shall be maintained via appropriate easements at all times.
  7. The facilities shall be constructed as shown on the approved plans. This permit shall become void unless the facilities are constructed in accordance with the conditions of this permit, the approved plans and specifications, and other supporting data.
  8. Upon completion of construction, prior to issuance of a Certificate of Occupancy, and prior to operation of this permitted facility, a certification must be received from an appropriate designer for the system installed certifying that the permitted facility has been installed in accordance with this permit, the approved plans and specifications, and other supporting documentation. Any deviations from the approved plans and specifications must be noted on the Certification. A modification may be required for those deviations.
  9. If the stormwater system was used as an Erosion Control device, it must be restored to design condition prior to operation as a stormwater treatment device, and prior to occupancy of the facility.
  10. The permittee shall submit to the Director and shall have received approval for revised plans, specifications, and calculations prior to construction, for any modification to the approved plans, including, but not limited to, those listed below:
    - a. Any revision to any item shown on the approved plans, including the stormwater management measures, built-upon area, details, etc.
    - b. Project name change.
    - c. Transfer of ownership.
    - d. Redesign or addition to the approved amount of built-upon area or to the drainage area.
    - e. Further subdivision, acquisition, lease or sale of all or part of the project area. The project area is defined as all property owned by the permittee,

- for which Sedimentation and Erosion Control Plan approval or a CAMA Major permit was sought.
- f. Filling in, altering, or piping of any vegetative conveyance shown on the approved plan.
11. The Director may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the permittee shall submit a written time schedule to the Director for modifying the site to meet minimum requirements. The permittee shall provide copies of revised plans and certification in writing to the Director that the changes have been made.
  12. The permittee shall submit final site layout and grading plans for any permitted future areas shown on the approved plans, prior to construction.
  13. A copy of the approved plans and specifications shall be maintained on file by the Permittee at all times.

### III. GENERAL CONDITIONS

1. This permit is not transferable except after notice to and approval by the Director. In the event of a change of ownership, or a name change, the permittee must submit a completed Name/Ownership Change form, to the Division of Energy, Mineral, and Land Resources, signed by both parties, and accompanied by supporting documentation as listed on page 2 of the form. The project must be in good standing with the Division. The approval of this request will be considered on its merits and may or may not be approved.
2. The permittee is responsible for compliance with all permit conditions until such time as the Division approves the transfer request.
3. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to enforcement action by the Division of Energy, Mineral, and Land Resources, in accordance with North Carolina General Statute 143-215.6A to 143-215.6C.
4. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state, and federal) having jurisdiction.
5. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement stormwater management systems.
6. The permittee grants DEQ Staff permission to enter the property during normal business hours for the purpose of inspecting all components of the permitted stormwater management facility.
7. The permit issued shall continue in force and effect until revoked or terminated. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation and re-issuance or termination does not stay any permit condition.

**Designer's Certification**

I, \_\_\_\_\_, as a duly registered \_\_\_\_\_ in the State of North Carolina, having been authorized to observe (periodically/ weekly/ full time) the construction of the project,

---

(Project)

for \_\_\_\_\_ (Project Owner) hereby state that, to the best of my abilities, due care and diligence was used in the observation of the project construction such that the construction was observed to be built within substantial compliance and intent of the approved plans and specifications.

The checklist of items on page 2 of this form is included in the Certification.

Noted deviations from approved plans and specification:

SEAL

Signature \_\_\_\_\_

Registration Number \_\_\_\_\_

Date \_\_\_\_\_

\*8. IT IS IMPERATIVE THAT ALL SLOPES AND DISTURBED AREAS WITHIN THE PROJECT AREA BE FINE GRADED AND STABILIZED WITH PERMANENT VEGETATION. REGULAR MAINTAINANCE OF THE ONSITE STORMWATER MANAGEMENT FACILITIES MUST BE ONGOING UNTIL STABILIZATION IS COMPLETE AND ACCEPTABLE. TO ENSURE STABILIZATION IS COMPLETED, BONDING HAS BEEN OBTAINED THROUGH THE LOCALITY FOR ALL AREAS DISTURBED.

\*9. INFILTRATION BASIN #3 HAS AN AREA WHERE 3:1 SIDE SLOPES WERE NOT MET. THE OWNER HAS BEEN MADE AWARE OF THIS AREA AND WILL CONTINUE TO INSPECT AND MAINTAIN REGULARLY. IF THE PROPOSED SLOPES CANNOT BE STABILIZED, THIS AREA OF THE BASIN WILL NEED TO BE REGRADED.

\*15. THE INFILTRATION BASIN #3 DIMENSIONS HAVE BEEN REVISED FROM THE PREVIOUSLY APPROVED PLAN SET DUE TO CONFLICTS THAT AROSE DURING CONSTRUCTION. THE DESIGN DEPTHS AND BASIN DIMENSIONS WERE FIELD ADJUSTED TO AVOID FENCING. REVISED DIMENSIONS WERE REVIEWED TO CONFIRM STORMWATER STORAGE MEETS THE PREVIOUSLY PROVIDED CALCULATIONS. EXISTING TREES WERE PRESERVED WITHIN THE PROPOSED EMBANKMENT AND THE OWNER HAS BEEN MADE AWARE OF THE POTENTIAL MAINTENANCE CONCERNS. A COURTESY COPY OF THE ASBUILT SURVEY WILL BE PROVIDED TO THE STATE FOR THEIR RECORDS UPON REQUEST.

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8. Unless specified elsewhere, permanent seeding requirements for the stormwater control must follow the guidelines established in the North Carolina Erosion and Sediment Control Planning and Design Manual.
9. Approved plans and specifications for this project are incorporated by reference and are enforceable parts of the permit.
10. The issuance of this permit does not prohibit the Director from reopening and modifying the permit, revoking and reissuing the permit, or terminating the permit as allowed by the laws, rules and regulations contained in Title 15A NCAC 2H.1000, and NCGS 143-215.1 et.al.
11. The permittee shall notify the Division of any name, ownership or mailing address changes at least 30 days prior to making such changes.
12. This permit shall be effective from the date of issuance until August 1, 2024. Application for permit renewal shall be submitted 180 days prior to the expiration date of this permit and must be accompanied by the processing fee.

Permit issued this the 26<sup>th</sup> day of May, 2017.

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION



for

Tracy E. Davis, PE, CPM  
Division of Energy, Mineral, and Land Resources  
By Authority of the Environmental Management Commission

Stormwater Permit No. SW7160706 MOD

Certification Requirements:

- \_\_\_ 1. The drainage area to the system contains approximately the permitted acreage.
- \_\_\_ 2. The drainage area to the system contains no more than the permitted amount of built-upon area.
- \_\_\_ 3. All the built-upon area associated with the project is graded such that the runoff drains to the system.
- \_\_\_ 4. All roof drains are located such that the runoff is directed into the system.
- \_\_\_ 5. The outlet/bypass structure elevations are per the approved plan.
- \_\_\_ 6. The outlet structure is located per the approved plans.
- \_\_\_ 7. Trash rack is provided on the outlet/bypass structure.
- \_\_\_ 8. All slopes are grassed with permanent vegetation.
- \_\_\_ 9. Vegetated slopes are no steeper than 3:1.
- \_\_\_ 10. The inlets are located per the approved plans and do not cause short-circuiting of the system.
- \_\_\_ 11. The permitted amounts of surface area and/or volume have been provided.
- \_\_\_ 12. Required drawdown devices are correctly sized per the approved plans.
- \_\_\_ 13. All required design depths are provided.
- \_\_\_ 14. All required parts of the system are provided, such as a vegetated shelf, and a forebay.
- \_\_\_ 15. The required system dimensions are provided per the approved plans.

cc: NCDEQ-DEMLR Washington Regional Office  
Currituck County Planning Division



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Prepared by:  
Christopher B. Frantze  
STINSON LLP

Under the supervision of and as approved by:  
John C. Surles, Esq.  
THE SURLES LAW FIRM, PLLC  
6200 Fairview Road, Suite 325  
Charlotte, NC 28210

Doc No: 347800  
Recorded: 12/12/2019 02:56:53 PM  
Fee Amt: \$26.00 Page 1 of 8  
Excise Tax: \$76,830.00  
Currituck County North Carolina  
Denise A. Hall, Register of Deeds  
BK 1512 PG 459 - 466 (8)

After recording return to:  
First American Title  
1201 Walnut St. 700  
Kansas City, MO 64106  
NCS-986567 AXCTY

Tax Collector Certification That No Delinquent Taxes  
Are Due. Date 12-12-19 By DS: Certification  
expires Jan. 6<sup>th</sup> of the year following certification date.

TRANSFER TAX AMOUNT: 384150.00 DS  
DATE/COLLECTOR 12-12-2019-ENC

Excise Tax: \$ 76,830.00

**SPECIAL WARRANTY DEED**

THIS DEED made as of the 11th day of December, 2019, by and between **EPR RESORTS, LLC**, a Delaware limited liability company ("Grantor"), whose address is c/o EPR Properties, 909 Walnut, Suite 200, Kansas City, MO 64106, and **H2OBX, LLC**, a Delaware limited liability company ("Grantee"), whose address is 13 Green Mountain Drive, Cohoes, New York 12047. The designation Grantor and Grantee, as used herein, shall include said parties, their heirs, successors and assigns, and shall include singular, plural, masculine, feminine or neuter, as required by context.

This is not the personal residence of Grantor.

WITNESSETH:

That the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in Poplar Branch Township, Currituck County, North Carolina and more particularly described as follows:

See **Exhibit A** attached hereto and incorporated herein by this reference.

Together with all improvements thereon, known as 8504 Caratoke Hwy., 8524 Caratoke Hwy., 8526 Caratoke Hwy., and Ballast Rock Rd., Powells Point, NC, and all of Grantor's rights, title and interests, if any, in and to all abutting roads and rights of way and all reversionary rights therein, and in and to all appurtenant easements, if any.

The property hereinabove described is commonly referred to as:  
Map/Parcel ID Numbers: 0124000137L0000; 012400001270000;  
0124000137E0000; 0124000068J0000

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The property hereinabove described was acquired by Grantor by instruments recorded in Book 1383, Page 80, Book 1383, Page 84, Book 1383, Page 87, and Book 1396, Page 63, Currituck County Registry.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land, the improvements thereon and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor has done nothing to impair such title as Grantor received, and Grantor will warrant and defend the title against the lawful claims of all persons claiming by, under or through Grantor, subject to the exceptions hereinafter stated.

Title to the property hereinabove described is subject to: (a) easements, restrictions, declarations, reservations, agreements, instruments and other matters of record, if any; (b) taxes and assessments, general and special, not now due and payable; and (c) rights of the public in and to the parts thereof in streets, roads or alleys.

[This page's remainder is intentionally blank; signature pages follow.]

Unofficial Document

Unofficial Document

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IN WITNESS WHEREOF, the Grantor has caused this instrument to be duly executed as of the day and year first above written.

EPR RESORTS, LLC,  
a Delaware limited liability company

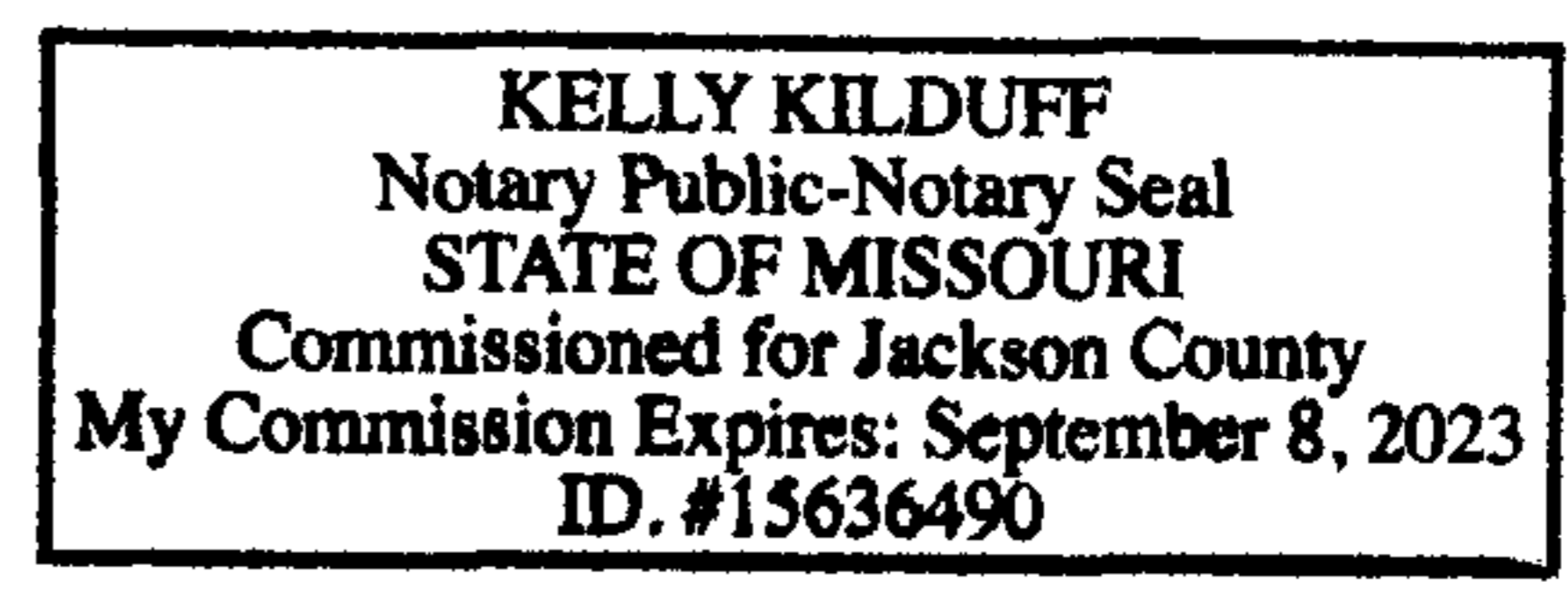
By: \_\_\_\_\_  
Print: Gregory K. Silvers  
Title: President

STATE OF MISSOURI )  
) ss.  
COUNTY OF JACKSON )

I, Kelly Kilduff, a Notary Public of the County and State aforesaid, certify that Gregory K. Silvers personally came before me this day and acknowledged that s/he is the President of EPR Resorts, LLC, a Delaware limited liability company, and on behalf of the company, duly executed the foregoing instrument on behalf of the company.

Witness my hand and official stamp or seal, this 5th day of December, 2019.

K. Kilduff  
Notary Public  
Print Name: Kelly Kilduff  
My Commission Expires: 9/8/2023



EPR-OBX – Signature Page

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**EXHIBIT A TO SPECIAL WARRANTY DEED  
LEGAL DESCRIPTION OF PROPERTY**

PARCEL 1:

TRACT 1:

BEGINNING AT A SET IRON PIN OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 80.81 FEET IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, FROM AN IRON PIN, SAID IRON PIN BEING LOCATED ON A CHORD BEARING OF SOUTH 42 DEG. 18 MIN. 10 SEC. EAST 80.80 FEET FROM THE BEGINNING POINT, SAID IRON PIN BEING ALSO LOCATED SOUTH 03 DEG. 15 MIN. 04 SEC. WEST 119.38 FEET FROM N.C.G.S. MONUMENT CUR9 N 873,965.67' E 2,937,616.75' NAD(83) (2011); THENCE FROM SAID POINT OF BEGINNING NORTH 69 DEG. 32 MIN. 44 SEC. WEST 176.98 FEET TO AN EXISTING IRON ROD; THENCE SOUTH 69 DEG. 42 MIN. 48 SEC. WEST 352.98 FEET TO A SET IRON ROD; THENCE SOUTH 69 DEG. 45 MIN. 03 SEC. WEST 635.34 FEET TO A SET IRON ROD; THENCE SOUTH 68 DEG. 52 MIN. 31 SEC. WEST 94.93 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 39 MIN. 22 SEC. WEST 175.02 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 40 MIN. 53 SEC. WEST 603.07 FEET TO A SET IRON ROD; THENCE NORTH 36 DEG. 19 MIN. 07 SEC. WEST 2,575.07 FEET TO A SET IRON ROD; THENCE NORTH 83 DEG. 48 MIN. 44 SEC. EAST 383.35 FEET TO A CONCRETE MONUMENT LOCATED IN THE SOUTH LINE OF PROPERTY NOW OR FORMERLY OWNED BY ROBERT F. HARRELL ET AL; THENCE ALONG THE SOUTH LINE OF THE AFORESAID HARRELL ET AL PROPERTY NORTH 83 DEG. 48 MIN. 44 SEC. EAST 859.73 FEET TO A CONCRETE MONUMENT LOCATED IN THE WEST LINE OF PROPERTY NOW OR FORMERLY OWNED BY GARLAND H. DUNSTAN, JR.; THENCE ALONG THE NOW OR FORMERLY DUNSTAN PROPERTY SOUTH 30 DEG. 15 MIN. 24 SEC. EAST 833.22 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 60 DEG. 44 MIN. 49 SEC. EAST 149.77 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 31 DEG. 01 MIN. 52 SEC. WEST 9.54 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 65 DEG. 04 MIN. 33 SEC. EAST 299.09 FEET TO AN EXISTING IRON PIN; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 78 DEG. 02 MIN. 57 SEC. EAST 357.72 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 72 DEG. 25 MIN. 25 SEC. EAST 354.74 FEET TO AN EXISTING IRON PIN LOCATED IN THE WEST MARGIN OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 SOUTH 25 DEG. 32 MIN. 35 SEC. EAST 200.99 FEET TO AN IRON PIN OR OTHER MARKER LOCATED IN THE NORTH LINE OF PROPERTY NOW OR FORMERLY OWNED BY BARNHILL CONTRACTING CO.; THENCE ALONG THE AFORESAID BARNHILL CONTRACTING CO. PROPERTY SOUTH 64 DEG. 27 MIN. 25 SEC. WEST 174.55 FEET TO A SET IRON PIN; THENCE CONTINUING ALONG THE AFORESAID BARNHILL CONTRACTING CO. PROPERTY SOUTH 25 DEG. 32 MIN. 35 SEC. EAST 200.00 FEET TO A SET IRON PIN; THENCE CONTINUING ALONG THE AFORESAID BARNHILL CONTRACTING CO. PROPERTY NORTH 64 DEG. 27 MIN. 25 SEC. EAST 175.82 FEET TO A SET IRON PIN LOCATED IN THE WEST MARGIN OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OF THE RIGHT-OF-WAY OF U.S. HIGHWAY 158 IN A SOUTHERLY DIRECTION FOLLOWING A CURVATURE THEREOF A DISTANCE OF 292.49 FEET TO AN EXISTING IRON ROD, SAID CURVE HAVING A RADIUS OF

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2,924.79 FEET, SAID IRON ROD BEING LOCATED ON A CHORD BEARING OF SOUTH 30 DEG. 05 MIN. 43 SEC. EAST 292.37 FEET FROM THE TERMINAL POINT OF THE NEXT PRECEDING CALL, SAID IRON ROD BEING IN THE NORTH LINE OF THE NOW OR FORMERLY GEORGE M. FARROW PROPERTY; THENCE ALONG THE AFORESAID FARROW PROPERTY SOUTH 56 DEG. 32 MIN. 43 SEC. WEST 129.03 FEET TO AN EXISTING IRON PIN; THENCE CONTINUING ALONG THE AFORESAID FARROW PROPERTY SOUTH 32 DEG. 36 MIN. 57 SEC. EAST 154.28 FEET TO AN EXISTING IRON PIN; THENCE CONTINUING ALONG THE AFORESAID FARROW PROPERTY NORTH 56 DEG. 32 MIN. 43 SEC. EAST 131.34 FEET TO AN IRON PIN OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 IN A SOUTHERLY DIRECTION FOLLOWING THE CURVATURE THEREOF A DISTANCE OF 282.19 FEET TO A SET IRON ROD, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, SAID IRON ROD BEING LOCATED ON A CHORD BEARING OF SOUTH 38 DEG. 44 MIN. 50 SEC. EAST 282.08 FEET FROM THE TERMINAL POINT OF THE NEXT PRECEDING CALL, SAID IRON ROD BEING THE POINT AND PLACE OF BEGINNING.

THIS BEING THAT CERTAIN PROPERTY DESIGNATED AS "NEW PARCEL "A" 3,484,800 SQ.FT., 80.0 AC", AS SHOWN ON THAT CERTAIN MAP OR PLAT ENTITLED "RECOMBINATION PLAT NEW PARCEL "A" & 2 RESIDUAL PARCELS 5 EXISTING PARCELS", PREPARED BY MATTHEW R. BATTEY, REGISTERED SURVEYOR, DATED APRIL 12, 2016, WHICH MAP OR PLAT IS DULY RECORDED IN PLAT CABINET O, SLIDE 84, CURRITUCK COUNTY REGISTRY.

TRACT 2 - EASEMENT:

BEGINNING AT A SET IRON PIN OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 80.81 FEET IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, FROM AN IRON PIN, SAID IRON PIN BEING LOCATED ON A CHORD BEARING OF SOUTH 42 DEG. 18 MIN. 10 SEC. EAST 80.80 FEET FROM THE BEGINNING POINT, SAID IRON PIN BEING ALSO LOCATED SOUTH 03 DEG. 15 MIN. 04 SEC. WEST 119.38 FEET FROM N.C.G.S. MONUMENT CUR9 N 873,965.67' E 2,937,616.75' NAD 83 (2011); THENCE FROM SAID POINT OF BEGINNING SOUTH 69 DEG. 32 MIN. 44 SEC. WEST 176.98 FEET TO A SET IRON ROD; THENCE SOUTH 69 DEG. 42 MIN. 48 SEC. WEST 352.98 FEET TO A SET IRON ROD; THENCE SOUTH 69 DEG. 45 MIN. 03 SEC. WEST 635.34 FEET TO A SET IRON ROD; THENCE SOUTH 68 DEG. 52 MIN. 31 SEC. WEST 94.93 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 39 MIN. 22 SEC. WEST 175.02 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 40 MIN. 53 SEC. WEST 603.07 FEET TO A SET IRON ROD; THENCE NORTH 36 DEG. 19 MIN. 07 SEC. EAST 75 FEET TO A SET IRON ROD; THENCE NORTH 53 DEG. 40 MIN. 53 SEC. EAST 603.10 FEET TO A CONCRETE MONUMENT; THENCE NORTH 53 DEG. 39 MIN. 22 SEC. EAST 165 FEET TO A SET IRON ROD; THENCE NORTH 68 DEG. 52 MIN. 31 SEC. EAST 84.34 FEET TO A CONCRETE MONUMENT; THENCE NORTH 69 DEG. 45 MIN. 03 SEC. EAST 634.82 FEET TO AN EXISTING IRON ROD; THENCE NORTH 69 DEG. 42 MIN. 48 SEC. EAST 353.09 FEET TO AN IRON ROD OR OTHER MARKER; THENCE NORTH 69 DEG. 32 MIN. 44 SEC. EAST 207.16 FEET TO A SET IRON ROD LOCATED IN THE WEST MARGIN OR RIGHT OF WAY OF THE AFORESAID U.S. 158; THENCE ALONG THE WEST MARGIN OR RIGHT OF WAY OF U.S. 158 IN THE NORTHERLY DIRECTION ALONG THE CURVATURE THEREOF A DISTANCE 80.81 FEET TO A SET IRON ROD, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, SAID IRON ROD BEING LOCATED ON A CHORD BEARING OF NORTH 38 DEG. 44 MIN.

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50 SEC. WEST FROM THE TERMINAL POINT OF THE NEXT PRECEDING CALL, SAID IRON ROD BEING THE POINT AND PLACE OF BEGINNING.

THIS BEING THAT CERTAIN AREA DESIGNATED AS "75' ACCESS EASEMENT", AS SHOWN ON THAT CERTAIN MAP OR PLAT ENTITLED "RECOMBINATION PLAT NEW PARCEL "A" & 2 RESIDUAL PARCEL 5 EXISTING PARCELS", PREPARED BY MATTHEW R. BATTEY, REGISTERED SURVEYOR, DATED APRIL 12, 2016, WHICH MAP OR PLAT IS DULY RECORDED IN PLAT CABINET O, SLIDE 84, CURRITUCK COUNTY REGISTRY.

PARCEL 2:

ALL THAT CERTAIN LOT OR PARCEL OF LAND LOCATED IN POPLAR BRANCH TOWNSHIP, CURRITUCK COUNTY, NORTH CAROLINA, ADJOINING THE PROPERTIES NOW OR FORMERLY OWNED BY W. R. GRIGGS AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN EXISTING IRON PIPE LOCATED ON THE SOUTHWEST MARGIN OF THE RIGHT OF WAY OF HIGHWAY US 158, SAID POINT OF BEGINNING BEING LOCATED SOUTH 44 DEG. 15 MIN. 03 SEC. EAST 981.76 FEET FROM THE POINT OF INTERSECTION OF THE SOUTHERN MARGIN OF THE RIGHT OF WAY OF PARK DRIVE AND THE SOUTHWEST MARGIN OF THE RIGHT OF WAY OF HIGHWAY US 158, RUNNING THENCE FROM SAID BEGINNING POINT ALONG THE SOUTH MARGIN OF THE RIGHT OF WAY OF HIGHWAY US 158 NORTH 33 DEG. 39 MIN. 25 SEC. WEST 154.28 FEET TO AN EXISTING IRON PIPE; THENCE ALONG THE PROPERTY LINE OF THE PROPERTY NOW OR FORMERLY OWNED BY W. R. GRIGGS SOUTH 56 DEG. 30 MIN. 15 SEC. WEST 128.12 FEET TO AN EXISTING IRON BAR; THENCE CORNERING AND RUNNING SOUTH 33 DEG. 39 MIN. 25 SEC. EAST 154.28 FEET TO AN EXISTING IRON BAR; THENCE CORNERING AND RUNNING NORTH 56 DEG 30 MIN 15 SEC. EAST 128.12 FEET TO THE POINT OF BEGINNING, SAID PARCEL CONTAINING 19,766.28 SQUARE FEET MORE OR LESS BY CALCULATION.

FOR A MORE PARTICULAR DESCRIPTION, REFERENCE IS MADE TO A MAP OR PLAT MADE FROM A SURVEY BY DONALD E. WOOD, REGISTERED LAND SURVEYOR, OF EASTERN DEVELOPMENT SERVICES, DATED NOVEMBER 4, 1997 ENTITLED "SURVEY FOR DON S. WILLIAMS, PARCEL 127 TAX MAP 124, POPLAR BRANCH TOWNSHIP, CURRITUCK COUNTY, NORTH CAROLINA", WHICH IS INCORPORATED HEREIN BY REFERENCE.

THE ABOVE PARCEL 2 IS ALSO DESCRIBED BY SURVEY METES AND BOUNDS AS FOLLOWS:

BEGINNING AT A IRON ROD LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 363.00' IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79' AND A CHORD BEARING OF N 39° 32' 20" W - 362.76', FROM AN IRON ROD, SAID IRON ROD BEING LOCATED IN 03° 15' 04" E 119.35' FROM N.C.G.S MONUMENT CUR\_N 873,965.67' E 2,937,616.75' NAD 83 (2011); THENCE FROM SAID POINT OF BEGINNING S 56° 32' 43" W - 131.34' TO AN IRON STAKE; THENCE CORNERING FROM SAID IRON N 33° 36' 57" W - 154.28' TO AN IRON STAKE; THENCE CORNERING FROM SAID IRON N 56° 32' 43" E - 129.03' TO AN IRON ROD IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, THENCE CORNERING FROM SAID IRON 154.32' IN A SOUTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79'

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AND A CHORD BEARING OF S 34° 28' 18" E – 154.30' TO THE POINT OF BEGINNING. SAID PARCEL CONTAINING 19,979.92 SF, 0.46 AC, MORE OR LESS BY CALCULATION.

PARCEL 3:

BEGINNING AT A CONCRETE MONUMENT OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID POINT OF BEGINNING BEING ALSO LOCATED SOUTH 25 DEG. 32 MIN. 35 SEC. EAST FROM THE SOUTHEAST CORNER OF THE HINES COMMERCIAL PARK SUBDIVISION AS RECORDED IN PLAT CABINET H, SLIDE 395, CURRITUCK COUNTY REGISTRY; THENCE FROM SAID POINT OF BEGINNING SOUTH 64 DEG. 27 MIN. 25 SEC. WEST 174.55 FEET TO A SET IRON PIN; THENCE SOUTH 25 DEG. 32 MIN. 35 SEC. EAST 200.00 FEET TO A SET IRON PIN; THENCE NORTH 64 DEG. 27 MIN. 25 SEC. EAST 175.82 FEET TO A SET IRON PIN LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 IN A GENERAL NORTHERLY DIRECTION 200 FEET, MORE OR LESS, THE POINT AND PLACE OF BEGINNING.

REFERENCE IS MADE TO A CERTAIN AREA DESIGNATED AS "N/F BARNHILL CONTRACTING CO. DB 1298, PG. 262" AS SHOWN ON THAT CERTAIN MAP OR PLAT ENTITLED "RECOMBINATION PLAT NEW PARCEL "A" & 2 RESIDUAL PARCELS 5 EXISTING PARCELS", PREPARED BY MATTHEW R. BATTEY, REGISTERED SURVEYOR, DATED APRIL 12, 2016, WHICH MAP OR PLAT IS DULY RECORDED IN PLAT CABINET O, SLIDE 84, CURRITUCK COUNTY REGISTRY.

THE ABOVE PARCEL 3 IS ALSO DESCRIBED BY SURVEY METES AND BOUNDS AS FOLLOWS:

BEGINNING AT A IRON ROD LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 809.81' IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79' AND A CHORD BEARING OF N 35° 09' 45" W – 807.22', FROM AN IRON ROD, SAID IRON ROD BEING LOCATED IN 03° 15' 04" E 119.38' FROM N.C.G.S MONUMENT CUR\_N 873,965.67' E 2,937,616.75' NAD 83 (2011); THENCE FROM SAID POINT OF BEGINNING S 64° 27' 25" W – 175.82' TO AN IRON ROD; THENCE CORNERING FROM SAID IRON N 25° 32' 35" W – 200' TO AN IRON ROD; THENCE CORNERING FROM SAID IRON N 64° 27' 25" E – 174.55' TO AN IRON ROD IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158; THENCE CORNERING FROM SAID IRON, ALONG THE MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, S 25° 32' 35" - 113.87' TO A SET IRON ROD, THENCE 86.14' IN A SOUTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79' AND A CHORD BEARING OF S 26° 23' 12" E - 86.14' TO THE POINT OF BEGINNING. SAID PARCEL CONTAINING 34,946.87 SF, 0.80 AC, MORE OR LESS BY CALCULATION.

PARCEL 4:

BEGINNING AT A POINT, A SET 5/8" REBAR SITUATED AND LYING IN THE SOUTHERN LINE OF LOT 6, BALLAST ROCK COMMERCE CENTER, PHASE II AS DESCRIBED IN PLAT CABINET 1, SLIDE 188 & 189, CURRITUCK COUNTY PUBLIC REGISTRY, SAID BEGINNING POINT ALSO MARKING THE NORTHWESTERNMOST CORNER OF LOT 5, BALLAST ROCK COMMERCE CENTER, PHASE II, PLAT CABINET I, SLIDE 304, CURRITUCK REGISTRY, BEING LOCATED IN

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THE WESTERN LINE OF THAT 120-FOOT RIGHT OF WAY FOR NORTH CAROLINA POWER; RUNNING THENCE FROM SAID BEGINNING POINT S 24 DEG. 41 MIN. 45 SEC. E 200.91 FEET TO A SET 5/8" REBAR; THENCE CONTINUING ALONG THE WESTERN EDGE OF SAID RIGHT OF WAY S 35 DEG. 21 MIN. 01 SEC. E 534.25 FEET TO A SET 5/8" REBAR LOCATED IN THE NORTHERN EDGE OF THAT 60-FOOT RIGHT OF WAY FOR BALLAST ROCK ROAD; THENCE RUNNING S 35 DEG. 21 MIN. 01 SEC. E 60.00 FEET TO A SET 5/8" REBAR LOCATED IN THE SOUTHERN LINE OF THE AFOREMENTIONED RIGHT OF WAY FOR BALLAST ROCK ROAD; CONTINUING ALONG THE WESTERN EDGE OF THAT RIGHT OF WAY FOR NC POWER S 35 DEG. 21 MIN. 01 SEC. E 283.66 FEET TO A SET 5/8" REBAR, SAID POINT BEING A CONTROL CORNER AND BEING SITUATED IN THE SOUTHWESTERN CORNER OF LOT 4A, BALLAST ROCK COMMERCE CENTER, PHASE III, PLAT CABINET I, SLIDE 206, CURRITUCK REGISTRY, AND SAID CONTROL CORNER BEING SITUATED IN THE NORTHWESTERMOST CORNER OF LOT 3, HINES COMMERCIAL PARK, PLAT CAB H, SLIDE 395, CURRITUCK REGISTRY; RUNNING THENCE FROM SAID CONTROL CORNER S 83 DEG. 29 MIN. 05 SEC. W 164.58 FEET TO AN EXISTING CONCRETE MONUMENT; THENCE RUNNING S 83 DEG. 50 MIN. 05 SEC. W 859.13 FEET TO AN EXISTING CONCRETE MONUMENT, A CORNER IN THE LINE OF PROPERTY NOW OR FORMERLY OWNED BY WILBUR GRIGGS; RUNNING THENCE ALONG THE COMMON LINE WITH GRIGGS N 05 DEG. 57 MIN. 34 SEC. E 207.46 FEET TO AN EXISTING IRON PIPE; THENCE N 19 DEG. 49 MIN. 57 SEC. W 318.00 FEET TO AN EXISTING IRON PIPE; THENCE CONTINUING ALONG THE GRIGGS LINE N 74 DEG. 17 MIN. 19 SEC. W 207.79 FEET TO A SET 5/8" REBAR LOCATED IN THE SOUTHWESTERMOST CORNER OF LOT 6, BALLAST ROCK COMMERCE CENTER, PHASE II, PLAT CABINET I, SLIDE 188 & 189, CURRITUCK REGISTRY; THENCE RUNNING ALONG AND WITH THE SOUTHERNMOST LINE OF THE AFOREMENTIONED LOT 6 N 57 DEG. 50 MIN. 25 SEC. E 841.25 FEET TO THE POINT AND PLACE OF BEGINNING. FURTHER REFERENCE BEING MADE TO THAT RESIDUAL PARCEL FOR BALLAST ROCK COMMERCE CENTER, PHASE II, PLAT CABINET I SLIDE 206, CURRITUCK REGISTRY CONTAINING APPROXIMATELY 15.51 ACRES, MORE OR LESS, AND BEING IDENTIFIED AS THAT RESIDUAL PARCEL IN THAT BOUNDARY SURVEY FOR SCHAUBACH RENTALS, LLP PREPARED BY HYMAN ROBEY, DATED AUGUST 24, 2007, AND RECORDED IN PLAT CABINET K, SLIDE 55 OF THE CURRITUCK PUBLIC REGISTRY.

TOGETHER WITH AN EASEMENT FOR INGRESS, EGRESS AND REGRESS TO AND FROM U.S. HIGHWAY 158 AS SHOWN AND DESIGNATED "BALLAST ROCK ROAD", A SIXTY (60) FOOT RIGHT OF WAY, ON MAP OR PLAT BY HYMAN & ROBEY, P.C. ENTITLED "PHASE II, EXEMPT SUBDIVISION & RECOMBINATION FOR BALLAST ROCK COMMERCE CENTER, POPLAR BRANCH TOWNSHIP, CURRITUCK COUNTY, NORTH CAROLINA", RECORDED IN CURRITUCK COUNTY REGISTRY AT PLAT CABINET I, SLIDE 188.

CORE/0503816.0359/156231233.2

Unofficial Document



**DRAFT**  
**SURVEYOR'S CERTIFICATE**

I, JOHN M. HURDLE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION AND AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (SEE NOTES), THAT THE BOUNDARIES NOT SURVEYED ARE SHOWN AS DASHED LINES AND ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION FOUND IN (SEE ADDITIONAL REFERENCES IN NOTES); THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY AS CALCULATED IS 2-CENTIMETERS; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 41-30 AS AMENDED.

CLASS OF SURVEY: CLASS A  
 POSITIONAL ACCURACY: 2-CENTIMETERS  
 TYPE OF GPS FIELD PROCEDURE: RTK  
 DATES OF SURVEY: NOVEMBER 2021  
 DATUM/EPOCH: NC GRID / NAD 83 / EPOCH 2011  
 PUBLISHED/FIXED-CONTROL USE: NC G855 RTN  
 GEOID MODEL: 2018  
 COMBINATION GRID FACTOR(S): 0.99999041  
 UNITS: US SURVEY FEET

IF THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXEMPTION OR EXCEPTION TO THE DEFINITION OF SUBDIVISION,  
 WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 1ST DAY OF FEBRUARY, 2022.

*John M. Hurdle*  
 JOHN M. HURDLE, PLS NC L-5209

NO APPROVAL REQUIRED

*Tammy Glave*  
 TAMMY GLAVE, MEANINGS DIRECTOR  
 DATE: 2/1/2022

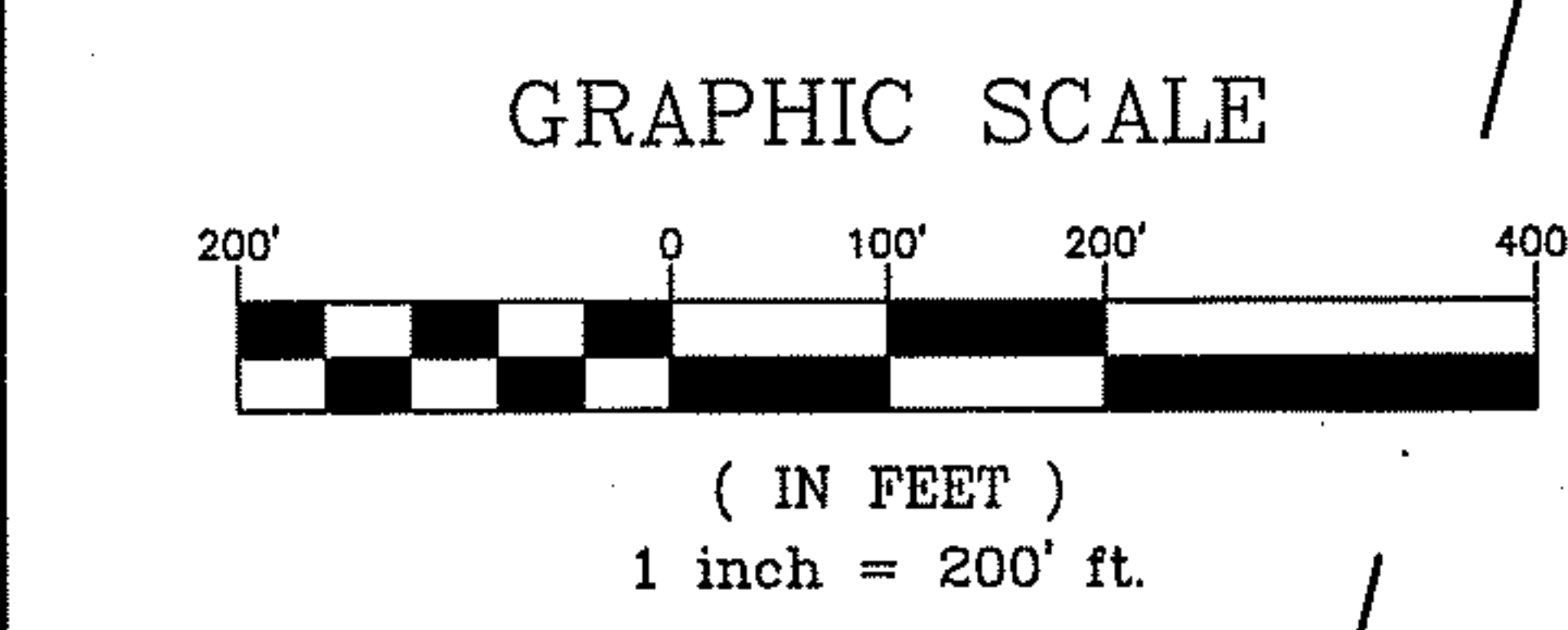
**REVIEW OFFICER'S CERTIFICATE**

STATE OF NORTH CAROLINA  
 COUNTY OF CURRITUCK  
 I, TAMMY GLAVE, REVIEW OFFICER OF CURRITUCK COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION APPLIES MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

*Tammy Glave*  
 TAMMY GLAVE, REVIEW OFFICER  
 DATE: 2/1/2022

- NOTES:**
- CURRENT OWNERS: H2OBX LLC  
 13 GREEN MOUNTAIN DR  
 COHOES, NY 12041
  - TOTAL PARCEL AREA = 4,215,494.77 SF / 96.77 AC (AREAS BY COORDINATE METHOD.)
  - SUBJECT REFERENCES: DB 1512, PG 454 PG '0', SL 84; PG K, SL 55
  - FIELD SURVEY DATES: 03/2016 - 01/2017, 11/17/21 & 11/30/21
  - HORIZONTAL DATUM IS NAD 83(2011), VERTICAL DATUM IS NAVD 88. ALL DISTANCES ARE HORIZONTAL GROUND AND US SURVEY FEET.
  - PROPERTY IS LOCATED IN NFIP FLOOD ZONES AS SHOWN AND SUBJECT TO CHANGES BASED ON COMMUNITY CID NO. 310078; PANEL 4837; SUFFIX K. (MAP NUMBER 3120483700K) EFFECTIVE DATE: 12/21/2018
  - THIS SURVEY SUBJECT TO ANY FACTS, INCLUDING BUILDING SETBACK RESTRICTIONS, EASEMENTS, COVENANTS, ETC., THAT MAY BE REVEALED BY A FULL AND ACCURATE TITLE SEARCH.

- LEGEND:**
- EXISTING CONCRETE MONUMENT, EGM
  - EXISTING IRON PIPE, EIP
  - EXISTING IRON ROD, EIR
  - EXISTING IRON STAKE, EIS
  - CALCULATED POINT
  - (T) - TOTAL DISTANCE
  - AG - ABOVE GRADE
  - BG - BELOW GRADE



| CURVE# | LENGTH  | RADIUS   | CHD LENGTH | CHD BEARING     |
|--------|---------|----------|------------|-----------------|
| C1     | 10.92'  | 2424.79' | 10.92'     | S 25° 43' 41" E |
| C2     | 86.14'  | 2424.79' | 86.14'     | S 26° 23' 12" E |
| C3     | 242.44' | 2424.79' | 242.37'    | S 30° 05' 43" E |
| C4     | 154.32' | 2424.79' | 154.30'    | S 34° 28' 18" E |
| C5     | 282.19' | 2424.79' | 282.08'    | S 38° 44' 50" E |
| C6     | 80.81'  | 2424.79' | 80.80'     | S 42° 18' 10" E |

NF  
 GB INVESTMENT GROUP, LLC  
 PARCEL 1A  
 DB 1372, PG 517

PROJECT NO:  
**P15004**

DRAWN BY:  
**JMH**

CHECKED BY:  
**DLT/JMH**

SCALE:  
**1" = 200'**

ISSUE DATE:  
**02/01/22**

**RECOMBINATION PLAT**

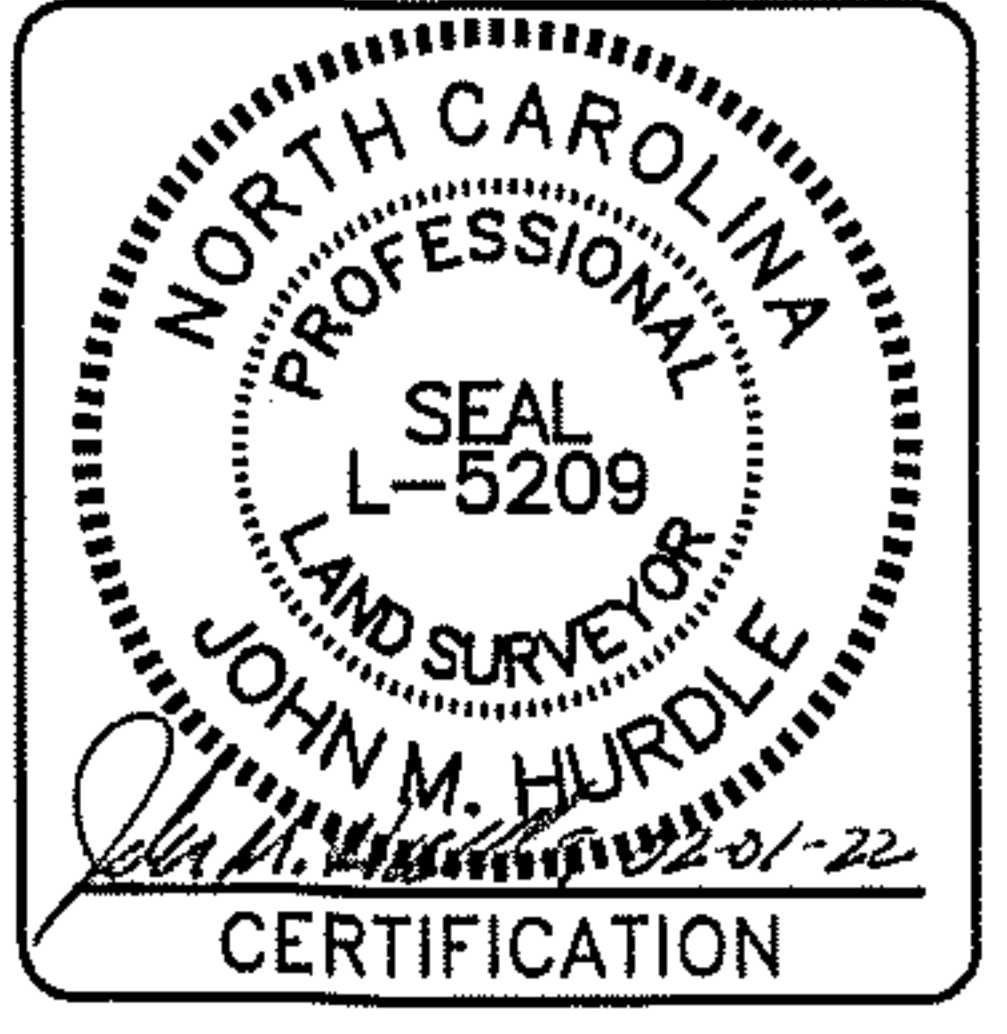
**H2OBX WATERPARK**  
**H2OBX LLC**

POPLAR BRANCH TOWNSHIP CURRITUCK COUNTY NORTH CAROLINA

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 QUILBE & ASSOCIATES, P.C.

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NC License#: C-0208

**Quible** SINCE 1959

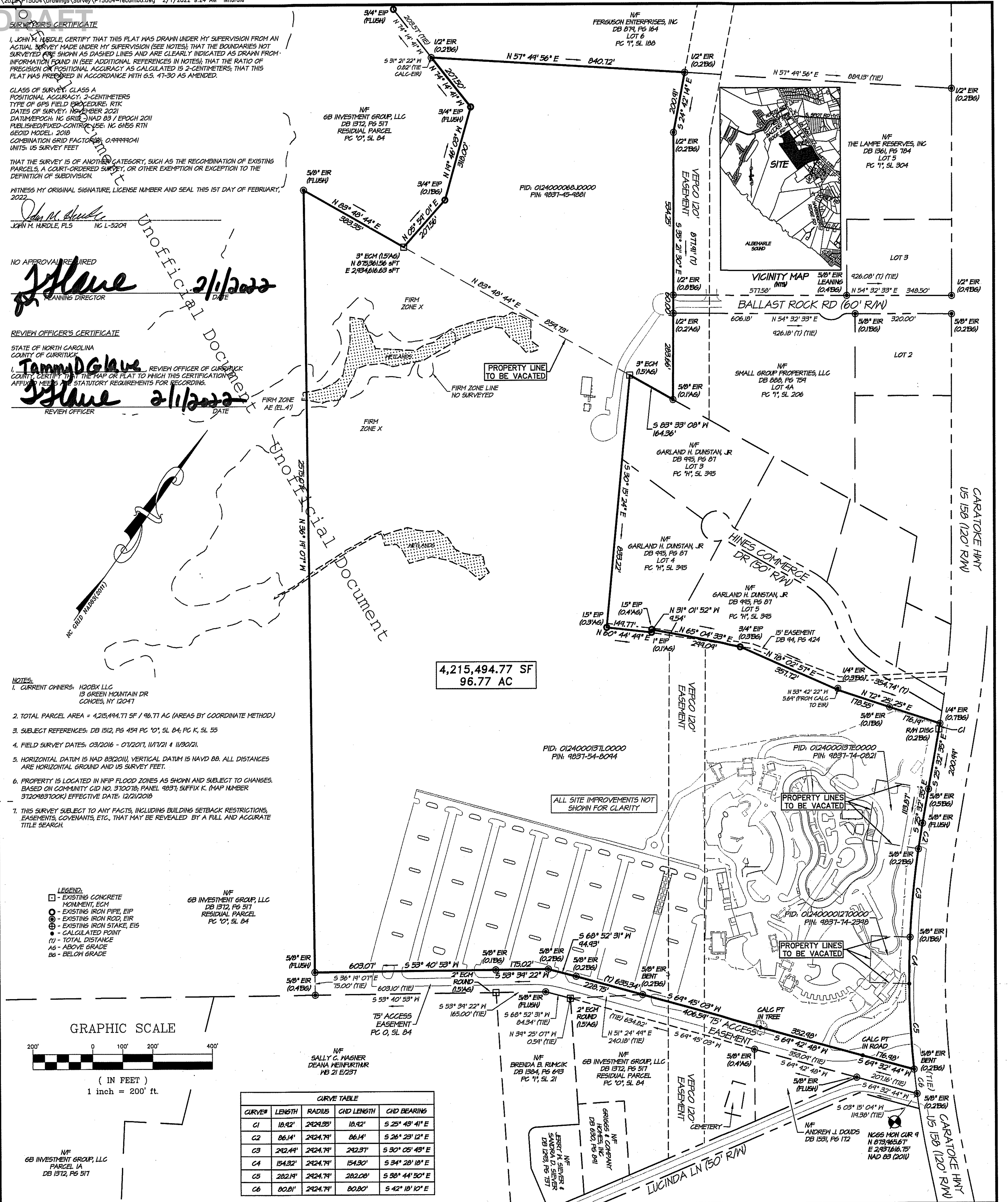
**& Associates, P.C.**

ENGINEERING\*\* CONSULTING\* PLANNING  
 ENVIRONMENTAL SCIENCES\* SURVEYING\*\*

\*ENGINEERING/SURVEYING NOT OFFERED AT BLACK MTN. OFFICE\*

8466 CARATOKE HWY BLDG 400 POWELLS POINT, NC 27966 Phone: (252) 491-8147 administrator@quible.com

90 CHURCH STREET SUITE B BLACK MOUNTAIN, NC 28711 Phone: (828) 357-5149 administrator@quible.com





H2OBX

8526 Caratoke Hwy USGS TOPO

Legend



8526 Caratoke Hwy



Google Earth

Imagery © 2024 Airbus

Point Harbor

## Limited Liability Company

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### Legal Name

H2OBX, LLC

## Information

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**SosId:** 1915198

**Status:** Current-Active ⓘ

**Date Formed:** 11/8/2019

**Citizenship:** Foreign

**State of Incorporation:** DE

**Annual Report Due Date:** April 15th

**Current Annual Report Status:**

**Registered Agent:** Malarney, Jeffrey

DRAFT

## Addresses

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### Principal Office

13 Green Mountain Drive  
Cohoes, NY 12047

### Reg Office

4112 N. Croatan Highway  
Kitty Hawk, NC 27949

### Reg Mailing

4112 N. Croatan Highway  
Kitty Hawk, NC 27949

### Mailing

PO Box 648  
Cohoes, NY 12047

## Company Officials

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All LLCs are managed by their managers pursuant to N.C.G.S. 57D-3-20.

### Managing Member

Arthur B Berry , III  
35A Moorings  
Key Largo FL 33037

### General Manager

Damian Dondero  
132 W Holly Trail  
Southern Shores NC 27949

### Managing Member

Kenneth Ellis  
1 E Ridge Rd  
Loudonville NY 12211

### Authorized Representative

Jeff Malarney  
PO Box 928 4112 N. Croatan Highway  
Kitty Hawk NC 27949

### Chief Financial Officer

Kristin Renchkovsky  
13 Green Mountain Dr.  
Cohoes NY 12047



**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**

| <b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b> |                                     |                               |                               |                               |                               |                               |                              |                              |                             |                            |
|--|-------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|------------------------------|-----------------------------|----------------------------|
| Duration   | Average recurrence interval (years) |                               |                               |                               |                               |                               |                              |                              |                             |                            |
|  | 1                                   | 2                             | 5                             | 10                            | 25                            | 50                            | 100                          | 200                          | 500                         | 1000                       |
| <b>5-min</b>   | <b>0.449</b><br>(0.409-0.495)       | <b>0.525</b><br>(0.478-0.577) | <b>0.598</b><br>(0.545-0.657) | <b>0.682</b><br>(0.619-0.749) | <b>0.769</b><br>(0.695-0.842) | <b>0.845</b><br>(0.760-0.925) | <b>0.915</b><br>(0.821-1.00) | <b>0.984</b><br>(0.877-1.08) | <b>1.07</b><br>(0.945-1.17) | <b>1.15</b><br>(1.01-1.26) |
| <b>10-min</b>  | <b>0.717</b><br>(0.653-0.790)       | <b>0.840</b><br>(0.764-0.924) | <b>0.958</b><br>(0.873-1.05)  | <b>1.09</b><br>(0.990-1.20)   | <b>1.23</b><br>(1.11-1.34)    | <b>1.35</b><br>(1.21-1.47)    | <b>1.46</b><br>(1.30-1.59)   | <b>1.56</b><br>(1.39-1.71)   | <b>1.69</b><br>(1.49-1.85)  | <b>1.81</b><br>(1.59-1.99) |
| <b>15-min</b>  | <b>0.897</b><br>(0.816-0.988)       | <b>1.06</b><br>(0.961-1.16)   | <b>1.21</b><br>(1.10-1.33)    | <b>1.38</b><br>(1.25-1.52)    | <b>1.55</b><br>(1.40-1.70)    | <b>1.70</b><br>(1.53-1.87)    | <b>1.84</b><br>(1.65-2.01)   | <b>1.97</b><br>(1.75-2.15)   | <b>2.13</b><br>(1.88-2.33)  | <b>2.27</b><br>(1.99-2.49) |
| <b>30-min</b>  | <b>1.23</b><br>(1.12-1.36)          | <b>1.46</b><br>(1.33-1.60)    | <b>1.72</b><br>(1.57-1.89)    | <b>2.00</b><br>(1.82-2.20)    | <b>2.30</b><br>(2.08-2.52)    | <b>2.57</b><br>(2.31-2.81)    | <b>2.82</b><br>(2.52-3.08)   | <b>3.06</b><br>(2.73-3.35)   | <b>3.39</b><br>(2.99-3.71)  | <b>3.68</b><br>(3.22-4.04) |
| <b>60-min</b>  | <b>1.53</b><br>(1.40-1.69)          | <b>1.83</b><br>(1.66-2.01)    | <b>2.21</b><br>(2.01-2.42)    | <b>2.60</b><br>(2.36-2.86)    | <b>3.06</b><br>(2.77-3.36)    | <b>3.48</b><br>(3.13-3.81)    | <b>3.88</b><br>(3.48-4.25)   | <b>4.30</b><br>(3.83-4.70)   | <b>4.86</b><br>(4.29-5.33)  | <b>5.37</b><br>(4.71-5.90) |
| <b>2-hr</b>  | <b>1.76</b><br>(1.59-1.95)          | <b>2.11</b><br>(1.91-2.33)    | <b>2.60</b><br>(2.35-2.87)    | <b>3.13</b><br>(2.82-3.44)    | <b>3.76</b><br>(3.38-4.13)    | <b>4.34</b><br>(3.89-4.76)    | <b>4.93</b><br>(4.38-5.40)   | <b>5.55</b><br>(4.91-6.09)   | <b>6.40</b><br>(5.61-7.02)  | <b>7.17</b><br>(6.24-7.87) |
| <b>3-hr</b>  | <b>1.92</b><br>(1.73-2.13)          | <b>2.30</b><br>(2.08-2.55)    | <b>2.84</b><br>(2.57-3.15)    | <b>3.44</b><br>(3.10-3.81)    | <b>4.19</b><br>(3.75-4.63)    | <b>4.89</b><br>(4.35-5.39)    | <b>5.61</b><br>(4.97-6.17)   | <b>6.39</b><br>(5.62-7.02)   | <b>7.48</b><br>(6.50-8.22)  | <b>8.50</b><br>(7.32-9.35) |
| <b>6-hr</b>  | <b>2.33</b><br>(2.11-2.59)          | <b>2.79</b><br>(2.52-3.10)    | <b>3.45</b><br>(3.11-3.83)    | <b>4.18</b><br>(3.76-4.63)    | <b>5.10</b><br>(4.56-5.64)    | <b>5.98</b><br>(5.32-6.59)    | <b>6.88</b><br>(6.07-7.56)   | <b>7.87</b><br>(6.89-8.64)   | <b>9.26</b><br>(8.00-10.2)  | <b>10.6</b><br>(9.04-11.6) |
| <b>12-hr</b>   | <b>2.76</b><br>(2.49-3.09)          | <b>3.30</b><br>(2.97-3.70)    | <b>4.10</b><br>(3.69-4.59)    | <b>5.00</b><br>(4.47-5.58)    | <b>6.14</b><br>(5.46-6.83)    | <b>7.25</b><br>(6.40-8.04)    | <b>8.40</b><br>(7.35-9.30)   | <b>9.68</b><br>(8.39-10.7)   | <b>11.5</b><br>(9.81-12.7)  | <b>13.2</b><br>(11.1-14.7) |
| <b>24-hr</b>   | <b>3.29</b><br>(3.03-3.59)          | <b>4.00</b><br>(3.69-4.37)    | <b>5.17</b><br>(4.76-5.64)    | <b>6.15</b><br>(5.64-6.69)    | <b>7.61</b><br>(6.92-8.25)    | <b>8.86</b><br>(7.98-9.60)    | <b>10.2</b><br>(9.13-11.1)   | <b>11.7</b><br>(10.4-12.7)   | <b>14.0</b><br>(12.2-15.3)  | <b>15.9</b><br>(13.6-17.5) |
| <b>2-day</b>   | <b>3.82</b><br>(3.50-4.18)          | <b>4.62</b><br>(4.24-5.06)    | <b>5.93</b><br>(5.45-6.49)    | <b>7.06</b><br>(6.46-7.71)    | <b>8.75</b><br>(7.94-9.54)    | <b>10.2</b><br>(9.18-11.1)    | <b>11.9</b><br>(10.5-12.9)   | <b>13.7</b><br>(12.0-15.0)   | <b>16.4</b><br>(14.2-18.1)  | <b>18.8</b><br>(15.9-20.8) |
| <b>3-day</b>   | <b>4.06</b><br>(3.73-4.43)          | <b>4.91</b><br>(4.52-5.37)    | <b>6.27</b><br>(5.77-6.85)    | <b>7.42</b><br>(6.80-8.09)    | <b>9.12</b><br>(8.29-9.93)    | <b>10.6</b><br>(9.54-11.5)    | <b>12.2</b><br>(10.9-13.2)   | <b>13.9</b><br>(12.3-15.2)   | <b>16.6</b><br>(14.4-18.2)  | <b>19.0</b><br>(16.2-20.9) |
| <b>4-day</b>   | <b>4.29</b><br>(3.97-4.68)          | <b>5.20</b><br>(4.80-5.68)    | <b>6.61</b><br>(6.10-7.21)    | <b>7.79</b><br>(7.15-8.48)    | <b>9.49</b><br>(8.65-10.3)    | <b>10.9</b><br>(9.89-11.9)    | <b>12.5</b><br>(11.2-13.6)   | <b>14.2</b><br>(12.6-15.4)   | <b>16.8</b><br>(14.6-18.4)  | <b>19.1</b><br>(16.5-21.1) |
| <b>7-day</b>   | <b>4.96</b><br>(4.58-5.40)          | <b>5.98</b><br>(5.53-6.52)    | <b>7.51</b><br>(6.93-8.17)    | <b>8.78</b><br>(8.06-9.53)    | <b>10.6</b><br>(9.68-11.5)    | <b>12.1</b><br>(11.0-13.1)    | <b>13.7</b><br>(12.3-14.9)   | <b>15.5</b><br>(13.8-16.9)   | <b>18.0</b><br>(15.8-19.7)  | <b>20.1</b><br>(17.4-22.1) |
| <b>10-day</b>  | <b>5.59</b><br>(5.21-6.03)          | <b>6.71</b><br>(6.24-7.24)    | <b>8.31</b><br>(7.72-8.96)    | <b>9.63</b><br>(8.93-10.4)    | <b>11.5</b><br>(10.6-12.4)    | <b>13.1</b><br>(12.0-14.1)    | <b>14.8</b><br>(13.4-15.9)   | <b>16.6</b><br>(14.9-17.9)   | <b>19.1</b><br>(17.0-20.8)  | <b>21.2</b><br>(18.6-23.2) |
| <b>20-day</b>  | <b>7.50</b><br>(7.03-8.02)          | <b>8.93</b><br>(8.38-9.56)    | <b>10.9</b><br>(10.2-11.6)    | <b>12.5</b><br>(11.6-13.3)    | <b>14.7</b><br>(13.7-15.7)    | <b>16.5</b><br>(15.3-17.7)    | <b>18.5</b><br>(17.0-19.8)   | <b>20.5</b><br>(18.7-22.0)   | <b>23.4</b><br>(21.0-25.2)  | <b>25.7</b><br>(22.8-27.8) |
| <b>30-day</b>  | <b>9.23</b><br>(8.69-9.82)          | <b>11.0</b><br>(10.3-11.7)    | <b>13.2</b><br>(12.4-14.0)    | <b>15.0</b><br>(14.0-15.9)    | <b>17.4</b><br>(16.3-18.5)    | <b>19.4</b><br>(18.0-20.6)    | <b>21.4</b><br>(19.8-22.8)   | <b>23.5</b><br>(21.5-25.1)   | <b>26.3</b><br>(23.9-28.3)  | <b>28.5</b><br>(25.7-30.8) |
| <b>45-day</b>  | <b>11.4</b><br>(10.7-12.1)          | <b>13.5</b><br>(12.7-14.3)    | <b>16.1</b><br>(15.2-17.2)    | <b>18.3</b><br>(17.1-19.4)    | <b>21.4</b><br>(19.9-22.7)    | <b>23.8</b><br>(22.1-25.3)    | <b>26.4</b><br>(24.4-28.1)   | <b>29.1</b><br>(26.7-31.1)   | <b>32.9</b><br>(29.8-35.3)  | <b>35.9</b><br>(32.2-38.7) |
| <b>60-day</b>  | <b>13.6</b><br>(12.9-14.4)          | <b>16.1</b><br>(15.2-17.0)    | <b>19.0</b><br>(17.9-20.1)    | <b>21.3</b><br>(20.1-22.6)    | <b>24.5</b><br>(23.1-26.0)    | <b>27.1</b><br>(25.3-28.6)    | <b>29.6</b><br>(27.6-31.4)   | <b>32.2</b><br>(29.8-34.3)   | <b>35.8</b><br>(32.7-38.2)  | <b>38.5</b><br>(34.9-41.3) |

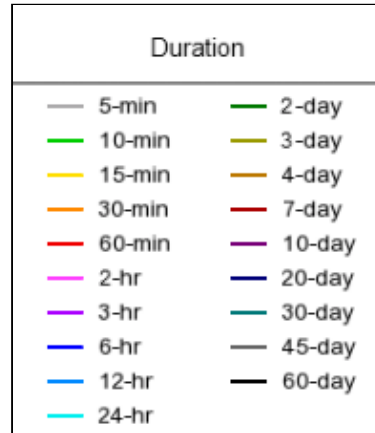
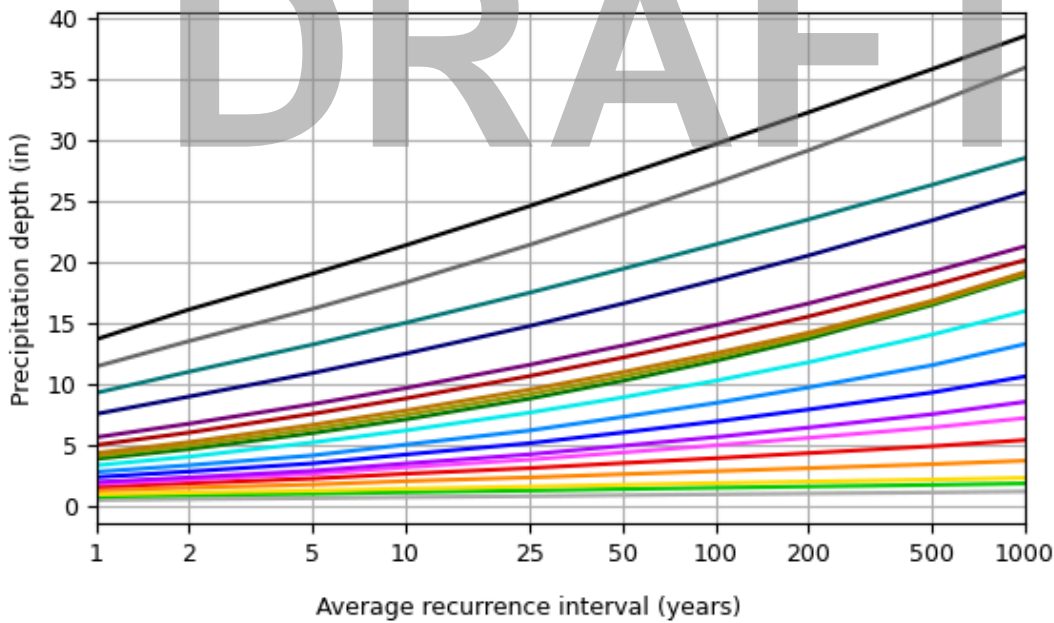
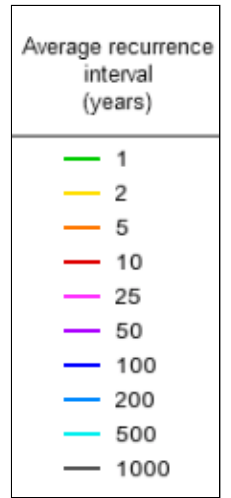
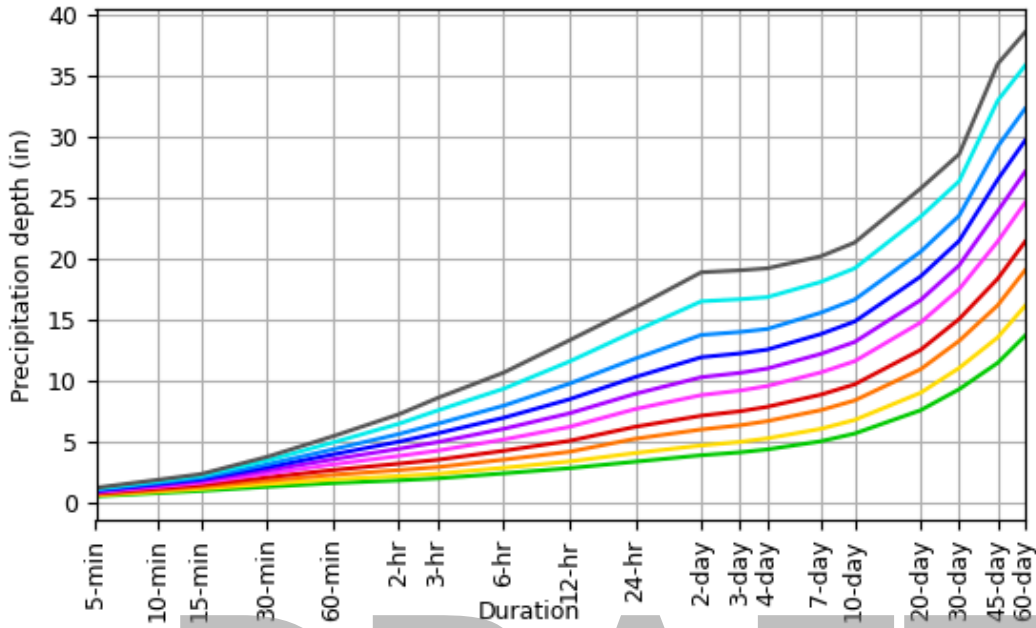
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration 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: 36.1105°, Longitude: -75.8281°



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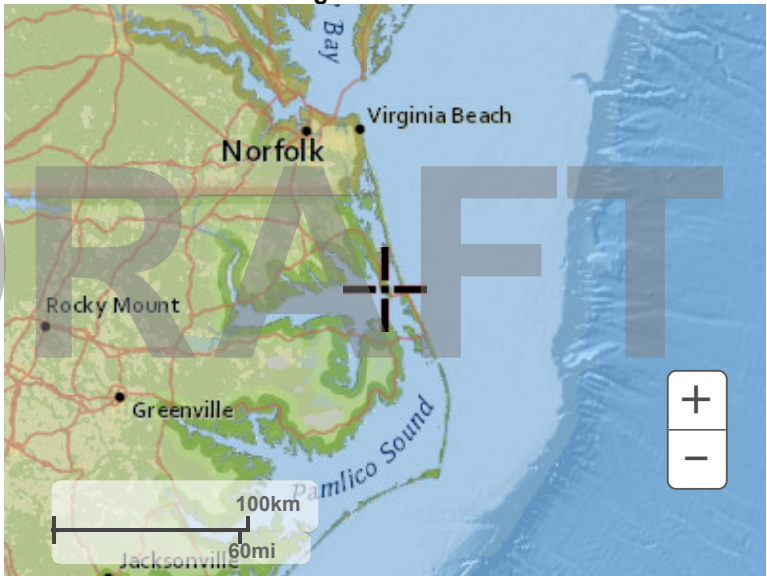
## Maps & aerials

Small scale terrain

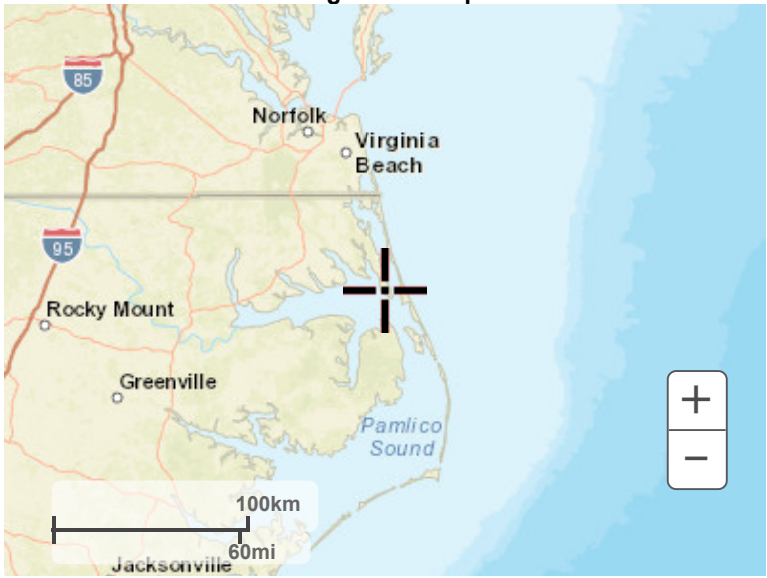




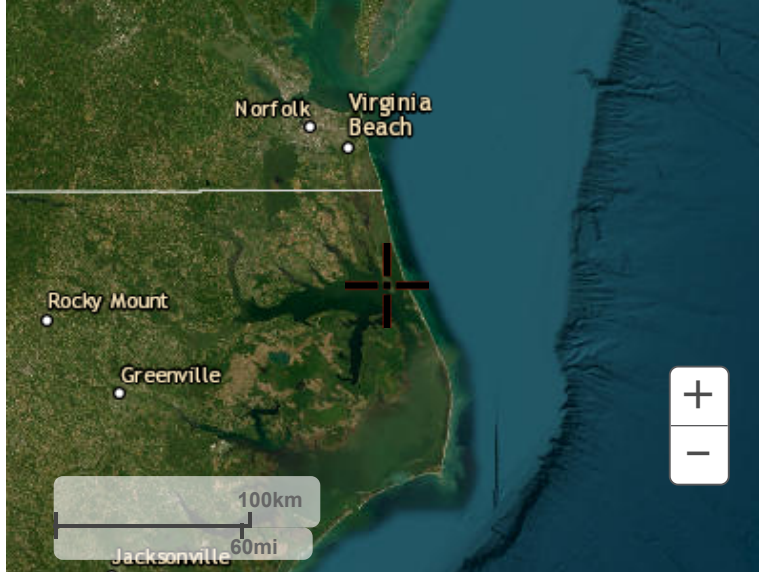
Large scale terrain



Large scale map



Large scale aerial



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[Disclaimer](#)



WithersRavenel  
Our People. Your Success.



# Stormwater Management Plan

**H2OBX RV & Waterpark Resort**

**Currituck County**

**H2OBX, LLC**

Prepared For:  
H2OBX, LLC  
13 Green Mountain Drive  
Cohoes, NY 12047  
Contact Name  
Contact Email  
Contact Phone

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

WithersRavenel Project No. 24-0941

Month DD, YYYY

---

Professional Name  
Plan Preparer

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## Introduction/Project Data

The project consists of 96.77 acres of land located at 8528 Caratoke Hwy. (US Hwy. 158) in Powells Point, NC. See Table 1 for detailed site information. This report serves as the stormwater impact analysis for the H2OBX RV & Waterpark Resort project.

**Table 1 - Project Information Summary**

|                                    |                                  |
|------------------------------------|----------------------------------|
| <b>Project Name</b>                | H2OBX RV Park & Waterpark Resort |
| <b>Project Address</b>             | 8526 Caratoke Highway, NC 27966  |
| <b>PIN(s)</b>                      | 9837-54-9004                     |
| <b>Zoning</b>                      | C-GB                             |
| <b>River Basin</b>                 | Pasquotank Basin                 |
| <b>Stormwater Regulatory Basin</b> | Albemarle Sound                  |
| <b>Total Site Area</b>             | 96.77 AC                         |
| <b>Total Project Area</b>          | 81.26 AC (3,539,685.5 SF)        |
| <b>Land Disturbance Area</b>       | 60.5 AC (2,635,380 SF)           |
| <b>Existing Impervious %</b>       | 0%                               |
| <b>Proposed Impervious %</b>       | 29.5%                            |

## Site History & Existing 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. The existing wet pond has a surface area of approximately 0.17 acres.

A summary of the overall existing built upon area within the site is provided in the table on the next page. The boundary for all drainage areas is provided within **Appendix A** on the pre-developed drainage area map. These drainage areas have been combined for simplicity as the proposed impervious surfaces throughout all drainage areas will be accounted for within the Wet Detention Basin and infiltrations basins Calculations.

*Table 1: Existing Built Upon Area Summary*

|  |                      |        |
|--|----------------------|--------|
|  | <b>Combined Site</b> |        |
|  | (sq.ft.)             | (acre) |

|                             |              |       |
|-----------------------------|--------------|-------|
| <b>Drainage Area =</b>      | 2,136,790.00 | 49.05 |
| <b>Open Space =</b>         | 1,541,730.20 | 35.39 |
| <b>Parkinglot/Roadway =</b> | 510,111.30   | 11.71 |
| <i>Gravel =</i>             | 20,951.00    | 0.00  |
| <i>Concrete/Asphalt =</i>   | 11,565.00    | 0.00  |
| <b>Buildings =</b>          | 45,059.50    | 0.00  |
| <b>Wetlands/Ponds =</b>     | 7,373.00     | 0.17  |
| <b>Impervious =</b>         | 587,686.80   | 13.49 |
| <b>Total Impervious =</b>   | 595,059.80   | 13.66 |

The current site has approximately 595,059 sq. ft. of existing impervious surface within the entire site. Portions of the existing impervious surface will be left in place.

### Proposed Development

The H2OBX RV & Waterpark Resort property is zoned Conditional General Business (C-GB). Proposed development will include construction of the parking lot and associated drive aisle access. Phase 2 will include construction of the waterpark facilities and main access drive. Phase 1 and 2 construction and the associated impervious coverage areas are shown on the pre and post development drainage area maps within **Appendix A**. Proposed Stormwater management will consist of a wet detention basin on the subject parcel of land. The following narrative and calculations will demonstrate the parameters of the proposed design, which will illustrate an effective stormwater management system in compliance with all State and County regulations.

The project proposes the addition of approximately 1,081,471 sq. ft. of impervious surface to the existing site within the construction. Approximately 557,078 sq. ft of existing impervious surface will be removed in order to complete the installation of the proposed impervious coverage. The existing wet pond will be expanded and permitted to meet State requirements.

*Table 2: Proposed Built Upon Area Summary*

|                        | <b>Combined DA</b> |        |
|------------------------|--------------------|--------|
|                        | (sq.ft.)           | (acre) |
| <b>Drainage Area =</b> | 1,979,396.00       | 45.44  |
| <b>Open Space =</b>    | 866,346.00         | 19.89  |

|                             |              |       |
|-----------------------------|--------------|-------|
| <b>Parkinglot/Roadway =</b> | 502,587.00   | 11.54 |
| <b>Sidewalk =</b>           | 11,500.00    | 0.26  |
| <b>Waterpark Total =</b>    | 414,373.00   | 9.51  |
| <b>Pond =</b>               | 153,011.00   | 3.51  |
| <b>Impervious =</b>         | 928,460.00   | 21.31 |
| <b>Total Impervious =</b>   | 1,081,471.00 | 24.83 |

Stormwater management improvements will be provided to treat runoff from all proposed impervious construction. The primary method of stormwater treatment will be via a wet detention basin located to the rear (southwest) of the site.

The wet detention basin has been sized to manage an overall impervious area of 524,394 sq. ft. This includes all proposed impervious areas within the entire site for Phase 1 and Phase 2 construction. A credit for 557,078 sq. ft. of existing impervious surface to be removed has been taken from this overall impervious area. This is summarized in **Table 3** below.

*Table 3: Overall Drainage Area Summary*

|                                   | <b>Combined Final Impervious Areas</b> |
|-----------------------------------|--|
| <b>Drainage Area =</b>            | 1,979,396                              |
| <b>Open Space =</b>               | 897,925                                |
| <b>Impervious =</b>               | 1,081,471                              |
| <b>Existing (to be removed) =</b> | 557,078                                |
| <b>Treated Impervious =</b>       | 524,394                                |

Drainage area 1 as shown on the provided drainage area map, currently flows toward the existing NCDOT right-of-way. This impervious area has been accounted for within the provided wet detention basin, however, the existing grades do not reasonably allow for redirection of all flows.

Drainage Area 2 includes a majority of the proposed impervious coverage, all of this drainage area will be collected in an underground pipe network and directed towards the proposed wet detention basin.

Drainage Area 3 currently flows toward the NDOT right-of-way and will continue to after development. This drainage area will be reduced and will not have any impervious coverage post development.

Drainage Area 4 currently flows offsite and will continue to post development. This impervious area has been accounted for within the wet detention basin. The existing grades do not reasonably allow for redirection of flows.

## Quantifying Land Disturbance and Changes in Impervious Surface

The proposed development will increase the impervious area of the project area (**Error! Reference source not found.**) from 0% to 32%. For the purposes of nutrient compliance and peak flow calculations, impervious area assumptions per lot type are detailed in Proposed development will include construction of the parking lot and associated drive aisle access. Phase 2 will include construction of the waterpark facilities and main access drive. Phase 1 and 2 construction and the associated impervious coverage areas are shown on the pre and post development drainage area maps within **Appendix A**. Proposed Stormwater management will consist of a wet detention basin on the subject parcel of land. The following narrative and calculations will demonstrate the parameters of the proposed design, which will illustrate an effective stormwater management system in compliance with all State and County regulations.. The impervious surface assumption for the proposed amenity center is 70%.

## Streams

The entirety of the site lies within the Lick Creek sub-watershed of Falls Lake watershed. Earthquake Creek, a tributary of Lick Creek (Water Supply IV (WS-IV); Nutrient Sensitive Water (NSW)), flows through the western portion of the property and the southeastern portion of the property drains to tributaries of Martins Creek (WS-IV; NSW). All streams (perennial and intermittent) require a 100-ft buffer in accordance with F/J-B Watershed Protection Overlay standards per section 8.5.4B of the Unified Development Ordinance (UDO).

To comply with Section 8.5.5 of the UDO, diffuse flow will be met by a level spreader vegetated filter strip (LS-VFS) downstream of (1) of the (3) proposed stormwater control measures (SCMs) outlet structures. The remaining (2) SCMs will reach diffuse flow requirements by means of a lined conveyance channel with approval of a No Practical Alternatives Application.

## Floodplains

There are no Special Flood Hazard Areas (SFHAs) located on the subject site per the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) 3720086000K dated October 19, 2018, or 3720076900J dated May 2, 2006. Copies of the previously mentioned FIRMs are included in the **Appendix**.

A detailed hydrologic and hydraulic study of the onsite buffered streams will be completed at a later date for the purpose of establishing 1% Annual Chance Water Surface Elevations (Base Flood Elevations). This analysis and associated results will be documented in a separate report.

## Applicable Requirements

### Currituck County Stormwater Compliance

#### Storage Requirements

Per the Currituck County Stormwater Manual, all major site plans need to provide adequate stormwater controls to retain the 5-year post development peak discharge so that it does not release a peak discharge greater than the 2- year, 24-hour peak discharge using a wooded site condition. As the current site is greater than 10 acres, TR-55 was performed using Hydraflow Hydrographs Extension for AutoCAD®. Results of this model analysis are provided within **Appendix C** of this stormwater narrative. Based on the provided reports, the storage required on-site is 640,889 cf of storage.

The required storage on-site has been provided through the design of multiple swales and basins. The storage within each element has been summarized within Table 4 for ease of review with additional details provided within the supplied calculations. A plan that labels the location of each collection point has been provided within the Currituck County Stormwater Calculations also within **Appendix C** of this package.

Table 4: Overall Storage Summary

|              | Description                             | Storage Volume (cf) |
|--------------|---|---------------------|
| Area A       | Waterpark Basin                         | 148,164             |
| Area B       | Parking lot storage (Western)           | 10,687              |
| Area C       | Parking lot storage (Middle)            | 14,219              |
| Area D       | Parking lot storage (Eastern)           | 12,236              |
| Area E       | Depression Southeast of the Parking lot | 3,478               |
| Area F       | Wet Detention Basin                     | 477,912             |
| Pipe Network | Circular and Elliptical                 | 29,835              |
| <b>Total</b> |   | <b>696,530</b>      |

Based on the provided calculations, the total storage provided onsite is 696,530. This provided storage exceeds the required 640,889 cf.

#### Wet Detention Basin Maintenance

The proposed wet detention basin on-site requires regular maintenance. Initial inspections should take place within the first six months following construction, these should include inspecting the

basin at least twice after storm events that exceed a ½-inch rainfall. After the initial inspection period, annual inspections should take place. These inspections should be used to evaluate the condition and performance of the pond, including sediment within the forebay, growth of wetland plants, trees, and shrubs, inspection of inlets and outfall channels. Based on inspection results, specific maintenance tasks will be triggered. An example maintenance inspection checklist has been provided in **Appendix F**.

### Infiltration Basin (DA-6)

### Infiltration Basin (DA-7)

### Infiltration Basin (DA-8)

### Wetpond (DA-5)

Per 15A NCAC 02H.1005 (a) (3) (B) High Density Coastal Development is required to meet particular criteria. This development is proposed to have 29.5% of impervious coverage over the entire project area. The proposed wet detention basin onsite is designed in accordance with NCDEQ Requirements and is designed to store, control, and treat the stormwater runoff from all surfaces generated by the one and one-half inch of rainfall. In addition to these requirements, a minimum 50' vegetative buffer from surface waters is provided.

### Collection

Runoff from the proposed vehicular area is to be collected and conveyed to the wet detention basin via vegetated swales and a stormwater conveyance network. This storm system is provided on plan Sheet 6. Runoff draining from the proposed waterpark will be collected by an underground pipe network and will discharge into the proposed forebay of the wet detention basin. Plan Sheets 6 and 7 within the high density application package show the proposed pipe network.

### Treatment

The proposed system will offer several methods of treatment prior to release.

Runoff from vehicular areas will be directed to the wet detention basin via vegetated swales and culverts. The vegetated swales will provide the first level treatment for these areas and will provide filtration of small particulates and nutrients prior to entering the wet detention basin.

Riprap will be provided at the inlet to the pond from the stormwater conveyance connections. Stormwater entering the basin will be deenergized by the riprap as to reduce inflow velocities to the basin. Larger debris and pollutants will settle on the riprap aprons as the stormwater enters the basin.



The primary treatment of runoff will be provided within the wet detention basin. Several modes of treatment are available in the wet detention basin. Runoff first entering the basin will lose velocity and large particulates and sediment will settle out primarily in the forebay. The vegetated side slopes and vegetated shelf will provide filtration of runoff and nutrient uptake through natural biological processes.

## **Storage**

The wet basin temporary storage is sized to accommodate a storage volume in excess of the volume of runoff produced by the 1.5 inch rainfall event over the drainage area. The storage required to completely capture the first 1.5 inch of rainfall is 71,300 cf. The proposed wet detention basin will have a temporary storage capacity of 256,724 cf above the pond's drawdown orifice located at 2.3' elevation.

The season high water table (SWHT) is at an elevation of 2.3'.

For NCDEQ calculations, the permanent pool and surface areas referenced in the application documents and attached calculations are measured at the orifice drawdown elevation of 2.3'. Utilizing permanent pool average depth equations from section 10.3.4 of the NCDEQ Stormwater BMP Manual, the average depth was calculated to be 3.7 ft. using Option 1, and 4.1 ft. using Option 2 (see NCDEQ Stormwater Calculations in **Appendix C**). When utilizing SA/DA Table 10-4 of the NCDEQ Stormwater BMP Manual, the more conservative average depth using Option 1 and a percent impervious cover rounded to 50%, were applied to obtain a Surface Area to Drainage Area Ratio of 5.0 (see the attached Wet Detention Basin Supplement). This is the SA/DA ratio to achieve 90% TSS Pollutant Removal Efficiency in the Coastal Region. Using this SA/DA ratio, the area required for the permanent pool is 74,235 sq. ft., while the area provided for the permanent pool is 86,067 sq. ft.

The basin's 10 foot wide, 10:1 vegetated shelf is specified to be constructed between the elevations of 1.8' and 2.8'; the lower half of the shelf will be approximately at the season high water table.

## **Disposal**

The wet detention basin's primary mode of disposal is through an overflow orifice located at the end of the detention basin. The overflow orifice will be a 5" diameter orifice and is calculated to completely drawdown the required storage volume in 4.77 days. Regular inspection of the overflow orifice for evidence of clogging, leakage, debris accumulations, etc. is recommended. Stormwater overflows will be conveyed to an existing ditch located along the western property line. As the Wet Detention Basin is designed to 90% TSS with additional storage, a vegetated filter strip is not provided.

For disposal during the 2-yr storm and greater, a principal spillway has been designed to handle the proposed flows. The structure will release flows starting at elevation 5' within the detention basin through an 18" RCP culvert. This culvert will tie into the existing ditch located adjacent to the proposed wet detention basin. An emergency spillway has been provided to release the 10-yr storm and greater. A weir will be provided at elevation 6' and will be graded to tie into the existing

ditch. Rip-rap protection will be provided at both the emergency spillway and downstream of the primary spillway.

Calculations for the proposed wet detention basin have been provided in **Appendix C**. A Hydraflow report has been provided to demonstrate that the 2-yr and 5-yr storms have been routed to pre-developed conditions.

## Methodology

The stormwater study was conducted using the natural drainage features as depicted by Light Detection and Ranging (LIDAR) topography and existing field surveys. Proposed drainage areas were based on field survey data and proposed development within the drainage areas.

The scope of work included the following analyses:

### Hydrology

- Simulation of the 1-year, 2-year, 10-year, and 100-year rainfall events for the Durham, NC area.
- Formulation of the 1-year, 2-year, 10-year, and 100-year flood hydrographs for the existing development and proposed development drainage areas.

### Hydraulic

- Routing the 1-year, 2-year, 10-year, and 100-year flood hydrographs for existing development runoff from the site.
- Routing the 1-year, 2-year, 10-year, and 100-year flood hydrographs for proposed development runoff through the SCM.
- Analyzing results at the analysis points.

The results of the hydrology calculations were used for the hydraulic analyses. The hydraulic design requires the development of stage-storage and stage-discharge functions for the SCMs. The rainfall/runoff hydrographs, stage-storage, and stage-discharge functions have been compiled to create a computer routing simulation model using Bentley Systems PondPack v8i software. This PondPack model was then used to assess the peak water surface elevations in the SCM for the design rainfall events. The routing results, along with the hydrologic and hydraulic calculations, are provided as in the **PondPack Routing Calculations** sections of this report.

## 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 in excess 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: Municipal Submittal Checklist

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## Appendix 2: Reference Materials

- ◆ USGS 7.5-Minute Quadrangle Map
- ◆ Web Soil Survey Map
- ◆ FEMA Flood Insurance Rate Map
- ◆ NOAA Atlas 14 Precipitation Frequency Estimates
- ◆ PONDPACK Precipitation Hydrograph Input Data

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## Appendix 5: SCM Design Calculations

- ◆ SCM 1 – Wetland MDC Requirements
- ◆ SCM 2 – Wet Pond MDC Requirements
- ◆ SCM 3 – Wet Pond MDC Requirements

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## Appendix 6: SCM Design Summaries

- ◆ SCM 1 Outlet Structure Design
- ◆ SCM 1 Elevation-Volume Table
- ◆ SCM 2 Outlet Structure Design
- ◆ SCM 2 Elevation-Volume Table
- ◆ SCM 3 Outlet Structure Design
- ◆ SCM 3 Elevation-Volume Table

DRAFT



September 24, 2024

Randall Jones, P.E.  
Division of Energy, Mineral, and Land Resources  
Land Quality Section – Washington Regional Office  
North Carolina Department of Environmental Quality  
943 Washington Square Mall  
Washington, NC 27889

**RE: Soil Erosion and Sedimentation Control Permit Application**  
**H2OBX RV Park**  
Powells Point, Currituck County, NC

Mr. Jones,

On behalf of H2OBX, LLC., WithersRavenel hereby submits for your review and approval a Soil Erosion and Sedimentation Control Permit Application package for the above referenced project located in Powells Point, Currituck County.

The following items are included and shall be considered part of this submittal package:

1. A Review Fee Check in the amount of \$6,100.00 made payable to “NCDEQ”;
2. One (1) copy of the Soil Erosion and Sediment Control Narrative;
3. One (1) Copy of the NCDEQ SESC Checklist;
4. One (1) original and one (1) copy of the Financial Responsibility and Ownership Form;
5. One (1) copy of the Soils Report;
6. One (1) copy of the USGS Topography Map;
7. One (1) copy of Deed Book 1512 Page 459;
8. One (1) Copy of the NC Secretary of State Documentation;
9. Two (2) copies of the Plan Set.

Please do not hesitate to contact me at (252) 491-8147 or [csaunders@withersravenel.com](mailto:csaunders@withersravenel.com) should you have any questions or require any additional information.

Thank you for your attention to this project.

Sincerely,  
WithersRavenel

Cathleen M. Saunders. P.E.  
CC:



WithersRavenel

Our People. Your Success.



# Erosion Control Calculations

**H2OBX RV Park**

**Washington Regional Office**

**H2OBX, LLC**

Prepared For:  
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WithersRavenel Project No. 24-0941

September 24, 2024

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Cathleen Saunders  
John J. Corcella E.I.

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Appendix 2: Financial Ownership and Responsibility Form

Appendix 3: NRCS Soils Report

Appendix 4: USGS Topography Map

Appendix 5: Deed Book 1512, Page 459

Appendix 6: North Carolina Secretary of State Documentation

Appendix 7: Plan Set

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## Project Description

The proposed H2OBX RV Park is located at 8526 Caratoke Highway in Powells Point, Currituck County, North Carolina, Parcel #0124000137L000 and PIN# 9837-54-9004. The property is approximately 96.77 acres. The site in its existing conditions is primarily woods and grassy areas. The proposed development consists of 248 RV/modular camp sites, an amenity center with a pool and various recreational areas including pickleball courts, cornhole area, playground, and basketball court. The site also proposes associated parking and infrastructure. Existing ground elevations range between -5.92' and 17.05' with an average slope of 3.95%.

## Adjacent Properties

The adjacent properties zoning varies from General Business to Heavy Industrial, individual lot zoning can be seen on the plan set. Adjacent property uses include general; business districts, agriculture, industrial and residential.

## Offsite Areas

Construction staging and any temporary soil stockpiling will take place on-site interior to the limits of disturbance shown. Any off-site areas used for disposal or borrow material shall be approved and permitted in accordance with applicable local, state, and federal regulations.

## Critical Erosion Areas

The onsite soils' erosion hazard is moderate due to the proposed disturbance associated with the development of the site. Adequate erosion control measures will be employed to minimize potential erosion problems.

## Critical Erosion Areas

Per the Natural Resources Conservation Service, the predominant on-site soils belong to the following groups as described below:

## Soils

CnA – Conetoe Loamy Sand. This soil typically has 0 to 5 percent slopes. Conetoe Loamy Sand typically has a very low runoff class and is well drained. This soil is categorized in Hydrologic Soil Group: A.

Ds – Dragston Loamy Fine Sand. This soil typically has 0 to 2 percent slopes. Dragston Loamy Fine Sand typically has a very low runoff class and is somewhat poorly drained. This soil is categorized in Hydrologic Soil Group: A/D.

Mu – Munden Loamy Sand. This soil typically has 0 to 2 percent slopes. Munden Loamy Sand typically has a very low runoff class and is moderately well drained. This soil is categorized in Hydrologic Soil Group: B.

## Erosion and Sediment Control Measures

The proposed limits of disturbance for the site is approximately 60.50 acres. All erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the NCEC Planning and Design Manual, latest edition.

### Structural Practices

1. Temporary Construction Entrance (CE) – 6.06.1  
A construction entrance will be installed off of the existing right-of-way access to the lot.
2. Silt Fence (SF) – 6.62.1  
Silt fence will be installed down slope of areas with minimal grades to filter sediment runoff from sheet flow as shown on the plans.
3. Sediment Basin (SB) – 6.61.1  
A sediment basin is proposed at the southwest corner of the property. Calculations are available within this report.
4. Outlet Protection (OP) – 6.40  
Outlet protection should be provided to lower velocities prior to discharge of stormwater to avoid potential erosion.
5. Dust Control – 6.84.1  
Dust control measures will be used to prevent surface and air movement of dust from exposed soil surfaces and reduce the presence of airborne substances, which may present health hazards, traffic safety problems or harm animals or plant life.
6. Tree Protection (TP) – 6.05.1  
Tree protection will be placed around trees and vegetated areas that are not to be disturbed during construction. This will provide protection from construction equipment.

### Vegetative Practices

1. Topsoiling (TO) – 6.04.1  
Topsoil shall be used to provide a suitable growth medium for vegetation used to stabilize disturbed areas. It is applicable where preservation or importation of topsoil is the most cost-effective method of providing suitable growth medium.
2. Temporary Seeding (TS) – 6.10.1  
All denuded areas which will be left dormant for longer than 21 days shall be seeded with fast germinating temporary vegetation immediately following rough grading of the area.
3. Permanent Seeding (PS) – 6.11.1  
Permanent seeding shall be applied to all denuded areas that will be left dormant for more than one year and to all areas where final grade has been established.
4. Mulching (MU) – 6.14.1  
Mulching shall be applied to all seeding operations, other plant materials which do not provide adequate soil protection by themselves, and bare areas which cannot be seeded (See Std. & Spec. 6.11.1) and mulch shall be used in conjunction with temporary seeding operations as specified in Temporary Seeding Std. & Spec. 6.10.1.

## Management Strategies

The following sequence of events and erosion control measures shall be incorporated into the construction schedule for this project and shall apply to all construction activities.

1. All hard surface public roads shall be clean at the end of each workday. Temporary construction entrance(s) are required at all points of access where any material may be spilled, dropped, washed, or tracked off-site.
2. Erosion and sediment control devices shall be constructed and installed as a first step in any land disturbing activity and shall be made functional before upslope land disturbing activity takes place.
3. Right-of-way diversions, sediment barriers, fill diversions, construction entrances, and erosion control stone are to be placed during clearing and grubbing.
4. Permanent or temporary soil stabilization shall be applied to denuded areas within fourteen (14) days after final grade is reached on any portion of the site.
5. During construction of the project, any soil stockpiles shall be stabilized or protected with sediment trapping measures.
6. Additional erosion and sediment control measures to those found on the plans may be required by NCDEQ if deemed necessary.
7. All temporary erosion and sediment control measures shall be removed and disposed of after final site stabilization.

## Maintenance: Structural Practices

1. Temporary Construction Entrance (CE) – 6.06.1  
The construction entrance shall be maintained in a condition which will prevent tracking or flow of mud onto private or public streets. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleaning of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.
2. Silt Fence (SF) – 6.62.1
  - a. Silt fence shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.
  - b. Close attention shall be paid to repair of damaged silt fence resulting from end runs and undercutting.
  - c. Should the fabric on a silt fence decompose or become ineffective prior to the end

- of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.
- d. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
  - e. Any sediment deposits remaining in place after the silt fence is no longer required shall be dressed to conform to the existing grade, prepared and seeded.
3. Sediment Basin (SB) – 6.61.1
    - a. The proposed wet pond shall be used as a sediment basin during construction. The wet pond shall be cleaned and grades restored to original design elevations prior to demobilization.
    - b. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.
  4. Outlet Protection (OP) – 6.40  
Outlet Protection shall be inspected after each rain and repairs made as needed.
  5. Dust Control – 6.84.1  
Dust control measures will be used through all dry weather periods until all disturbed areas have been stabilized.
  6. Tree Protection (TP) – 6.05.1  
In spite of precautions, some damage to protected trees may occur. In such cases, the following maintenance guidelines should be followed:
    - a. Soil Aeration – If the soil has become compacted over the root zone of any tree, the ground shall be aerated by punching holes with an iron bar. The bar shall be driven 1-foot deep and then moved back and forth until the soil is loosened. This procedure shall be repeated every 18 inches until all of the compacted soil beneath the crown of the tree has been loosened.
    - b. Repair of damage
      1. Any damage to the crown, trunk, or root system of any tree retained on the site shall be repaired immediately.
      2. Whenever major root or bark damage occurs, remove some foliage to reduce the demand for water and nutrients.
      3. Damaged roots shall be immediately cut off cleanly inside the exposed or damaged area. Cut surfaced shall be painted with appropriate tree paint, and moist peat moss, burlap, or top-soil shall be spread over the exposed area.

## Maintenance: Vegetative Practices

1. Temporary Seeding (6.10.1) and Permanent Seeding (6.11.1)  
The seeded areas will be checked regularly to ensure that a good stand is maintained. For temporary seeding, areas which fail to establish vegetative cover adequate to prevent rill erosion will be re-seeded as soon as such areas are identified. For permanent seeding, when it is clear that plants have not germinated on an area or have died these areas must be reseeded immediately to prevent erosion damage. However, it is extremely important

to determine for what reason germination did not take place and make any corrective action necessary prior to reseeding the area.

2. Mulching (MU) – 6.14.1

All mulching and soil coverings shall be inspected periodically (particularly after rain storms) to check for erosion. Where erosion is observed in mulched areas, additional mulch should be applied. Nets and mats should be inspected after rainstorms for dislocation or failure. If washouts or breakage occur, re-install netting matting as necessary after repairing damage to the slope or ditch. Inspections should take place up until grasses are firmly established. Where mulch is used in conjunction with ornamental plantings, inspect periodically throughout the year to determine if mulch is maintaining coverage of the soil surface; repair as needed.

## Calculations

### Silt Fence Design

Runoff from land disturbance will be treated by silt fence surrounding all disturbed areas. The required minimum linear feet (Lf) of silt fence is 100 Lf per ¼ acre (a.c); which is provided as indicated in the table below.

Maximum DA for Silt Fence:

$$\text{Max DA} = \text{SF Provided} / (100 \times 4)$$

$$\underline{9,035 \text{ LF} / (100 \text{ AC} \times 4.0) = 22.6 \text{ AC}}$$

$$\text{Silt Fence Provided} = 9,035 \text{ LF}$$



## EROSION and SEDIMENTATION CONTROL PLAN PRELIMINARY REVIEW CHECKLIST

The following items shall be incorporated with respect to specific site conditions, in an erosion & sedimentation control plan:

### NPDES Construction Stormwater General Permit NCG010000

- SH 10**  Designation on the plans where the 7 or 14 day ground stabilization requirements apply per Part II.E.1 of the permit.  
 Design of basins with one acre or more of drainage area for surface withdrawal as per Part II.B.8 of the permit.

### LOCATION INFORMATION

- SH 1**  Project location & labeled vicinity map (roads, streets, landmarks)  
**SH 1**  North arrow and scale  
**SH 1**  Identify River Basin.  
**Attachment**  Provide a copy of site located on applicable USGS quadrangle and NRCS Soils maps if it is in a River Basin with Riparian Buffer requirements.

- SH 1**  Name and classification of receiving water course or name of municipal operator (only where stormwater discharges are to occur)

### GENERAL SITE FEATURES (Plan elements)

- SH 1**  Property lines & ownership ID for adjoining properties  
**SH 1**  Existing contours (topographic lines)  
**SH 8 & 9**  Proposed contours  
**SH 10&11**  Limits of disturbed area (provide acreage total, delineate limits, and label). Be sure to include all access to measures, lots that will be disturbed, and utilities that may extend offsite.  
**SH 4 & 5**  Planned and existing building locations and elevations  
**SH 4 & 5**  Planned & existing road locations & elevations, including temporary access roads  
**SH 4 & 5**  Lot and/or building numbers  
**SH 2 & 3**  Hydrogeologic features: rock outcrops, seeps, springs, wetland and their limits, streams, lakes, ponds, dams, etc. (include all required local or state buffer zones and any DWQ Riparian Buffer determinations)  
**SH 2 & 3**  Easements and drainageways, particularly required for offsite affected areas. Include copies of any recorded easements and/or agreements with adjoining property owners.  
 Profiles of streets, utilities, ditch lines, etc.  
 Stockpiled topsoil or subsoil locations  
 If the same person conducts the land-disturbing activity & any related borrow or waste activity, the related borrow or waste activity shall constitute part of the land-disturbing activity unless the borrow or waste activity is regulated under the Mining Act of 1971, or is a landfill regulated by the Division of Waste Management. If the land-disturbing activity and any related borrow or waste activity are not conducted by the same person, they shall be considered separate land-disturbing activities and must be permitted either through the Sedimentation Pollution Control Act as a one-use borrow site or through the Mining Act.  
 Location and details associated with any onsite stone crushing or other processing of material excavated. If the affected area associated with excavation, processing, stockpiles and transport of such materials will comprise 1 or more acres, and materials will be leaving the development tract, a mining permit will be required.  
**Attachment**  Required Army Corps 404 permit and Water Quality 401 certification (e.g. stream disturbances over 150 linear feet)

### EROSION & SEDIMENT CONTROL MEASURES (on plan)

- SH 10&11**  Legend (provide appropriate symbols for all measures and reference them to the construction details)  
**SH 10&11**  Location of temporary measures  
**SH 10&11**  Location of permanent measures  
**SH 10&11**  Construction drawings and details for temporary and permanent measures. Show measures to scale on plan and include proposed contours where necessary. Ensure design storage requirements are maintained through all phases of construction.  
**SH 13**  Maintenance requirements for measures  
**SH 1**  Contact person responsible for maintenance

### SITE DRAINAGE FEATURES

- SH 8 & 9**  Existing and planned drainage patterns (include off-site areas that drain through project and address temporary and permanent conveyance of stormwater over graded slopes)  
**SH 1**  Method used to determine acreage of land being disturbed and drainage areas to all proposed measures (e.g. delineation map)  
**SH 8 & 9**  Size, pipe material and location of culverts and sewers  
**Narr.**  Soil information: type, special characteristics  
**Narr.**  Soil information below culvert storm outlets

### STORMWATER CALCULATIONS

- Narr.**  Pre-construction runoff calculations for each outlet from the site (at peak discharge points). Be sure to provide all supporting data for the computation methods used (rainfall data for required storm events, time of concentration/storm duration, and runoff coefficients).  
**Narr.**  Design calculations for peak discharges of runoff (including the construction phase & the final runoff coefficients for the site)  
**Narr.**  Design calcs for culverts and storm sewers (include HW, TW and outlet velocities)  
**Narr.**  Discharge and velocity calculations for open channel and ditch flows (easement & rights-of-way)  
**Narr.**  Design calcs for cross sections and method of stabilization for existing and planned channels (include temporary linings). Include appropriate permissible velocity and/or shear stress data.  
**Narr.**  Design calcs and construction details for energy dissipaters below culvert and storm sewer outlets (include stone/material specs & apron dimensions). Avoid discharges on fill slopes.  
**Narr.**  Design calcs and dimension of sediment basins (note current surface area and dewatering standards as well as diversion of runoff to the basins). Be sure that all surface drains, including ditches and berms, will have positive drainage to the basins.

### VEGETATIVE STABILIZATION

- SH 10&11 & Narr.**  Area & acreage to be stabilized with vegetation  
 Method of soil preparation  
 Seed type & rates (temporary & permanent)  
 Fertilizer type and rates  
 Mulch type and rates (include mulch anchoring methods)  
**NOTE:** Plan should include provisions for groundcover in accordance with NPDES Construction Stormwater General Permit NCG010000.

### FINANCIAL RESPONSIBILITY/OWNERSHIP FORM

- Completed, signed & notarized FR/O Form  
 Accurate application fee payable to NCDEQ (\$100.00 per acre rounded up the next acre with no ceiling amount)  
 Certificate of assumed name, if the owner is a partnership  
 Name of Registered Agent (if applicable)  
 Copy of the most current Deed for the site. Please make sure the deed(s) and ownership information are consistent between the plan sheets, local records and this form.  
**SH 1**  Provide latitude & longitude (in decimal degrees) at the project entrance.  
 Two hard-copies of the plans (some regional offices require additional plans or multiple sizes; please contact the regional coordinator prior to such submittal.)

**NOTE:** For the Express Permitting Option, inquire at the local Regional Office for availability. Express Reviews are performed by appointment only.

### NARRATIVE AND CONSTRUCTION SEQUENCE

- Narrative describing the nature & purpose of the construction activity.  
 Pre-construction conference, if requested.  
**SH 13**  Construction sequence related to erosion and sediment control (including installation of critical measures prior to the initiation of the land-disturbing activity & removal of measures after areas they serve are permanently stabilized). Address all phases of construction and necessary practices associated with temporary stream bypasses and/or crossings.  
 Bid specifications related only to erosion control rev. 1-18-22

**FINANCIAL RESPONSIBILITY/OWNERSHIP FORM  
SEDIMENTATION POLLUTION CONTROL ACT**

No person may initiate any land-disturbing activity on one or more acres as covered by the Act before this form and an acceptable erosion and sedimentation control plan have been completed and approved by the Land Quality Section, N.C. Department of Environmental Quality. Submit the completed form to the appropriate Regional Office. (Please type or print and, if the question is not applicable or the e-mail and/or fax information unavailable, place N/A in the blank.)

**Part A.**

1. Project Name H2OBX RV Park
2. Location of land-disturbing activity: County Currituck City or Township Poplar Branch  
Highway/Street US 158 Latitude 36.114925 Longitude -75.834466
3. Approximate date land-disturbing activity will commence: December 2024
4. Purpose of development (residential, commercial, industrial, institutional, etc.): Commercial
5. Total acreage disturbed or uncovered (including off-site borrow and waste areas): 60.5
6. Amount of fee enclosed: \$ 6,100. The application fee of \$100.00 per acre (rounded up to the next acre) is assessed without a ceiling amount (Example: 8.10 ac = \$900.00).
7. Has an erosion and sediment control plan been filed? Yes  No  Enclosed
8. Person to contact should erosion and sediment control issues arise during land-disturbing activity:  
Name Kenneth Ellis E-mail Address kene@aquaticgroup.com  
Telephone 518-369-2422 Cell # 518-369-2422 Fax # N/A
9. Landowner(s) of Record (attach accompanied page to list additional owners):  

|                                |                                |            |
|--------------------------------|--------------------------------|------------|
| <u>H2OBX, LLC</u>              | <u>518-369-2422</u>            | <u>N/A</u> |
| Name                           | Telephone                      | Fax Number |
| <u>13 Green Mountain Drive</u> | <u>13 Green Mountain Drive</u> |            |
| Current Mailing Address        | Current Street Address         |            |
| <u>Cohoes NY 12047</u>         | <u>Cohoes NY 12047</u>         |            |
| City State Zip                 | City State Zip                 |            |
10. Deed Book No. 1512 Page No. 459 Provide a copy of the most current deed.

**Part B.**

1. Company(ies) or firm(s) who are financially responsible for the land-disturbing activity (Provide a comprehensive list of all responsible parties on an attached sheet.) *If the company or firm is a sole proprietorship, the name of the owner or manager may be listed as the financially responsible party.*  

|                                |                                |
|--------------------------------|--------------------------------|
| <u>H2OBX, LLC</u>              | <u>kene@aquaticgroup.com</u>   |
| Name                           | E-mail Address                 |
| <u>13 Green Mountain Drive</u> | <u>13 Green Mountain Drive</u> |
| Current Mailing Address        | Current Street Address         |
| <u>Cohoes NY 12047</u>         | <u>Cohoes NY 12047</u>         |
| City State Zip                 | City State Zip                 |
| Telephone <u>518-369-2422</u>  | Fax Number <u>N/A</u>          |

2. (a) If the Financially Responsible Party is not a resident of North Carolina, give name and street address of the designated North Carolina Agent:

N/A

Name

N/A

Current Mailing Address

N/A

City State Zip

Telephone N/A

N/A

E-mail Address

N/A

Current Street Address

N/A

City State Zip

Fax Number N/A

(b) If the Financially Responsible Party is a Partnership or other person engaging in business under an assumed name, **attach a copy of the Certificate of Assumed Name.** If the Financially Responsible Party is a Corporation, give name and street address of the Registered Agent:

Jeffery Malarny

Name of Registered Agent

E-mail Address

Current Mailing Address

Current Street Address

City State Zip

City State Zip

Telephone

Fax Number

The above information is true and correct to the best of my knowledge and belief and was provided by me under oath (This form must be signed by the Financially Responsible Person if an individual or his attorney-in-fact, or if not an individual, by an officer, director, partner, or registered agent with the authority to execute instruments for the Financially Responsible Person). I agree to provide corrected information should there be any change in the information provided herein.

Type or print name

Title or Authority

Signature

Date

I, \_\_\_\_\_, a Notary Public of the County of \_\_\_\_\_

State of North Carolina, hereby certify that \_\_\_\_\_ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_

Seal

Notary

My commission expires \_\_\_\_\_

# Custom Soil Resource Report for Currituck County, North Carolina

DRAFT



# Preface

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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](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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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil



## Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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# Soil Map

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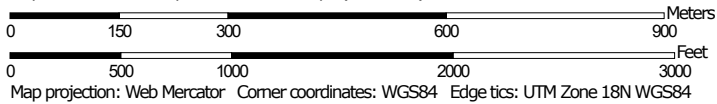
The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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# Custom Soil Resource Report Soil Map



Map Scale: 1:10,400 if printed on A landscape (11" x 8.5") sheet.



### 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
- Water Features**
  -  Streams and Canals
- Transportation**
  -  Rails
  -  Interstate Highways
  -  US Routes
  -  Major Roads
  -  Local Roads
- Background**
  -  Aerial Photography
- Other Features**
  -  Spoil Area
  -  Stony Spot
  -  Very Stony Spot
  -  Wet Spot
  -  Other
  -  Special Line Features

### 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 |
|------------------------------------|--|--------------|----------------|
| BoA                                | Bojac loamy sand, 0 to 3 percent slopes            | 2.5          | 0.6%           |
| Bp                                 | Borrow pit   | 2.0          | 0.5%           |
| Cb                                 | Conaby muck  | 39.7         | 9.2%           |
| CnA                                | Conetoe loamy sand, 0 to 3 percent slopes          | 46.2         | 10.7%          |
| Cu                                 | Currituck mucky peat                               | 10.0         | 2.3%           |
| Ds                                 | Dragston loamy fine sand                           | 116.9        | 27.1%          |
| Mu                                 | Munden loamy sand                                  | 143.2        | 33.2%          |
| Po                                 | Ponzer muck, 0 to 2 percent slopes, rarely flooded | 29.5         | 6.9%           |
| Pt                                 | Portsmouth fine sandy loam                         | 29.7         | 6.9%           |
| W                                  | Water  | 11.2         | 2.6%           |
| <b>Totals for Area of Interest</b> |  | <b>431.1</b> | <b>100.0%</b>  |

## 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

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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

### BoA—Bojac loamy sand, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 3rnb  
*Elevation:* 0 to 30 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:* Farmland of statewide importance

#### Map Unit Composition

*Bojac and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Bojac

##### Setting

*Landform:* Ridges on marine terraces  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Parent material:* Loamy and sandy fluviomarine deposits

##### Typical profile

*Ap - 0 to 8 inches:* loamy fine sand  
*Bt - 8 to 47 inches:* fine sandy loam  
*C - 47 to 85 inches:* loamy fine sand

##### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)  
*Depth to water table:* About 48 to 72 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 6.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2s  
*Hydrologic Soil Group:* A  
*Ecological site:* F153BY030NC - Dry Loamy Rises and Flats  
*Hydric soil rating:* No

#### Minor Components

##### Conetoe

*Percent of map unit:* 4 percent  
*Landform:* Ridges on stream terraces, ridges on marine terraces  
*Landform position (two-dimensional):* Summit, shoulder  
*Landform position (three-dimensional):* Crest



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*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Ecological site:* F153BY030NC - Dry Loamy Rises and Flats  
*Hydric soil rating:* No

### **Seabrook**

*Percent of map unit:* 3 percent  
*Landform:* Depressions on marine terraces  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Ecological site:* F153BY020NC - Moist Sands  
*Hydric soil rating:* No

### **Munden**

*Percent of map unit:* 3 percent  
*Landform:* Marine terraces  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Ecological site:* F153BY040NC - Moist Loamy Rises and Flats  
*Hydric soil rating:* No

## **Bp—Borrow pit**

### **Map Unit Setting**

*National map unit symbol:* 21ydy  
*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**

*Pits, sand:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Pits, Sand**

#### **Setting**

*Parent material:* Sandy fluviomarine deposits

#### **Typical profile**

*C1 - 0 to 10 inches:* sand  
*C2 - 10 to 80 inches:* sand

#### **Properties and qualities**

*Slope:* 0 to 3 percent  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 39.96 in/hr)  
*Depth to water table:* About 0 to 6 inches  
*Available water supply, 0 to 60 inches:* Very low (about 2.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 8s  
*Hydric soil rating:* No

**Cb—Conaby muck**

**Map Unit Setting**

*National map unit symbol:* 3rnd  
*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:* Prime farmland if drained

**Map Unit Composition**

*Conaby, drained, and similar soils:* 80 percent  
*Conaby, undrained, and similar soils:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Conaby, Drained**

**Setting**

*Landform:* Depressions, pocosins  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Woody and herbaceous organic material over sandy and loamy fluviomarine deposits

**Typical profile**

*Oa - 0 to 13 inches:* muck  
*A - 13 to 21 inches:* sand  
*Bg - 21 to 33 inches:* sandy loam  
*Cg - 33 to 80 inches:* sand

**Properties and qualities**

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Very poorly drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 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:* Moderate (about 7.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3w  
*Hydrologic Soil Group:* B/D  
*Ecological site:* F153BY060NC - Wet Loamy Flats and Depressions

*Hydric soil rating:* Yes

### **Description of Conaby, Undrained**

#### **Setting**

*Landform:* Depressions, pocosins

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Woody and herbaceous organic material over sandy and loamy fluviomarine deposits

#### **Typical profile**

*Oa - 0 to 13 inches:* muck

*A - 13 to 21 inches:* sand

*Bg - 21 to 33 inches:* sandy loam

*Cg - 33 to 80 inches:* sand

#### **Properties and qualities**

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Very poorly drained

*Runoff class:* Very high

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 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:* Moderate (about 7.4 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6w

*Hydrologic Soil Group:* B/D

*Ecological site:* F153BY060NC - Wet Loamy Flats and Depressions

*Hydric soil rating:* Yes

### **CnA—Conetoe loamy sand, 0 to 3 percent slopes**

#### **Map Unit Setting**

*National map unit symbol:* 3rnf

*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:* Farmland of statewide importance

#### **Map Unit Composition**

*Conetoe and similar soils:* 85 percent

*Minor components:* 5 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

## Description of Conetoe

### Setting

*Landform:* Ridges on stream terraces, ridges on marine terraces

*Landform position (two-dimensional):* Summit, shoulder

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Sandy and loamy fluviomarine deposits and/or marine deposits

### Typical profile

*Ap - 0 to 8 inches:* loamy sand

*E - 8 to 22 inches:* loamy sand

*Bt - 22 to 40 inches:* sandy loam

*BC - 40 to 46 inches:* loamy sand

*C - 46 to 80 inches:* sand

### Properties and qualities

*Slope:* 0 to 5 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.57 to 5.95 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Low (about 5.1 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

*Ecological site:* F153AY030NC - Dry Loamy Rises and Flats, F153BY030NC - Dry  
Loamy Rises and Flats

*Hydric soil rating:* No

## Minor Components

### Leon

*Percent of map unit:* 5 percent

*Landform:* Flats on marine terraces

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Ecological site:* F153BY070NC - Wet Spodosol Flats and Depressions,  
F153AY070NC - Wet Spodosol Flats and Depressions

*Hydric soil rating:* Yes

## **Cu—Currituck mucky peat**

### **Map Unit Setting**

*National map unit symbol:* 3rnj  
*Elevation:* 0 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**

*Currituck, tidal, and similar soils:* 90 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Currituck, Tidal**

#### **Setting**

*Landform:* Tidal marshes  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Herbaceous organic material over sandy fluviomarine deposits

#### **Typical profile**

*Oe - 0 to 14 inches:* mucky peat  
*Oa - 14 to 28 inches:* muck  
*Cg - 28 to 80 inches:* sand

#### **Properties and qualities**

*Slope:* 0 to 1 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Very poorly drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 5.95 in/hr)  
*Depth to water table:* About 0 to 12 inches  
*Frequency of flooding:* Very frequent  
*Frequency of ponding:* None  
*Maximum salinity:* Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 10.0  
*Available water supply, 0 to 60 inches:* High (about 10.6 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 8w  
*Hydrologic Soil Group:* A/D  
*Ecological site:* R153BY140NC - Tidal Marsh on Organic Soil  
*Hydric soil rating:* Yes

## Ds—Dragston loamy fine sand

### Map Unit Setting

*National map unit symbol:* 3rnm

*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:* Farmland of statewide importance

### Map Unit Composition

*Dragston, drained, and similar soils:* 45 percent

*Dragston, undrained, and similar soils:* 40 percent

*Minor components:* 5 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Dragston, Drained

#### Setting

*Landform:* Marine terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy and loamy fluviomarine deposits and/or marine deposits

#### Typical profile

*A - 0 to 6 inches:* loamy fine sand

*E - 6 to 10 inches:* loamy fine sand

*Bt - 10 to 42 inches:* sandy loam

*2Cg - 42 to 80 inches:* loamy sand

#### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Somewhat poorly drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)

*Depth to water table:* About 12 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 6.3 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* A/D

*Ecological site:* F153AY040NC - Moist Loamy Rises and Flats, F153BY040NC - Moist Loamy Rises and Flats

*Hydric soil rating:* No

## Description of Dragston, Undrained

### Setting

*Landform:* Marine terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy and loamy fluviomarine deposits and/or marine deposits

### Typical profile

*A - 0 to 6 inches:* loamy fine sand

*E - 6 to 10 inches:* loamy fine sand

*Bt - 10 to 42 inches:* sandy loam

*2Cg - 42 to 80 inches:* loamy sand

### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Somewhat poorly drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)

*Depth to water table:* About 12 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 6.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3w

*Hydrologic Soil Group:* A/D

*Ecological site:* F153AY040NC - Moist Loamy Rises and Flats, F153BY040NC - Moist Loamy Rises and Flats

*Hydric soil rating:* No

## Minor Components

### Portsmouth, undrained

*Percent of map unit:* 3 percent

*Landform:* Depressions on marine terraces, flats on marine terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Ecological site:* F153AY060NC - Wet Loamy Flats and Depressions, F153BY060NC - Wet Loamy Flats and Depressions

*Hydric soil rating:* Yes

### Nimmo, undrained

*Percent of map unit:* 2 percent

*Landform:* Flats on marine terraces, depressions on marine terraces

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Ecological site:* F153BY060NC - Wet Loamy Flats and Depressions, F153AY060NC - Wet Loamy Flats and Depressions

*Hydric soil rating:* Yes

## Mu—Munden loamy sand

### Map Unit Setting

*National map unit symbol:* 3mr

*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:* Farmland of statewide importance

### Map Unit Composition

*Munden and similar soils:* 85 percent

*Minor components:* 5 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Munden

#### Setting

*Landform:* Ridges on marine terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy and loamy fluviomarine deposits and/or marine deposits

#### Typical profile

*A - 0 to 9 inches:* loamy sand

*Bt - 9 to 37 inches:* fine sandy loam

*C - 37 to 72 inches:* loamy fine sand

#### Properties and qualities

*Slope:* 0 to 2 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):* Moderately high to high  
(0.57 to 5.95 in/hr)

*Depth to water table:* About 18 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Low (about 5.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* B

*Ecological site:* F153BY040NC - Moist Loamy Rises and Flats

*Hydric soil rating:* No



**Minor Components**

**Nimmo, undrained**

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

**Po—Ponzer muck, 0 to 2 percent slopes, rarely flooded**

**Map Unit Setting**

*National map unit symbol: 2v9nw*  
*Elevation: 0 to 30 feet*  
*Mean annual precipitation: 45 to 60 inches*  
*Mean annual air temperature: 60 to 61 degrees F*  
*Frost-free period: 190 to 270 days*  
*Farmland classification: Farmland of statewide importance*

**Map Unit Composition**

*Ponzer, undrained, and similar soils: 90 percent*  
*Minor components: 10 percent*  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Ponzer, Undrained**

**Setting**

*Landform: Flats, depressions*  
*Landform position (three-dimensional): Talf, dip*  
*Down-slope shape: Linear, concave*  
*Across-slope shape: Linear, concave*  
*Parent material: Herbaceous organic material and/or woody organic material over loamy marine deposits*

**Typical profile**

*Oa - 0 to 32 inches: muck*  
*Cg - 32 to 63 inches: loam*

**Properties and qualities**

*Slope: 0 to 2 percent*  
*Depth to restrictive feature: More than 80 inches*  
*Drainage class: Very poorly drained*  
*Runoff class: Very high*  
*Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)*  
*Depth to water table: About 0 to 6 inches*  
*Frequency of flooding: Rare*  
*Frequency of ponding: None*  
*Available water supply, 0 to 60 inches: Very high (about 19.5 inches)*

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### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6w  
*Hydrologic Soil Group:* D  
*Ecological site:* F153BY080NC - Wet Organic Soil Flats and Depressions  
*Hydric soil rating:* Yes

### Minor Components

#### Belhaven, undrained

*Percent of map unit:* 6 percent  
*Landform:* Flats, depressions, pocosins, flood plains  
*Landform position (three-dimensional):* Tread, talf, dip  
*Down-slope shape:* Linear, concave  
*Across-slope shape:* Linear, concave  
*Ecological site:* F153BY080NC - Wet Organic Soil Flats and Depressions  
*Hydric soil rating:* Yes

#### Roper, undrained

*Percent of map unit:* 4 percent  
*Landform:* Depressions on marine terraces, flats on marine terraces  
*Landform position (three-dimensional):* Talf  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave, linear  
*Ecological site:* F153BY065NC - Wet Clay Flats and Depressions  
*Hydric soil rating:* Yes

## Pt—Portsmouth fine sandy loam

### Map Unit Setting

*National map unit symbol:* 3rp0  
*Elevation:* 0 to 30 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:* Prime farmland if drained

### Map Unit Composition

*Portsmouth, drained, and similar soils:* 75 percent  
*Portsmouth, undrained, and similar soils:* 10 percent  
*Minor components:* 7 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Portsmouth, Drained

#### Setting

*Landform:* Flats on marine terraces, depressions on marine terraces  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Loamy fluviomarine deposits over sandy fluviomarine deposits

**Typical profile**

*Ap - 0 to 12 inches:* fine sandy loam  
*Eg - 12 to 19 inches:* fine sandy loam  
*Btg - 19 to 35 inches:* sandy clay loam  
*BCg - 35 to 38 inches:* sandy loam  
*2Cg - 38 to 80 inches:* loamy sand

**Properties and qualities**

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* 20 to 40 inches to strongly contrasting textural stratification  
*Drainage class:* Very poorly drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)  
*Depth to water table:* About 0 to 12 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 5.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3w  
*Hydrologic Soil Group:* B/D  
*Ecological site:* F153BY060NC - Wet Loamy Flats and Depressions  
*Hydric soil rating:* Yes

**Description of Portsmouth, Undrained**

**Setting**

*Landform:* Depressions on marine terraces, flats on marine terraces  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Loamy fluviomarine deposits over sandy fluviomarine deposits

**Typical profile**

*A - 0 to 12 inches:* fine sandy loam  
*Eg - 12 to 19 inches:* fine sandy loam  
*Btg - 19 to 35 inches:* sandy clay loam  
*BCg - 35 to 38 inches:* sandy loam  
*2Cg - 38 to 80 inches:* loamy sand

**Properties and qualities**

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* 20 to 40 inches to strongly contrasting textural stratification  
*Drainage class:* Very poorly drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)  
*Depth to water table:* About 0 to 12 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 5.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified

## Custom Soil Resource Report

*Land capability classification (nonirrigated): 6w*  
*Hydrologic Soil Group: B/D*  
*Ecological site: F153BY060NC - Wet Loamy Flats and Depressions*  
*Hydric soil rating: Yes*

### Minor Components

#### **Cape lookout, undrained**

*Percent of map unit: 4 percent*  
*Landform: Depressions, pocosins, flats*  
*Down-slope shape: Linear*  
*Across-slope shape: Concave*  
*Ecological site: F153BY065NC - Wet Clay Flats and Depressions*  
*Hydric soil rating: Yes*

#### **Portsmouth, undrained**

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

## W—Water

### Map Unit Composition

*Water: 100 percent*  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Water

#### **Interpretive groups**

*Land capability classification (irrigated): None specified*  
*Land capability classification (nonirrigated): 8*  
*Hydric soil rating: No*

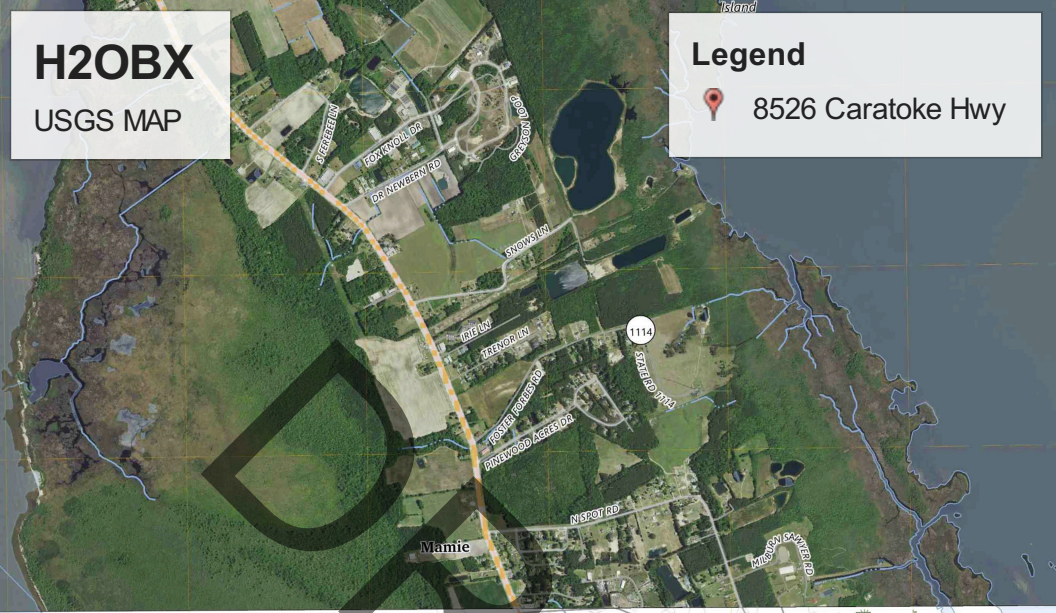
H2OBX

USGS MAP

Legend



8526 Caratoke Hwy



Google Earth





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Prepared by:  
Christopher B. Frantze  
STINSON LLP

Under the supervision of and as approved by:  
John C. Surles, Esq.  
THE SURLES LAW FIRM, PLLC  
6200 Fairview Road, Suite 325  
Charlotte, NC 28210

Doc No: 347800  
Recorded: 12/12/2019 02:56:53 PM  
Fee Amt: \$26.00 Page 1 of 8  
Excise Tax: \$76,830.00  
Currituck County North Carolina  
Denise A. Hall, Register of Deeds  
BK 1512 PG 459 - 466 (8)

After recording return to:  
First American Title  
1201 Walnut St. 700  
Kansas City, MO 64106  
NCS-986567 AXCTY

Tax Collector Certification That No Delinquent Taxes  
Are Due. Date 12-12-19 By DS. Certification  
expires Jan. 6<sup>th</sup> of the year following certification date.

TRANSFER TAX AMOUNT: 384150.00 DS  
DATE/COLLECTOR 12-12-2019-ENC

Excise Tax: \$ 76,830.00

**SPECIAL WARRANTY DEED**

THIS DEED made as of the 11th day of December, 2019, by and between **EPR RESORTS, LLC**, a Delaware limited liability company ("Grantor"), whose address is c/o EPR Properties, 909 Walnut, Suite 200, Kansas City, MO 64106, and **H2OBX, LLC**, a Delaware limited liability company ("Grantee"), whose address is 13 Green Mountain Drive, Cohoes, New York 12047. The designation Grantor and Grantee, as used herein, shall include said parties, their heirs, successors and assigns, and shall include singular, plural, masculine, feminine or neuter, as required by context.

This is not the personal residence of Grantor.

WITNESSETH:

That the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in Poplar Branch Township, Currituck County, North Carolina and more particularly described as follows:

See **Exhibit A** attached hereto and incorporated herein by this reference.

Together with all improvements thereon, known as 8504 Caratoke Hwy., 8524 Caratoke Hwy., 8526 Caratoke Hwy., and Ballast Rock Rd., Powells Point, NC, and all of Grantor's rights, title and interests, if any, in and to all abutting roads and rights of way and all reversionary rights therein, and in and to all appurtenant easements, if any.

The property hereinabove described is commonly referred to as:  
Map/Parcel ID Numbers: 0124000137L0000; 012400001270000;  
0124000137E0000; 0124000068J0000

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The property hereinabove described was acquired by Grantor by instruments recorded in Book 1383, Page 80, Book 1383, Page 84, Book 1383, Page 87, and Book 1396, Page 63, Currituck County Registry.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land, the improvements thereon and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor has done nothing to impair such title as Grantor received, and Grantor will warrant and defend the title against the lawful claims of all persons claiming by, under or through Grantor, subject to the exceptions hereinafter stated.

Title to the property hereinabove described is subject to: (a) easements, restrictions, declarations, reservations, agreements, instruments and other matters of record, if any; (b) taxes and assessments, general and special, not now due and payable; and (c) rights of the public in and to the parts thereof in streets, roads or alleys.

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**EXHIBIT A TO SPECIAL WARRANTY DEED  
LEGAL DESCRIPTION OF PROPERTY**

PARCEL 1:

TRACT 1:

BEGINNING AT A SET IRON PIN OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 80.81 FEET IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, FROM AN IRON PIN, SAID IRON PIN BEING LOCATED ON A CHORD BEARING OF SOUTH 42 DEG. 18 MIN. 10 SEC. EAST 80.80 FEET FROM THE BEGINNING POINT, SAID IRON PIN BEING ALSO LOCATED SOUTH 03 DEG. 15 MIN. 04 SEC. WEST 119.38 FEET FROM N.C.G.S. MONUMENT CUR9 N 873,965.67' E 2,937,616.75' NAD(83 (2011)); THENCE FROM SAID POINT OF BEGINNING NORTH 69 DEG. 32 MIN. 44 SEC. WEST 176.98 FEET TO AN EXISTING IRON ROD; THENCE SOUTH 69 DEG. 42 MIN. 48 SEC. WEST 352.98 FEET TO A SET IRON ROD; THENCE SOUTH 69 DEG. 45 MIN. 03 SEC. WEST 635.34 FEET TO A SET IRON ROD; THENCE SOUTH 68 DEG. 52 MIN. 31 SEC. WEST 94.93 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 39 MIN. 22 SEC. WEST 175.02 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 40 MIN. 53 SEC. WEST 603.07 FEET TO A SET IRON ROD; THENCE NORTH 36 DEG. 19 MIN. 07 SEC. WEST 2,575.07 FEET TO A SET IRON ROD; THENCE NORTH 83 DEG. 48 MIN. 44 SEC. EAST 383.35 FEET TO A CONCRETE MONUMENT LOCATED IN THE SOUTH LINE OF PROPERTY NOW OR FORMERLY OWNED BY ROBERT F. HARRELL ET AL; THENCE ALONG THE SOUTH LINE OF THE AFORESAID HARRELL ET AL PROPERTY NORTH 83 DEG. 48 MIN. 44 SEC. EAST 859.73 FEET TO A CONCRETE MONUMENT LOCATED IN THE WEST LINE OF PROPERTY NOW OR FORMERLY OWNED BY GARLAND H. DUNSTAN, JR.; THENCE ALONG THE NOW OR FORMERLY DUNSTAN PROPERTY SOUTH 30 DEG. 15 MIN. 24 SEC. EAST 833.22 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 60 DEG. 44 MIN. 49 SEC. EAST 149.77 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 31 DEG. 01 MIN. 52 SEC. WEST 9.54 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 65 DEG. 04 MIN. 33 SEC. EAST 299.09 FEET TO AN EXISTING IRON PIN; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 78 DEG. 02 MIN. 57 SEC. EAST 357.72 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 72 DEG. 25 MIN. 25 SEC. EAST 354.74 FEET TO AN EXISTING IRON PIN LOCATED IN THE WEST MARGIN OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 SOUTH 25 DEG. 32 MIN. 35 SEC. EAST 200.99 FEET TO AN IRON PIN OR OTHER MARKER LOCATED IN THE NORTH LINE OF PROPERTY NOW OR FORMERLY OWNED BY BARNHILL CONTRACTING CO.; THENCE ALONG THE AFORESAID BARNHILL CONTRACTING CO. PROPERTY SOUTH 64 DEG. 27 MIN. 25 SEC. WEST 174.55 FEET TO A SET IRON PIN; THENCE CONTINUING ALONG THE AFORESAID BARNHILL CONTRACTING CO. PROPERTY SOUTH 25 DEG. 32 MIN. 35 SEC. EAST 200.00 FEET TO A SET IRON PIN; THENCE CONTINUING ALONG THE AFORESAID BARNHILL CONTRACTING CO. PROPERTY NORTH 64 DEG. 27 MIN. 25 SEC. EAST 175.82 FEET TO A SET IRON PIN LOCATED IN THE WEST MARGIN OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OF THE RIGHT-OF-WAY OF U.S. HIGHWAY 158 IN A SOUTHERLY DIRECTION FOLLOWING A CURVATURE THEREOF A DISTANCE OF 292.49 FEET TO AN EXISTING IRON ROD, SAID CURVE HAVING A RADIUS OF

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2,924.79 FEET, SAID IRON ROD BEING LOCATED ON A CHORD BEARING OF SOUTH 30 DEG. 05 MIN. 43 SEC. EAST 292.37 FEET FROM THE TERMINAL POINT OF THE NEXT PRECEDING CALL, SAID IRON ROD BEING IN THE NORTH LINE OF THE NOW OR FORMERLY GEORGE M. FARROW PROPERTY; THENCE ALONG THE AFORESAID FARROW PROPERTY SOUTH 56 DEG. 32 MIN. 43 SEC. WEST 129.03 FEET TO AN EXISTING IRON PIN; THENCE CONTINUING ALONG THE AFORESAID FARROW PROPERTY SOUTH 32 DEG. 36 MIN. 57 SEC. EAST 154.28 FEET TO AN EXISTING IRON PIN; THENCE CONTINUING ALONG THE AFORESAID FARROW PROPERTY NORTH 56 DEG. 32 MIN. 43 SEC. EAST 131.34 FEET TO AN IRON PIN OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 IN A SOUTHERLY DIRECTION FOLLOWING THE CURVATURE THEREOF A DISTANCE OF 282.19 FEET TO A SET IRON ROD, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, SAID IRON ROD BEING LOCATED ON A CHORD BEARING OF SOUTH 38 DEG. 44 MIN. 50 SEC. EAST 282.08 FEET FROM THE TERMINAL POINT OF THE NEXT PRECEDING CALL, SAID IRON ROD BEING THE POINT AND PLACE OF BEGINNING.

THIS BEING THAT CERTAIN PROPERTY DESIGNATED AS "NEW PARCEL "A" 3,484,800 SQ.FT., 80.0 AC", AS SHOWN ON THAT CERTAIN MAP OR PLAT ENTITLED "RECOMBINATION PLAT NEW PARCEL "A" & 2 RESIDUAL PARCELS 5 EXISTING PARCELS", PREPARED BY MATTHEW R. BATTEY, REGISTERED SURVEYOR, DATED APRIL 12, 2016, WHICH MAP OR PLAT IS DULY RECORDED IN PLAT CABINET O, SLIDE 84, CURRITUCK COUNTY REGISTRY.

TRACT 2 - EASEMENT:

BEGINNING AT A SET IRON PIN OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 80.81 FEET IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, FROM AN IRON PIN, SAID IRON PIN BEING LOCATED ON A CHORD BEARING OF SOUTH 42 DEG. 18 MIN. 10 SEC. EAST 80.80 FEET FROM THE BEGINNING POINT, SAID IRON PIN BEING ALSO LOCATED SOUTH 03 DEG. 15 MIN. 04 SEC. WEST 119.38 FEET FROM N.C.G.S. MONUMENT CUR9 N 873,965.67' E 2,937,616.75' NAD 83 (2011); THENCE FROM SAID POINT OF BEGINNING SOUTH 69 DEG. 32 MIN. 44 SEC. WEST 176.98 FEET TO A SET IRON ROD; THENCE SOUTH 69 DEG. 42 MIN. 48 SEC. WEST 352.98 FEET TO A SET IRON ROD; THENCE SOUTH 69 DEG. 45 MIN. 03 SEC. WEST 635.34 FEET TO A SET IRON ROD; THENCE SOUTH 68 DEG. 52 MIN. 31 SEC. WEST 94.93 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 39 MIN. 22 SEC. WEST 175.02 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 40 MIN. 53 SEC. WEST 603.07 FEET TO A SET IRON ROD; THENCE NORTH 36 DEG. 19 MIN. 07 SEC. EAST 75 FEET TO A SET IRON ROD; THENCE NORTH 53 DEG. 40 MIN. 53 SEC. EAST 603.10 FEET TO A CONCRETE MONUMENT; THENCE NORTH 53 DEG. 39 MIN. 22 SEC. EAST 165 FEET TO A SET IRON ROD; THENCE NORTH 68 DEG. 52 MIN. 31 SEC. EAST 84.34 FEET TO A CONCRETE MONUMENT; THENCE NORTH 69 DEG. 45 MIN. 03 SEC. EAST 634.82 FEET TO AN EXISTING IRON ROD; THENCE NORTH 69 DEG. 42 MIN. 48 SEC. EAST 353.09 FEET TO AN IRON ROD OR OTHER MARKER; THENCE NORTH 69 DEG. 32 MIN. 44 SEC. EAST 207.16 FEET TO A SET IRON ROD LOCATED IN THE WEST MARGIN OR RIGHT OF WAY OF THE AFORESAID U.S. 158; THENCE ALONG THE WEST MARGIN OR RIGHT OF WAY OF U.S. 158 IN THE NORTHERLY DIRECTION ALONG THE CURVATURE THEREOF A DISTANCE 80.81 FEET TO A SET IRON ROD, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, SAID IRON ROD BEING LOCATED ON A CHORD BEARING OF NORTH 38 DEG. 44 MIN.

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50 SEC. WEST FROM THE TERMINAL POINT OF THE NEXT PRECEDING CALL, SAID IRON ROD BEING THE POINT AND PLACE OF BEGINNING.

THIS BEING THAT CERTAIN AREA DESIGNATED AS "75' ACCESS EASEMENT", AS SHOWN ON THAT CERTAIN MAP OR PLAT ENTITLED "RECOMBINATION PLAT NEW PARCEL "A" & 2 RESIDUAL PARCEL 5 EXISTING PARCELS", PREPARED BY MATTHEW R. BATTEY, REGISTERED SURVEYOR, DATED APRIL 12, 2016, WHICH MAP OR PLAT IS DULY RECORDED IN PLAT CABINET O, SLIDE 84, CURRITUCK COUNTY REGISTRY.

PARCEL 2:

ALL THAT CERTAIN LOT OR PARCEL OF LAND LOCATED IN POPLAR BRANCH TOWNSHIP, CURRITUCK COUNTY, NORTH CAROLINA, ADJOINING THE PROPERTIES NOW OR FORMERLY OWNED BY W. R. GRIGGS AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN EXISTING IRON PIPE LOCATED ON THE SOUTHWEST MARGIN OF THE RIGHT OF WAY OF HIGHWAY US 158, SAID POINT OF BEGINNING BEING LOCATED SOUTH 44 DEG. 15 MIN. 03 SEC. EAST 981.76 FEET FROM THE POINT OF INTERSECTION OF THE SOUTHERN MARGIN OF THE RIGHT OF WAY OF PARK DRIVE AND THE SOUTHWEST MARGIN OF THE RIGHT OF WAY OF HIGHWAY US 158, RUNNING THENCE FROM SAID BEGINNING POINT ALONG THE SOUTH MARGIN OF THE RIGHT OF WAY OF HIGHWAY US 158 NORTH 33 DEG. 39 MIN. 25 SEC. WEST 154.28 FEET TO AN EXISTING IRON PIPE; THENCE ALONG THE PROPERTY LINE OF THE PROPERTY NOW OR FORMERLY OWNED BY W. R. GRIGGS SOUTH 56 DEG. 30 MIN. 15 SEC. WEST 128.12 FEET TO AN EXISTING IRON BAR; THENCE CORNERING AND RUNNING SOUTH 33 DEG. 39 MIN. 25 SEC. EAST 154.28 FEET TO AN EXISTING IRON BAR; THENCE CORNERING AND RUNNING NORTH 56 DEG 30 MIN 15 SEC. EAST 128.12 FEET TO THE POINT OF BEGINNING, SAID PARCEL CONTAINING 19,766.28 SQUARE FEET MORE OR LESS BY CALCULATION.

FOR A MORE PARTICULAR DESCRIPTION, REFERENCE IS MADE TO A MAP OR PLAT MADE FROM A SURVEY BY DONALD E. WOOD, REGISTERED LAND SURVEYOR, OF EASTERN DEVELOPMENT SERVICES, DATED NOVEMBER 4, 1997 ENTITLED "SURVEY FOR DON S. WILLIAMS, PARCEL 127 TAX MAP 124, POPLAR BRANCH TOWNSHIP, CURRITUCK COUNTY, NORTH CAROLINA", WHICH IS INCORPORATED HEREIN BY REFERENCE.

THE ABOVE PARCEL 2 IS ALSO DESCRIBED BY SURVEY METES AND BOUNDS AS FOLLOWS:

BEGINNING AT A IRON ROD LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 363.00' IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79' AND A CHORD BEARING OF N 39° 32' 20" W - 362.76', FROM AN IRON ROD, SAID IRON ROD BEING LOCATED IN 03° 15' 04" E 119.35' FROM N.C.G.S MONUMENT CUR\_ N 873,965.67' E 2,937,616.75' NAD 83 (2011); THENCE FROM SAID POINT OF BEGINNING S 56° 32' 43" W - 131.34' TO AN IRON STAKE; THENCE CORNERING FROM SAID IRON N 33° 36' 57" W - 154.28' TO AN IRON STAKE; THENCE CORNERING FROM SAID IRON N 56° 32' 43" E - 129.03' TO AN IRON ROD IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, THENCE CORNERING FROM SAID IRON 154.32' IN A SOUTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79'

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AND A CHORD BEARING OF S 34° 28' 18" E – 154.30' TO THE POINT OF BEGINNING. SAID PARCEL CONTAINING 19,979.92 SF, 0.46 AC, MORE OR LESS BY CALCULATION.

PARCEL 3:

BEGINNING AT A CONCRETE MONUMENT OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID POINT OF BEGINNING BEING ALSO LOCATED SOUTH 25 DEG. 32 MIN. 35 SEC. EAST FROM THE SOUTHEAST CORNER OF THE HINES COMMERCIAL PARK SUBDIVISION AS RECORDED IN PLAT CABINET H, SLIDE 395, CURRITUCK COUNTY REGISTRY; THENCE FROM SAID POINT OF BEGINNING SOUTH 64 DEG. 27 MIN. 25 SEC. WEST 174.55 FEET TO A SET IRON PIN; THENCE SOUTH 25 DEG. 32 MIN. 35 SEC. EAST 200.00 FEET TO A SET IRON PIN; THENCE NORTH 64 DEG. 27 MIN. 25 SEC. EAST 175.82 FEET TO A SET IRON PIN LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 IN A GENERAL NORTHERLY DIRECTION 200 FEET, MORE OR LESS, THE POINT AND PLACE OF BEGINNING.

REFERENCE IS MADE TO A CERTAIN AREA DESIGNATED AS "N/F BARNHILL CONTRACTING CO. DB 1298, PG. 262" AS SHOWN ON THAT CERTAIN MAP OR PLAT ENTITLED "RECOMBINATION PLAT NEW PARCEL "A" & 2 RESIDUAL PARCELS 5 EXISTING PARCELS", PREPARED BY MATTHEW R. BATTEY, REGISTERED SURVEYOR, DATED APRIL 12, 2016, WHICH MAP OR PLAT IS DULY RECORDED IN PLAT CABINET O, SLIDE 84, CURRITUCK COUNTY REGISTRY.

THE ABOVE PARCEL 3 IS ALSO DESCRIBED BY SURVEY METES AND BOUNDS AS FOLLOWS:

BEGINNING AT A IRON ROD LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 809.81' IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79' AND A CHORD BEARING OF N 35° 09' 45" W – 807.22', FROM AN IRON ROD, SAID IRON ROD BEING LOCATED IN 03° 15' 04" E 119.38' FROM N.C.G.S MONUMENT CUR\_N 873,965.67' E 2,937,616.75' NAD 83 (2011); THENCE FROM SAID POINT OF BEGINNING S 64° 27' 25" W – 175.82' TO AN IRON ROD; THENCE CORNERING FROM SAID IRON N 25° 32' 35" W – 200' TO AN IRON ROD; THENCE CORNERING FROM SAID IRON N 64° 27' 25" E – 174.55' TO AN IRON ROD IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158; THENCE CORNERING FROM SAID IRON, ALONG THE MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, S 25° 32' 35" - 113.87' TO A SET IRON ROD, THENCE 86.14' IN A SOUTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79' AND A CHORD BEARING OF S 26° 23' 12" E - 86.14' TO THE POINT OF BEGINNING. SAID PARCEL CONTAINING 34,946.87 SF, 0.80 AC, MORE OR LESS BY CALCULATION.

PARCEL 4:

BEGINNING AT A POINT, A SET 5/8" REBAR SITUATED AND LYING IN THE SOUTHERN LINE OF LOT 6, BALLAST ROCK COMMERCE CENTER, PHASE II AS DESCRIBED IN PLAT CABINET 1, SLIDE 188 & 189, CURRITUCK COUNTY PUBLIC REGISTRY, SAID BEGINNING POINT ALSO MARKING THE NORTHWESTERNMOST CORNER OF LOT 5, BALLAST ROCK COMMERCE CENTER, PHASE II, PLAT CABINET I, SLIDE 304, CURRITUCK REGISTRY, BEING LOCATED IN

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THE WESTERN LINE OF THAT 120-FOOT RIGHT OF WAY FOR NORTH CAROLINA POWER; RUNNING THENCE FROM SAID BEGINNING POINT S 24 DEG. 41 MIN. 45 SEC. E 200.91 FEET TO A SET 5/8" REBAR; THENCE CONTINUING ALONG THE WESTERN EDGE OF SAID RIGHT OF WAY S 35 DEG. 21 MIN. 01 SEC. E 534.25 FEET TO A SET 5/8" REBAR LOCATED IN THE NORTHERN EDGE OF THAT 60-FOOT RIGHT OF WAY FOR BALLAST ROCK ROAD; THENCE RUNNING S 35 DEG. 21 MIN. 01 SEC. E 60.00 FEET TO A SET 5/8" REBAR LOCATED IN THE SOUTHERN LINE OF THE AFOREMENTIONED RIGHT OF WAY FOR BALLAST ROCK ROAD; CONTINUING ALONG THE WESTERN EDGE OF THAT RIGHT OF WAY FOR NC POWER S 35 DEG. 21 MIN. 01 SEC. E 283.66 FEET TO A SET 5/8" REBAR, SAID POINT BEING A CONTROL CORNER AND BEING SITUATED IN THE SOUTHWESTERN CORNER OF LOT 4A, BALLAST ROCK COMMERCE CENTER, PHASE III, PLAT CABINET I, SLIDE 206, CURRITUCK REGISTRY, AND SAID CONTROL CORNER BEING SITUATED IN THE NORTHWESTERMOST CORNER OF LOT 3, HINES COMMERCIAL PARK, PLAT CAB H, SLIDE 395, CURRITUCK REGISTRY; RUNNING THENCE FROM SAID CONTROL CORNER S 83 DEG. 29 MIN. 05 SEC. W 164.58 FEET TO AN EXISTING CONCRETE MONUMENT; THENCE RUNNING S 83 DEG. 50 MIN. 05 SEC. W 859.13 FEET TO AN EXISTING CONCRETE MONUMENT, A CORNER IN THE LINE OF PROPERTY NOW OR FORMERLY OWNED BY WILBUR GRIGGS; RUNNING THENCE ALONG THE COMMON LINE WITH GRIGGS N 05 DEG. 57 MIN. 34 SEC. E 207.46 FEET TO AN EXISTING IRON PIPE; THENCE N 19 DEG. 49 MIN. 57 SEC. W 318.00 FEET TO AN EXISTING IRON PIPE; THENCE CONTINUING ALONG THE GRIGGS LINE N 74 DEG. 17 MIN. 19 SEC. W 207.79 FEET TO A SET 5/8" REBAR LOCATED IN THE SOUTHWESTERMOST CORNER OF LOT 6, BALLAST ROCK COMMERCE CENTER, PHASE II, PLAT CABINET I, SLIDE 188 & 189, CURRITUCK REGISTRY; THENCE RUNNING ALONG AND WITH THE SOUTHERNMOST LINE OF THE AFOREMENTIONED LOT 6 N 57 DEG. 50 MIN. 25 SEC. E 841.25 FEET TO THE POINT AND PLACE OF BEGINNING. FURTHER REFERENCE BEING MADE TO THAT RESIDUAL PARCEL FOR BALLAST ROCK COMMERCE CENTER, PHASE II, PLAT CABINET I SLIDE 206, CURRITUCK REGISTRY CONTAINING APPROXIMATELY 15.51 ACRES, MORE OR LESS, AND BEING IDENTIFIED AS THAT RESIDUAL PARCEL IN THAT BOUNDARY SURVEY FOR SCHAUBACH RENTALS, LLP PREPARED BY HYMAN ROBEY, DATED AUGUST 24, 2007, AND RECORDED IN PLAT CABINET K, SLIDE 55 OF THE CURRITUCK PUBLIC REGISTRY.

TOGETHER WITH AN EASEMENT FOR INGRESS, EGRESS AND REGRESS TO AND FROM U.S. HIGHWAY 158 AS SHOWN AND DESIGNATED "BALLAST ROCK ROAD", A SIXTY (60) FOOT RIGHT OF WAY, ON MAP OR PLAT BY HYMAN & ROBEY, P.C. ENTITLED "PHASE II, EXEMPT SUBDIVISION & RECOMBINATION FOR BALLAST ROCK COMMERCE CENTER, POPLAR BRANCH TOWNSHIP, CURRITUCK COUNTY, NORTH CAROLINA", RECORDED IN CURRITUCK COUNTY REGISTRY AT PLAT CABINET I, SLIDE 188.

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## Limited Liability Company

### Legal Name

H2OBX, LLC

### Information

**SosId:** 1915198

**Status:** Current-Active ⓘ

**Date Formed:** 11/8/2019

**Citizenship:** Foreign

**State of Incorporation:** DE

**Annual Report Due Date:** April 15th

**Current Annual Report Status:**

**Registered Agent:** Malarney, Jeffrey

### Addresses

#### Principal Office

13 Green Mountain Drive  
Cohoes, NY 12047

#### Reg Office

4112 N. Croatan Highway  
Kitty Hawk, NC 27949

#### Reg Mailing

4112 N. Croatan Highway  
Kitty Hawk, NC 27949

#### Mailing

PO Box 648  
Cohoes, NY 12047

## Company Officials

All LLCs are managed by their managers pursuant to N.C.G.S. 57D-3-20.

**Managing Member**

Arthur B Berry , III  
35A Moorings  
Key Largo FL 33037

**General Manager**

Damian Dondero  
132 W Holly Trail  
Southern Shores NC 27949

**Managing Member**

Kenneth Ellis  
1 E Ridge Rd  
Loudonville NY 12211

**Authorized Representative**

Jeff Malarney  
PO Box 928 4112 N. Croatan Highway  
Kitty Hawk NC 27949

**Chief Financial Officer**

Kristin Renchkovsky  
13 Green Mountain Dr.  
Cohoes NY 12047

DRAFT

September 25, 2024

Allen Clark  
**NCDEQ Water Quality**  
Washington Regional Office  
943 Washington Square Mall  
Washington, NC 27889

Re: Fast Track Sewer System Extension Application (FTA 10-23)  
**H2OBX RV Park**  
**H2OBX, LLC**  
Powells Point, Currituck County, NC

Dear Mr. Clark,

On behalf of H2OBX, LLC, WithersRavenel, hereby submits, for your review and approval, a Fast Track Sewer System Extension Application package for the above referenced project. The applicant is proposing to develop a 248 Site RV Park and associated amenities in Powells Point, Currituck County, North Carolina. A collection system has been designed in accordance with 15A NCAC 02T, the Minimum Design Criteria for the Permitting of Pump Stations and Force Mains, and the Gravity Sewer Minimum Design Criteria.

The wastewater flow from the proposed waterpark will be conveyed to the existing wastewater treatment plant (WQ0038695). The existing capacity of the wastewater treatment plant and associated high-rate infiltration area is 60,000 GPD and the current actual flow plus the proposed flow from the RV park is less than 60,000 GPD.

The following is attached and shall be considered part of this package:

1. One (1) original and one (1) copy of the Fast Track Application (FTA 10-23);
2. Review fee check in the amount of \$600.00 made payable to NCDEQ;
3. One (1) copy of the project narrative;
4. One (1) copy of the North Carolina Secretary of State Corporation Information;
5. One (1) original and one (1) copy of the Flow Tracking/Acceptance for Sewer Extension Applications (FTSE 10-23);
6. Two (2) copies of the USGS Topographic Map with project area identified;
7. Two (2) copies of the Developers Operational Agreement;
8. One (1) original and one (1) copy of the Watershed Classification Attachment (WSCAS 08-13);
9. Two (2) copies of the pump station calculations.

Please do not hesitate to contact Cathleen M. Saunders, P.E. at 252.491.8147 should you have any questions and/or concerns. Thank you for your attention to this project.

Sincerely,  
**WithersRavenel**

Cathleen M. Saunders, P.E.

Encl: as stated  
Cc: H2OBX, LLC;  
File



**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 INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE APPROPRIATE REGIONAL OFFICE:**

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

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: H2OBX, LLC (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: Kenneth Ellis per 15A NCAC 02T .0106(b)  
Title: CEO
4. Applicant's mailing address: 13 Green Mountain Drive  
City: Cohoes State: NY Zip: 12047- \_\_\_\_\_
5. Applicant's contact information:  
Phone number: (518) 369-2422 Email Address: kene@aquaticgroup.com

**II. PROJECT INFORMATION:**

1. Project name: H2OBX RV Park
2. Application/Project status:  Proposed (New Permit)  Existing Permit/Project  ARPA funded  
If a modification, provide the existing permit number: WQ00N/A and issued date: N/A,  
**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: WQ000
3. County where project is located: Currituck
4. Approximate Coordinates (Decimal Degrees): Latitude: 36.111492° Longitude: -75.830476°
5. Parcel ID (if applicable): 0124000137L0000 (or Parcel ID to closest downstream sewer)

**III. CONSULTANT INFORMATION:**

1. Professional Engineer: Cathleen M. Saunders, P.E. License Number: 04365  
Firm: WithersRavenel, inc  
Mailing address: PO Drawer 870  
City: Kitty Hawk State: NC Zip: 27949- \_\_\_\_\_  
Phone number: (252) 491-8147 Email Address: csaunders@withersravenel.com

**IV. WASTEWATER TREATMENT FACILITY (WWTF) INFORMATION:**

1. Facility Name: H2OBX Waterpark WWTP Permit Number: WQ0038695  
Owner Name: H2OBX, LLC

**V. RECEIVING DOWNSTREAM SEWER INFORMATION:**

1. Permit Number(s): WQN/A
2. Downstream (Receiving) Sewer Information: N/A inch  Gravity  Force Main
3. System Wide Collection System Permit Number(s) (if applicable): WQCSN/A  
Owner Name(s): N/A

**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):

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Residential (Individually Owned) | <input type="checkbox"/> Retail (stores, centers, malls)                 | <input type="checkbox"/> Car Wash                           |
| <input type="checkbox"/> Residential (Leased)             | <input checked="" type="checkbox"/> Retail with food preparation/service | <input type="checkbox"/> Hotel and/or Motels                |
| <input type="checkbox"/> School / preschool / day care    | <input type="checkbox"/> Medical / dental / veterinary facilities        | <input checked="" type="checkbox"/> Swimming Pool/Clubhouse |
| <input type="checkbox"/> Food and drink facilities        | <input type="checkbox"/> Church  | <input type="checkbox"/> Swimming Pool/Filter Backwash      |
| <input type="checkbox"/> Businesses / offices / factories | <input type="checkbox"/> Nursing Home                                    | <input type="checkbox"/> Other (Explain in Attachment)      |

5. Nature of wastewater : 95 % Domestic 5 % 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 <sup>a,b</sup> | No. of Units | Flow       |
|--------------------------------------|----------------------------------|--------------|------------|
| RV Campsites                         | 100 gal/site                     | 198          | 19,800 GPD |
| Park Model                           | 100 gal/Seat                     | 50           | 5,000 GPD  |
| Washing Machine                      | 500 gal/Machine                  | 4            | 2,000 GPD  |
| Barstools                            | 20 gal/Barstool                  | 20           | 400 GPD    |
|                                      | gal/                             |              | GPD        |
|                                      | gal/                             |              | GPD        |
|                                      |                                  | <i>Total</i> | 27,200 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: 27,200 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: N/A Issuance Date: N/A

Rehabilitation or replacement of existing sewers with no new flow expected

Other (Explain): N/A

**VII. GRAVITY SEWER DESIGN CRITERIA (If Applicable) - [02T .0305](#) & [MDC \(Gravity Sewers\)](#):**

1. Summarize gravity sewer to be permitted:

| Size (inches) | Length (feet) | Material |
|---------------|---------------|----------|
| 10"           | 1,237         | SDR 35   |
| 8"            | 6,753         | SDR 35   |
|               |               |          |
|               |               |          |
|               |               |          |
|               |               |          |

- 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: 2
2. Approximate Coordinates (Decimal Degrees): Latitude: 36.112110° Longitude: -75.832438°
3. Total number of pumps at the pump station: 2
3. Design flow of the pump station: 0.01740 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): \_\_\_\_\_ gallons per minute (GPM) at \_\_\_\_\_ feet total dynamic head (TDH)
5. Summarize the force main to be permitted (for this Pump Station):

| Size (inches) | Length (feet) | Material   |
|---------------|---------------|------------|
| 4"            | 686           | C-900 DR18 |
|               |               |            |
|               |               |            |

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) N/A

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           |
| <sup>2</sup> Water mains (vertical - water over sewer preferred, including in benched trenches)  | 18 inches           |
| <sup>2</sup> 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: Pasquotank  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.**

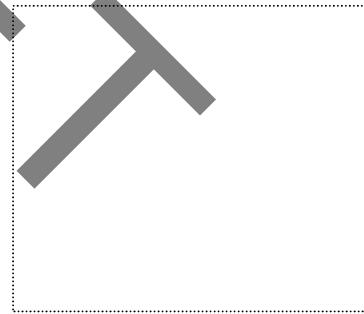
2. Professional Engineer's Certification:

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: \_\_\_\_\_

**VII. GRAVITY SEWER DESIGN CRITERIA (If Applicable) - [02T .0305](#) & [MDC \(Gravity Sewers\)](#):**

1. Summarize gravity sewer to be permitted:

| Size (inches) | Length (feet) | Material |
|---------------|---------------|----------|
| 10"           | 1,237         | SDR 35   |
| 8"            | 6,753         | SDR 35   |
|               |               |          |
|               |               |          |
|               |               |          |
|               |               |          |

- 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: 3
2. Approximate Coordinates (Decimal Degrees): Latitude: 36.115502° Longitude: -75.833238°
3. Total number of pumps at the pump station: 2
3. Design flow of the pump station: 0.00980 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): !!!! gallons per minute (GPM) at !!!! feet total dynamic head (TDH)
5. Summarize the force main to be permitted (for this Pump Station):

| Size (inches) | Length (feet) | Material   |
|---------------|---------------|------------|
| 4"            | 501           | C-900 DR18 |
|               |               |            |
|               |               |            |

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) N/A

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.



**WithersRavenel**  
Our People. Your Success.



# Sewer System Extension Narrative

## H2OBX RV Park

Washington Regional Office

## Owner Name

Prepared For:  
H2OBX, LLC  
13 Green Mountain Drive  
Cohoes, NY 12047  
Kenneth Ellis  
Kene@aquaticgroup.com  
518-369-2422

Prepared By:  
WithersRavenel  
8466 Caratoke Highway  
Powells Point, NC 27966  
(252) 491-8147  
License No.: F-1479

WithersRavenel Project No. 24-0941

September 25, 2024

---

Cathleen M. Saunders, P.E.  
John J. Corcella, E.I.

## General

H2OBX, LLC is proposing to construct a 248 site RV Park with associated amenities including an amenity center and bathhouse in Powells Point, Currituck County, North Carolina. The wastewater generated from the operation and use of the proposed RV Park will be collected and conveyed to the proposed wastewater treatment plant designed to serve the waterpark. The wastewater treatment plant is currently permitted by NCDEQ Division of Water Resources, WQ0038695.

## Origin of Wastewater

The origin of the wastewater includes 248 RV/Modular Camp sites, an amenity center with a swimming pool/clubhouse and a bathhouse. The proposed total flow generated by this project is calculated as follows:

|  |            |
|--|------------|
| 248 RV/Modular Sites @ 100 GPD/Site =  | 24,800 GPD |
| 4 Washing Machines @ 500 GPD/Machine = | 2,000 GPD  |
| 20 Barstools @ 20 GPD/Barstool =       | 400 GPD    |
| Total Flow =                           | 27,200 GPD |

## Wastewater Treatment Facility

The existing Wastewater Treatment Plant is permitted at a flow of 60,000 GPD.

• File an Annual Report/Amend an Annual Report • Upload a PDF Filing • Order a Document Online • Add Entity to My Email Notification List • View Filings • Print a Pre-Populated Annual Report form • Print an Amended a Annual Report form

## Limited Liability Company

### Legal Name

H2OBX, LLC

### Information

**SosId:** 1915198

**Status:** Current-Active ⓘ

**Date Formed:** 11/8/2019

**Citizenship:** Foreign

**State of Incorporation:** DE

**Annual Report Due Date:** April 15th

**Current Annual Report Status:**

**Registered Agent:** Malarney, Jeffrey

### Addresses

#### Principal Office

13 Green Mountain Drive  
Cohoes, NY 12047

#### Reg Office

4112 N. Croatan Highway  
Kitty Hawk, NC 27949

#### Reg Mailing

4112 N. Croatan Highway  
Kitty Hawk, NC 27949

#### Mailing

PO Box 648  
Cohoes, NY 12047

## Company Officials

All LLCs are managed by their managers pursuant to N.C.G.S. 57D-3-20.

**Managing Member**

Arthur B Berry , III  
35A Moorings  
Key Largo FL 33037

**General Manager**

Damian Dondero  
132 W Holly Trail  
Southern Shores NC 27949

**Managing Member**

Kenneth Ellis  
1 E Ridge Rd  
Loudonville NY 12211

**Authorized Representative**

Jeff Malarney  
PO Box 928 4112 N. Croatan Highway  
Kitty Hawk NC 27949

**Chief Financial Officer**

Kristin Renchkovsky  
13 Green Mountain Dr.  
Cohoes NY 12047

DRAFT





III. Certification Statement:

I \_\_\_\_\_ 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.

\_\_\_\_\_  
*Signing Official Signature*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Title of Signing Official*

DRAFT

**PLANNING ASSESSMENT ADDENDUM (PAA)**

Submit a planning assessment addendum for each pump station listed in Section II where Available Capacity is  $\leq 0$ .

Pump Station (Name or Number):

**Given that:**

- a. The proportion and amount of Obligated, Not Yet Tributary Daily Flow (C) accounts for \_\_\_\_\_ % and \_\_\_\_\_ MGD of the Available Capacity (E) in Pump Station \_\_\_\_\_; and that \_\_\_\_\_
- b. The rate of activation of this obligated, not yet tributary capacity is currently approximately \_\_\_\_\_ MGD per year; and that \_\_\_\_\_
- c. A funded Capital Project that will provide the required planned capacity, namely \_\_\_\_\_ is in design or under construction with planned completion in \_\_\_\_\_; and/or \_\_\_\_\_
- d. The following applies:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Therefore:**

Given reasonably expected conditions and planning information, there is sufficient justification to allow this flow to be permitted, without a significant likelihood of over-allocating capacity in the system infrastructure.

I understand that this does not relieve the collection system owner from complying with G.S. 143-215.67(a) which prohibits the introduction of any waste in excess of the capacity of the waste disposal system.

\_\_\_\_\_  
*Signing Official Signature*

\_\_\_\_\_  
*Date*

## Instructions for Flow Tracking form (FTSE) and Planning Assessment Addendum (PAA)

### Section I

- a. WWTP Facility Name: Enter the name of the WWTP that will receive the wastewater flow.
- b. WWTP Facility Permit #: Enter the NPDES or Non-Discharge number for the WWTP receiving the wastewater flow.
- c. WWTP facility's permitted flow, MGD: From WWTP owner's NPDES or Non-Discharge permit.
- d. Estimated obligated flow not yet tributary to the WWTP, MGD: This includes flows allocated to other construction projects not yet contributing flow to the collection system. Flows allocated through interlocal agreements or other contracts not yet contributing flow to the collection system are also included. For POTWs that implement a pretreatment program, include flows allocated to industrial users who may not be using all of their flow allocation. Please contact your Pretreatment Coordinator for information on industrial flow tributary to your WWTP.

As of January 15, 2008 the POTW should have reviewed flow allocations made over the last two years and reconciled their flow records, to the best of their ability, so it is known how much flow has been obligated and is not yet been made tributary to the WWTP, in accordance with local policies and procedures employed by the reporting entity.

- e. WWTP facility's actual avg. flow, MGD: Previous 12 month average.
- f. Total flow for this specific request, MGD: Enter the requested flow volume.
- g. Total actual and obligated flows to the facility, MGD Equals  $[d + e + f]$
- h. Percent of permitted flow used: Equals  $[(g / c) * 100]$

For example:

On January 15 a POTW with a permitted flow of 6.0 MGD, reported to the Regional Office that there is 0.5 MGD of flow that is obligated but not yet tributary. The annual average flow for 2007 is 2.7 MGD. There is a proposed flow expansion of 0.015 MGD.

The first Form FTSE submitted after January 15, 2008 may have numbers like this:

- c. = 6.0 MGD
- d. = 0.5 MGD
- e. = 2.7 MGD
- f. = 0.015 MGD
- g. = 3.215 MGD
- h. = 53.6 %

The next Form FTSE may be updated like this with a proposed flow expansion of 0.102 MGD:

- c. = 6.0 MGD
- d. = 0.515 MGD
- e. = 2.73 MGD
- f. = 0.102 MGD
- g. = 3.349 MGD
- h. = 55.8 %

Each subsequent FTSE form will be updated in the same manner.

**Section II**

List the pump station name or number and approximate pump station firm capacity, approximate design average daily flow (A) approximate current average daily flow (B), and the obligated, not yet tributary flow through the pump station (C) for each pump station that will be impacted by the proposed sewer extension project. Calculate the total current flow plus obligated flow (D=B+C) and the available capacity (E=A-D). Include the proposed flow for this project with other obligated flows that have been approved for the pump station but are not yet tributary (C).

Firm capacity is the maximum pumped flow that can be achieved with the largest pump out of service as per the Minimum Design Criteria.

Design Average Daily Flow is the firm capacity of the pump station divided by a peaking factor (pf) of not less than 2.5.

If the available capacity (E) for any pump station is  $\leq 0$ , then prepare a planning assessment for that pump station if the system has future specific plans related to capacity that should be considered in the permitting process.

|                                  |                         | (A)  | (B)   | (C)  | (D)=(B+C)                                       | (E)=(A-D)              |
|----------------------------------|-------------------------|--|---|--|---|------------------------|
| Pump Station<br>(Name or Number) | Firm<br>Capacity<br>MGD | Design<br>Average<br>Daily Flow<br>(Firm / pf) | Approx.<br>Current Avg.<br>Daily Flow,<br>MGD | Obligated,<br>Not Yet<br>Tributary<br>Daily Flow,<br>MGD | Total Current<br>Flow Plus<br>Obligated<br>Flow | Available<br>Capacity* |
| Kaw Creek PS                     | 0.800                   | <b>0.320</b>                                   | 0.252   | 0.080  | 0.332   | -0.012                 |
| Valley Road PS                   | 1.895                   | 0.758  | 0.472   | 0.135  | 0.607   | 0.151                  |

### **Planning Assessment Addendum Instructions**

Submit a planning assessment addendum for each pump station listed in Section II where available capacity is  $\leq 0$ .

A planning assessment for Kaw Creek PS (see example data above) may be performed to evaluate whether there is significant likelihood that needed improvements or reductions in obligated flows will be in place prior to activating the flows from the proposed sewer extension project.

If the system decides to accept the flow based on a planning assessment addendum, it is responsible to manage the flow without capacity related sanitary overflows and must take all steps necessary to complete the project or control the rate of flow to prevent sanitary sewer overflows.

The planning assessment may identify a funded project currently in design or construction, or a planned project in the future not yet funded but in a formal plan adopted by the system. The system should carefully weigh the certainty of successful timely project completion for any expansion, flow management diversion or infiltration and inflow elimination projects that are the foundation of a planned solution to capacity tracking and acceptance compliance.

For example:

**Given that:**

- a. The proportion and amount of obligated, not yet tributary flow accounts for 24 % and 0.080 MGD of the committed flow in Pump Station Kaw Creek; and that
- b. The rate of activation of this obligated, not yet tributary capacity is currently approximately 0.01 MGD per year; and that
- c. A funded capital project that will provide the required planned capacity, namely \_\_\_\_\_ is in design or under construction with planned completion in \_\_\_\_\_; and/or
- d. The following applies:

The master plan and ten year capital plan contain recommended scope and funding for a capital project entitled Kaw Creek Pump Station upgrade with funding planned in July 2014. This project is planned to add 0.100 MGD to the firm capacity of the pump station by October 2015. Inclusion of this proposed capital project as a condition of this Flow Tracking/Acceptance for Sewer Extension Permit Application elevates this project's priority for funding and construction to be implemented ahead of the activation of obligated, not yet tributary flows in amounts that exceed the firm pump station capacities identified in Section II above.

**Therefore:**

Given reasonably expected conditions and planning information, there is sufficient justification to allow this flow to be permitted, without a significant likelihood of over-allocating capacity in the system infrastructure.

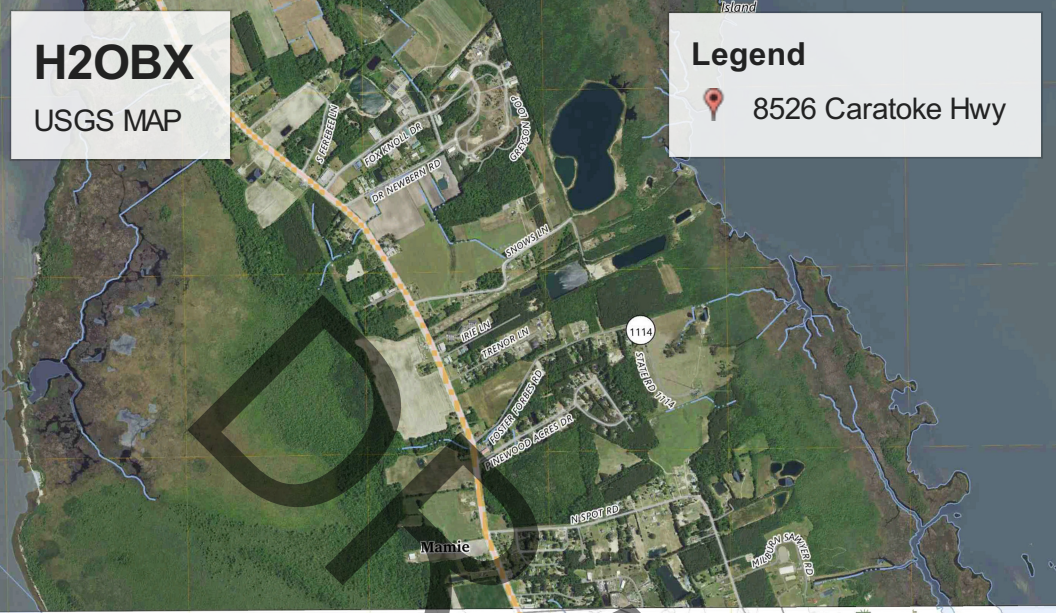
# H2OBX

USGS MAP

## Legend



8526 Caratoke Hwy



Google Earth



GRIGGS ALLEY  
NEW BEACH

DEVELOPER'S OPERATIONAL AGREEMENT

This AGREEMENT made pursuant to G.S. 143-215.1 (d1) and entered into this \_\_\_\_\_ day of \_\_\_\_\_, by and between the North Carolina Environmental Management Commission, an agency of the State of North Carolina, hereinafter known as the COMMISSION; and H2OBX, LLC, a corporation/general partnership registered/licensed to do business in the State of North Carolina, hereinafter known as the DEVELOPER.

## WITNESSETH:

1. The DEVELOPER is the owner of the certain lands lying in Currituck County County, upon which it is erecting and will erect dwelling units and other improvements, said development to be known as H2OBX RV Park (hereinafter the Development).
2. The DEVELOPER desires, to construct a wastewater collection system with pumps, wastewater treatment works, and/or disposal facilities (hereinafter Disposal System) to provide sanitary sewage disposal to serve the Development on said lands.
3. The DEVELOPER has applied to the COMMISSION for the issuance of a permit pursuant to G.S. 143-215.1 to construct, maintain, and operate the Disposal System.
4. The DEVELOPER has created or shall create unit ownership in said dwellings units, other improvements and lands through filing of a Declaration of Unit Ownership (hereinafter Declaration), pursuant to Chapter 47C or 47F of the North Carolina General Statutes.
5. The DEVELOPER has caused to be formed or will cause to be formed at the time of filing of the Declaration, (Unit Owners Association) (hereinafter Association), a non-profit corporation organized and existing under and by the virtue of the laws of the State of North Carolina, for the purpose, among others, of handling the property, affairs and business of the Development; of operating, maintaining, re-constructing and repairing the common elements of the lands and improvements subject to unit ownership, including the Disposal System; and of collecting dues and assessments to provide funds for such operation, maintenance, re-construction and repair.
6. The COMMISSION desires to assure that the Disposal System of the Development is properly constructed, maintained and operated in accordance with law and permit provisions in order to protect the quality of the waters of the State and the public interest therein.

NOW, THEREFORE, in consideration of the promises and the benefits to be derived by each of the parties hereto, the COMMISSION and DEVELOPER do hereby mutually agree as follows:

1. The DEVELOPER shall construct the Disposal System in accordance with the permit and plans and specifications hereafter issued and approved by the COMMISSION, and shall thereafter properly operate and maintain such systems and facilities in accordance with applicable permit provisions and law.
2. The DEVELOPER shall not transfer ownership and/or control of the Disposal System to the Association until construction has been completed in accordance with the permit and approved plans, and the staff of the Division of Water Resources has inspected and approved of the facilities. In order to change the name of the permit holder, the DEVELOPER must request that the permit be reissued to the Association. The request must include a copy of the Association Bylaws and Declaration.
3. The DEVELOPER shall not transfer, convey, assign or otherwise relinquish or release its responsibility for the operation and maintenance of its Disposal System until a permit has been reissued to the DEVELOPER's successor.



4. The DEVELOPER shall provide in the Declaration and Association Bylaws that the Disposal System and appurtenances thereto are part of the common elements and shall thereafter be properly maintained and operated in conformity with law and the provisions of the permit for construction, operation, repair, and maintenance of the system and facilities. The Declaration and Bylaws shall identify the entire wastewater treatment, collection and disposal system as a common element which will receive the highest priority for expenditures by the Association except for Federal, State, and local taxes and insurance.
5. The DEVELOPER shall provide in the Declaration and Association Bylaws that the Disposal System will be maintained out of the common expenses. In order to assure that there shall be funds readily available to repair, maintain or construct the Disposal System, beyond the routine operation and maintenance expenses, the Declaration and Association Bylaws shall provide that a fund be created out of the common expenses. Such fund shall be separate from the routine maintenance funds allocated for the facility and shall be part of the yearly budget.
6. In the event the common expense allocation and separate fund are not adequate for the construction, repair, and maintenance of the Disposal System, the Declaration and Association Bylaws shall provide for special assessments to cover such necessary costs. There shall be no limit on the amount of such assessments, and the Declaration and Bylaws shall provide that such special assessments can be made as necessary at any time.
7. If a wastewater collection system and wastewater treatment and/or disposal facility provided by any city, town, village, county, water and sewer authorities, or other unit of government shall hereinafter become available to serve the Development, the DEVELOPER shall take such action as is necessary to cause the existing and future wastewater of the Development to be accepted and discharged into said governmental system, and shall convey or transfer as much of the Disposal System and such necessary easements as the governmental unit may require as condition of accepting the Development's wastewater.
8. Recognizing that it would be contrary to the public interest and to the public health, safety and welfare for the Association to enter into voluntary dissolution without having made adequate provision for the continued proper maintenance, repair and operation of its Disposal System, the DEVELOPER shall provide in the Association Bylaws that the Association shall not enter into voluntary dissolution without first having transferred its said system and facilities to some person, corporation or other entity acceptable to and approved by the COMMISSION by the issuance of a permit.
9. The agreements set forth in numbered paragraphs 1, 2, 3, 4, 5, 6, 7, and 8 above shall be conditions of any permit issued by the COMMISSION to the DEVELOPER for the construction, maintenance, repair and operation of the Disposal System.
10. A copy of this agreement shall be filed at the Register of Deeds in the County(ies) where the Declaration is filed and in the offices of the Secretary of State of North Carolina with the Articles of Incorporation of the Association.

IN WITNESS WHEREOF, this agreement was executed in duplicate originals by the duly authorized representative of the parties hereto on the day and year written as indicated by each of the parties named below:

\_\_\_\_\_  
 Michael Montebello  
 Supervisor, NPDES Branch Chief  
 Division of Water Resources

\_\_\_\_\_  
 (Date)

H2OBX, LLC  
 \_\_\_\_\_  
 Name of DEVELOPER

By: \_\_\_\_\_  
 (Signature)

\_\_\_\_\_  
 Print Name and Title

\_\_\_\_\_  
 (Date)

**State of North Carolina**  
**Department of Environment and Natural Resources**  
**Division of Water Quality**  
**WATERSHED CLASSIFICATION ATTACHMENT**  
(FORM: WSCA 08-13)

*(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)*

**The Division of Water Resources will not accept this attachment form unless all the instructions are followed. Failure to submit all required items will lead to additional processing and review time.**

*For more information, visit our web site at: <http://portal.ncdenr.org/web/wq/aps/lau>.*

**INSTRUCTIONS TO THE APPLICANT:**

**A. Attachment Form:**

- ✓ **Do not submit this attachment form for review without a corresponding program application form.**
- ✓ Any changes to this attachment form will result in the application package being returned.

**B. Prepare the attachment form with the requested information for each land application site.**

- ✓ Additional copies of Page 5 of 5 of this attachment form may be used if necessary.
- ✓ Use a portion of an 8.5-inch by 11-inch copy of the portion of a 7.5-minute USGS Topographic Map to identify the location where the residuals program activities are planned to occur as well as the closest downslope surface waters as clearly as possible. Each map portion must be labeled with the map name and number, the identified location, and be of clear and reproducible quality.
- ✓ Latitudes and longitudes must be reported as being based on either the NAD 27 or the NAD 83 data systems.
- ✓ Acceptable methods of determining location latitudes and longitudes and their corresponding codes are as follows:

- |  |   |
|--|---|
| ◆ Address Matching (ADD)                                   | ◆ Digital or Raw Photo Extraction (EXT) |
| ◆ Aerial Photography with Ground Control (AER)             | ◆ Geodetic Quality GPS Survey (GEO)     |
| ◆ Cadastral Survey (SUR)                                   | ◆ LORAN-C Navigation Device (LOR)       |
| ◆ Conversion from Coordinate Plane (CP)                    | ◆ Navigation Quality GPS (GPS)          |
| ◆ Conversion from Township-Section-Range (TSR)             | ◆ Remote Sensing (RS)                   |
| ◆ Conversion from Universal Trans Merc (UTM)               | ◆ Zip Code Centroid (ZIP)               |
| ◆ Map Interpretation by Digital or Manual Extraction (MAP) |   |

- ✓ Location accuracy must be provided to the nearest unit (e.g., nearest second, tenth of a second, etc.).

**C. Fill in all required information, including waterbody and classifications information.**

- ✓ Surface water body classifications information may be found at: <http://portal.ncdenr.org/web/wq/ps/csu>.
- ✓ Any questions concerning the waterbody and its classification, please contact the Division's regional offices.
- ✓ A list of the Division's regional offices, their county coverage, and their contact information may be downloaded from the web site at: <http://portal.ncdenr.org/web/wq/home/ro>.

**\*\*\*INSTRUCTIONS CONTINUE ON NEXT PAGE\*\*\***

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## D. General Instructions

There are 17 river basins in North Carolina. Each basin has associated waterbodies with assigned subbasins, location descriptions, stream index numbers and established classifications.

1. Identify the project area on a 7.5 minute USGS topographical map (an 8.5" x 11" sheet showing the project area should be submitted with the permit application regardless of whether a Stream classification was completed).
2. Determine the names of all the closest down slope surface waters from the project site. For unnamed tributaries, see Table 1: Unnamed Tributaries Entering Other States or for Specific Basin Areas. Label any unnamed tributaries as "UT to *stream name*" as the waterbody name Watershed Classification Attachment (FORM: WSCA 10-06).
3. Open the link <http://h2o.enr.state.nc.us/bims/reports/reportsWB.html> (Figure 1). [If this link does not work, open <http://h2o.enr.state.nc.us/> and select Classifications from the Streams, Rivers, Lakes and Estuaries list. Then select NC Stream Classification Schedules (BIMS).

Basinwide Information Management System BIMS

North Carolina Waterbodies Reports:

Please note: Reports are updated weekly and available here in PDF format which can be viewed/printed using Acrobat Reader.

|  |     |
|--|-----|
| List all waterbodies in Neuse Basin sorted Alphabetically                        | Go! |
| List all waterbodies in Chowan county, hydrologically                            | Go! |
| List all waterbodies in 03-01-01 subbasin, hydrologically                        | Go! |
| Clickable basin map to alphabetically sorted list                                | Go! |
| Clickable basin map to hydrologically sorted list                                | Go! |
| Short Descriptions of Stream Classifications (see Rules for longer descriptions) | Go! |
| Descriptions of Special Designations   | Go! |

Figure 1 North Carolina Waterbody Reports Web Page

## E. STREAM CLASSIFICATION PROCESS

One of the options below may be used depending on the known initial project information.

### ☒ KNOWN BASIN WHERE CLOSEST DOWN SLOPE SURFACE WATER IS LOCATED

1. Select proper basin from the List all Waterbodies in  Basin sorted  report. Sort hydrologically as this will provide the proper location descriptions if multiple runs.
2. Locate the name of the identified waterbody (from General Directions) on the list.

3. For multiple listings of the same waterbody name in the report, select and verify the location description. The term "source" in the description means the beginning of the waterbody segment (most upstream point).
4. Record all Basins, Stream Index Numbers and Classifications applicable to the project in Watershed Classification Attachment (FORM: WSCA 10-06).

**☒ KNOWN COUNTY WHERE CLOSEST DOWN SLOPE SURFACE WATER IS LOCATED**

1. Select the proper county from the List all Waterbodies in  county, hydrologically report.
2. Locate the name of the identified waterbody (from General Directions) on the list.
3. For multiple listings of the same waterbody name in the report, select and verify the location description. The term "source" in the description means the beginning of the waterbody segment (most upstream point).
4. Record all Basins, Stream Index Numbers and Classifications applicable to the project in Watershed Classification Attachment (FORM: WSCA 10-06).

**☒ UNKNOWN BASIN WHERE CLOSEST DOWN SLOPE SURFACE WATER IS LOCATED**

1. Use the Clickable basin map to hydrologically sorted list report.
2. Click on the approximate project location to bring up the hydrologically sorted list.
3. Locate the name of the identified waterbody (from General Directions) on the list.
4. For multiple listings of the same waterbody name in the report, select and verify the location description. The term "source" in the description means the beginning of the waterbody segment (most upstream point).
5. Record all Basins, Stream Index Numbers and Classifications applicable to the project in Watershed Classification Attachment (FORM: WSCA 10-06).

**F. NOTES ON INDEX NUMBER AND UNNAMED STREAMS**

Unnamed Streams 15A NCAC 02B .0301(i).

- Any stream which is not named in the schedule of stream classifications carries the same classification as that assigned to the stream segment to which it is tributary (at the point of entry) except:
  - (A) unnamed streams specifically described in the schedule of classifications;
  - (B) unnamed freshwaters tributary to tidal saltwaters will be classified "C"; or
  - (C) after November 1, 1986, any newly created areas of tidal saltwater which are connected to Class SA waters by approved dredging projects will be classified "SC" unless case-by-case reclassification proceedings are conducted.
- The following river basins have different policies for unnamed streams entering other states or for specific areas of the basin (Table 1: Unnamed Tributaries Entering Other States or for Specific Basin Areas.)

| <b>Table 1: Unnamed Tributaries Entering Other States or for Specific Basin Areas</b> |  |
|---|--|
| Hiwassee River Basin  | Streams entering Georgia or Tennessee shall be classified "C Tr."  |
| Little Tennessee River Basin And Savannah River Drainage Area                         | Streams entering Georgia or Tennessee shall be classified "C Tr." Such streams in the Savannah River drainage area entering South Carolina shall be classified "B Tr."   |
| French Broad River Basin  | Streams entering Tennessee will be classified "B."   |
| Watauga River Basin   | Streams entering the State of Tennessee are classified "C."  |
| Broad River Basin   | Streams entering South Carolina are classified "C."  |
| New River Basin   | Streams entering the State of Tennessee are classified "C."  |
| Catawba River Basin   | Streams entering South Carolina are classified "C."  |
| Yadkin-Pee Dee River Basin  | Streams entering Virginia are classified "C," and such streams entering South Carolina are classified "C."   |
| Lumber River Basin  | Streams entering South Carolina are classified "C Sw."   |
| Roanoke River Basin   | Streams entering Virginia are classified "C." Except that all backwaters of John H. Kerr Reservoir and the North Carolina portion of streams tributary thereto not otherwise named or described shall carry the classification "B," and all backwaters of Lake Gaston and the North Carolina portion of streams tributary thereto not otherwise named or described shall carry the classification "C and B." |
| Chowan River Basin  | Streams entering Virginia are classified "C."  |
| Tar-Pamlico River Basin   | All drainage canals not noted in the schedule are classified "C Sw," except the main drainage canals to Pamlico Sound and its bays which shall be classified "SC."   |
| Pasquotank River Basin  | All drainage canals not noted in the schedule are classified "C."  |

**Contact the appropriate Division of Water Resources regional office for assistance with these instructions.**



September 25, 2024

Review Engineer  
NCDEQ, Public Water Supply – Washington Regional Office  
North Carolina Department of Environmental Quality  
943 Washington Square Mall  
Washington, NC 27889

**RE:** Application for Approval of Engineering Plans and Specifications  
**H2OBX RV Park**  
Powells Point, Currituck County, NC

To Whom it Concerns,

On behalf of H2OBX, LLC WithersRavenel hereby submits for your review and approval an *Application for Approval of Engineering Plans and Specifications for Water Supply Systems* for the above referenced project located in Powells Point, Currituck County.

Currituck Co – Mainland proposes to install approximately 11.4 LF of 6" C-900 waterline extension and RPZ to serve a proposed RV Park.

The following items are included and shall be considered part of this submittal package:

1. One (1) review fee in the amount of \$300.00 made payable to "NCDEQ, PWSS";
2. One (1) copy of the Application for Approval for Water Supply Systems;
3. One (1) copy of the Engineer's Report;
4. One (1) copy of the Plan Set;

Please do not hesitate to contact me at (252) 491-8147 or [csaunders@withersravenel.com](mailto:csaunders@withersravenel.com) should you have any questions or require any additional information.

Thank you for your attention to this project.

Sincerely,  
WithersRavenel

Cathleen M. Saunders. P.E.  
CC:



**North Carolina Department of Environmental Quality  
Division of Water Resources  
Public Water Supply Section**

## Application for Approval of Engineering Plans and Specifications For Water Supply Systems

| <b>Applicant</b>   | <b>Design Engineer</b>   |
|--|--|
| Currituck Co - Mainland<br><small>(Name of Board, Council or Owner – the Applicant)</small>              | Cathleen M. Saunders, P.E.<br><small>(Name of Design Engineer of Record)</small> |
| Ken Griffin<br><small>(Name and Title of Authorized Official or Representative of the Applicant)</small> | WithersRavenel<br><small>(Name of Engineering Firm)</small>                      |
| 444 Maple Road<br><small>(Mailing Address)</small>   | P.O. Drawer 870<br><small>(Mailing Address)</small>                              |
| Maple, North Carolina 27956<br><small>(City, State &amp; ZIP)</small>                                    | Kitty Hawk, NC 27949<br><small>(City, State &amp; ZIP)</small>                   |
| 252-232-2769<br><small>(Phone Number)</small>  | 252-491-8147<br><small>(Phone Number)</small>                                    |
| N/A<br><small>(FAX Number)</small>   | N/A<br><small>(FAX Number)</small>   |
| ken.griffin@currituckcountync.gov<br><small>(Email address)</small>                                      | csaunders@withersravenel.com<br><small>(Email address)</small>                   |
| <small>(Signature of Authorized Official or Representative of the Applicant)</small>                     |  |

Project Name: H2OBX RV Park  
(Name of Project to appear on Public Water Supply Section records and tracking system)

11.4 LF of 6" C-900 Waterline and associated RPZ.  
(description of project)

8526 Caratoke Highway Powells Point, North Carolina 27966  
(general location of project)

in Currituck County.

Date \_\_\_\_\_  
(for DEQ use only)

Serial No. \_\_\_\_\_  
(for DEQ use only)

# Application for Approval of Engineering Plans and Specifications for Water Supply Systems

To: Division of Water Resources,  
Department of Environmental Quality

The **Applicant** applies under and in full accord with the provision of NCGS 130A-317, and such other statutes and rules as relate to public water systems. The **Authorized Official** or **Representative** of the **Applicant** represents that he is authorized to act for the **Applicant**. The **Authorized Official** or **Representative** of the **Applicant** understands and agrees to the following:

1. The **Applicant** shall not award contracts or begin construction without first receiving "Authorization to Construct" from DEQ.
2. The **Applicant** shall make no change or deviation from the engineering plans and specifications approved by DEQ except as allowed by 15A NCAC 18C .0306 or with the written consent and approval of DEQ.
3. The **Applicant** shall obtain Final Approval in accordance with 15A NCAC 18C .0306 prior to placing the project (or any portion thereof) into service.
4. Digital (PDF) submittals are true image copy of the original sealed/signed documents.

An authorized representative of the **Public Water System** (not always the same as the **Applicant**) is to complete and sign the following WSMP section.

## Status of Water System Management Plan (WSMP)

Check one of the following, and if applicable, provide the required information:

- The WSMP for the project, as defined in the attached engineering plans and specifications, has not been submitted.
- Three copies of the WSMP for the project, as defined in the attached engineering plans and specifications, are submitted with this application.
- The WSMP that includes this project, as defined in the attached engineering plans and specifications, was previously submitted.

Provide the following:

Public Water System Name: Currituck Co - Mainland

Owner Name: Currituck County

Water System No.: NC 04-27-010

Serial Number of Deemed Complete WSMP: 00-02618

By my signature below, I certify that the previously submitted WSMP contains the information required by 15A NCAC 18C .0307(c) for the project defined in the attached engineering plans and specifications.

Ken Griffin

(Type or print name of authorized representative of Public Water System)

Public Utilities Director, Currituck County

(Title of authorized representative of Public Water System)

(Signature of authorized representative of Public Water System)

(Date)

# Application for Approval of Engineering Plans and Specifications for Water Supply Systems

In accordance with NCGS 130A-328, the Public Water Supply Section charges a fee for plan review. **Any documents submitted for review must be accompanied by a check payable to DEQ-Public Water Supply Section before the review will begin.**

There is a \$25 fee for returned checks.

The charges for review of plans are shown below. Check one of the following.

**Distribution System fees**

- |                                     |   |              |
|-------------------------------------|---|--------------|
| <input checked="" type="checkbox"/> | Construction of water lines, less than 5000 linear feet   | <b>\$300</b> |
| <input type="checkbox"/>            | Construction of water lines, 5000 linear feet or more     | <b>\$400</b> |
| <input type="checkbox"/>            | Other construction or alteration to a distribution system | <b>\$150</b> |

**Ground Water System fees**

- |                          |  |              |
|--------------------------|--|--------------|
| <input type="checkbox"/> | Construction of a new ground water system or adding a new well | <b>\$400</b> |
| <input type="checkbox"/> | Alteration to an existing ground water system                  | <b>\$200</b> |

**Surface water system fees**

- |                          |   |              |
|--------------------------|---|--------------|
| <input type="checkbox"/> | Construction of a new surface water intake or treatment facility  | <b>\$500</b> |
| <input type="checkbox"/> | Alteration to existing surface water intake or treatment facility | <b>\$300</b> |

**Other fees**

- |                          |  |              |
|--------------------------|--|--------------|
| <input type="checkbox"/> | Water System Management Plan review                    | <b>\$150</b> |
| <input type="checkbox"/> | Miscellaneous changes or maintenance not covered above | <b>\$100</b> |

Notes:

1. Projects for Tank Reconditioning use separate "Application for Water Tank Reconditioning Plan Approval." Tank Reconditioning is considered a miscellaneous change with regard to fee requirements.
2. The fee is not refundable if the plans are not approved.
3. Revisions to plans to address the Public Water Supply Section's or other state agency's comments do not incur an additional fee.
4. If one set of plans has multiple related items (such as a new well with construction of water lines) only one fee must be submitted for highest price item. The amounts are not cumulative, except for fees for Water System Management Plans.
5. **If the appropriate plan review fee is not received within thirty days after the receipt of plans, specifications, and reports for approval, then all plan documents will be recycled. A new set of documents must then be submitted with the appropriate fee for approval.**

This approval does not address all applicable laws, rules, standards and criteria, and other approvals and licenses that may be required by the local, state or federal government.

The Public Water Supply Section has stamped and sealed the official copies of plans and specifications accompanying this application with the serial number of this application \_\_\_\_\_. Any erasures, additions or alterations of the proposed improvements except those permitted in 15A NCAC 18C .0306 make this approval null and void.

This approval does not constitute a warranty of the design, construction or future operation of the water system.

Rebecca Sadosky, Ph.D., Chief  
Public Water Supply Section  
Division of Water Resources, NCDEQ

# Application for Approval of Engineering Plans and Specifications for Water Supply Systems

## Other Information and Checklist Page

---

- Attached is a check for the proper plan review fee amount, in accordance with NCGS 130A-328. See note 4 on page 3.
- 

This-submittal includes one paper original with two digital (PDF) CDs of the following items, each item in separate folders:

- This completed “*Application for Approval of Engineering Plans and Specifications for Water Supply Systems*”
- The sealed plan drawings, separate file in PDF format for each drawing. Cover sheet must include drawings index;
- The project-specific Engineering Report (ER) describing the scope and purpose of the project and addressing each of the items listed in 15A NCAC 18C .0307(b), including the design basis of the project. [15A NCAC 18C .0307(b) (12)];
- Specifications for this project; **OR**
- The project will use the following system’s previously approved standard specifications for waterline extensions:

Name of System: Currituck Co - Mainland

Serial Number: 00-02618

The Serial Numbers for previously approved standard specifications can be found at the following website:

<https://deq.nc.gov/about/divisions/water-resources/water-planning/plans-specifications/water-systems-approved-standard-specifications>

---

One of the following:

- Attached is a letter signed by an authorized representative of the Public Water System agreeing to serve the project and stating that the system has adequate supply;

**OR**

- The **Applicant** is the Public Water System.
- 

If the project has sought funding (for example, DWSRF loan) list the program and (if available) the application or funding number below:

| Program Name | Application or Funding Number, if available |
|--------------|---|
|              |   |
|              |   |

- Yes    No
- Project will be completed with significant expenditure of state moneys, greater than ten million dollars (\$10,000,000) in accordance with G.S. 113A-9 (7a).
- Project will cause substantial, permanent land-disturbing activity of an area greater than 10 acres of public lands in accordance with G.S. 113A-9 (11).
- Project will be at least partially funded through the American Rescue Plan Act (ARPA).

# Recommended Template

## Engineer's Report for Water Main Extensions

Date: 09-25-2024

Project Name: H2OBX, LLC

Water System Name: Currituck Co - Mainland

Water System ID: 04-27-010

County of Project: Currituck

Prepared by:

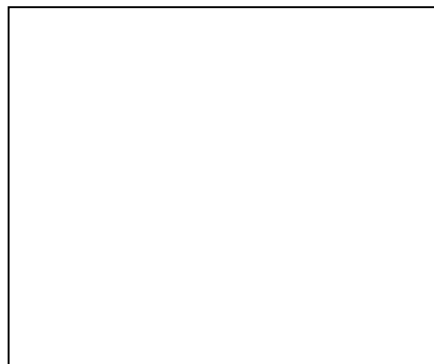
Withers Ravenel

P.O. Drawer 870

Kitty Hawk, NC 27949

This form includes the minimum information needed for the N.C. Public Water Supply Section to review water main extension projects. Complex or unique design conditions must be addressed in a supplemental document as deemed appropriate by the design engineer.

Signature and seal of professional engineer that prepared this report



I attest that this engineer's report has been prepared by me, or under my responsible charge, and is accurate, complete and consistent with the information supplied in the engineering calculations. I further attest that the proposed design has been prepared in accordance with 15A NCAC 18C. Although page 4 of this report incorporates data provided by others, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design.

# Water Main Extension Engineer's Report Mandatory Information

To present data required by 15A NCAC 18C .0307(b)

Specific citations from 15A NCAC 18C are provided when data is required to confirm compliance with another regulation.

## Applicant Information

Applicant name (must be a person): Ken Griffin

Applicant mailing address: 444 Maple Road, Maple, North Carolina 27956

Applicant phone numbers: Business 252-232-2769 Cell 252-232-2769

Applicant e-mail address: ken.griffin@currituckcountync.gov

## Description of Proposed Project

Name of proposed project: H2OBX RV Park

Provide a summary of the diameter, length and material of all piping proposed in the project.

| Diameter of piping | Length of piping        | Material |
|--------------------|-------------------------|----------|
| <u>6</u> -inch     | <u>11.4</u> linear feet | C-900    |
| _____ -inch        | _____ linear feet       |          |
| _____ -inch        | _____ linear feet       |          |
| _____ -inch        | _____ linear feet       |          |
| _____ -inch        | _____ linear feet       |          |

Location of project: (use existing road and intersections, address if available; and identify municipality).

8526 Caratoke Highway Powells Point, North Carolina 27966

Waterline Extensions runs along the north side of Ballast Rock Road

The proposed project is an expansion of the existing public water system.  Yes  No

The source of water for the proposed project will be provided by a separately owned public water system.  Yes  No

Is the project phased?  Yes  No

If yes, delineate all phases in plan sheets. Partial final approvals may be granted to completed phases specified in this submittal.

N/A

If yes, depending on whether the water system does or does not provide fire flow; provide calculations to demonstrate that the project can provide adequate peak demand (domestic peak demand) at the minimum required residual pressure of 30 pounds per square inch gauge (psig) or can provide peak demand with fire flow (domestic plus fire flow) at the minimum pressure of 20 psig through *each* phase of construction.

|   |   |
|---|---|
| <p><b>Check here if project is a water main replacement with no additional demands.</b><br/> <b>(Water main replacement consists of like size, no additional service connections, and no additional hydrants and no added fire demand.)</b></p> | <p><input type="checkbox"/> If box checked, proceed to page 4</p> |
|---|---|

**Provide anticipated project flows for any project that will increase demands**

|   |   |
|---|---|
| Does the proposed project include any in-ground irrigation?   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| If yes, attach appropriate analysis to address how the system is designed to accommodate the impact of irrigation use on treated water supply, storage needs and system pressure.   |   |
| Peak demand of the proposed project   | <u>47.2</u> gpm   |
| Maximum daily demand of the proposed project  | <u>28,080</u> gpd   |
| Per Rule .0901, are the water mains and water system designed to carry fire protection flows for this project?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| If the water mains and water system <b>are not</b> designed to provide fire protection flow, indicate the minimum <b>calculated</b> pressure at domestic peak demand (non-fire flow). The pressure must be at least 30 psig per Rule .0901. | _____ psig  |
| If the water mains and water system <b>are</b> designed to provide fire protection flow, indicate the minimum <b>calculated</b> pressure at peak demand (domestic plus fire flow). Pressure must be at least 20 psig per Rule .0901.        | <u>20 psig @ 1,000 gpm</u> psig                                     |

**gpm: gallons per minute**

**gpd: gallons per day**

**psig: pounds per square inch gauge**

DRAFT



**INFORMATION TO BE PROVIDED BY CURRITUCK COUNTY**

**Water System-Supplied Information**

*Information on this page must be updated on an annual basis*

Data provided by: \_\_\_\_\_ Date provided: 09-25-2024

Position: \_\_\_\_\_

|   |   |
|---|---|
| Number of current connections in water system   | _____ connections   |
| Approved number of connections in water system  | _____ connections<br><input type="checkbox"/> N/A – local government system           |
| Current average and maximum daily demand of existing system. Average day demand is the one day average demand for the latest calendar year.   | _____ average gpd<br>_____ maximum gpd  |
| Current maximum daily treated water supply of existing system<br>Maximum daily treated water supply is the maximum quantity of treated water that can be produced and/or purchased by the system.                             | _____ maximum gpd   |
| Total elevated storage capacity of existing system  | _____ gallons   |
| Total ground storage capacity of existing system  | _____ gallons   |
| Total hydropneumatic storage capacity of existing system  | _____ gallons   |
| Contractual storage with other system(s) Attach a copy of the agreement with the providing system   | _____ gallons   |
| Systems > 300 connections:  |   |
| <ul style="list-style-type: none"> <li>• Total storage volume is at least half the average annual daily demand (Rule .0805(c))</li> </ul>   | <input type="checkbox"/> Yes <input type="checkbox"/> No                              |
| <ul style="list-style-type: none"> <li>• For municipalities, at least 75,000 gallons elevated storage and at least half the average day demand combined elevated and ground finished water storage (Rule .0805(b))</li> </ul> | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| Systems with hydropneumatic storage tanks up to 300 connections:  |   |
| <ul style="list-style-type: none"> <li>• Volume of hydropneumatic storage tank is sufficient to meet peak demands based on Rule .0802 and calculations in Appendix B, Figure 6</li> </ul>                                     | <input type="checkbox"/> Yes <input type="checkbox"/> No                              |
| <ul style="list-style-type: none"> <li>• For residential community systems, volume of hydropneumatic storage tank is at least 40 times the number of connections or 500 gallons, whichever is greater (Rule .0803)</li> </ul> | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| <ul style="list-style-type: none"> <li>• For mobile home park systems, volume of hydropneumatic storage tank is at least 25 times the number of connections or 500 gallons, whichever is greater (Rule .0803)</li> </ul>      | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| <ul style="list-style-type: none"> <li>• For campground systems, volume of hydropneumatic storage tank is at least 10 times the number of connections or 500 gallons, whichever is greater (Rule .0803)</li> </ul>            | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |



## Pre-Construction Notification (PCN) Form

For Nationwide Permits and Regional General Permits  
(along with corresponding Water Quality Certifications)

December 4, 2023 Ver 4.3

Please note: fields marked with a red asterisk \* below are required. You will not be able to submit the form until all mandatory questions are answered.

Also, if at any point you wish to print a copy of the E-PCN, all you need to do is right-click on the document and you can print a copy of the form.

Below is a link to the online help file.

<https://edocs.deq.nc.gov/WaterResources/DocView.aspx?dbid=0&id=2196924>

### A. Processing Information

If this is a courtesy copy, please fill in this with the submission date.

Does this project involve maintenance dredging funded by the Shallow Draft Navigation Channel Dredging and Aquatic Weed Fund or involve the distribution or transmission of energy or fuel, including natural gas, diesel, petroleum, or electricity? \*

Yes  No

Is this project connected with ARPA funding? \*

Yes  No

County (or Counties) where the project is located: \*

Currituck

Is this a NCDMS Project? \*

Yes  No

Click Yes, only if NCDMS is the applicant or co-applicant.

**DO NOT CHECK YES, UNLESS YOU ARE DMS OR CO-APPLICANT.**

Is this project a public transportation project? \*

Yes  No

This is any publicly funded by municipal, state or federal funds road, rail, airport transportation project.

1a. Type(s) of approval sought from the Corps: \*

- Section 404 Permit (wetlands, streams and waters, Clean Water Act)  
 Section 10 Permit (navigable waters, tidal waters, Rivers and Harbors Act)

Has this PCN previously been submitted? \*

Yes  
 No

1b. What type(s) of permit(s) do you wish to seek authorization? \*

- Nationwide Permit (NWP)  
 Regional General Permit (RGP)  
 Standard (IP)

1c. Has the NWP or GP number been verified by the Corps? \*

Yes  No

Nationwide Permit (NWP) Number:

14 - Linear transportation

NWP Numbers (for multiple NWPS):

List all NW numbers you are applying for not on the drop down list.

1d. Type(s) of approval sought from the DWR: \*

check all that apply

- 401 Water Quality Certification - Regular  
 Non-404 Jurisdictional General Permit  
 Individual 401 Water Quality Certification  
 401 Water Quality Certification - Express  
 Riparian Buffer Authorization

1e. Is this notification solely for the record because written approval is not required?

\*

For the record only for DWR 401 Certification:

Yes  No

For the record only for Corps Permit:

Yes  No

1f. Is this an after-the-fact permit application? \*

Yes  No

1g. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts?

If so, attach the acceptance letter from mitigation bank or in-lieu fee program.

Yes  No

Acceptance Letter Attachment

Click the upload button or drag and drop files here to attach document

FILE TYPE MUST BE PDF

1h. Is the project located in any of NC's twenty coastal counties? \*

Yes  No

1i. Is the project located within a NC DCM Area of Environmental Concern (AEC)? \*

Yes  No  Unknown

1j. Is the project located in a designated trout watershed? \*

Yes  No

Link to trout information: <http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout.aspx>

## B. Applicant Information



1a. Who is the Primary Contact? \*

Ken Ellis

1c. Primary Contact Phone: \*

(xxx)xxx-xxxx

(518)783-0038

1b. Primary Contact Email: \*

kene@aquaticgroup.com

1d. Who is applying for the permit? \*

Owner  
(Check all that apply)

Applicant (other than owner)

1e. Is there an Agent/Consultant for this project? \*

Yes  No

## 2. Owner Information

2a. Name(s) on recorded deed: \*

H2OBX, LLC

2b. Deed book and page no.:

DB 1512 PG 459

2c. Contact Person:

(for Corporations)

Ken Ellis

2d. Address \*

Street Address

13 Green Mountain Drive

Address Line 2

City

Cohoes

Postal / Zip Code

12047

State / Province / Region

NY

Country

USA

2e. Telephone Number: \*

(xxx)xxx-xxxx

(518)783-0038

2f. Fax Number:

(xxx)xxx-xxxx

2g. Email Address: \*

kene@aquaticgroup.com

## 4. Agent/Consultant (if applicable)

4a. Name: \*

Warren Eadus

**4b. Business Name:**

(if applicable)

WithersRavenel

**4c. Address \***

Street Address

90 Church Street Ste B

Address Line 2

City

Black Mountain

State / Province / Region

NC

Postal / Zip Code

28711

Country

USA

**4d. Telephone Number: \***

(828)357-5149

(xxx)xxx-xxxx

**4e. Fax Number:**

(xxx)xxx-xxxx

**4f. Email Address: \***

weadus@withersravenel.com

**C. Project Information and Prior Project History**



**1. Project Information**



**1a. Name of project: \***

H2OBX, LLC RV Park Expansion

**1b. Subdivision name:**

(if appropriate)

H2OBX Waterpark

**1c. Nearest municipality / town: \***

Powells Point

**2. Project Identification**



**2a. Property Identification Number:**

(tax PIN or parcel ID)

0124000137L0000

**2b. Property size:**

(in acres)

96

**2c. Project Address**

Street Address

8526 Caratoke Hwy

Address Line 2

City

Powells Point

State / Province / Region

NC

Postal / Zip Code

27966

Country

USA

**2d. Site coordinates in decimal degrees**

Please collect site coordinates in decimal degrees. Use between 4-6 digits (unless you are using a survey-grade GPS device) after the decimal place as appropriate, based on how the location was determined. (For example, most mobile phones with GPS provide locational precision in decimal degrees to map coordinates to 5 or 6 digits after the decimal place.)

**Latitude: \***

36.113

ex: 34.208504

**Longitude: \***

-75.832

-77.796371

**3. Surface Waters**

**3a. Name of the nearest body of water to proposed project: \***

Albemarle Sound

**3b. Water Resources Classification of nearest receiving water: \***

SB

[Surface Water Lookup](#)

**3c. What river basin(s) is your project located in? \***

Pasquotank

**3d. Please provide the 12-digit HUC in which the project is located. \***

030102051401

## 4. Project Description and History

### 4a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: \*

The property is currently developed as an outdoor water park. The areas for the proposed development include undeveloped property and areas that were formerly an asphalt plant and road materials waste (asphalt millings) storage.

### 4b. Have Corps permits or DWR certifications been obtained for this project (including all prior phases) in the past? \*

Yes  No  Unknown

### 4f. List the total estimated acreage of all existing wetlands on the property:

1.9

### 4g. List the total estimated linear feet of all existing streams on the property:

(intermittent and perennial)

NA

### 4h. Explain the purpose of the proposed project: \*

Development of an RV park to complement the existing water park.

### 4i. Describe the overall project in detail, including indirect impacts and the type of equipment to be used: \*

Conventional construction equipment will be used to install internal roads, RV pads and all associated infrastructure. The proposed development also includes recreational amenities to serve the RV park.

## 5. Jurisdictional Determinations

### 5a. Have the wetlands or streams been delineated on the property or proposed impact areas? \*

Yes  No  Unknown

Comments:

### 5b. If the Corps made a jurisdictional determination, what type of determination was made? \*

Preliminary  Approved  Not Verified  Unknown  N/A

Corps AID Number:

Example: SAW-2017-99999

SAW-2022-00794

### 5c. If 5a is yes, who delineated the jurisdictional areas?

Name (if known): Warren Eadus/Brian Rubino/Troy Murphy

Agency/Consultant Company: Quible

Other:

### 5d. List the dates of the Corp jurisdiction determination or State determination if a determination was made by the Corps or DWR.

2022

## 6. Future Project Plans

### 6a. Is this a phased project? \*

Yes  No

### 6b. If yes, explain.

Only half of the RV park will be constructed in 2025 due to pausing construction during summer months so that construction does not interfere with tourism. The RV Park is planned to be completed by May 2026.

Are any other NWP(s), regional general permit(s), or individual permits(s) used, or intended to be used, to authorize any part of the proposed project or related activity? This includes other separate and distant crossing for linear projects that require Department of the Army authorization but don't require pre-construction notification.

NA

## D. Proposed Impacts Inventory



### 1. Impacts Summary

#### 1a. Where are the impacts associated with your project? (check all that apply):

Wetlands  Streams-tributaries  Buffers  
 Open Waters  Pond Construction

### 2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

"W." will be used in the table below to represent the word "wetland".

|  |
|--|
|  |
|--|

| 2a. Site #* (?) | 2a1 Reason* (?)       | 2b. Impact type* (?) | 2c. Type of W.*   | 2d. W. name*   | 2e. Forested* | 2f. Type of Jurisdiction* (?) | 2g. Impact area* |
|-----------------|-----------------------|----------------------|-------------------|----------------|---------------|-------------------------------|------------------|
| W Area 1        | Road Crossing         | P                    | Pine Flat         | Wetland Area 1 | Yes           | Corps                         | 0.010<br>(acres) |
| W Area 2        | Road Crossing         | P                    | Pine Flat         | Wetland Area 2 | Yes           | Corps                         | 0.070<br>(acres) |
| W Area 3        | Road Crossing         | P                    | Isolated Wetlands | Wetland Area 3 | Yes           | Corps                         | 0.075<br>(acres) |
| W Area 4        | Road Crossing-setback | P                    | Isolated Wetlands | Wetland Area 4 | Yes           | Corps                         | 0.045<br>(acres) |

**2g. Total Temporary Wetland Impact**

0.000

**2g. Total Permanent Wetland Impact**

0.200

**2g. Total Wetland Impact**

0.200

**2i. Comments:**

0.12 acres of proposed impacts occur in non-adjacent wetlands. JD was issued prior to Sackett ruling.

## E. Impact Justification and Mitigation

### 1. Avoidance and Minimization

**1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing the project: \***

The original waterpark design and subsequent RV park layout have avoided wetlands impacts to the maximum extent possible while still being able to access portions of the interior of the property. The high-rate infiltration wastewater drain field prohibits access of useable property without crossing wetlands.

**1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques: \***

Grading is limited to only that which is necessary to establish a stable slope and install required road widths.

### 2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State

**2a. Does the project require Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State?**

Yes  No

**2b. If this project DOES NOT require Compensatory Mitigation, explain why:**

Impacts to WOTUS are less than .10 acres. The additional impacts to wetlands are limited to two isolated pockets/depressions as shown on the attached. The JD was issued prior to the Sackett ruling.

NC Stream Temperature Classification Maps can be found under the Mitigation Concepts tab on the Wilmington District's [RIBITS](#) website.

## F. Stormwater Management and Diffuse Flow Plan (required by DWR)

\*\*\* Recent changes to the stormwater rules have required updates to this section.\*\*\*

### 1. Diffuse Flow Plan

**1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?**

Yes  No

For a list of options to meet the diffuse flow requirements, click [here](#).

**If no, explain why:**

This area is not subject to NC Riparian Buffer Protection.

### 2. Stormwater Management Plan

**2a. Is this a NCDOT project subject to compliance with NCDOT's Individual NPDES permit NCS000250? \***

Yes  No

**2b. Does this project meet the requirements for low density projects as defined in 15A NCAC 02H .1003(2)? \***

Yes  No

To look up low density requirement click here [15A NCAC 02H .1003\(2\)](#).

**2c. Does this project have a stormwater management plan (SMP) reviewed and approved under a state stormwater program or state-approved local government stormwater program? \***

Yes  No

N/A - project disturbs < 1 acre

Hint: projects that have vested rights, exemptions, or grandfathering from state or locally implemented stormwater programs or projects that satisfy state or locally-implemented stormwater programs through use of community in-lieu programs should answer no to this question.

### 3. Stormwater Requirements

3a. Select whether a completed stormwater management plan (SMP) is included for review and approval or if calculations are provided to document the project will not cause degradation of downstream surface waters.\*

Stormwater Management Plan  Antidegradation Calculations

**Comments:**

An NC DEQ DEMLR stormwater plan will be submitted and approved as part of the site development package.

## G. Supplementary Information



### 1. Environmental Documentation

1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? \*

Yes  No

### 2. Violations (DWR Requirement)

2a. Is the site in violation of DWR Water Quality Certification Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), or DWR Surface Water or Wetland Standards or Riparian Buffer Rules (15A NCAC 2B .0200)? \*

Yes  No

### 3. Cumulative Impacts (DWR Requirement)

3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? \*

Yes  No

### 4. Sewage Disposal (DWR Requirement)

4a. Is sewage disposal required by DWR for this project? \*

Yes  No  N/A

4b. Describe, in detail, the treatment methods and dispositions (non-discharge or discharge) of wastewater generated from the proposed project. If the wastewater will be treated at a treatment plant, list the capacity available at that plant.

An existing permitted onsite sewage treatment plant will be used.

### 5. Endangered Species and Designated Critical Habitat (Corps Requirement)

5a. Will this project occur in or near an area with federally protected species or habitat? \*

Yes  No

5b. Have you checked with the USFWS concerning Endangered Species Act impacts? \*

Yes  No

5d. Is another Federal agency involved? \*

Yes  No  Unknown

5e. Is this a DOT project located within Division's 1-8? \*

Yes  No

5f. Will you cut any trees in order to conduct the work in waters of the U.S.? \*

Yes  No

5g. Does this project involve bridge maintenance or removal? \*

Yes  No

Link to the NLEB SLOPES document: [http://saw-reg.usace.army.mil/NLEB/1-30-17-signed\\_NLEB-SLOPES&apps.pdf](http://saw-reg.usace.army.mil/NLEB/1-30-17-signed_NLEB-SLOPES&apps.pdf)

5h. Does this project involve the construction/installation of a wind turbine(s)? \*

Yes  No

5i. Does this project involve (1) blasting, and/or (2) other percussive activities that will be conducted by machines, such as jackhammers, mechanized pile drivers, etc.? \*

Yes  No

5j. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? \*

IPaC

### 6. Essential Fish Habitat (Corps Requirement)

6a. Will this project occur in or near an area designated as an Essential Fish Habitat? \*

Yes  No



**6b. What data sources did you use to determine whether your site would impact an Essential Fish Habitat? \***

While the wetlands on site eventually connect to a vast expanse of coastal marsh adjacent to the Albemarle Sound, the proposed project is several thousand feet from the Albemarle Sound.

**7. Historic or Prehistoric Cultural Resources (Corps Requirement)**

Link to the State Historic Preservation Office Historic Properties Map (does not include archaeological data: <http://gis.ncdcr.gov/hpweb/>)

**7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)? \***

Yes  No

**7b. What data sources did you use to determine whether your site would impact historic or archeological resources? \***

NHP website.

**8. Flood Zone Designation (Corps Requirement)**

Link to the FEMA Floodplain Maps: <https://msc.fema.gov/portal/search>

**8a. Will this project occur in a FEMA-designated 100-year floodplain? \***

Yes  No

**8c. What source(s) did you use to make the floodplain determination? \***

NC FRIS

**Miscellaneous**

**Comments**

Please use the space below to attach all required documentation or any additional information you feel is helpful for application review. Documents should be combined into one file when possible, with a Cover Letter, Table of Contents, and a Cover Sheet for each Section preferred.

Click the upload button or drag and drop files here to attach document

P15004.1-ENV PCN SUBMISSION.pdf

34.32MB

File must be PDF or KMZ

**Signature**

\*

By checking the box and signing below, I certify that:

- The project proponent hereby certifies that all information contained herein is true, accurate, and complete to the best of my knowledge and belief; and
- The project proponent hereby requests that the certifying authority review and take action on this CWA 401 certification request within the applicable reasonable period of time.
- I have given true, accurate, and complete information on this form;
- I agree that submission of this PCN form is a "transaction" subject to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");
- I agree to conduct this transaction by electronic means pursuant to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");
- I understand that an electronic signature has the same legal effect and can be enforced in the same way as a written signature; AND
- I intend to electronically sign and submit the PCN form.

**Full Name: \***

Warren Eadus

**Signature \***



**Date**

9/3/2024



WithersRavenel

Our People. Your Success.

September 3, 2024

USACE Washington Regulatory Field Office  
Wilmington District  
2407 W. 5<sup>th</sup> Street  
Washington, NC 27889-1000

Re: H2OBX, LLC  
RV Park Expansion PCN Request

### **Project Narrative**

The applicants (H2OBX, LLC) propose to develop the remaining portions of their property (Currituck County PIN# 0124000137L0000; DB 1512 PG 459) as an RV Park to complement the existing water park use. There are two wetland fingers (Wetland Area 1 and Wetland Area 2 on attached site plan) that are required to be crossed to provide access to interior portions of the property and also provide adequate traffic flow for the RV Park.

There are two wetland pockets that are not connected to any larger wetland areas that are also proposed to be filled. It is our opinion that these wetlands are non-jurisdictional and therefore, these wetlands are not used in our impact's summary. The proposed crossings involve permanent filling of 0.080 acres of non-riparian wetlands. The mitigation threshold for Nationwide 14 is 0.10 acres and no mitigation is required. 0.12 acres of non-adjacent wetlands are proposed as shown on the attached site plan.

### **State Permitting**

An NC DEQ Stormwater and Erosion Control Permits will be applied for the proposed development. There is an existing permitted wastewater treatment facility and disposal field that will be used to serve the RV Park.

### **Local Permitting**

The property where the RV park is proposed received conditional rezoning approval from Currituck County. The approval included a detailed conceptual site plan. As proposed, the development would be in conformance with the approved conditional rezoning plan. A Major Site Plan is required to be submitted to Currituck County.

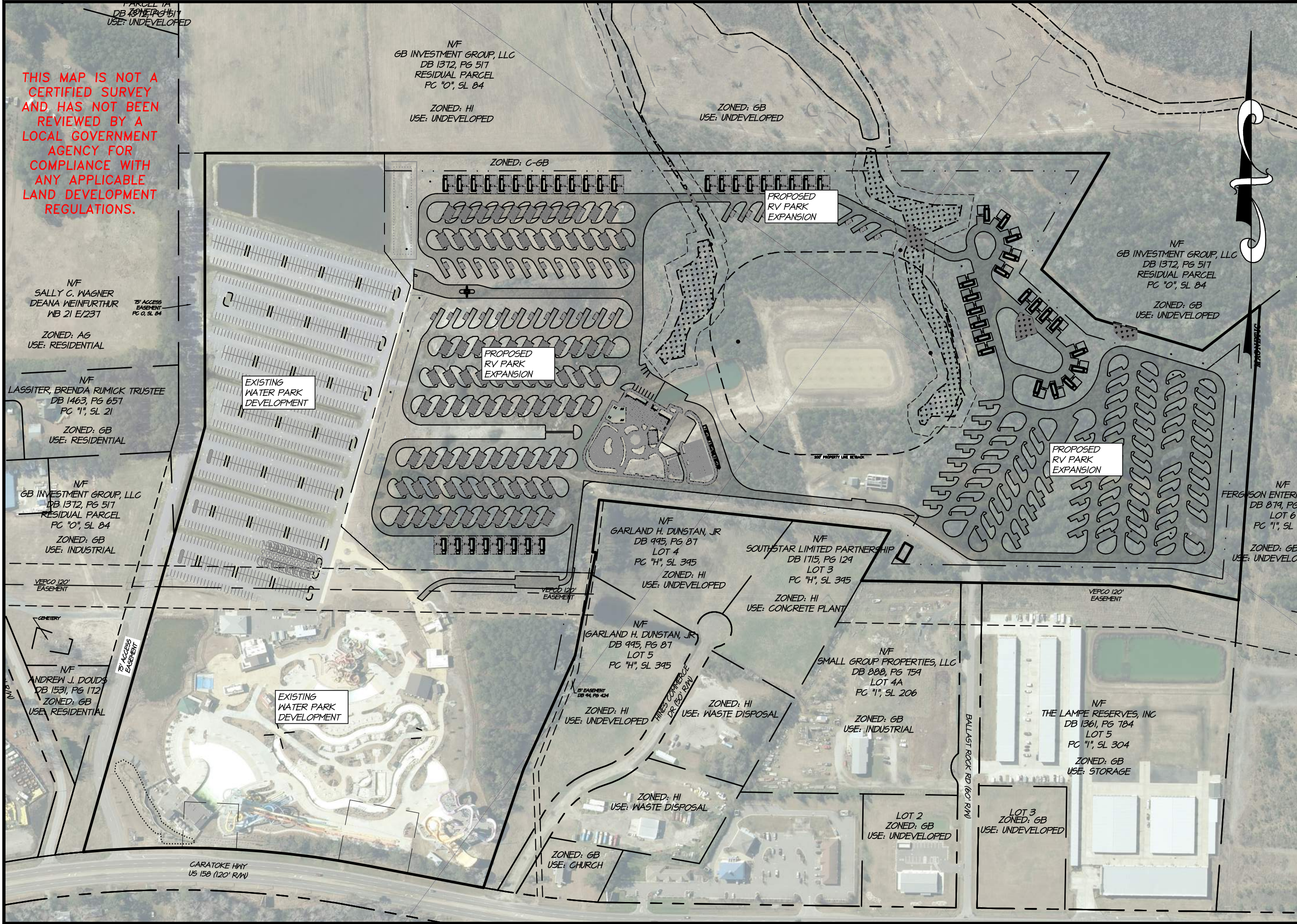
### **Attachments**

- Site Plans (Sheet 1-2 of 2)
- Agent Authorization
- Copy of Deed Book 1512 Page 459
- USGS Topographic Quadrangle-Point Harbor
- IPaC Printout
- NRCS Soils Report



C:\2015\15004 H2OBX Waterpark\15004.1\DRAWINGS\15004.1-ENV\_PCN\_EXHIBIT-WDE.dwg 8/29/2024 5:22 PM Weadus

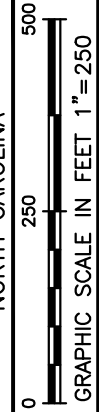
THIS MAP IS NOT A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS.



NC License#: C-0208  
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ENVIRONMENTAL SCIENCES \* SURVEYING\*\*  
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8466 Caratoke Hwy, Powells Point, NC 27966  
Phone: (252) 491-8147  
90 Church St., Ste. B, Black Mountain, NC 28711  
administrator@quible.com

**FINAL DRAWINGS FOR PERMITTING ONLY**

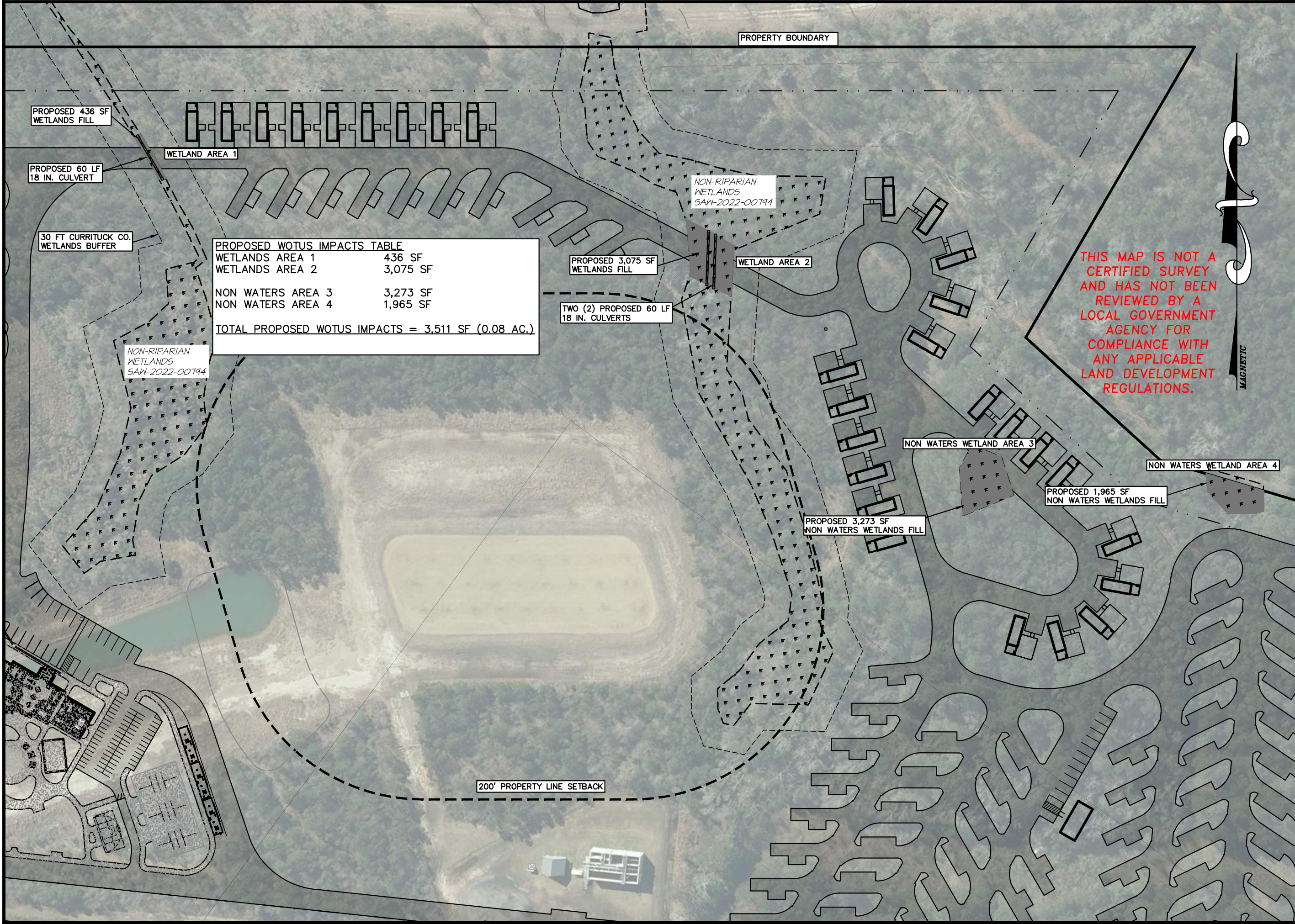
**NATIONWIDE PERMITTING EXHIBIT OVERVIEW**  
**H2OBX, LLC RV PARK EXPANSION**  
**+/- 96 ACRES**  
CURRITUCK COUNTY  
FRUITVILLE TOWNSHIP  
NORTH CAROLINA



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PROJECT  
**15004.1**  
DRAWN BY  
**OTH**  
CHECKED BY  
**WDE**  
DATE  
**08/29/24**



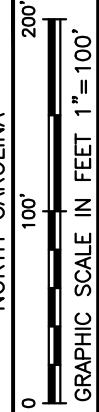


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**NATIONWIDE PERMITTING EXHIBIT**  
**H2OBX, LLC RV PARK EXPANSION**  
**+/- 96 ACRES**  
 CURRITUCK COUNTY  
 FRUITVILLE TOWNSHIP  
 NORTH CAROLINA



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PROJECT  
**P15004.1**  
 DRAWN BY  
**OTH**  
 CHECKED BY  
**WDE**  
 DATE  
**08/29/24**

NC License#: C-0208

SINCE 1959



US ARMY CORPS OF ENGINEERS  
AGENT AUTHORIZATION FORM

PROPERTY LEGAL DESCRIPTION:

PIN: 9837-54-9004

Deed: DB 1512, PG 459

Street Address: 8526 Caratoke Highway, Powells Point, NC 27966

Property Owner: H2OBX, LLC

The undersigned, registered property owners of the above noted property, do hereby authorize

Troy Murphy of Quible & Associates P.C.  
(Contractor/Agent) (Name of Consulting Firm)

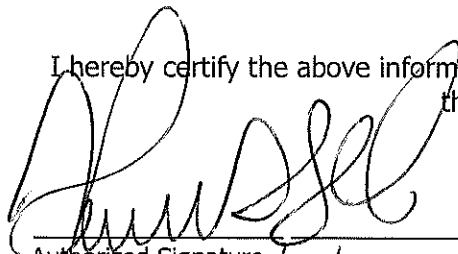
to act on my behalf and take all actions necessary for the processing, issuance, and acceptance of any permits, jurisdictional determinations, or certifications.

Property Owner's Address (if different than property above):

13 Green Mountain Drive, Cohoes, NY 12047

Telephone: \_\_\_\_\_

I hereby certify the above information submitted in this application is true and accurate to the best of our knowledge.

  
\_\_\_\_\_  
Authorized Signature

Date: 8/9/22

UNOFFICIAL

Prepared by:  
Christopher B. Frantze  
STINSON LLP

Under the supervision of and as approved by:  
John C. Surles, Esq.  
THE SURLES LAW FIRM, PLLC  
6200 Fairview Road, Suite 325  
Charlotte, NC 28210

Doc No: 347800  
Recorded: 12/12/2019 02:56:53 PM  
Fee Amt: \$26.00 Page 1 of 8  
Excise Tax: \$76,830.00  
Currituck County North Carolina  
Denise A. Hall, Register of Deeds  
BK 1512 PG 459 - 466 (8)

After recording return to:  
First American Title  
1201 Walnut St. 700  
Kansas City, MO 64106  
NCS-986567 AXCTY

Tax Collector Certification That No Delinquent Taxes  
Are Due. Date 12-12-19 By DS: Certification  
expires Jan. 6<sup>th</sup> of the year following certification date.

TRANSFER TAX AMOUNT: 384150.00 DS  
DATE/COLLECTOR 12-12-2019-ENC

Excise Tax: \$ 76,830.00

**SPECIAL WARRANTY DEED**

THIS DEED made as of the 11th day of December, 2019, by and between **EPR RESORTS, LLC**, a Delaware limited liability company ("Grantor"), whose address is c/o EPR Properties, 909 Walnut, Suite 200, Kansas City, MO 64106, and **H2OBX, LLC**, a Delaware limited liability company ("Grantee"), whose address is 13 Green Mountain Drive, Cohoes, New York 12047. The designation Grantor and Grantee, as used herein, shall include said parties, their heirs, successors and assigns, and shall include singular, plural, masculine, feminine or neuter, as required by context.

This is not the personal residence of Grantor.

WITNESSETH:

That the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in Poplar Branch Township, Currituck County, North Carolina and more particularly described as follows:

See **Exhibit A** attached hereto and incorporated herein by this reference.

Together with all improvements thereon, known as 8504 Caratoke Hwy., 8524 Caratoke Hwy., 8526 Caratoke Hwy., and Ballast Rock Rd., Powells Point, NC, and all of Grantor's rights, title and interests, if any, in and to all abutting roads and rights of way and all reversionary rights therein, and in and to all appurtenant easements, if any.

The property hereinabove described is commonly referred to as:  
Map/Parcel ID Numbers: 0124000137L0000; 012400001270000;  
0124000137E0000; 0124000068J0000

UNOFFICIAL Document

The property hereinabove described was acquired by Grantor by instruments recorded in Book 1383, Page 80, Book 1383, Page 84, Book 1383, Page 87, and Book 1396, Page 63, Currituck County Registry.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land, the improvements thereon and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor has done nothing to impair such title as Grantor received, and Grantor will warrant and defend the title against the lawful claims of all persons claiming by, under or through Grantor, subject to the exceptions hereinafter stated.

Title to the property hereinabove described is subject to: (a) easements, restrictions, declarations, reservations, agreements, instruments and other matters of record, if any; (b) taxes and assessments, general and special, not now due and payable; and (c) rights of the public in and to the parts thereof in streets, roads or alleys.

[This page's remainder is intentionally blank; signature pages follow.]

Unofficial Document

Unofficial Document

Unofficial Document







**EXHIBIT A TO SPECIAL WARRANTY DEED**  
**LEGAL DESCRIPTION OF PROPERTY**

PARCEL 1:

TRACT 1:

BEGINNING AT A SET IRON PIN OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 80.81 FEET IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, FROM AN IRON PIN, SAID IRON PIN BEING LOCATED ON A CHORD BEARING OF SOUTH 42 DEG. 18 MIN. 10 SEC. EAST 80.80 FEET FROM THE BEGINNING POINT, SAID IRON PIN BEING ALSO LOCATED SOUTH 03 DEG. 15 MIN. 04 SEC. WEST 119.38 FEET FROM N.C.G.S. MONUMENT CUR9 N 873,965.67' E 2,937,616.75' NAD(83) (2011); THENCE FROM SAID POINT OF BEGINNING NORTH 69 DEG. 32 MIN. 44 SEC. WEST 176.98 FEET TO AN EXISTING IRON ROD; THENCE SOUTH 69 DEG. 42 MIN. 48 SEC. WEST 352.98 FEET TO A SET IRON ROD; THENCE SOUTH 69 DEG. 45 MIN. 03 SEC. WEST 635.34 FEET TO A SET IRON ROD; THENCE SOUTH 68 DEG. 52 MIN. 31 SEC. WEST 94.93 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 39 MIN. 22 SEC. WEST 175.02 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 40 MIN. 53 SEC. WEST 603.07 FEET TO A SET IRON ROD; THENCE NORTH 36 DEG. 19 MIN. 07 SEC. WEST 2,575.07 FEET TO A SET IRON ROD; THENCE NORTH 83 DEG. 48 MIN. 44 SEC. EAST 383.35 FEET TO A CONCRETE MONUMENT LOCATED IN THE SOUTH LINE OF PROPERTY NOW OR FORMERLY OWNED BY ROBERT F. HARRELL ET AL; THENCE ALONG THE SOUTH LINE OF THE AFORESAID HARRELL ET AL PROPERTY NORTH 83 DEG. 48 MIN. 44 SEC. EAST 859.73 FEET TO A CONCRETE MONUMENT LOCATED IN THE WEST LINE OF PROPERTY NOW OR FORMERLY OWNED BY GARLAND H. DUNSTAN, JR.; THENCE ALONG THE NOW OR FORMERLY DUNSTAN PROPERTY SOUTH 30 DEG. 15 MIN. 24 SEC. EAST 833.22 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 60 DEG. 44 MIN. 49 SEC. EAST 149.77 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 31 DEG. 01 MIN. 52 SEC. WEST 9.54 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 65 DEG. 04 MIN. 33 SEC. EAST 299.09 FEET TO AN EXISTING IRON PIN; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 78 DEG. 02 MIN. 57 SEC. EAST 357.72 FEET TO AN IRON PIN OR OTHER MARKER; THENCE CONTINUING ALONG THE AFORESAID DUNSTAN PROPERTY NORTH 72 DEG. 25 MIN. 25 SEC. EAST 354.74 FEET TO AN EXISTING IRON PIN LOCATED IN THE WEST MARGIN OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 SOUTH 25 DEG. 32 MIN. 35 SEC. EAST 200.99 FEET TO AN IRON PIN OR OTHER MARKER LOCATED IN THE NORTH LINE OF PROPERTY NOW OR FORMERLY OWNED BY BARNHILL CONTRACTING CO.; THENCE ALONG THE AFORESAID BARNHILL CONTRACTING CO. PROPERTY SOUTH 64 DEG. 27 MIN. 25 SEC. WEST 174.55 FEET TO A SET IRON PIN; THENCE CONTINUING ALONG THE AFORESAID BARNHILL CONTRACTING CO. PROPERTY SOUTH 25 DEG. 32 MIN. 35 SEC. EAST 200.00 FEET TO A SET IRON PIN; THENCE CONTINUING ALONG THE AFORESAID BARNHILL CONTRACTING CO. PROPERTY NORTH 64 DEG. 27 MIN. 25 SEC. EAST 175.82 FEET TO A SET IRON PIN LOCATED IN THE WEST MARGIN OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OF THE RIGHT-OF-WAY OF U.S. HIGHWAY 158 IN A SOUTHERLY DIRECTION FOLLOWING A CURVATURE THEREOF A DISTANCE OF 292.49 FEET TO AN EXISTING IRON ROD, SAID CURVE HAVING A RADIUS OF

CORE/0503816.0359/156231233.2

Document



2,924.79 FEET, SAID IRON ROD BEING LOCATED ON A CHORD BEARING OF SOUTH 30 DEG. 05 MIN. 43 SEC. EAST 292.37 FEET FROM THE TERMINAL POINT OF THE NEXT PRECEDING CALL, SAID IRON ROD BEING IN THE NORTH LINE OF THE NOW OR FORMERLY GEORGE M. FARROW PROPERTY; THENCE ALONG THE AFORESAID FARROW PROPERTY SOUTH 56 DEG. 32 MIN. 43 SEC. WEST 129.03 FEET TO AN EXISTING IRON PIN; THENCE CONTINUING ALONG THE AFORESAID FARROW PROPERTY SOUTH 32 DEG. 36 MIN. 57 SEC. EAST 154.28 FEET TO AN EXISTING IRON PIN; THENCE CONTINUING ALONG THE AFORESAID FARROW PROPERTY NORTH 56 DEG. 32 MIN. 43 SEC. EAST 131.34 FEET TO AN IRON PIN OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 IN A SOUTHERLY DIRECTION FOLLOWING THE CURVATURE THEREOF A DISTANCE OF 282.19 FEET TO A SET IRON ROD, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, SAID IRON ROD BEING LOCATED ON A CHORD BEARING OF SOUTH 38 DEG. 44 MIN. 50 SEC. EAST 282.08 FEET FROM THE TERMINAL POINT OF THE NEXT PRECEDING CALL, SAID IRON ROD BEING THE POINT AND PLACE OF BEGINNING.

THIS BEING THAT CERTAIN PROPERTY DESIGNATED AS "NEW PARCEL "A" 3,484,800 SQ.FT., 80.0 AC", AS SHOWN ON THAT CERTAIN MAP OR PLAT ENTITLED "RECOMBINATION PLAT NEW PARCEL "A" & 2 RESIDUAL PARCELS 5 EXISTING PARCELS", PREPARED BY MATTHEW R. BATTEY, REGISTERED SURVEYOR, DATED APRIL 12, 2016, WHICH MAP OR PLAT IS DULY RECORDED IN PLAT CABINET O, SLIDE 84, CURRITUCK COUNTY REGISTRY.

TRACT 2 - EASEMENT:

BEGINNING AT A SET IRON PIN OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 80.81 FEET IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, FROM AN IRON PIN, SAID IRON PIN BEING LOCATED ON A CHORD BEARING OF SOUTH 42 DEG. 18 MIN. 10 SEC. EAST 80.80 FEET FROM THE BEGINNING POINT, SAID IRON PIN BEING ALSO LOCATED SOUTH 03 DEG. 15 MIN. 04 SEC. WEST 119.38 FEET FROM N.C.G.S. MONUMENT CUR9 N 873,965.67' E 2,937,616.75' NAD 83 (2011); THENCE FROM SAID POINT OF BEGINNING SOUTH 69 DEG. 32 MIN. 44 SEC. WEST 176.98 FEET TO A SET IRON ROD; THENCE SOUTH 69 DEG. 42 MIN. 48 SEC. WEST 352.98 FEET TO A SET IRON ROD; THENCE SOUTH 69 DEG. 45 MIN. 03 SEC. WEST 635.34 FEET TO A SET IRON ROD; THENCE SOUTH 68 DEG. 52 MIN. 31 SEC. WEST 94.93 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 39 MIN. 22 SEC. WEST 175.02 FEET TO A SET IRON ROD; THENCE SOUTH 53 DEG. 40 MIN. 53 SEC. WEST 603.07 FEET TO A SET IRON ROD; THENCE NORTH 36 DEG. 19 MIN. 07 SEC. EAST 75 FEET TO A SET IRON ROD; THENCE NORTH 53 DEG. 40 MIN. 53 SEC. EAST 603.10 FEET TO A CONCRETE MONUMENT; THENCE NORTH 53 DEG. 39 MIN. 22 SEC. EAST 165 FEET TO A SET IRON ROD; THENCE NORTH 68 DEG. 52 MIN. 31 SEC. EAST 84.34 FEET TO A CONCRETE MONUMENT; THENCE NORTH 69 DEG. 45 MIN. 03 SEC. EAST 634.82 FEET TO AN EXISTING IRON ROD; THENCE NORTH 69 DEG. 42 MIN. 48 SEC. EAST 353.09 FEET TO AN IRON ROD OR OTHER MARKER; THENCE NORTH 69 DEG. 32 MIN. 44 SEC. EAST 207.16 FEET TO A SET IRON ROD LOCATED IN THE WEST MARGIN OR RIGHT OF WAY OF THE AFORESAID U.S. 158; THENCE ALONG THE WEST MARGIN OR RIGHT OF WAY OF U.S. 158 IN THE NORTHERLY DIRECTION ALONG THE CURVATURE THEREOF A DISTANCE 80.81 FEET TO A SET IRON ROD, SAID CURVE HAVING A RADIUS OF 2,924.79 FEET, SAID IRON ROD BEING LOCATED ON A CHORD BEARING OF NORTH 38 DEG. 44 MIN.

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50 SEC. WEST FROM THE TERMINAL POINT OF THE NEXT PRECEDING CALL, SAID IRON ROD BEING THE POINT AND PLACE OF BEGINNING.

THIS BEING THAT CERTAIN AREA DESIGNATED AS "75' ACCESS EASEMENT", AS SHOWN ON THAT CERTAIN MAP OR PLAT ENTITLED "RECOMBINATION PLAT NEW PARCEL "A" & 2 RESIDUAL PARCEL 5 EXISTING PARCELS", PREPARED BY MATTHEW R. BATTEY, REGISTERED SURVEYOR, DATED APRIL 12, 2016, WHICH MAP OR PLAT IS DULY RECORDED IN PLAT CABINET O, SLIDE 84, CURRITUCK COUNTY REGISTRY.

PARCEL 2:

ALL THAT CERTAIN LOT OR PARCEL OF LAND LOCATED IN POPLAR BRANCH TOWNSHIP, CURRITUCK COUNTY, NORTH CAROLINA, ADJOINING THE PROPERTIES NOW OR FORMERLY OWNED BY W. R. GRIGGS AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN EXISTING IRON PIPE LOCATED ON THE SOUTHWEST MARGIN OF THE RIGHT OF WAY OF HIGHWAY US 158, SAID POINT OF BEGINNING BEING LOCATED SOUTH 44 DEG. 15 MIN. 03 SEC. EAST 981.76 FEET FROM THE POINT OF INTERSECTION OF THE SOUTHERN MARGIN OF THE RIGHT OF WAY OF PARK DRIVE AND THE SOUTHWEST MARGIN OF THE RIGHT OF WAY OF HIGHWAY US 158, RUNNING THENCE FROM SAID BEGINNING POINT ALONG THE SOUTH MARGIN OF THE RIGHT OF WAY OF HIGHWAY US 158 NORTH 33 DEG. 39 MIN. 25 SEC. WEST 154.28 FEET TO AN EXISTING IRON PIPE; THENCE ALONG THE PROPERTY LINE OF THE PROPERTY NOW OR FORMERLY OWNED BY W. R. GRIGGS SOUTH 56 DEG. 30 MIN. 15 SEC. WEST 128.12 FEET TO AN EXISTING IRON BAR; THENCE CORNERING AND RUNNING SOUTH 33 DEG. 39 MIN. 25 SEC. EAST 154.28 FEET TO AN EXISTING IRON BAR; THENCE CORNERING AND RUNNING NORTH 56 DEG 30 MIN 15 SEC. EAST 128.12 FEET TO THE POINT OF BEGINNING, SAID PARCEL CONTAINING 19,766.28 SQUARE FEET MORE OR LESS BY CALCULATION.

FOR A MORE PARTICULAR DESCRIPTION, REFERENCE IS MADE TO A MAP OR PLAT MADE FROM A SURVEY BY DONALD E. WOOD, REGISTERED LAND SURVEYOR, OF EASTERN DEVELOPMENT SERVICES, DATED NOVEMBER 4, 1997 ENTITLED "SURVEY FOR DON S. WILLIAMS, PARCEL 127 TAX MAP 124, POPLAR BRANCH TOWNSHIP, CURRITUCK COUNTY, NORTH CAROLINA", WHICH IS INCORPORATED HEREIN BY REFERENCE.

THE ABOVE PARCEL 2 IS ALSO DESCRIBED BY SURVEY METES AND BOUNDS AS FOLLOWS:

BEGINNING AT A IRON ROD LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 363.00' IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79' AND A CHORD BEARING OF N 39° 32' 20" W - 362.76', FROM AN IRON ROD, SAID IRON ROD BEING LOCATED IN 03° 15' 04" E 119.35' FROM N.C.G.S MONUMENT CUR\_ N 873,965.67' E 2,937,616.75' NAD 83 (2011); THENCE FROM SAID POINT OF BEGINNING S 56° 32' 43" W - 131.34' TO AN IRON STAKE; THENCE CORNERING FROM SAID IRON N 33° 36' 57" W - 154.28' TO AN IRON STAKE; THENCE CORNERING FROM SAID IRON N 56° 32' 43" E - 129.03' TO AN IRON ROD IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, THENCE CORNERING FROM SAID IRON 154.32' IN A SOUTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79'

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AND A CHORD BEARING OF S 34° 28' 18" E - 154.30' TO THE POINT OF BEGINNING. SAID PARCEL CONTAINING 19,979.92 SF, 0.46 AC, MORE OR LESS BY CALCULATION.

PARCEL 3:

BEGINNING AT A CONCRETE MONUMENT OR OTHER MARKER LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID POINT OF BEGINNING BEING ALSO LOCATED SOUTH 25 DEG. 32 MIN. 35 SEC. EAST FROM THE SOUTHEAST CORNER OF THE HINES COMMERCIAL PARK SUBDIVISION AS RECORDED IN PLAT CABINET H, SLIDE 395, CURRITUCK COUNTY REGISTRY; THENCE FROM SAID POINT OF BEGINNING SOUTH 64 DEG. 27 MIN. 25 SEC. WEST 174.55 FEET TO A SET IRON PIN; THENCE SOUTH 25 DEG. 32 MIN. 35 SEC. EAST 200.00 FEET TO A SET IRON PIN; THENCE NORTH 64 DEG. 27 MIN. 25 SEC. EAST 175.82 FEET TO A SET IRON PIN LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF THE AFORESAID U.S. HIGHWAY 158; THENCE ALONG THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 IN A GENERAL NORTHERLY DIRECTION 200 FEET, MORE OR LESS, THE POINT AND PLACE OF BEGINNING.

REFERENCE IS MADE TO A CERTAIN AREA DESIGNATED AS "N/F BARNHILL CONTRACTING CO. DB 1298, PG. 262" AS SHOWN ON THAT CERTAIN MAP OR PLAT ENTITLED "RECOMBINATION PLAT NEW PARCEL "A" & 2 RESIDUAL PARCELS 5 EXISTING PARCELS", PREPARED BY MATTHEW R. BATTEY, REGISTERED SURVEYOR, DATED APRIL 12, 2016, WHICH MAP OR PLAT IS DULY RECORDED IN PLAT CABINET O, SLIDE 84, CURRITUCK COUNTY REGISTRY.

THE ABOVE PARCEL 3 IS ALSO DESCRIBED BY SURVEY METES AND BOUNDS AS FOLLOWS:

BEGINNING AT A IRON ROD LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, ALSO KNOWN AS CARATOKE HIGHWAY, SAID HIGHWAY HAVING A RIGHT-OF-WAY OF 120 FEET AT THIS POINT, SAID BEGINNING POINT BEING ALSO LOCATED IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158 809.81' IN A NORTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79' AND A CHORD BEARING OF N 35° 09' 45" W - 807.22', FROM AN IRON ROD, SAID IRON ROD BEING LOCATED IN 03° 15' 04" E 119.38' FROM N.C.G.S MONUMENT CUR\_N 873,965.67' E 2,937,616.75' NAD 83 (2011); THENCE FROM SAID POINT OF BEGINNING S 64° 27' 25" W - 175.82' TO AN IRON ROD; THENCE CORNERING FROM SAID IRON N 25° 32' 35" W - 200' TO AN IRON ROD; THENCE CORNERING FROM SAID IRON N 64° 27' 25" E - 174.55' TO AN IRON ROD IN THE WEST MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158; THENCE CORNERING FROM SAID IRON, ALONG THE MARGIN OR RIGHT-OF-WAY OF U.S. HIGHWAY 158, S 25° 32' 35" - 113.87' TO A SET IRON ROD, THENCE 86.14' IN A SOUTHERLY DIRECTION FOLLOWING THE CURVATURE OF SAID RIGHT-OF-WAY, SAID CURVE HAVING A RADIUS OF 2,924.79' AND A CHORD BEARING OF S 26° 23' 12" E - 86.14' TO THE POINT OF BEGINNING. SAID PARCEL CONTAINING 34,946.87 SF, 0.80 AC, MORE OR LESS BY CALCULATION.

PARCEL 4:

BEGINNING AT A POINT, A SET 5/8" REBAR SITUATED AND LYING IN THE SOUTHERN LINE OF LOT 6, BALLAST ROCK COMMERCE CENTER, PHASE II AS DESCRIBED IN PLAT CABINET 1, SLIDE 188 & 189, CURRITUCK COUNTY PUBLIC REGISTRY, SAID BEGINNING POINT ALSO MARKING THE NORTHWESTERNMOST CORNER OF LOT 5, BALLAST ROCK COMMERCE CENTER, PHASE II, PLAT CABINET I, SLIDE 304, CURRITUCK REGISTRY, BEING LOCATED IN

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Document



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THE WESTERN LINE OF THAT 120-FOOT RIGHT OF WAY FOR NORTH CAROLINA POWER; RUNNING THENCE FROM SAID BEGINNING POINT S 24 DEG. 41 MIN. 45 SEC. E 200.91 FEET TO A SET 5/8" REBAR; THENCE CONTINUING ALONG THE WESTERN EDGE OF SAID RIGHT OF WAY S 35 DEG. 21 MIN. 01 SEC. E 534.25 FEET TO A SET 5/8" REBAR LOCATED IN THE NORTHERN EDGE OF THAT 60-FOOT RIGHT OF WAY FOR BALLAST ROCK ROAD; THENCE RUNNING S 35 DEG. 21 MIN. 01 SEC. E 60.00 FEET TO A SET 5/8" REBAR LOCATED IN THE SOUTHERN LINE OF THE AFOREMENTIONED RIGHT OF WAY FOR BALLAST ROCK ROAD; CONTINUING ALONG THE WESTERN EDGE OF THAT RIGHT OF WAY FOR NC POWER S 35 DEG. 21 MIN. 01 SEC. E 283.66 FEET TO A SET 5/8" REBAR, SAID POINT BEING A CONTROL CORNER AND BEING SITUATED IN THE SOUTHWESTERN CORNER OF LOT 4A, BALLAST ROCK COMMERCE CENTER, PHASE III, PLAT CABINET I, SLIDE 206, CURRITUCK REGISTRY, AND SAID CONTROL CORNER BEING SITUATED IN THE NORTHWESTERMOST CORNER OF LOT 3, HINES COMMERCIAL PARK, PLAT CAB H, SLIDE 395, CURRITUCK REGISTRY; RUNNING THENCE FROM SAID CONTROL CORNER S 83 DEG. 29 MIN. 05 SEC. W 164.58 FEET TO AN EXISTING CONCRETE MONUMENT; THENCE RUNNING S 83 DEG. 50 MIN. 05 SEC. W 859.13 FEET TO AN EXISTING CONCRETE MONUMENT, A CORNER IN THE LINE OF PROPERTY NOW OR FORMERLY OWNED BY WILBUR GRIGGS; RUNNING THENCE ALONG THE COMMON LINE WITH GRIGGS N 05 DEG. 57 MIN. 34 SEC. E 207.46 FEET TO AN EXISTING IRON PIPE; THENCE N 19 DEG. 49 MIN. 57 SEC. W 318.00 FEET TO AN EXISTING IRON PIPE; THENCE CONTINUING ALONG THE GRIGGS LINE N 74 DEG. 17 MIN. 19 SEC. W 207.79 FEET TO A SET 5/8" REBAR LOCATED IN THE SOUTHWESTERMOST CORNER OF LOT 6, BALLAST ROCK COMMERCE CENTER, PHASE II, PLAT CABINET I, SLIDE 188 & 189, CURRITUCK REGISTRY; THENCE RUNNING ALONG AND WITH THE SOUTHERNMOST LINE OF THE AFOREMENTIONED LOT 6 N 57 DEG. 50 MIN. 25 SEC. E 841.25 FEET TO THE POINT AND PLACE OF BEGINNING. FURTHER REFERENCE BEING MADE TO THAT RESIDUAL PARCEL FOR BALLAST ROCK COMMERCE CENTER, PHASE II, PLAT CABINET I SLIDE 206, CURRITUCK REGISTRY CONTAINING APPROXIMATELY 15.51 ACRES, MORE OR LESS, AND BEING IDENTIFIED AS THAT RESIDUAL PARCEL IN THAT BOUNDARY SURVEY FOR SCHAUBACH RENTALS, LLP PREPARED BY HYMAN ROBEY, DATED AUGUST 24, 2007, AND RECORDED IN PLAT CABINET K, SLIDE 55 OF THE CURRITUCK PUBLIC REGISTRY.

TOGETHER WITH AN EASEMENT FOR INGRESS, EGRESS AND REGRESS TO AND FROM U.S. HIGHWAY 158 AS SHOWN AND DESIGNATED "BALLAST ROCK ROAD", A SIXTY (60) FOOT RIGHT OF WAY, ON MAP OR PLAT BY HYMAN & ROBEY, P.C. ENTITLED "PHASE II, EXEMPT SUBDIVISION & RECOMBINATION FOR BALLAST ROCK COMMERCE CENTER, POPLAR BRANCH TOWNSHIP, CURRITUCK COUNTY, NORTH CAROLINA", RECORDED IN CURRITUCK COUNTY REGISTRY AT PLAT CABINET I, SLIDE 188.

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075° 51' 00.00" W

075° 50' 00.00" W

075° 49' 00.00" W

036° 08' 00.00" N

036° 08' 00.00" N

036° 07' 00.00" N

036° 07' 00.00" N

036° 06' 00.00" N

036° 06' 00.00" N

075° 51' 00.00" W

075° 50' 00.00" W

075° 49' 00.00" W



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 Fax: (252) 261-1260  
 Web: www.quible.com

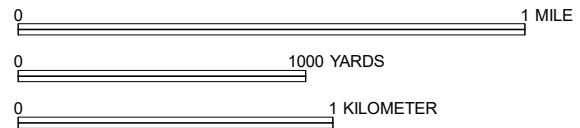
SITE

Declination

MN

MN 10.76° W

SCALE 1:24000



Name: POINT HARBOR  
 Date: 03/28/22  
 Scale: 1 inch = 2,000 ft.

Location: 036° 06' 41.87" N 075° 49' 43.30" W



# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Project information

### NAME

H2OBX RV Park

### LOCATION

Currituck County, North Carolina





### DESCRIPTION

Some(Development of RV park to complement existing water park.)

# Local office

Raleigh Ecological Services Field Office

 (919) 856-4520

 (919) 856-4556

3916 Sunset Ridge Rd

Raleigh, NC 27607

NOT FOR CONSULTATION

# Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

- 
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
  2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of

Commerce.

The following species are potentially affected by activities in this location:

## Mammals

| NAME  | STATUS              |
|---|---------------------|
| <b>Tricolored Bat</b> <i>Perimyotis subflavus</i><br>Wherever found<br>No critical habitat has been designated for this species.<br><a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a> | Proposed Endangered |

## Birds

| NAME   | STATUS     |
|--|------------|
| <b>Eastern Black Rail</b> <i>Laterallus jamaicensis ssp. jamaicensis</i><br>Wherever found<br>No critical habitat has been designated for this species.<br><a href="https://ecos.fws.gov/ecp/species/10477">https://ecos.fws.gov/ecp/species/10477</a>                               | Threatened |
| <b>Piping Plover</b> <i>Charadrius melodus</i><br>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.<br><a href="https://ecos.fws.gov/ecp/species/6039">https://ecos.fws.gov/ecp/species/6039</a>                         | Threatened |
| <b>Red-cockaded Woodpecker</b> <i>Picoides borealis</i><br>Wherever found<br>No critical habitat has been designated for this species.<br><a href="https://ecos.fws.gov/ecp/species/7614">https://ecos.fws.gov/ecp/species/7614</a>  | Endangered |
| <b>Rufa Red Knot</b> <i>Calidris canutus rufa</i><br>Wherever found<br>There is <b>proposed</b> critical habitat for this species. Your location does not overlap the critical habitat.<br><a href="https://ecos.fws.gov/ecp/species/1864">https://ecos.fws.gov/ecp/species/1864</a> | Threatened |

## Reptiles

| NAME  | STATUS |
|---|--------|
| <b>American Alligator</b> <i>Alligator mississippiensis</i><br>Wherever found<br>No critical habitat has been designated for this species.<br><a href="https://ecos.fws.gov/ecp/species/776">https://ecos.fws.gov/ecp/species/776</a> | SAT    |

Green Sea Turtle *Chelonia mydas* Threatened  
There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.  
<https://ecos.fws.gov/ecp/species/6199>

Kemp's Ridley Sea Turtle *Lepidochelys kempii* Endangered  
Wherever found  
There is **proposed** critical habitat for this species.  
<https://ecos.fws.gov/ecp/species/5523>

Leatherback Sea Turtle *Dermochelys coriacea* Endangered  
Wherever found  
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.  
<https://ecos.fws.gov/ecp/species/1493>

## Insects

NAME

STATUS

Monarch Butterfly *Danaus plexippus* Candidate  
Wherever found  
No critical habitat has been designated for this species.  
<https://ecos.fws.gov/ecp/species/9743>

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

## Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act<sup>1</sup> and the Migratory Bird Treaty Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats<sup>3</sup>, should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "[Supplemental Information on Migratory Birds and Eagles](#)".

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds  
<https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds  
<https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC  
<https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to [Bald Eagle Nesting and Sensitivity to Human Activity](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

| NAME  | BREEDING SEASON        |
|---|------------------------|
| <b>Bald Eagle</b> <i>Haliaeetus leucocephalus</i><br>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.<br><a href="https://ecos.fws.gov/ecp/species/1626">https://ecos.fws.gov/ecp/species/1626</a> | Breeds Sep 1 to Jul 31 |

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "[Supplemental Information on Migratory Birds and Eagles](#)", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

**Probability of Presence (■)**

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### **Breeding Season (■)**

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### **Survey Effort (|)**

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

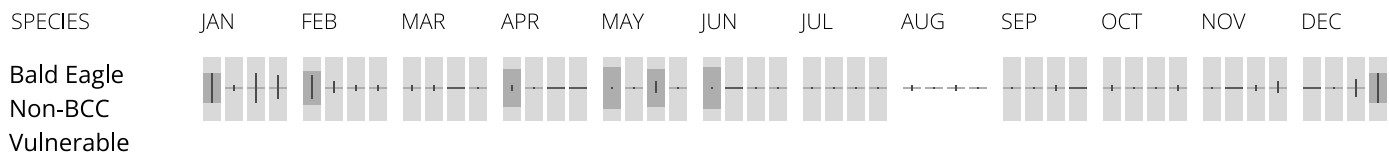
### **No Data (–)**

A week is marked as having no data if there were no survey events for that week.

### **Survey Timeframe**

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





**What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?**

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

**What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

**What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the [Eagle Act](#) should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats<sup>3</sup> should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the ["Supplemental Information on Migratory Birds and Eagles"](#).

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds  
<https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC  
<https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

**The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location.** To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON

American Kestrel *Falco sparverius paulus*

Breeds Apr 1 to Aug 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA  
<https://ecos.fws.gov/ecp/species/9587>

|  |                                |
|--|--------------------------------|
| <p><b>Bald Eagle</b> <i>Haliaeetus leucocephalus</i><br/> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.<br/> <a href="https://ecos.fws.gov/ecp/species/1626">https://ecos.fws.gov/ecp/species/1626</a></p> | <p>Breeds Sep 1 to Jul 31</p>  |
| <p><b>Brown-headed Nuthatch</b> <i>Sitta pusilla</i><br/> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>  | <p>Breeds Mar 1 to Jul 15</p>  |
| <p><b>Chimney Swift</b> <i>Chaetura pelagica</i><br/> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>   | <p>Breeds Mar 15 to Aug 25</p> |
| <p><b>Chuck-will's-widow</b> <i>Antrostomus carolinensis</i><br/> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>  | <p>Breeds May 10 to Jul 10</p> |
| <p><b>Red-headed Woodpecker</b> <i>Melanerpes erythrocephalus</i><br/> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>  | <p>Breeds May 10 to Sep 10</p> |
| <p><b>Ruddy Turnstone</b> <i>Arenaria interpres morinella</i><br/> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>   | <p>Breeds elsewhere</p>        |
| <p><b>Willet</b> <i>Tringa semipalmata</i><br/> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>   | <p>Breeds Apr 20 to Aug 5</p>  |

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "[Supplemental Information on Migratory Birds and Eagles](#)", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### **Breeding Season (■)**

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### **Survey Effort (|)**

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

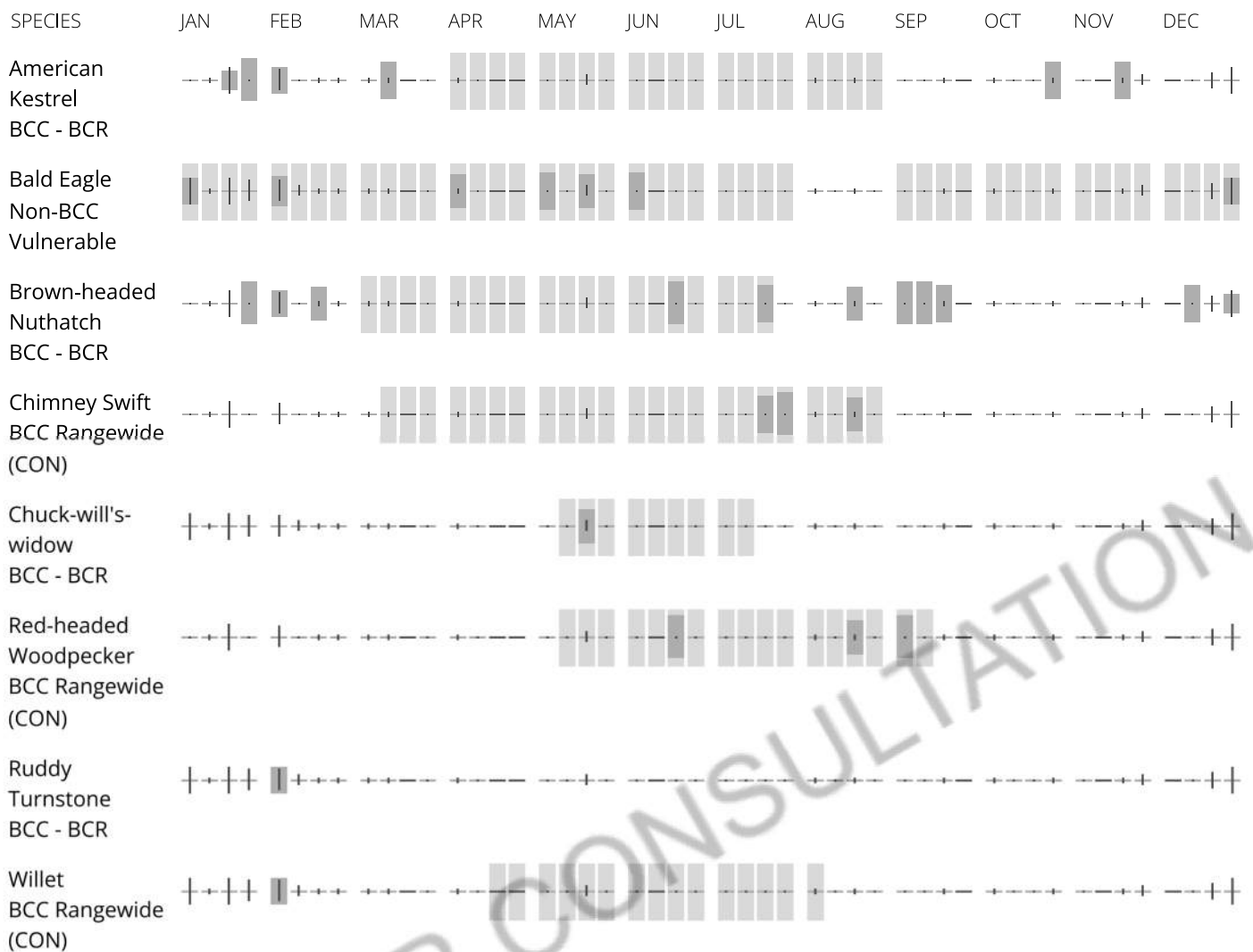
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

### **No Data (–)**

A week is marked as having no data if there were no survey events for that week.

### **Survey Timeframe**

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?**

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid

cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

### **What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### **How do I know if a bird is breeding, wintering or migrating in my area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### **What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### **Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to



you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### **What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### **Proper Interpretation and Use of Your Migratory Bird Report**

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## Facilities

### **National Wildlife Refuge lands**

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

# Fish hatcheries

There are no fish hatcheries at this location.

## Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER POND

PUBHx

A full description for each wetland code can be found at the National Wetlands Inventory website

**NOTE:** This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### **Data exclusions**

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### **Data precautions**

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION



Soil Map—Currituck County, North Carolina



Map Scale: 1:9,670 if printed on A landscape (11" x 8.5") sheet.

0 100 200 400 600 Meters

0 450 900 1800 2700 Feet

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 21, Jan 21, 2022

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 19, 2017

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 |
|------------------------------------|---|--------------|----------------|
| At                                 | Augusta fine sandy loam                               | 10.7         | 2.3%           |
| BoA                                | Bojac loamy sand, 0 to 3 percent slopes               | 7.8          | 1.6%           |
| Bp                                 | Borrow pit  | 1.4          | 0.3%           |
| Ca                                 | Cape Fear loam, 0 to 2 percent slopes, rarely flooded | 5.1          | 1.1%           |
| Cb                                 | Conaby muck   | 29.3         | 6.2%           |
| CnA                                | Conetoe loamy sand, 0 to 3 percent slopes             | 39.5         | 8.4%           |
| Cu                                 | Currituck mucky peat                                  | 7.3          | 1.5%           |
| Ds                                 | Dragston loamy fine sand                              | 123.2        | 26.1%          |
| Mu                                 | Munden loamy sand                                     | 146.7        | 31.1%          |
| Po                                 | Ponzer muck, 0 to 2 percent slopes, rarely flooded    | 28.1         | 6.0%           |
| Pt                                 | Portsmouth fine sandy loam                            | 61.0         | 12.9%          |
| W                                  | Water   | 11.6         | 2.5%           |
| WnB                                | Wando loamy fine sand, 0 to 5 percent slopes          | 0.3          | 0.1%           |
| <b>Totals for Area of Interest</b> |   | <b>471.8</b> | <b>100.0%</b>  |



**U.S. ARMY CORPS OF ENGINEERS  
WILMINGTON DISTRICT**

Action Id. SAW-2022-00794 County: Currituck U.S.G.S. Quad: NC-Point Harbor

**NOTIFICATION OF JURISDICTIONAL DETERMINATION**

Requestor: H2OBX, LLC  
c/o Ken Ellis  
Address: 13 Green Mountain Drive  
Cohoes, NY 12047  
Telephone Number: (518) 783-0038  
E-mail: KenE@aquaticgroup.com

|                  |                        |              |  |
|------------------|------------------------|--------------|--|
| Size (acres)     | <u>96.8</u>            | Nearest Town | <u>Powells Point</u>                                     |
| Nearest Waterway | <u>Albemarle Sound</u> | River Basin  | <u>Albemarle-Chowan</u>                                  |
| USGS HUC         | <u>03010205</u>        | Coordinates  | Latitude: <u>36.111479</u><br>Longitude: <u>-75.8324</u> |

Location description: The review area for this Jurisdictional Determination is located at 8526 Caratoke Hwy in Powells Point, North Carolina. The property is identified by parcel #: 0124000137L0000. The property totals 96.8 acres and contains 1.9 acres of wetlands.

**Indicate Which of the Following Apply:**

**A. Preliminary Determination**

- There appear to be **wetlands** on the above described project area/property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). The **wetlands** have been delineated, and the delineation has been verified by the Corps to be sufficiently accurate and reliable. The approximate boundaries of these waters are shown on the enclosed delineation map dated 3/28/2022. Therefore this preliminary jurisdiction determination may be used in the permit evaluation process, including determining compensatory mitigation. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). However, you may request an approved JD, which is an appealable action, by contacting the Corps district for further instruction.
- There appear to be **wetlands** on the above described project area/property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). However, since the **wetlands** have not been properly delineated, this preliminary jurisdiction determination may not be used in the permit evaluation process. Without a verified wetland delineation, this preliminary determination is merely an effective presumption of CWA/RHA jurisdiction over all of the **wetlands** at the project area, which is not sufficiently accurate and reliable to support an enforceable permit decision. We recommend that you have the **wetlands** on your project area/property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

**B. Approved Determination**

- There are Navigable Waters of the United States within the above described project area/property subject to the permit requirements of Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403) and Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- There are **wetlands** on the above described project area/property subject to the permit requirements of Section 404 of the Clean Water Act (CWA) (33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- We recommend you have the **wetlands** on your project area/property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

**SAW-2022-00794**

The **wetlands** on your project area/property have been delineated and the delineation has been verified by the Corps. The approximate boundaries of these waters are shown on the enclosed delineation map dated . We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in **in Elizabeth City, NC, at (252) 264-3901** to determine their requirements.

Placement of dredged or fill material within waters of the US, including wetlands, without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). Placement of dredged or fill material, construction or placement of structures, or work within navigable waters of the United States without a Department of the Army permit may constitute a violation of Sections 9 and/or 10 of the Rivers and Harbors Act (33 USC § 401 and/or 403). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **Billy W. Standridge at (910) 251-4595 or Billy.w.standridge@usace.army.mil.**

**C. Basis For Determination: See the preliminary jurisdictional determination form dated 01/24/2023.**

**D. Remarks: The wetlands within the review area are depicted on the attached Preliminary JD Exhibit – 8526 Caratoke Highway – H2OBX LLC, dated 03/28/22. This jurisdictional determination is a reverification of two previous JDs issued under SAW-2016-01281 (Aug 11,2016) and SAW-2017-01313 (Aug 29,2022). The previous JDs were issued on separate parcels that were combined to form the current 96.8-acre review area.**

**E. Attention USDA Program Participants**

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

**F. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B. above)**

If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers  
South Atlantic Division  
Attn: Mr. Philip A. Shannin  
Administrative Appeal Review Officer  
60 Forsyth Street SW, Floor M9  
Atlanta, Georgia 30303-8803  
**AND**  
**PHILIP.A.SHANNIN@USACE.ARMY.MIL**

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **Not applicable.**

\*\*It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.\*\*

Corps Regulatory Official: \_\_\_\_\_

*Billy W. Standridge*

Date of JD: **01/24/2023**    Expiration Date of JD: **Not applicable**

**SAW-2022-00794**

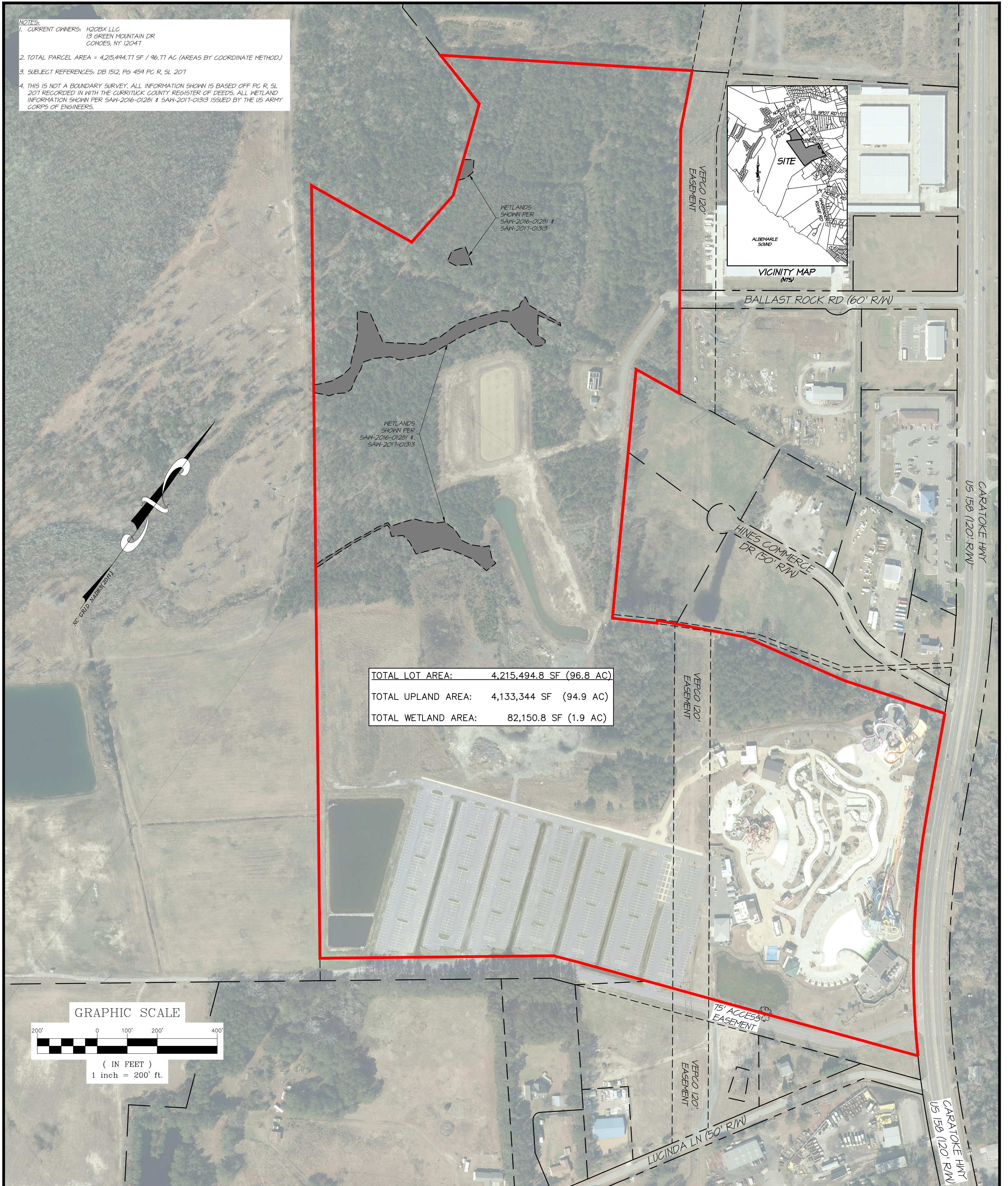
The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete our Customer Satisfaction Survey, located online at <https://regulatory.ops.usace.army.mil/customer-service-survey/>.

Copy Furnished:

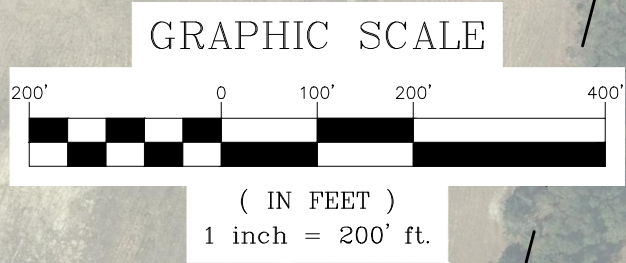
Agent: **Quible & Associates, P.C.**  
**Troy Murphy**  
Address: **P.O. Drawer 870**  
**Kitty Hawk, NC 27949**  
Telephone Number: **(252) 491-8147**  
E-mail: **tmurphy@quible.com**



NOTES:  
 1. CURRENT OWNERS: H2OBX LLC  
 13 GREEN MOUNTAIN DR  
 COHOES, NY 12041  
 2. TOTAL PARCEL AREA = 4,215,494.77 SF / 96.77 AC (AREAS BY COORDINATE METHOD.)  
 3. SUBJECT REFERENCES: DB 1512, PG 454 PG R, SL 207  
 4. THIS IS NOT A BOUNDARY SURVEY. ALL INFORMATION SHOWN IS BASED OFF PG R, SL 207 RECORDED IN WITH THE CURRITUCK COUNTY REGISTER OF DEEDS. ALL WETLAND INFORMATION SHOWN PER SAN-2016-01281 & SAN-2017-01313 ISSUED BY THE US ARMY CORPS OF ENGINEERS.



|                     |                          |
|---------------------|--------------------------|
| TOTAL LOT AREA:     | 4,215,494.8 SF (96.8 AC) |
| TOTAL UPLAND AREA:  | 4,133,344 SF (94.9 AC)   |
| TOTAL WETLAND AREA: | 82,150.8 SF (1.9 AC)     |



ISSUE DATE: 03/28/22  
 SCALE: 1"=200'  
 CHECKED BY: JTM  
 DRAWN BY: JTM  
 PROJECT NO.: P15004

**PRELIMINARY JD EXHIBIT**

**8526 CARATOKE HIGHWAY**  
**H2OBX LLC**

POPLAR BRANCH TOWNSHIP      CURRITUCK COUNTY      NORTH CAROLINA

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 QUILBE & ASSOCIATES, P.C.

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IF THIS DOCUMENT IS NOT SIGNED AND SEALED BY A LICENSED PROFESSIONAL THEN THIS DOCUMENT SHALL BE CONSIDERED PRELIMINARY, NOT A CERTIFIED DOCUMENT AND SHALL NOT BE USED FOR CONSTRUCTION, RECORDATION, SALES OR LAND CONVEYANCES, UNLESS OTHERWISE NOTED.

**THIS MAP IS NOT A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS.**

**CERTIFICATION**

NC License#: C-0208

**Quible & Associates, P.C.**  
 SINCE 1959

ENGINEERING\*\* \* CONSULTING \* PLANNING  
 ENVIRONMENTAL SCIENCES \* SURVEYING\*\*  
 \*\*ENGINEERING/SURVEYING NOT OFFERED AT BLACK MTN. OFFICE\*\*

8466 CARATOKE HWY  
 BLDG 400  
 POWELLS POINT, NC 27966  
 Phone: (252) 491-8147  
 administrator@quible.com

90 CHURCH STREET  
 SUITE B  
 BLACK MOUNTAIN, NC 28711  
 Phone: (828) 357-5149  
 administrator@quible.com



**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND  
REQUEST FOR APPEAL**

Applicant: **H2OBX, LLC, c/o Ken Ellis**

File Number: **SAW-2022-00794**

Date: **01/24/2023**

Attached is:

See Section below

|                                     |  |   |
|-------------------------------------|--|---|
| <input type="checkbox"/>            | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | A |
| <input type="checkbox"/>            | PROFFERED PERMIT (Standard Permit or Letter of permission)         | B |
| <input type="checkbox"/>            | PERMIT DENIAL  | C |
| <input type="checkbox"/>            | APPROVED JURISDICTIONAL DETERMINATION                              | D |
| <input checked="" type="checkbox"/> | PRELIMINARY JURISDICTIONAL DETERMINATION                           | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx> or the Corps regulations at 33 CFR Part 331.

**A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.**

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

**B: PROFFERED PERMIT: You may accept or appeal the permit**

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**C: PERMIT DENIAL:** You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**D: APPROVED JURISDICTIONAL DETERMINATION:** You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**E: PRELIMINARY JURISDICTIONAL DETERMINATION:** You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

**SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT**

**REASONS FOR APPEAL OR OBJECTIONS:** (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

**ADDITIONAL INFORMATION:** The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

**POINT OF CONTACT FOR QUESTIONS OR INFORMATION:**

If you have questions regarding this decision and/or the appeal process you may contact:  
**District Engineer, Wilmington Regulatory Division**  
**Attn: Billy W. Standridge**  
**Washington Regulatory Office**  
**U.S Army Corps of Engineers**  
**2407 West Fifth Street**  
**Washington, North Carolina 27889**

If you only have questions regarding the appeal process you may also contact:  
MR. PHILIP A. SHANNIN  
ADMINISTRATIVE APPEAL REVIEW OFFICER  
CESAD-PDS-O  
60 FORSYTH STREET SOUTHWEST, FLOOR M9  
ATLANTA, GEORGIA 30303-8803  
  
PHONE: (404) 562-5136; FAX (404) 562-5138  
EMAIL: [PHILIP.A.SHANNIN@USACE.ARMY.MIL](mailto:PHILIP.A.SHANNIN@USACE.ARMY.MIL)

**RIGHT OF ENTRY:** Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation, and will have the opportunity to participate in all site investigations.

|                                  |       |                   |
|----------------------------------|-------|-------------------|
| _____                            | Date: | Telephone number: |
| Signature of appellant or agent. |       |                   |

*For appeals on Initial Proffered Permits send this form to:*

**District Engineer, Wilmington Regulatory Division, Attn: Billy W. Standridge, 69 Darlington Avenue, Wilmington, North Carolina 28403**

*For Permit denials, Proffered Permits and Approved Jurisdictional Determinations send this form to:*

**Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Philip Shannin, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801**  
**Phone: (404) 562-5137**



**PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM**

**BACKGROUND INFORMATION**

- A. REPORT COMPLETION DATE FOR PJD:** 01/24/2023
- B. NAME AND ADDRESS OF PERSON REQUESTING PJD:** H2OBX, LLC, c/o Ken Ellis, 13 Green Mountain Drive, Cohoes, NY 12047
- C. DISTRICT OFFICE, FILE NAME, AND NUMBER:** Wilmington District, 8526 Caratoke Hwy / Powells Point NC / Currituck County, SAW-2022-00794
- D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:** The review area for this Jurisdictional Determination is located at 8526 Caratoke Hwy in Powells Point, North Carolina. The property is identified by parcel #: 0124000137L0000. The property totals 96.8 acres and contains 1.9 acres of wetlands.

**(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**

State: NC County: Currituck City: Powells Point  
Center coordinates of site (lat/long in degree decimal format): Latitude: 36.111479 Longitude: -75.8324

Universal Transverse Mercator:

Name of nearest waterbody: Albemarle Sound

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

Office (Desk) Determination. Date:01/20/2023

Field Determination. Date(s):

**TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION**

| Site Number                        | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resources in review area (acreage and linear feet, if applicable) | Type of aquatic resources (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404) |
|------------------------------------|----------------------------|-----------------------------|---|--|---|
| SAW-2022-00794 Wetlands (combined) | 36.112087                  | -75.83332                   | 1.9 acres   | Wetland  | Section 404   |

1. The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "*may be*" waters of the U.S. and/or that there "*may be*" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (check all that apply)** Checked items are included in the administrative record and are appropriately cited:

Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:

Map: PJD Exhibit dated 03/28/22

Data sheets prepared/submitted by or on behalf of the PJD requestor. Datasheets:

Office concurs with data sheets/delineation report.

Office does not concur with data sheets/delineation report. Rationale: \_\_\_\_\_

Data sheets prepared by the Corps: \_\_\_\_\_

Corps navigable waters' study:

U.S. Geological Survey Hydrologic Atlas:

USGS NHD data:

USGS 8 and 12 digit HUC maps:

U.S. Geological Survey map(s). Cite scale & quad name:

Natural Resources Conservation Service Soil Survey. Citation:

National wetlands inventory map(s). Cite name:

State/local wetland inventory map(s): \_\_\_\_\_

FEMA/FIRM maps:

100-year Floodplain Elevation is: \_\_\_\_\_ (National Geodetic Vertical Datum of 1929)

Photographs:  Aerial (Name & Date):

or  Other (Name & Date):

Previous determination(s). File no. and date of response letter: SAW-2016-01281 (Aug 11,2016) and

SAW-2017-01313 (Aug 29,2022)

Other information (please specify):

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**



Signature and date of Regulatory staff member completing PJD  
01/24/2023



Signature and date of person requesting PJD  
(REQUIRED, unless obtaining the signature is impracticable)<sup>1</sup>

<sup>1</sup> Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.