Question 1. Please provide any correspondence and/or documentation regarding environmental review coordination (e.g. scoping requests, environmental assessments/impact statements, categorical exclusions) with local municipalities, other state agencies, or federal agencies for the proposed mine expansion.

WSC response:
Early in our due diligence period, Wake Stone determined that environmental review/coordination for a project of this scope might potentially require review by local municipalities, various divisions within the State of North Carolina’s Department of Environmental Quality, and one or more federal agencies; with primary review/oversight being with the Mining Program within NCDEMLR. In performance of due diligence activities prior to submittal of the Mining Permit Modification Application, Wake Stone considered all applicable local, State, and Federal land use and environmental regulatory programs under which the proposed mine expansion might require review.

Local Municipality Review
The subject quarry expansion property, Raleigh-Durham Airport Authority’s (RDUAA’s) “Odd Fellows” tract, is located outside the corporate limits of the nearby cities of Raleigh, Cary, and Morrisville. Therefore, no oversight or approval of the project is required from them. The subject property is situated within Wake County. Under the RDUAA’s statutory authority to apply their own land use regulations, no zoning or other land use permits are required from Wake County. This was confirmed by the Wake County Manager’s office. Wake County’s Environmental Services Department, as the delegated local administrator of the Federal Emergency Management Agency’s floodplain management program, has reviewed and accepted the “no-rise certification” flood study associated with the proposed Crabtree Creek bridge crossing as submitted by Sungate Design Group, PA on behalf of Michael Baker International (Wake Stone’s retained bridge engineering design firm). A construction permit will be sought from Wake County for construction of the bridge across Crabtree Creek once final engineering design is completed. (See attached email chain from Timothy W. Maloney, Director of Wake County Planning Development & Inspections.)

State of NC Environmental Review
Primary review responsibility for land disturbance activities associated with the expansion of the Triangle Quarry (Mining Permit 92-10) is delegated to the Mining Program staff of NCDEMLR under the Mining Act of 1971 (NCGS 74, Article 7). Engineering staff of the Raleigh Regional Office (RRO) have provided technical review of the application materials as related to the proposed erosion and sediment control structures/activities to be employed. RRO staff comments have been incorporated in DEMLR’s request for supplemental information and are being addressed individually later in this response package.

The application was also forwarded to “sister” agencies within the Department of Environmental Quality (the Division of Water Resources, the Division of Air Quality, the NC Geological Survey, the NC Wildlife Resources Commission, and the NC Division of Parks and Recreation) for review and comment.
Comments received from these review agencies have been incorporated in DEMLR’s request for supplemental information and are being addressed in the order in which they occur in the ADI letter.

**NC Division of Water Resources Review - Neuse River Riparian Buffer Rule**

With the project area being located within the Neuse River basin, a determination was made as to the applicability of the Neuse River Riparian Buffer Rule (15A NCAC 02B .0233) (NRRB). Staff of the Division of Water Resources visited the site under the accompaniment of Soil and Environmental Consultants, PA and conducted a buffer applicability determination. Stream features potentially subject to the NRRB rule were identified in the Division’s Buffer Determination Letter dated June 20, 2019 (copy attached). Wake Stone’s site development plans were devised in such a manner as to avoid impacts to any features subject to the NRRB rule. Under the NRRB, bridges are treated as allowable uses. Allowable impacts to the Neuse River Riparian Buffer (along Crabtree Creek) associated with the proposed Crabtree Creek bridge crossing are identified in the NC DWR Buffer Authorization issued by the Division on June 4, 2020 (copy attached).

**Federal Agency Environmental Review**

**Section 404 of the Federal Clean Water Act – Jurisdictional Wetlands and Waters**

Wake Stone retained the environmental consulting firm Soil and Environmental Consultants, PA (S&EC) for assistance with matters pertaining to streams, wetlands, and other potentially jurisdictional water resources. A detailed delineation of all wetlands and waters was performed by staff of S&EC. All identified wetlands and waters were field verified by staff of the US Army Corps of Engineers (USACE) Raleigh Regulatory Field Office under Action Id No. SAW-2019-01286. Following USACE field verification of all identified wetland and water features, S&EC prepared and submitted a request for an Approved Jurisdictional Determination (AJD). The USACE issued the Approved Jurisdictional Determination on January 15, 2020. A copy of the AJD was included in the Mining Permit Modification Application package submitted to NCDEMLR on April 8, 2020 (copy attached). As identified and detailed in the application submittal, Wake Stone proposes no impact to any identified jurisdictional wetlands or waters. No USACE permit or NC DWR 401 Water Quality Certifications are required for the project.

**National Environmental Policy Act (NEPA)**

The FAA has determined that the National Environmental Policy Act is not applicable to locating a quarry operation on the Oddfellows tract. Please see the attached April 29, 2019 letter from Steven Hicks, Director of the FAA’s Office of Airports Southern Region to Michael Landguth, President and CEO of RDUAA discussing applicability of the NEPA.
From: Timothy Maloney <tmaloney@wakegov.com>
Date: September 3, 2020 at 2:17:54 PM EDT
To: Chris Dillon <Chris.Dillon@wakegov.com>
Cc: Tom Oxholm <tomoxholm@wakestonecorp.com>, Michael Orbon <Michael.Orbon@wakegov.com>
Subject: RE: Wake County Permits

Tom/Chris,

Below is a summary of all permits that may or may not be required for the quarry on RDU leased property.

*Land Use/Zoning Permits*
No permits are required from Wake County. The property is under the jurisdiction of RDU Airport Authority.

*Building Permits*
Permits are required from Wake County for structures subject to the NC State Building Code. This includes the bridge over Crabtree Creek.

*Stormwater and Erosion Control*
No permits are required from Wake County for stormwater or erosion control. This will be addressed under the mining permit. As for the bridge, the quarry has applied to Wake County for a flood study, which is required, and to date has submitted a no-rise certificate.

*On-Site Septic*
Permits are required from Wake County for on-site septic systems.

*Wells*
Permits are required from Wake County for wells used for potable water. Test wells do not require a permit from Wake County.

Please feel free to contact me if you have any questions.

Thanks, Tim

Timothy W. Maloney, PLA, ASLA
Director
Wake County Government
Planning Development & Inspections
tmaloney@wakegov.com
919.856.6678 office
P.O. Box 550 Raleigh, NC 27602
wakegov.com

From: Chris Dillon <Chris.Dillon@wakegov.com>
Sent: Wednesday, September 2, 2020 4:38 PM
To: Timothy Maloney <tmaloney@wakegov.com>
Subject: Fwd: Wake County Permits

Sent from my iPhone

Begin forwarded message:

From: Chris Dillon <Chris.Dillon@wakegov.com>
Date: September 2, 2020 at 2:27:00 PM EDT
To: Tom Oxholm <tomoxholm@wakestonecorp.com>
Subject: RE: Wake County Permits

Thanks Tom. I am copying Tim Maloney, Wake County Director of Wake County Planning, Development, and Inspections for a response.

Tim: Could you please respond to Tom and copy me? Thank you -- Chris

From: Tom Oxholm <tomoxholm@wakestonecorp.com>
Sent: Wednesday, September 2, 2020 2:23 PM
To: Chris Dillon <Chris.Dillon@wakegov.com>
Subject: Wake County Permits

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

Chris
From our previous meetings and discussions with Wake County government staff, we believe that the only Wake County permit we will need in regard to opening our quarry on RDU Airport land (should we get a State Mining Permit) is a permit to construct the bridge over Crabtree Creek.
The State has asked us to get that in writing.

Would you mind having the correct person in Wake County government, respond to us by their own email (showing their title and office credentials), telling us exactly what is required and when we will need it. Of course, if something else is needed, please include that, too.

Thank you very much.

tom

Thomas B Oxholm
Vice President
Wake Stone Corporation
PO Box 190
Knightdale, NC 27545
(919)266-1100

E-mail correspondence sent to and received from this address may be subject to disclosure under the North Carolina Public Records Act unless made confidential under applicable law.
June 20, 2019

Raleigh-Durham Airport Authority  
Atttn: Michael J. Landguth, President  
1000 Trade Drive  
P.O. Box 80001  
RDU Airport, NC 27623

Subject: Buffer Determination Letter  
NBRRO #19-176  
Wake County

<table>
<thead>
<tr>
<th>Determination Type:</th>
<th>Intermittent/Perennial</th>
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</thead>
<tbody>
<tr>
<td>✗ Neuse (15A NCAC 2B .0233)</td>
<td></td>
</tr>
<tr>
<td>☐ Tar-Pamlico (15A NCAC 2B .0259)</td>
<td>Intermittent/Perennial Determination (where local buffer ordinances apply)</td>
</tr>
<tr>
<td>☐ Jordan (15A NCAC 2B .0267) (governmental and/or interjurisdictional projects)</td>
<td></td>
</tr>
</tbody>
</table>

Project Name: Wake Stone Property

Address/Location: Old Reedy Creek Road, Cary, NC; PIN # 0767324317

Stream(s): Crabtree Creek

Determination Date: June 18, 2019  
Staff: Stephanie Goss

<table>
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<th>E/I/P</th>
<th>Not Subject</th>
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<th>Start @</th>
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<td>P</td>
<td>✗</td>
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<td>X</td>
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<tr>
<td>Pond 1</td>
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<td></td>
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<td>X</td>
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<tr>
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<td>Pond 1</td>
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<td>2</td>
<td>I</td>
<td></td>
<td>X</td>
<td>DWR Flag</td>
<td>Crabtree Crk.</td>
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<td>3</td>
<td>E</td>
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<td>Crabtree Crk.</td>
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<td>Crabtree Crk.</td>
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<td></td>
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</tbody>
</table>
Wake Stone Property
Wake County
June 20, 2019
Page 2 of 2

1) E = Ephemeral, I = Intermittent, P = Perennial, NP = Not Present, NA = Not Applicable
(2) Refers to State riparian buffer rules only. Stream, wetland, or pond impacts are still subject to applicable water quality standards and permitting requirements.

Explanation: The stream(s)/pond(s) listed above has been located on the most recent published NRCS Soil Survey of Wake County, North Carolina and/or the most recent copy of the USGS Topographic map at a 1:24,000 scale. Each feature that is checked “Not Subject” has been determined to not be an intermittent stream, perennial stream, a pond connected to a stream feature, or the feature is determined not to be present. Stream features that are checked “Subject” have been located on the property and possess characteristics that qualify them to be subject to the buffer rules. There may be other streams located on the property that are not depicted on the maps referenced above and are therefore not subject to the buffer rules. However, if the stream features are present on the tract they are subject to all other applicable North Carolina stream standards and permitting requirements as outlined in 15A NCAC 02B, and may be considered jurisdictional according to the US Army Corps of Engineers.

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWR may request a determination by the Director. An appeal request must be made within sixty (60) days of date of this letter. A request for a determination by the Director shall be referred to the Director in writing. If sending via US Postal Service: c/o Karen Higgins; DWR – 401 & Buffer Permitting Unit; 1617 Mail Service Center; Raleigh, NC 27699-1617. If sending via delivery service (UPS, FedEx, etc.): Karen Higgins; DWR – 401 & Buffer Permitting Unit; 512 N. Salisbury Street; Raleigh, NC 27604.

This determination is final and binding unless, as detailed above, unless an appeal is requested within sixty (60) days.

This project may require a Section 404/401 Permit for the proposed activity. Any inquiries should be directed to the US Army Corp of Engineers (Raleigh Regulatory Field Office) at (919)-554-4884.

If you have questions regarding this determination, please feel free to contact Stephanie Goss at (919)791-4256.

Sincerely,

Karen Higgins
Supervisor, 401 & Buffer Permitting Branch

cc: RRO DWR File Copy
Bob Zarzecki via e-mail at bzarzecki@sandec.com
June 4, 2020

DWR # 2017-1487v3
Wake County

Wake Stone Corporation
Mr. Sam Bratton
PO Box 190
6281 Knightdale Blvd
Knightdale, NC 27545-0190

Subject: AUTHORIZATION CERTIFICATE PER THE NEUSE RIVER BASIN RIPARIAN BUFFER PROTECTION RULES (15A NCAC 02B .0233) WITH ADDITIONAL CONDITIONS
Wake Stone Corporation – Triangle Quarry – Bridge Across Crabtree Creek

Dear Mr. Bratton:

You have our approval for the impacts listed below for the purpose described in your application dated April 7, 2020 and received by the Division of Water Resources (Division) April 7, 2020. Additional information was requested April 22, 2020 and was received on April 23, 2020. This Authorization Certificate shall expire five (5) years from the date of this letter. These impacts are covered by the Neuse River Basin Riparian Buffer Rules and the conditions listed below. Please note that you should get any other federal, state or local permits before proceeding with your project, including those required by (but not limited to) Sediment and Erosion Control, Non-Discharge, and Water Supply Watershed regulations.

This approval requires you to follow the following additional conditions:

1. The following impacts are hereby approved upon issuance of modified Mining Permit 92-10 allowing for mining activities on the “Odd Fellows Tract” property and provided that all of the other specific and general conditions of the Buffer Rules are met. No other impacts are approved, including incidental impacts [15A NCAC 02B .0233(8)]:

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Amount Approved (units)</th>
<th>Amount Approved (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Permanent</td>
<td>Temporary</td>
</tr>
<tr>
<td>Buffers – Zone 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bridge</td>
<td>6,404 (square feet)</td>
<td>0 (square feet)</td>
</tr>
<tr>
<td>Type of Impact</td>
<td>Amount Approved (units)</td>
<td>Amount Approved (units)</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>Permanent</td>
<td>Temporary</td>
</tr>
<tr>
<td>Buffers – Zone 2</td>
<td>5,645 (square feet)</td>
<td>0 (square feet)</td>
</tr>
</tbody>
</table>

2. **Diffuse Flow**
   All stormwater must be directed and maintained as diffuse flow at non-erosive velocities through the protected stream buffers such that it will not re-concentrate before discharging into a stream. [15A NCAC 02B .0233(5)]

3. This approval is for the purpose and design described in your application. The plans and specifications for this project are incorporated by reference as part of the Application. If you change your project, you must notify the Division and you may be required to submit a new application package. If the property is sold, the new owner must be given a copy of this approval letter and is responsible for complying with all conditions. [15A NCAC 02B .0233(8)(b)]

This approval and its conditions are final and binding unless contested. [G.S. 143-215.5]

This Certification can be contested as provided in General Statute 150B by filing a written petition for an administrative hearing to the Office of Administrative Hearings (hereby known as OAH) within sixty (60) calendar days.

A petition form may be obtained from the OAH at http://www.ncoah.com/ or by calling the OAH Clerk’s Office at (919) 431-3000 for information. A petition is considered filed when the original and one (1) copy along with any applicable OAH filing fee is received in the OAH during normal office hours (Monday through Friday between 8:00am and 5:00pm, excluding official state holidays).

The petition may be faxed to the OAH at (919) 431-3100, provided the original and one copy of the petition along with any applicable OAH filing fee is received by the OAH within five (5) business days following the faxed transmission.
Mailing address for the OAH:

If sending via US Postal Service:  
Office of Administrative Hearings  
6714 Mail Service Center  
Raleigh, NC 27699-6714

If sending via delivery service (UPS, FedEx, etc):  
Office of Administrative Hearings  
1711 New Hope Church Road  
Raleigh, NC 27609-6285

One (1) copy of the petition must also be served to Department of Environmental Quality:

William F. Lane, General Counsel  
Department of Environmental Quality  
1601 Mail Service Center  
Raleigh, NC 27699-1601

This letter completes the review of the Division under the Neuse River Basin Riparian Buffer Rules. Please contact Paul Wojoski at 919-707-3631 or Paul.Wojoski@ncdenr.gov if you have any questions or concerns.

Sincerely,

[Signature]

Paul Wojoski, Supervisor  
401 & Buffer Permitting Branch

cc: Bob Zarzecki, Soil and Environmental Consultants (via email)  
    Michael Landguth, RDUAA (via email)  
    Judy Wehner, DEMLR (via email)  
    DWR RRO  
    DWR 401 & Buffer Permitting Branch file
NOTIFICATION OF JURISDICATIONAL DETERMINATION

Requestor: Soil & Environmental Consultants PA
Attn: Bob Zarzecki
Address: 8412 Falls of Neuse Rd. Suite 104
Raleigh, NC 27615

Size (acres) ~105 Nearest Town Cary
Nearest Waterway Crabtree Creek River Basin Neuse
USGS HUC 03020201 Coordinates 35.841639, -78.774819

Location description: The project area is located on the north side of I-40 and the east side of Old Reedy Creek Road in Cary, Wake County, North Carolina. PIN: 0767324317. The project area is limited to the area within the line labeled "PL" on the attached survey titled "Plat of Waters of the US Survey for Wake Stone Corporation."

Indicate Which of the Following Apply:

A. Preliminary Determination

☐ There appear to be waters, including 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 waters, including 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 DATE. 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 waters, including 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 waters, including 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 waters, including wetlands at the project area, which is not sufficiently accurate and reliable to support an enforceable permit decision. We recommend that you have the waters, including 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 waters, including 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 waters, including 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.

☐ The waters, including 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 DATE. 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.
SAW-2019-01286

☒ The waters, including wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on 1/15/2020. 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.

☐ There are no waters of the U.S., to include wetlands, present on the above described project area/property which are subject to the permit requirements of Section 404 of the Clean Water Act (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.

☐ 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 Morehead City, NC, at (252) 808-2808 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 David E. Bailey at (919) 554-4884 X 30 or David.E.Bailey2@usace.army.mil.

C. Basis For Determination: See the Approved Jurisdictional Determination forms dated 01/15/2020.

D. Remarks: None.

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)

This correspondence constitutes an approved jurisdictional determination for the above described site. 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: Phillip Shannin, Review Officer
60 Forsyth Street SW, Room 10M15
Atlanta, Georgia 30303-8801

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 03/15/2020. **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: ________________________________ Date: 2020.01.15 14:32:34 -05'00'

Date of JD: 01/15/2020 Expiration Date of JD: 1/14/2025

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 the Customer Satisfaction Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

Copy furnished:
Michael Landguth, Raleigh-Durham Airport Authority, 1000 Trade Dr. PO Box 80001, RDU Airport, NC 27623
Stephanie Goss, NCDEQ-DWR, 3800 Barrett Dr, Raleigh, NC 27609
I, L. RANDALL JONES, PLS, certify that this project was completed under my direct and responsible charge from an actual survey made by me; that the boundaries not surveyed are drawn from Wake County GIS; that the ratio of precision of the positional accuracy is sub-meter, and that this map meets the requirements of The Standards of Practice for Land Surveying in North Carolina (21 NCAC 56.1600). This 28th day of August, 2019.

L. Randall Jones
NC Professional Land Surveyor (L-3245)

1) Waters of the US (WoUS) including wetlands, streams, and open waters (pond) shown on this map are delineated by Soil and Environmental Consultants, PA (S&EC), 8412 Falls of Neuse Road, Suite 104, Raleigh, N.C. 27615 and field verified by Ross Sullivan of the US Army Corps of Engineers on August 21, 2019.
2) NC State Plane coordinates shown hereon are referenced horizontally to the North American Datum of 1983 using the 2011 Adjustment (NAD83/2011).
3) This is a wetlands and US Regulated Waters Survey referenced to the property lines taken from Wake County GIS Data.
4) This Survey meets the horizontal accuracy standards for a Class B US/GIS SURVEY (sub-meter) as set forth by the NC Board for Engineers and Land Surveyors in 21 NCAC 56.1608.
5) Field survey was conducted using the Global Navigation Satellite System (GNSS) on July 8, 2019 using a Trimble GEO 7X (sn 5737479817) with external Zephyr L1/L2 Antenna (sn 31211179821) and post processed in reference to the closest three (3) CORS Stations (NCRD, DURH, NCIL) with Trimble Pathfinder Office software (version5.90).
6) Several Existing Iron Pipes (EIP) (property corners) were also located along Crabtree Creek at the time of survey and plotted on this map.
and post processed in reference to the closest three (3) CORS Stations (NCRD, DURH, NCJM) with Trimble Pathfinder Office software (version 5.90).

6) Several existing iron pipes (EIP) (property corners) were also located along Crabtree Creek at the time of survey and plotted on this map.

"This certifies that this copy of this plat accurately depicts the boundary of the jurisdiction of the Section 404 of the Clean Water Act as determined by the undersigned on this date. Unless there is change in the law or our published regulations, this determination of Section 404 jurisdiction may be relied upon for a period not to exceed five years from this date. The undersigned completed this determination utilizing the appropriate Regional Supplement to the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual, 33 C.F.R. part 328 and other U.S. Army Corps of Engineers guidance."

Date: 2020.01.15 14:32:03 -05'00''

Regulatory Official: 
Title: Regulatory Project Manager
Date: 1/15/2020
USACE Action ID No.: SAW-2019-01286

Plat of
Waters of the US Survey for
for
Wake Stone Corporation

Graphical Scale

Graphic Scale 1'' = 100'
NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Soil & Environmental Consultants PA, Attn: Bob Zarzecki  
File Number: SAW-2019-01286  
Date: 01/15/2020

Attached is: See Section below

| A | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) |
| B | PROFFERED PERMIT (Standard Permit or Letter of permission) |
| C | PERMIT DENIAL |
| D | APPROVED JURISDICTIONAL DETERMINATION |
| E | PRELIMINARY JURISDICTIONAL DETERMINATION |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at or [http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx](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.
<table>
<thead>
<tr>
<th>SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT</th>
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<tbody>
<tr>
<td>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.)</td>
</tr>
</tbody>
</table>

| 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. |

<table>
<thead>
<tr>
<th>POINT OF CONTACT FOR QUESTIONS OR INFORMATION:</th>
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<tbody>
<tr>
<td>If you have questions regarding this decision and/or the appeal process you may contact:</td>
</tr>
<tr>
<td><strong>District Engineer, Wilmington Regulatory Division</strong></td>
</tr>
<tr>
<td>Attn: David E. Bailey</td>
</tr>
<tr>
<td>Raleigh Regulatory Office</td>
</tr>
<tr>
<td>U.S Army Corps of Engineers</td>
</tr>
<tr>
<td>3331 Heritage Trade Drive, Suite 105</td>
</tr>
<tr>
<td>Wake Forest, North Carolina 27587</td>
</tr>
<tr>
<td>If you only have questions regarding the appeal process you may also contact:</td>
</tr>
<tr>
<td>Mr. Phillip Shannin, Administrative Appeal Review Officer</td>
</tr>
<tr>
<td>CESAD-PDO</td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers, South Atlantic Division</td>
</tr>
<tr>
<td>60 Forsyth Street, Room 10M15</td>
</tr>
<tr>
<td>Atlanta, Georgia 30303-8801</td>
</tr>
<tr>
<td>Phone: (404) 562-5137</td>
</tr>
</tbody>
</table>

| 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. |

| Signature of appellant or agent. | Date: | Telephone number: |

*For appeals on Initial Proffered Permits send this form to:*

District Engineer, Wilmington Regulatory Division, Attn: David E. Bailey, 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. Phillip Shannin, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801

Phone: (404) 562-5137
SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): January 15, 2020

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington District, Wake Stone Corp RDU 105 Acre Property/Wake Stone Corporation/Raleigh-Durham Airport Authority/Cary NC/Wake County, SAW-2019-01286

C. PROJECT LOCATION AND BACKGROUND INFORMATION: The project area is located on the north side of I-40 and the east side of Old Reedy Creek Road in Cary, Wake County, North Carolina. PIN: 0767324317. The project area is limited to the area within the line labeled "PL" on the attached survey titled "Plat of Waters of the US Survey for Wake Stone Corporation."

State: North Carolina  
County/parish/county: Wake County  
City: Cary

Center coordinates of site (lat/long in degree decimal format): Lati. 35.8416387187234° N, Long. -78.7748193820444° W  
Universal Transverse Mercator: 17 700966.44 3968669.84

Name of nearest waterbody: Crabtree Creek  
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Name of watershed or Hydrologic Unit Code (HUC): Upper Neuse, 03020201

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.  
Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form:

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:

☒ Field Determination. Date(s): 8/21/2019

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no “navigable waters of the U.S.” within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]  
☐ Waters subject to the ebb and flow of the tide.  
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.  

Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are “waters of the U.S.” within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.
   a. Indicate presence of waters of U.S. in review area (check all that apply): 1

   ☐ TNWs, including territorial seas  
   ☒ Wetlands adjacent to TNWs  
   ☐ Relatively permanent waters 2 (RPWs) that flow directly or indirectly into TNWs  
   ☒ Non-RPWs that flow directly or indirectly into TNWs  
   ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs  
   ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs  
   ☒ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs  
   ☒ Impoundments of jurisdictional waters  
   ☒ Isolated ( interstate or intrastate) waters, including isolated wetlands

   b. Identify (estimate) size of waters of the U.S. in the review area:
      Non-wetland waters: 748 linear feet, 4 wide, and/or 4 acres.  
      Wetlands: acres.

   c. Limits (boundaries) of jurisdiction based on: Established by OHWM.
      Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable): 3

   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.  
   ☐ Explain:

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

1 Boxes checked below shall be supported by completing the appropriate sections in Section III below.  
2 For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least “seasonally” (e.g., typically 3 months).  
3 Supporting documentation is presented in Section III.F.
The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
   Identify TNW:
   Summarize rationale supporting determination:

2. Wetland adjacent to TNW
   Summarize rationale supporting conclusion that wetland is “adjacent”:

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under Rapanos have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are “relatively permanent waters” (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

   (i) General Area Conditions:
      Watershed size: Pick List
      Drainage area: Pick List
      Average annual rainfall: inches
      Average annual snowfall: inches

   (ii) Physical Characteristics:
      (a) Relationship with TNW:
         🔹 Tributary flows directly into TNW.
         🔹 Tributary flows through Pick List tributaries before entering TNW.

         Project waters are Pick List river miles from TNW.
         Project waters are Pick List river miles from RPW.
         Project waters are Pick List aerial (straight) miles from TNW.
         Project waters are Pick List aerial (straight) miles from RPW.
         Project waters cross or serve as state boundaries. Explain:

         Identify flow route to TNW:
         Tributary stream order, if known:

      (b) General Tributary Characteristics (check all that apply):

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4 Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
5 Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
Tributary is: □ Natural □ Artificial (man-made). Explain: □ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
Average width:   feet
Average depth:   feet
Average side slopes: Pick List.

Primary tributary substrate composition (check all that apply):
□ Silts □ Sands □ Concrete
□ Cobble(s) □ Gravel □ Muck
□ Bedrock □ Vegetation. Type/ cover:
□ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:
Presence of run/riffle/pool complexes. Explain:
Tributary geometry: Pick List
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: Pick List
Estimate average number of flow events in review area/year: Pick List
Describe flow regime:
Other information on duration and volume:

Surface flow is: Pick List. Characteristics:
Subsurface flow: Pick List. Explain findings:
□ Dye (or other) test performed:

Tributary has (check all that apply):
□ Bed and banks
□ OHWM⁶ (check all indicators that apply):
□ the presence of litter and debris
□ changes in the character of soil
□ shelving
□ vegetation matted down, bent, or absent
□ leaf litter disturbed or washed away
□ sediment deposition
□ water staining
□ other (list):
□ Discontinuous OHWM.⁷ Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
□ High Tide Line indicated by:
□ Mean High Water Mark indicated by:
□ survey to available datum;
□ physical markings;
□ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain:
Identify specific pollutants, if known:

(iv) Biological Characteristics. Channel supports (check all that apply):
□ Riparian corridor. Characteristics (type, average width):
□ Wetland fringe. Characteristics:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody’s flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
⁷Ibid.
Habitat for:
- Federally Listed species. Explain findings:
- Fish/spawn areas. Explain findings:
- Other environmentally-sensitive species. Explain findings:
- Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:
   (a) General Wetland Characteristics:
      Properties:
      - Wetland size: ___ acres
      - Wetland type. Explain:
      - Wetland quality. Explain:
      Project wetlands cross or serve as state boundaries. Explain:

   (b) General Flow Relationship with Non-TNW:
      Flow is: Pick List. Explain:
      - Surface flow is: Pick List
        Characteristics:
      - Subsurface flow: Pick List. Explain findings:
        - Dye (or other) test performed:

   (c) Wetland Adjacency Determination with Non-TNW:
      - Directly abutting
      - Not directly abutting
        - Discrete wetland hydrologic connection. Explain:
          - Ecological connection. Explain:
          - Separated by berm/barrier. Explain:

   (d) Proximity (Relationship) to TNW
      Project wetlands are Pick List river miles from TNW.
      Project waters are Pick List aerial (straight) miles from TNW.
      Flow is from: Pick List.
      Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:
      Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
      Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):
      - Riparian buffer. Characteristics (type, average width):
      - Vegetation type/percent cover. Explain:
      - Habitat for:
        - Federally Listed species. Explain findings:
        - Fish/spawn areas. Explain findings:
        - Other environmentally-sensitive species. Explain findings:
        - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)
   All wetland(s) being considered in the cumulative analysis: Pick List
   Approximately ___ acres in total are being considered in the cumulative analysis.

   For each wetland, specify the following:
   - Directly abuts? (Y/N)
   - Size (in acres)

   Summarize overall biological, chemical and physical functions being performed:
C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
   - TNWs: linear feet, wide, Or acres.
   - Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.
   - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Streams 5 and 6 occur in natural valleys, and display strong bed and banks and several indicators of ordinary high water marks. Both streams are deeply entrenched in their respective valleys and intercept groundwater year-round during normal rainfall years. Both streams were determined to have perennial flow by the consultant (S&EC).
   - Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:
     - Provide estimates for jurisdictioonal waters in the review area (check all that apply):
       - Tributary waters: 748 linear feet 4 wide.
       - Other non-wetland waters: acres.
     - Identify type(s) of waters:

3. Non-RPWs\(^8\) that flow directly or indirectly into TNWs.

\(^8\)See Footnote # 3.
Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a
TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☐ Tributary waters:    linear feet,    wide.
☐ Other non-wetland waters: acres.

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that
tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☐ Wetlands directly abutting an RPW where tributaries typically flow “seasonally.” Provide data indicating that tributary is
seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly
abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area:    acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent
and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this
conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area:    acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and
with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this
conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:    acres.

7. Impoundments of jurisdictional waters.9

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from “waters of the U.S.,” or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE,
DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY
SUCH WATERS (CHECK ALL THAT APPLY):10

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain:
☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters:    linear feet,    wide.
☐ Other non-wetland waters: acres.

Identify type(s) of waters:

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9 To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
10 Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for
review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.
F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
- Prior to the Jan 2001 Supreme Court decision in “SWANCC,” the review area would have been regulated based solely on the “Migratory Bird Rule” (MBR).
- Waters do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, wide.
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, wide.
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply) - checked items shall be included in case file and, where checked and requested, appropriately reference sources below:

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Aerial, soils, and topo maps (S&EC)
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
- Office concurs with data sheets/delineation report.
- Office does not concur with data sheets/delineation report.
- 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: 1:24K; Cary
- USDA Natural Resources Conservation Service Soil Survey. Citation: Wake Co. Soil Survey
- 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): NC One Map (no date) or Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

This form documents Stream 5 and Stream 6 (perennial RPWs).
This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): January 15, 2020

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington District, Wake Stone Corp RDU 105 Acre Property/Wake Stone Corporation/Raleigh-Durham Airport Authority/Cary NC/Wake County, SAW-2019-01286

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
The project area is located on the north side of I-40 and the east side of Old Reedy Creek Road in Cary, Wake County, North Carolina. PIN: 0767324317. The project area is limited to the area within the line labeled "PL" on the attached survey titled "Plat of Waters of the US Survey for Wake Stone Corporation."

State: North Carolina
County/parish/borough: Wake County
City: Cary

Center coordinates of site (lat/long in degree decimal format): Lat. 35.8416387187234°N, Long. -78.7748193820444° W
Universal Transverse Mercator: 17 700966.44 3968669.84

Name of nearest waterbody: Crabtree Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows:
Name of watershed or Hydrologic Unit Code (HUC): Upper Neuse, 03020201

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form:

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 8/21/2019

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no “navigable waters of the U.S.” within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are “waters of the U.S.” within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.
   a. Indicate presence of waters of U.S. in review area (check all that apply): 1
      - TNWs, including territorial seas
      - Wetlands adjacent to TNWs
      - Relatively permanent waters2 (RPWs) that flow directly or indirectly into TNWs
      - Non-RPWs that flow directly or indirectly into TNWs
      - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      - Impoundments of jurisdictional waters
      - Isolated (interstate or intrastate) waters, including isolated wetlands

   b. Identify (estimate) size of waters of the U.S. in the review area:
      - Non-wetland waters: 252 linear feet, 3 wide, and/or  acres.
      - Wetlands:  acres.

   c. Limits (boundaries) of jurisdiction based on: Established by OHWM.
      Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):3

Explain:

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

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1 Boxes checked below shall be supported by completing the appropriate sections in Section III below.
2 For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least “seasonally” (e.g., typically 3 months).
3 Supporting documentation is presented in Section III.F.
The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW:
   
   Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is “adjacent”:

**B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):**

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are “relatively permanent waters” (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody\(^4\) is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) **General Area Conditions:**
   - Watershed size: 92,971 acres
   - Drainage area: 12 acres
   - Average annual rainfall: 46 inches
   - Average annual snowfall: 4 inches

   (ii) **Physical Characteristics:**
   
   (a) **Relationship with TNW:**
   - [x] Tributary flows directly into TNW.
   - [ ] Tributary flows through 3 tributaries before entering TNW.

   Project waters are 20-25 river miles from TNW.
   Project waters are 1 (or less) river miles from RPW.
   Project waters are 10-15 aerial (straight) miles from TNW.
   Project waters are 1 (or less) aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:

   Identify flow route to TNW\(^5\): **Stream 2 (UT to Crabtree Creek; seasonal RPW) to Crabtree Creek (RPW) to Neuse Rive (TNW)**
   Tributary stream order, if known: 1st

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\(4\) Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

\(5\) Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
(b) General Tributary Characteristics (check all that apply):

**Tributary is:**
- Natural
- Artificial (man-made). Explain:
- Manipulated (man-altered). Explain:

**Tributary properties with respect to top of bank (estimate):**
- Average width: 3 feet
- Average depth: 1 foot
- Average side slopes: **Vertical (1:1 or less).**

Primary tributary substrate composition (check all that apply):
- Silts
- Sands
- Cobbles
- Gravel
- Bedrock
- Vegetation. Type/% cover:
- Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: **Stable**

Presence of run/riffle/pool complexes. Explain: **few**

Tributary geometry: **Relatively straight**

Tributary gradient (approximate average slope): 2%

(c) Flow:

Tributary provides for: **Seasonal flow**

Estimate average number of flow events in review area/year: **6-10**

Describe flow regime: **Flow during the low evapotranspiration period of the year (typically December through April)**

Other information on duration and volume:

Surface flow is: **Confined.** Characteristics: **Confined to stream banks**

Subsurface flow: **Unknown.** Explain findings:
- Dye (or other) test performed:
- Bed and banks
- **OHWM** (check all indicators that apply):
  - clear, natural line impressed on the bank
  - changes in the character of soil
  - shelving
  - vegetation matted down, bent, or absent
  - leaf litter disturbed or washed away
  - sediment deposition
  - water staining
  - other (list):
- **Discontinuous OHWM.**

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- High Tide Line indicated by:
- Mean High Water Mark indicated by:
- oil or scum line along shore objects
- fine shell or debris deposits (foreshore)
- physical markings/channels
- tidal gauges
- other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain:

Identify specific pollutants, if known: **unknown**

(iv) Biological Characteristics. Channel supports (check all that apply):

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4A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody’s flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

5Ibid.
2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:
(a) General Wetland Characteristics:
Properties:
- Wetland size: acres
- Wetland type. Explain:
- Wetland quality. Explain:
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Pick List. Explain:
- Surface flow is: Pick List
  Characteristics:
- Subsurface flow: Pick List. Explain findings:
  - Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:
- Directly abutting
- Not directly abutting
  - Discrete wetland hydrologic connection. Explain:
  - Ecological connection. Explain:
  - Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are Pick List river miles from TNW.
Project waters are Pick List aerial (straight) miles from TNW.
Flow is from: Pick List.
Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:
Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):
- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
  Habitat for:
  - Federally Listed species. Explain findings:
  - Fish/spawn areas. Explain findings:
  - Other environmentally-sensitive species. Explain findings:
  - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)
All wetland(s) being considered in the cumulative analysis. Pick List
Approximately acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

- Directly abuts? (Y/N)
- Size (in acres)
- Directly abuts? (Y/N)
- Size (in acres)
Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
   - TNWs: linear feet, wide, Or acres.
   - Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.
   - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
   - Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Stream 2 occurs in a natural valley, and displays bed and banks and indicators of ordinary high water marks (see Section III.B.1.(ii)(c)).

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - Tributary waters: 252 linear feet 3 wide.
   - Other non-wetland waters: acres.

   Identify type(s) of waters:

3. Non-RPWs8 that flow directly or indirectly into TNWs.

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8See Footnote # 3.
Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
- Tributary waters: _____ linear feet, _____ wide.
- Other non-wetland waters: _____ acres.
Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
- Wetlands directly abutting an RPW and thus are jurisdictional as adjacent wetlands.
- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

- Wetlands directly abutting an RPW where tributaries typically flow “seasonally.” Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: _____ acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
- Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: _____ acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
- Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: _____ acres.

7. Impoundments of jurisdictional waters.9
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
- Demonstrate that impoundment was created from “waters of the U.S.,” or
- Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):10
- which are or could be used by interstate or foreign travelers for recreational or other purposes.
- from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- which are or could be used for industrial purposes by industries in interstate commerce.
- Interstate isolated waters. Explain:
- Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):
- Tributary waters: _____ linear feet, _____ wide.
- Other non-wetland waters: _____ acres.
Identify type(s) of waters:
- Wetlands: _____ acres.

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9 To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
10 Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.
F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

☐ Prior to the Jan 2001 Supreme Court decision in “SWANCC,” the review area would have been regulated based solely on the “Migratory Bird Rule” (MBR).

☐ Waters do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet, wide.

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet, wide.

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Aerial, soils, and topo maps (S&EC)

☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

☐ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report.

☐ 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: 1:24K; Cary

☒ USDA Natural Resources Conservation Service Soil Survey. Citation: Wake Co. Soil Survey

☐ 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): NC One Map (no date)

☐ or ☐ Other (Name & Date):

☐ Previous determination(s). File no. and date of response letter:

☐ Applicable/supporting case law:

☐ Applicable/supporting scientific literature:

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

This form documents Stream2 (seasonal RPW).
This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION
A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): January 15, 2020

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington District, Wake Stone Corp RDU 105 Acre Property/Wake Stone Corporation/Raleigh-Durham Airport Authority/Cary NC/Wake County, SAW-2019-01286

C. PROJECT LOCATION AND BACKGROUND INFORMATION: The project area is located on the north side of I-40 and the east side of Old Reedy Creek Road in Cary, Wake County, North Carolina. PIN: 0767324317. The project area is limited to the area within the line labeled "PL" on the attached survey titled "Plat of Waters of the US Survey for Wake Stone Corporation."
   State: North Carolina
   County/parish/borough: Wake County
   City: Cary
   Center coordinates of site (lat/long in degree decimal format): Lati. 35.8416387187234°N, Longi. -78.7748193820444° W
   Universal Transverse Mercator: 17 700966.44 3968669.84
   Name of nearest waterbody: Crabtree Creek
   Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Water of the U.S. in the review area is present.
   Name of watershed or Hydrologic Unit Code (HUC): Upper Neuse, 03020201
   Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
   Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form:

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☐ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): 8/21/2019

SECTION II: SUMMARY OF FINDINGS
A. RHA SECTION 10 DETERMINATION OF JURISDICTION.
There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]
   ☐ Waters subject to the ebb and flow of the tide.
   ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.
There are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.
   a. Indicate presence of waters of U.S. in review area (check all that apply): 1
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands
   b. Identify (estimate) size of waters of the U.S. in the review area:
      Non-wetland waters: 455 linear feet, 2-4 wide, and/or 0 acres.
      Wetlands: 0 acres.
   c. Limits (boundaries) of jurisdiction based on: Established by OHWM.
      Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable): 3
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

SECTION III: CWA ANALYSIS
A. TNWs AND WETLANDS ADJACENT TO TNWs

1 Boxes checked below shall be supported by completing the appropriate sections in Section III below.
2 For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least “seasonally” (e.g., typically 3 months).
3 Supporting documentation is presented in Section III.F.
The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW:
   Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is “adjacent”:

### B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are “relatively permanent waters” (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) **General Area Conditions:**
   - Watershed size: 92,971 acres
   - Drainage area: 3 acres
   - Average annual rainfall: 46 inches
   - Average annual snowfall: 4 inches

   (ii) **Physical Characteristics:**
   (a) **Relationship with TNW:**
   - ☐ Tributary flows directly into TNW.
   - ✗ Tributary flows through 4 tributaries before entering TNW.

   Project waters are 20-25 river miles from TNW.
   Project waters are 1 (or less) river miles from RPW.
   Project waters are 10-15 aerial (straight) miles from TNW.
   Project waters are 1 (or less) aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:

   Identify flow route to TNW: Stream 4a (UT to Crabtree Creek; seasonal RPW) to Stream 4 (UT to Crabtree Creek; RPW) to Crabtree Creek (RPW) to Neuse River (TNW)
   Tributary stream order, if known: 1st

4 Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

5 Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
(b) General Tributary Characteristics (check all that apply):

Tributary is:  
- Natural  
- Artificial (man-made). Explain:  
- Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
- Average width: 3 feet  
- Average depth: 1 foot  
- Average side slopes: **Vertical (1:1 or less).**

Primary tributary substrate composition (check all that apply):
- Silts  
- Sands  
- Cobble  
- Gravel  
- Bedrock  
- Vegetation. Type/cover:  
- Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: **Stable**

Presence of run/riffle/pool complexes. Explain: **few**

Tributary geometry: **Relatively straight**

Tributary gradient (approximate average slope): 2 %

(c) Flow:

Tributary provides for: **Seasonal flow**

Estimate average number of flow events in review area/year: 6-10

Describe flow regime: **Flow during the low evapotranspiration period of the year (typically December through April)**

Other information on duration and volume:

Surface flow is: **Confined.** Characteristics: **Confined to stream banks**

Subsurface flow: **Unknown.** Explain findings:
- Dye (or other) test performed:

Tributary has (check all that apply):
- Bed and banks  
- OHWM\(^6\) (check all indicators that apply):
  - clear, natural line impressed on the bank  
  - changes in the character of soil  
  - shelving  
  - vegetation matted down, bent, or absent  
  - leaf litter disturbed or washed away  
  - sediment deposition  
  - water staining  
  - other (list):  
- the presence of litter and debris  
- destruction of terrestrial vegetation  
- the presence of wrack line  
- sediment sorting  
- scour  
- multiple observed or predicted flow events  
- abrupt change in plant community  
- Discontinuous OHWM.\(^7\) Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- High Tide Line indicated by:  
- Mean High Water Mark indicated by:
  - oil or scum line along shore objects  
  - fine shell or debris deposits (foreshore)  
  - physical markings/characteristics  
  - tidal gauges  
  - other (list):

- survey to available datum;  
- physical markings;  
- vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Identify specific pollutants, if known: **unknown**

(iv) Biological Characteristics. Channel supports (check all that apply):

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\(^6\)A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody’s flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

\(^7\)Ibid.
Riparian corridor. Characteristics (type, average width): mixed pine-hardwood; 150 ft.

Wetland fringe. Characteristics:

Federally Listed species. Explain findings:
Fish/spawn areas. Explain findings:
Other environmentally-sensitive species. Explain findings:
Aquatic/wildlife diversity. Explain findings: Seasonal water source for typical wildland-urban interface species.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:
(a) General Wetland Characteristics:
Properties:
Wetland size: acres
Wetland type. Explain:
Wetland quality. Explain:
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: Pick List. Explain:

Surface flow is: Pick List
Characteristics:

Subsurface flow: Pick List. Explain findings:
Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:
Directly abutting
Not directly abutting
Discrete wetland hydrologic connection. Explain:
Ecological connection. Explain:
Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are Pick List river miles from TNW.
Project waters are Pick List aerial (straight) miles from TNW.
Flow is from: Pick List.
Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:
Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):
Riparian buffer. Characteristics (type, average width):
Vegetation type/percent cover. Explain:
Habitat for:
Federally Listed species. Explain findings:
Fish/spawn areas. Explain findings:
Other environmentally-sensitive species. Explain findings:
Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)
All wetland(s) being considered in the cumulative analysis: Pick List
Approximately ______ acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

| Directly abuts? (Y/N) | Size (in acres) | Directly abuts? (Y/N) | Size (in acres) |
Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
   - TNWs: linear feet, wide, Or acres.
   - Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.
   - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Stream 4 occurs in a natural valley, and display strong bed and banks and several indicators of ordinary high water marks. This stream is deeply entrenched in its respective valleys and intercepts groundwater year-round during normal rainfall years. The stream was determined to have perennial flow by the consultant (S&EC).
   - Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Stream 4a occurs in a natural valley, and displays bed and banks and indicators of ordinary high water marks (see Section III.B.1.(ii)(e)).

Provide estimates for jurisdictional waters in the review area (check all that apply):
   - Tributary waters: 455 linear feet 2-4 wide.
   - Other non-wetland waters: acres.
   - Identify type(s) of waters:
3. **Non-RPWs** that flow directly or indirectly into TNWs.
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.
   
   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - Tributary waters: linear feet, wide.
   - Other non-wetland waters: acres.

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
   
   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.
   
   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.
   
   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - Demonstrate that impoundment was created from “waters of the U.S.,” or
   - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - Demonstrate that water is isolated with a nexus to commerce (see E below).

E. **ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):**
   - ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
   - ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
   - ☐ which are or could be used for industrial purposes by industries in interstate commerce.
   - ☐ Interstate isolated waters. Explain:
   - ☐ Other factors. Explain:

   Identify water body and summarize rationale supporting determination:
   
   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - Tributary waters: linear feet, wide.
   - Other non-wetland waters: acres.
   - Wetlands: acres.

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8 See Footnote # 3.
9 To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
10 Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.
F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - Prior to the Jan 2001 Supreme Court decision in “SWANCC,” the review area would have been regulated based solely on the “Migratory Bird Rule” (MBR).
- Waters do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction. Explain:
  - Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, wide.
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, wide.
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply) - checked items shall be included in case file and, where checked and requested, appropriately reference sources below:

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Aerial, soils, and topo maps (S&EC)
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - Office concurs with data sheets/delineation report.
  - Office does not concur with data sheets/delineation report.
- 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: 1:24K; Cary
- USDA Natural Resources Conservation Service Soil Survey. Citation: Wake Co. Soil Survey
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): NC One Map (no date)
  - Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

This form documents Stream 4 (perennial RPW) and Stream 4a (seasonal RPW).
SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): January 15, 2020

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington District, Wake Stone Corp RDU 105 Acre Property/Wake Stone Corporation/Raleigh-Durham Airport Authority/Cary NC/Wake County, SAW-2019-01286

C. PROJECT LOCATION AND BACKGROUND INFORMATION: The project area is located on the north side of I-40 and the east side of Old Reedy Creek Road in Cary, Wake County, North Carolina. PIN: 0767324317. The project area is limited to the area within the line labeled "PL" on the attached survey titled "Plat of Waters of the US Survey for Wake Stone Corporation."

State: North Carolina
County/parish/borough: Wake County
City: Cary
Center coordinates of site (lat/long in degree decimal format): Lat. 35.8416387187234°N, Long. -78.7748193820444° W
Universal Transverse Mercator: 17 700966.44 3968669.84
Name of nearest waterbody: Crabtree Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Name of watershed or Hydrologic Unit Code (HUC): Upper Neuse, 03020201

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
- Office (Desk) Determination. Date: 
- Field Determination. Date(s): 8/21/2019

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no “navigable waters of the U.S.” within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]
- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are “waters of the U.S.” within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.
   a. Indicate presence of waters of U.S. in review area (check all that apply): 1

   - TNWs, including territorial seas
   - Wetlands adjacent to TNWs
   - Relatively permanent waters2 (RPWs) that flow directly or indirectly into TNWs
   - Non-RPWs that flow directly or indirectly into TNWs
   - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - Impoundments of jurisdictional waters
   - Isolated (interstate or intrastate) waters, including isolated wetlands

   b. Identify (estimate) size of waters of the U.S. in the review area:
      Non-wetland waters: 303 linear feet, 4 wide, and/or 1.58 acres.
      Wetlands: 0.143 acres.

   c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual
      Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable): 3
   Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

1 Boxes checked below shall be supported by completing the appropriate sections in Section III below.
2 For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least “seasonally” (e.g., typically 3 months).
3 Supporting documentation is presented in Section III.F.
The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   - Identify TNW:
     - Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   - Summarize rationale supporting conclusion that wetland is “adjacent”:

### B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are “relatively permanent waters” (RPWs), i.e., tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   **(i) General Area Conditions:**
   - Watershed size: 92,971 acres
   - Drainage area: 79 acres
   - Average annual rainfall: 46 inches
   - Average annual snowfall: 4 inches

   **(ii) Physical Characteristics:**
   - **Relationship with TNW:**
     - □ Tributary flows directly into TNW.
     - ☒ Tributary flows through 3 tributaries before entering TNW.

     - Project waters are **20-25** river miles from TNW.
     - Project waters are **1 (or less)** river miles from RPW.
     - Project waters are **10-15** aerial (straight) miles from TNW.
     - Project waters are **1 (or less)** aerial (straight) miles from RPW.
     - Project waters cross or serve as state boundaries. Explain:

     - Identify flow route to TNW: **Stream 1 (UT to Crabtree Creek; seasonal RPW) to Crabtree Creek (RPW) to Neuse Rive (TNW)**
     - Tributary stream order, if known: **1st**

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4. Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

5. Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
(b) General Tributary Characteristics (check all that apply):

Tributary is: □ Natural  □ Artificial (man-made). Explain: Man-made spillway eroded down to bedrock over many decades. Natural drainage connection to Crabtree Creek was cut off when erathen berm dam was constructed.

□ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
Average width: 4 feet
Average depth: 3 feet
Average side slopes: Vertical (1:1 or less).

Primary tributary substrate composition (check all that apply):
■ Silts  ■ Sands  ■ Concrete
■ Cobble  ■ Gravel  ■ Muck
■ Bedrock  ■ Vegetation. Type/% cover:
□ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Unstable; man-made spillway eroded down to bedrock

Presence of run/riffle/pool complexes. Explain: few

Tributary geometry: Relatively straight

Tributary gradient (approximate average slope): 2%

(c) Flow:

Tributary provides for: Seasonal flow

Estimate average number of flow events in review area/year: 6-10

Describe flow regime:
Flow during the low evapotranspiration period of the year (typically December through April)

Other information on duration and volume:

Surface flow is: Confined. Characteristics: Confined to stream banks

Subsurface flow: Unknown. Explain findings:
□ Dye (or other) test performed:

Tributary has (check all that apply):
■ Bed and banks
■ OHWM\(^6\) (check all indicators that apply):
   ■ clear, natural line impressed on the bank  □ the presence of litter and debris
   ■ changes in the character of soil  □ destruction of terrestrial vegetation
   ■ shelving  □ the presence of wrack line
   ■ vegetation matted down, bent, or absent  □ sediment sorting
   ■ leaf litter disturbed or washed away  □ scour
   ■ sediment deposition  □ multiple observed or predicted flow events
   ■ water staining  □ abrupt change in plant community
   ■ other (list):
□ Discontinuous OHWM.\(^7\) Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
□ High Tide Line indicated by:
□ Mean High Water Mark indicated by:
□ oil or scum line along shore objects  □ survey to available datum;
□ fine shell or debris deposits (foreshore)  □ physical markings;
□ physical markings/characteristics  □ vegetation lines/changes in vegetation types.
□ other (list):

(iii) Chemical Characteristics:

Charaterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain:

\(^6\)A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

\(^7\)Ibid.
Identify specific pollutants, if known: **unknown**

(iv) **Biological Characteristics.** Channel supports (check all that apply):
- [x] Riparian corridor. Characteristics (type, average width): mixed pine-hardwood; 150 ft.
- [ ] Wetland fringe. Characteristics:
- [x] Federally Listed species. Explain findings:
- [ ] Fish/spawn areas. Explain findings:
- [ ] Other environmentally-sensitive species. Explain findings:
- [x] Aquatic/wildlife diversity. Explain findings: **Seasonal water source for typical wildland-urban interface species.**

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

   (i) **Physical Characteristics:**
   - (a) **General Wetland Characteristics:**
     Properties:
     - Wetland size: 0.143 acres
     - Wetland type. Explain: **PEM**
     - Wetland quality. Explain: medium-high
     Project wetlands cross or serve as state boundaries. Explain:
   
   (b) **General Flow Relationship with Non-TNW:**
   Flow is: **Ephemeral flow**. Explain: **Flow during/following precipitation events.**
   Surface flow is: **Overland sheetflow**
   Characteristics: **Sheet flow from wetland to Stream 1 and Pond 1 during/following precipitation events**
   Subsurface flow: **Unknown**. Explain findings:
   - [ ] Dye (or other) test performed:
   
   (c) **Wetland Adjacency Determination with Non-TNW:**
   - [x] Directly abutting
   - [ ] Not directly abutting
   - [ ] Discrete wetland hydrologic connection. Explain:
   - [ ] Ecological connection. Explain:
   - [ ] Separated by berm/barrier. Explain:
   
   (d) **Proximity (Relationship) to TNW**
   Project wetlands are **20-25** river miles from TNW.
   Project waters are **10-15** aerial (straight) miles from TNW.
   Flow is from: **Pick List.**
   Estimate approximate location of wetland as within the **500-year or greater** floodplain.

   (ii) **Chemical Characteristics:**
   Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
   Identify specific pollutants, if known: **Unknown**

   (iii) **Biological Characteristics.** Wetland supports (check all that apply):
   - [x] Riparian buffer. Characteristics (type, average width): **Wetland is within 50 buffer of Stream 1 and Pond 1**
   - [x] Vegetation type/percent cover. Explain: **100** ; herbaceous veg including Juncus effuses and Typha latifolia.
   - [x] Habitat for:
   - [ ] Federally Listed species. Explain findings:
   - [ ] Fish/spawn areas. Explain findings:
   - [ ] Other environmentally-sensitive species. Explain findings:
   - [x] Aquatic/wildlife diversity. Explain findings: **Year-round cover and food source for common wildland-urban interface species.**

3. **Characteristics of all wetlands adjacent to the tributary (if any)**
   All wetland(s) being considered in the cumulative analysis: **1**
   Approximately **0.143** acres in total are being considered in the cumulative analysis.

   For each wetland, specify the following:
Summarize overall biological, chemical and physical functions being performed: This wetland and others in similar landscape positions receive precipitation-derived- and ground-water from surrounding land and occasional flooding from abutting impoundment, retain and slowly release water, physically trap and retain sediment, allow biogeochemical anaerobic processes (i.e. denitrification) to occur to improve water quality, and serve as groundwater recharge areas. These wetlands serve as year-round cover and food source for a variety of typical wildland-urban interface wildlife species.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
   - TNWs: linear feet, wide, Or acres.
   - Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.
   - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: 
     - Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Stream 1 occurs in a natural valley, and displays bed and banks and indicators of ordinary high water marks (see Section III.B.1.(ii)(c)).
Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: 303 linear feet 4 wide.
- Other non-wetland waters: 1.58 acres.

Identify type(s) of waters: Pond 1 is an impoundment of Stream 1. Pond 1 is formed by a man-made earthen berm dam, and Stream 1 flows through a man-made spillway out of the eastern side of the dam.

3. Non-RPWs that flow directly or indirectly into TNWs.
   - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: linear feet, wide.
- Other non-wetland waters: acres.

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
   - Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

   - Wetlands directly abutting an RPW where tributaries typically flow “seasonally.” Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Pond Wetland Fringe is a wetland along the edges of Stream 1 and Pond 1. This wetland extends all the way to the banks of Stream 1 and Pond 1.

Provide acreage estimates for jurisdictional wetlands in the review area: 0.143 acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
   - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
   - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.
   - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
     - Demonstrate that impoundment was created from “waters of the U.S.” or
     - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
     - Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):10

- which are or could be used by interstate or foreign travelers for recreational or other purposes.
- from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- which are or could be used for industrial purposes by industries in interstate commerce.
- Interstate isolated waters. Explain:
- Other factors. Explain:

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8 See Footnote # 3.
9 To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
10 Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.
Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet, wide.
☐ Other non-wetland waters: acres.

Identify type(s) of waters:

☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in “SWANCC,” the review area would have been regulated based solely on the “Migratory Bird Rule” (MBR).
☐ Waters do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction. Explain:
☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet, wide.
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet, wide.
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply) - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Aerial, soils, and topo maps (S&EC)
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ 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: 1:24K; Cary
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: Wake Co. Soil Survey
☐ 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): NC One Map (no date)
☐ or ☒ Other (Name & Date):
☐ Previous determination(s). File no. and date of response letter:
☐ Applicable/supporting case law:
☐ Applicable/supporting scientific literature:
☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

This form documents Stream1 (seasonal RPW), Pond 1 (Impoundment of Stream 1), and Pond Wetland Fringe (wetland abutting seasonal RPW).
Pond 1 is an impoundment of Stream1. Pond 1 is formed by a man-made earthen berm dam, and Stream 1 flows through a man-made spillway out of the eastern side of the dam.
This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): January 15, 2020

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington District, Wake Stone Corp RDU 105 Acre Property/Wake Stone Corporation/Raleigh-Durham Airport Authority/Cary NC/Wake County, SAW-2019-01286

C. PROJECT LOCATION AND BACKGROUND INFORMATION: The project area is located on the north side of I-40 and the east side of Old Reedy Creek Road in Cary, Wake County, North Carolina. PIN: 0767324317. The project area is limited to the area within the line labeled "PL" on the attached survey titled "Plat of Waters of the US Survey for Wake Stone Corporation."

State: North Carolina
County/parish/borough: Wake County
City: Cary
Center coordinates of site (lat/long in degree decimal format): Lat. 35.8416387187234°N, Long. -78.7748193820444° W
Universal Transverse Mercator: 17 700966.44 3968669.84
Name of nearest waterbody: Crabtree Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Name of watershed or Hydrologic Unit Code (HUC): Upper Neuse, 03020201

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form:

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date:
Field Determination. Date(s): 8/21/2019

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

Waters subject to the ebb and flow of the tide.
Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are “waters of the U.S.” within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): 1

TNWs, including territorial seas
Wetlands adjacent to TNWs
Relatively permanent waters\(^2\) (RPWs) that flow directly or indirectly into TNWs
Non-RPWs that flow directly or indirectly into TNWs
Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
Impoundments of jurisdictional waters
Isolated ( interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: 6,219 linear feet, 24 wide, and/or 0.142 acres.
Wetlands: 0.142 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):\(^3\)

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
Explain:

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

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1 Boxes checked below shall be supported by completing the appropriate sections in Section III below.
2 For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least “seasonally” (e.g., typically 3 months).
3 Supporting documentation is presented in Section III.F.
The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW:
   Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is “adjacent”:

### B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are “relatively permanent waters” (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody4 is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) **General Area Conditions:**
   - Watershed size: 92,971 acres
   - Drainage area: 33,752 acres
   - Average annual rainfall: 46 inches
   - Average annual snowfall: 4 inches

   (ii) **Physical Characteristics:**
   (a) **Relationship with TNW:**
   - ☑ Tributary flows directly into TNW.
   - ☑ Tributary flows through 1 tributaries before entering TNW.

   Project waters are 20-25 river miles from TNW.
   Project waters are 1 (or less) river miles from RPW.
   Project waters are 10-15 aerial (straight) miles from TNW.
   Project waters are 1 (or less) aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:
   Identify flow route to TNW5: **Crabtree Creek (RPW) to Neuse Rive (TNW)**
   Tributary stream order, if known: 5th

   (b) **General Tributary Characteristics (check all that apply):**

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4 Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

5 Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
Tributary is:  
- Natural
- Artificial (man-made). Explain:
- Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
- Average width: 24 feet
- Average depth: 4 feet
- Average side slopes: 2:1.

Primary tributary substrate composition (check all that apply):
- Silts
- Sands
- Cobble
- Gravel
- Bedrock
- Vegetable. Type/% cover:
- Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Stable; natural riparian vegetation along banks and no signs of scour

Presence of run/riffle/pool complexes. Explain: Present

Tributary geometry: Meandering

Tributary gradient (approximate average slope): <1 %

(c) Flow:

Tributary provides for: Perennial

Describe flow regime: Perennial

Other information on duration and volume:

Surface flow is: Discrete and confined. Characteristics: Confined to stream banks during normal flow and overbank flooding during high flow

Subsurface flow: Unknown. Explain findings:
- Dye (or other) test performed:

Tributary has (check all that apply):
- Bed and banks
- OHWM* (check all indicators that apply):
  - clear, natural line impressed on the bank
  - changes in the character of soil
  - shelving
  - vegetation matted down, bent, or absent
  - leaf litter disturbed or washed away
  - sediment deposition
  - water staining
  - other (list):

Discontinuous OHWM. Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- High Tide Line indicated by:
- Mean High Water Mark indicated by:
- oil or scum line along shore objects
- fine shell or debris deposits (foreshore)
- physical markings/characteristics
- other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: Water typically clear, although well known for high sediment load during heavy precipitation events. Classified as a Nutrient Sensitive Water by the NCDEQ.

Identify specific pollutants, if known: Sediment, nitrogen

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* A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody’s flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

Ibid.
(iv) **Biological Characteristics.** Channel supports (check all that apply):
- ☑ Riparian corridor. Characteristics (type, average width): mixed pine-hardwood; >300 ft.
- ☑ Wetland fringe. Characteristics: **Present in pockets**
- ☑ Habitat for:
  - ☑ Federally Listed species. Explain findings: Known occurrences of Atlantic pigtoe and dwarf wedgemussel within this watershed
  - ☑ Fish/spawn areas. Explain findings: Stream is of appropriate size and has appropriate habitat for numerous fish species
  - ☑ Other environmentally-sensitive species. Explain findings:
  - ☑ Aquatic/wildlife diversity. Explain findings: Year-round water source for typical wildland-urban interface species.

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

   (i) **Physical Characteristics:**
   - General Wetland Characteristics:
     - Properties:
       - Wetland size: 0.145 acres
       - Wetland type. Explain: **PFO**
       - Wetland quality. Explain: **medium**
   - Project wetlands cross or serve as state boundaries. Explain:

   (b) General Flow Relationship with Non-TNW:
   - Flow is: **Ephemeral flow.** Explain: Flow during/following precipitation events and flooding.
   - Surface flow is: **Discrete and confined**
   - Characteristics: Flow through cut-off channel for Wetland 2, and overland sheet flow from Wetland 1 to Crabtree Creek during/following precipitation events.
   - Subsurface flow: **Unknown.** Explain findings:
     - ☑ Dye (or other) test performed:

   (c) Wetland Adjacency Determination with Non-TNW:
   - Directly abutting
   - Not directly abutting
     - ☑ Discrete wetland hydrologic connection. Explain: Wetland 1 is within the Crabtree Creek 100-year floodplain
     - ☑ Ecological connection. Explain:
     - ☑ Separated by berm/barrier. Explain: Wetland 1 is separated by the natural levee of Crabtree Creek.

   (d) Proximity (Relationship) to TNW
   - Project wetlands are **20-25** river miles from TNW.
   - Project waters are **10-15** aerial (straight) miles from TNW.
   - Flow is from: Wetland to navigable waters.
   - Estimate approximate location of wetland as within the **50 - 100-year** floodplain.

   (ii) **Chemical Characteristics:**
   - Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
   - Identify specific pollutants, if known: **Unknown**

   (iii) **Biological Characteristics.** Wetland supports (check all that apply):
   - ☑ Riparian buffer. Characteristics (type, average width): Wetlands are within 50' buffer of Crabtree Creek
   - ☑ Vegetation type/percent cover. Explain: 25-50%; Platanus occidentalis, Acer rubrum, Liriodendron tulipifera, Carpinus caroliniana, Microstegium vimineum, Arundinaria gigantea
   - ☑ Habitat for:
     - ☑ Federally Listed species. Explain findings:
     - ☑ Fish/spawn areas. Explain findings:
     - ☑ Other environmentally-sensitive species. Explain findings:
     - ☑ Aquatic/wildlife diversity. Explain findings: Wetland 1 is a depressional-type wetland that provides amphibian breeding habitat.
     - ☑ Aquatic/wildlife diversity. Explain findings: Year-round cover and food source for common wildland-urban interface species.

3. **Characteristics of all wetlands adjacent to the tributary (if any)**
   - All wetland(s) being considered in the cumulative analysis: **30 (or more)**
Approximately 585 acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

<table>
<thead>
<tr>
<th>Wetland</th>
<th>Directly abuts? (Y/N)</th>
<th>Size (in acres)</th>
<th>Directly abuts? (Y/N)</th>
<th>Size (in acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland 2</td>
<td>Y</td>
<td>0.51</td>
<td>Wetland 1</td>
<td>N</td>
</tr>
</tbody>
</table>

See attached list of similarly situated wetlands based on USFWS NWI Mapping along relevant reach of Crabtree Creek (Crabtree Creek floodplain (Zone AE) along Stream Order 5)

Summarize overall biological, chemical and physical functions being performed: This wetland and others in similar landscape positions receive precipitation-derived- and ground-water from surrounding land and occasional flooding from adjacent RPWs, retain and slowly release water, physically trap and retain sediment, allow biogeochemical anaerobic processes (i.e. denitrification) to occur to improve water quality, serve as breeding habitat for amphibian species, and provide year-round cover, food source, and movement corridors for a variety of typical wildland-urban interface wildlife species.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all of its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Wetland 2 is hydrologically connected to Crabtree Creek (perennial RPW) as an abutting wetland, and Wetland 1 is hydrologically connected to Crabtree Creek given its position within a floodplain subject to occasional flooding. Such wetlands have the capability to capture overland runoff and floodwaters, retain and slowly release water and organic carbon downstream, physically trap and retain sediment, and allow biogeochemical anaerobic processes (i.e. denitrification) to occur to improve water quality. These actions limit sediment and nutrient input into Crabtree Creek, designated by the NCDEQ as a Nutrient Sensitive Water, which flows directly to the Neuse River within 25 river miles. Such wetlands also serve as breeding habitat for amphibian species, and provide year-round cover, food source, and movement corridors for a variety of typical wildland-urban interface wildlife species. As such, Wetlands 1 and 2, and
similarly situated wetlands, affect the chemical, physical, and biological integrity of, and have a significant nexus with, the Neuse River, a TNW.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
   - TNWs: linear feet, wide, or acres.
   - Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.
   - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Crabtree Creek is a named blue-line stream on the USGS topo map, occurs on the Wake Co. Soil Survey, comprises its own 10-digit HUC (0302020108), and is readily visible on all years of aerial photography. This stream is known to flow year-round, even in drought years. Crabtree Creek was determined to be perennial by the consultant.
   - Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

3. Non-RPWs that flow directly or indirectly into TNWs.
   - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
   - Wetlands directly abutting an RPW and thus are jurisdictional as adjacent wetlands.
   - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Wetland 2 occurs within an abandoned stream channel, cut-off by the construction of the earthen berm dam for Pond 1. This abandoned channel has subsequently silted in and partially vegetated. Wetland 2 extends all the way to the banks of Crabtree Creek.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
   - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
   - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters in the review area (check all that apply):
   - Tributary waters: $6,219$ linear feet, $24$ wide.
   - Other non-wetland waters: acres.
   - Identify type(s) of waters:

Provide estimates for jurisdictional wetlands in the review area:
   - 0.051 acres.

Provide acreage estimates for jurisdictional wetlands in the review area:
   - 0.051 acres.

Provide acreage estimates for jurisdictional wetlands in the review area: 0.091 acres.

Provide estimates for jurisdictional wetlands in the review area:
   - acres.

---

*See Footnote # 3.*
7. Impoundments of jurisdictional waters.⁹
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from “waters of the U.S.” or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE,
DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY
SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain:
☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet, wide.
☐ Other non-wetland waters: acres.
Identify type(s) of waters:
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers
Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in “SWANCC,” the review area would have been regulated based only on the
“Migratory Bird Rule” (MBR).
 ☐ Waters do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction. Explain:
☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR
factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional
judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, wide.
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the “Significant Nexus” standard, where such
a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, wide.
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.
A. SUPPORTING DATA. Data reviewed for JD (check all that apply) - checked items shall be included in case file and, where checked
and requested, appropriately reference sources below):
☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Aerial, soils, and topo maps (S&EC)
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps:
☐ Corps navigable waters’ study:

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⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for
review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.
B. ADDITIONAL COMMENTS TO SUPPORT JD:

This form documents Crabtree Creek (perennial RPW), Wetland 1 (wetland adjacent to perennial RPW) and Wetland 2 (wetland abutting perennial RPW).
## Significant Nexus Analysis - Similarly Situated Wetlands (based on NWI data within relevant reach)

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Significant Nexus Analysis - Similarly Situated Wetlands

Start Relevant Reach (confluence of Crabtree Creek with Briar Creek)

End Relevant Reach (confluence of Crabtree Creek with Neuse River [TNW])
April 29, 2019

Mr. Michael Landguth
President & CEO
Raleigh-Durham Airport Authority
1000 Trade Drive
P.O. Box 80001
RDU Airport, NC 27623

Re: Lease Agreement between RDUAA and Wake Stone Corp.

Dear Mr. Landguth:

This is a follow-up to the letter dated March 21, 2019, from James Lofton, FAA Assistant Chief Counsel, regarding the RDUAA mining lease (Lease) with the Wake Stone Corporation at the Raleigh Durham International Airport (RDU). The RDUAA lease agreement involves approximately 100 acres of airport property located 2.7 miles south of the RDU airport operations area to the Wake Stone Corporation. This parcel of land borders an existing, off-airport rock quarry operated by the lessee. The existing quarry is approximately 8,967 feet from the nearest aeronautical feature, and the quarry’s expansion onto airport property, would be 8,822 feet from the nearest aeronautical feature. The existing, approved ALP currently designates this parcel for “Industrial/Quarry” use. The leasehold is comprised of land acquired by the RDUAA, with airport revenue, between 1972 and 1984.

The FAA’s Determination Regarding the Lease

In our March 21 letter, we explained the limitations Section 163(a) of the 2018 FAA Reauthorization Act places on FAA’s regulatory authority over: (1) the acquisition, use, lease, encumbrance, transfer, or disposal of land by an airport owner or operator; (2) any facility upon such land; or (3) any portion of such land or facility. We also explained the exceptions to those limitations.

Based on: (1) information RDUAA has submitted to the FAA, and (2) a review of our records, including the current Exhibit “A” map and relevant property deeds, we have made the following determination:
• The lease does not appear to adversely affect the safe and efficient operation of aircraft or safety of people and property on the ground related to aircraft operations;

• No federal funding was used in the purchase of this parcel.

Therefore, the FAA will not require a release or other determination with respect to the lease.

Nevertheless, the FAA continues to have authority to ensure that RDUAA receives not less than fair market value under the lease terms and that the revenue received from the lease is used for the capital or operating costs of the airport, in accordance with 49 U.S.C. Sections 47107(b) and 47133. The FAA may verify compliance with these requirements through a financial compliance review, the enforcement of grant assurances, or other enforcement mechanisms at a later date.

Moreover, all of RDUAA’s federal statutory and grant assurance obligations remain in effect concerning the parcel. This includes the obligation under Grant Assurance 29 to maintain a current ALP at all times. The FAA’s review of the ALP indicates that the quarry as described in the lease is already reflected on the ALP. However, should the leaseholder seek future expansion of the quarry or other material revisions to the terms of the lease, then RDUAA should contact the FAA to assure any proposed revisions to the lease do not change any of the conclusions reached in this letter. RDUAA should retain sufficient authority over the parcel to prevent uses which conflict with its federal obligations and related requirements or create conditions resulting in violations of the assurances. Subordination clauses or other restrictions may be appropriate.

Applicability of the National Environmental Policy Act (NEPA)

Because the FAA will not require a release or otherwise determine whether RDUAA properly entered into the lease, and the ALP already reflects the quarry as described in the lease, there is no FAA action subject to NEPA.

If you have further questions or need for clarification, please feel free to contact me at 404-305-6700.

Sincerely,

[Signature]

Steven Hicks
Director,
Office of Airports Southern Region
Question 2. The proposed mine expansion site, known as the Odd Fellows tract, appears to be deeded to Wake County, Durham County, City of Raleigh, and City of Durham. However, Wake County’s tax map lists Raleigh-Durham International Airport as the owner. Please provide substantiation or documentation to support your answers to the following questions:

a. To whom is the title to the underlying property vested?

b. Does the entity identified in (a) meet the definition of a State Agency under GS 113A-9(9)?

c. Does the proposed mine expansion site include 10 or more acres of public land, as defined in GS 113A-9(7)?

Response (provided by RDUAA)

2a.

[This information was provided by the Raleigh-Durham Airport Authority upon request.] There are five parcels that make up Wake Stone’s leasehold (sometimes referred to as the “Odd Fellows Tract”). Three of these parcels are titled in the joint names of the City of Raleigh, the City of Durham, Wake County and Durham County (“RDWD”). One parcel is titled in the joint names of RDWD, care of RDU Airport. One parcel is titled in the name of Raleigh-Durham Airport Authority (“RDUAA”). These parcels were all purchased with RDUAA funds.

Specifically, the deeds associated with the Odd Fellows Tract are recorded in the Wake County Registry at:

(1) Deed Book 5054/Page 313 (filed February 16, 1972); Blanchard to RDWD

(2) Deed Book 2070/Page 69 (filed May 1, 1972); Barnes to RDWD

(3) Deed Book 2416/Page 433 (filed July 7, 1976); Sir Walter Lodge (the Odd Fellows) to RDWD

(4) Deed Book 2489/Page 689 (filed April 1, 1977); Collins and others to RDWD “c/o Raleigh-Durham Airport.”

(5) Deed Book 3295/Page 80 (filed April 2/20, 1984); Joyner to Raleigh-Durham Airport Authority.

RDUAA was created specifically by the North Carolina General Assembly in 1939 by authorizing the establishment of the Airport and the creation of RDUAA to govern the Airport property. (1939 N.C. Sess. Laws c.1) (“1939 Act”). The General Assembly has confirmed, amended and enhanced the enabling legislation of RDUAA several times since 1939 through the enactment of additional specific session laws that modify the 1939 Act or otherwise make changes that refer specifically to RDUAA. See, e.g., 1945 N.C. Sess. Laws c. 79 (“1945 Act”); 1955 N.C. Sess. Laws c 1096 (“1955 Act”); 1957 N.C. Sess. Laws c.455 (“1957 Act”); 1959 N.C. Sess. Laws c.755 (“1959 Act”). (These Acts and the 1939 Act may be referred to below as the “RDUAA Acts”.)
Starting with the 1939 Act and continuing through the remainder of the RDUAA Acts, the General Assembly established that the RDUAA Board has “complete authority” over airport lands jointly titled to RDWD. Therefore, pursuant to this statutory structure, these parcels were purchased with RDUAA funds and jointly titled to RDWD in order to be under RDUAA’s complete authority.  

On November 8, 2019, an Order and judgment was entered in Wake County Superior Court in The Umstead Coalition et al. v. RDUAA et al., 19 CVS 3859 and Plaintiffs’ appeal is currently before the North Carolina Court of Appeals. This order provides additional relevant information.

2b. [This information was provided by the Raleigh-Durham Airport Authority upon request.] Neither RDUAA nor RDWD meets the definition of a State agency under G.S. 113A-9 of SEPA, which defines the phrase “state agency” to include:

- every department, agency, institution, public authority, board, commission, bureau, division, council, member of Council of State, or officer of the State government of the State of North Carolina, but does not include local governmental units or bodies such as cities, towns, other municipal corporations or political subdivisions of the State, county or city boards of education, other local special-purpose public districts, units or bodies of any kind, or private corporations created by act of the General Assembly.

G.S. 113A-9(9) (emphasis added.) Clearly, RDWD are cities and counties, and are explicitly excluded from SEPA’s definition of State agency. As discussed below, RDUAA is properly classified under that statute as either or both of the following classifications in the statute: (1) as a “municipal corporation” or other “local governmental unit or body”; and/or (2) as a “local special-purpose public district, unit or body.” Thus, RDUAA is explicitly excluded from SEPA’s definition of State agency.

RDUAA was created specifically by the North Carolina General Assembly in 1939 by authorizing the establishment of the Airport and the creation of RDUAA to govern the Airport property. (1939 N.C. Sess. Laws c.1) (“1939 Act”). In doing so, the 1939 Act created a “special

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1 Beginning in the late 1970s and early 1980s, airport property purchased by RDUAA was titled in its own name.

2 SEPA defines a “special-purpose unit of government” to include “any special district or public authority.” G.S. 113A-9(8). However, this phrase is used only in SEPA’s section that allows a local government to require (through the adoption of ordinance) an “environmental document” of either private developers or a “special-purpose unit of government.” G.S. 113A-8(a). This provision does not apply to this situation.

3 The remaining portion of G.S. 113A-9(9) not quoted provides that “in those instances where programs, projects and actions of local governmental units or bodies are subject to review, approval or licensing by State agencies in accordance with existing statutory authority, in which case local governmental units or bodies shall supply information which may be required by such State agencies for preparation of any environmental statement required by this Article.” This language does not apply to this situation, since RDUAA is not, itself, undertaking any covered activity; however, even if it were, this language would not make RDUAA a “state agency,” but would simply require it to supply information.
purpose local government” or a “special purpose” municipality. See, Kara K. Millonzi, “special Purpose Local Governments and Public Authorities,” Institute of Government (Feb. 10, 2015). The North Carolina Supreme Court determined an airport authority created by act of the General Assembly (as was RDUAA) to be a “quasi-municipal corporation of the type known since McCulloch v. Maryland…” Greensboro-High Point Airport Authority v. Johnson, 226 N.C. 1, 9, 36 S.E.2d 803 (1946) (italics in the original).


The operation of public and municipal airports is governed generally by Chapter 63 of the General Statutes governing Aeronautics, portions of which were enacted as early as 1929. G.S. 63-1 et seq. (“Chapter 63”)⁴ Under the 1957 Act, the provisions of Chapter 63 are supplemental to the powers and authorities granted to it through the specific grants contain in the RDUAA Acts. However, there are provisions of Chapter 63 that do not apply to RDUAA, such as the provisions of G.S. 63-56 governing joint airports formed by joint agreement between multiple local governments, which RDUAA was not: RDUAA was “formed” by the General Assembly. To that end, through the 1957 Act, the General Assembly amended the airport’s enabling legislation to provide that “[i]n addition to all other rights and powers herein conferred, the [RDUAA] . . . is authorized and empowered to exercise the powers granted to municipalities by the terms of Article 6, Chapter 63 of the General Statutes of North Carolina concerning public airports and related facilities.” While RDUAA falls within the definition of a municipality or a “municipal authority,” RDUAA is not a “city.” See G.S. 160A-1(2) (“[t]he term ‘city’ does not include counties or municipal corporations organized for a special purpose”).

Instead, RDUAA is properly characterized as a municipal special purpose unit of local government as a “public corporation, authority, or district in this State, which is or may be authorized by law to acquire, establish, construct, maintain, improve, and operate airports. . . .” See G.S. 63-1(a)(14). It is an independent governing body with authority provided by its own enabling legislation.

On November 8, 2019, an Order and judgment was entered in Wake County Superior Court in The Umstead Coalition et al. v. RDUAA et al., 19 CVS 3859 and Plaintiffs’ appeal is currently before the NC Court of Appeals. This order provides additional relevant information

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⁴ Chapter 63 was largely enacted in its current form in 1945.
The proposed mine expansion site does not include 10 or more acres of public land, as defined in GS 113A-9(7), because none of the land involved falls within the definition of “public land” under Section 113A-9(7) of SEPA:

“Public land” means all land and interests therein, title of which is vested in the State of North Carolina, in any State agency, or in the State for the use of any State agency or political subdivision of the State, and includes all vacant and unappropriated land, swampland, submerged land, land acquired by the State by virtue of being sold for taxes or by any other manner of acquisition, or escheated land.

G.S. 113A-9(7) (emphasis added.) Thus, to be public land, title in the land must be vested in the (1) State of North Carolina or (2) a State agency. The proposed mine site is not vested in the State or a State agency; therefore, the proposed mine site is not “public land,” as defined in G.S. 113A-9(7), let alone 10 acres or more of such land.

On November 8, 2019, an Order and judgment was entered in Wake County Superior Court in The Umstead Coalition et al. v. RDUAA et al., 19 CVS 3859 and Plaintiffs’ appeal is currently before the NC Court of Appeals. This order provides additional relevant information.
Question 3. Does the proposed project involve any amount of public money, funding or other assistance? If so, please identify the amount of public money, funding or other assistance involved and the sources of such money, funding or other assistance.

Response (provided by RDUAA)
[This information was provided by the Raleigh-Durham Airport Authority upon request.]
RDUAA is not expending any public money, funding or other financial assistance that would offset WSC’s costs in leasing, permitting or operation of the mine. For purposes of answering this Question 3, we assume that the phrases “public money,” “public funding” and financial assistance collectively have had the same meaning as the phrase “public moneys” as used in SEPA.

RDUAA has leased the proposed mine expansion site to WSC in order to generate funds to support the operations of RDU Airport. WSC has the sole responsibility under the lease to undertake and finance all of the activities needed to permit, construct and operate the mine contemplated under the propose mine expansion site. It is not RDUAA’s responsibility to undertake or pay for those actions.

On November 8, 2019, an Order and judgment was entered in Wake County Superior Court in The Umstead Coalition et al. v. RDUAA et al., 19 CVS 3859 and Plaintiffs’ appeal is currently before the NC Court of Appeals. This order provides additional relevant information.

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5 The phrase “other assistance” is so broad and ambiguous that RDUAA must assume that it is referring only to financial assistance. RDUAA is supportive of WSC’s proposed expansion and operation of the mine, so RDUAA has made various statements or taken various actions that could be interpreted as being supportive of their efforts, but we do not interpret Question 3 as covering those types of activities.
Question 4. Please provide documentation that the Raleigh-Durham Airport Authority has the legal right and authority to lease the Odd Fellows tract and to sell the mineral rights from this tract.

Response (provided by RDUAA)
[This information was provided by the Raleigh-Durham Airport Authority upon request.] On November 8, 2019, an Order and judgment was entered in Wake County Superior Court in The Umstead Coalition et al. v. RDUAA et al, 19 CVS 3859. That Order confirms that RDUAA had the legal right and authority to enter into a mineral lease for the parcels known as the Odd Fellows tract.

RDUAA’s leasing authority derives from special statutes enacted by the General Assembly starting in 1939. Per 1939 N.C. Public-Local Laws Ch. 168, § 7, as amended by 1955 N.C. Sess. Laws ch. 1096, § 1, and 1959 N.C. Sess. Laws ch. 755, § 1, RDUAA has, among other rights, the authority to lease land “without the joinder in the lease agreements of the owning municipalities, to wit, the Counties of Wake and Durham, and the Cities of Raleigh and Durham” for terms not to exceed 40 years. Furthermore, as held in the Order, the authority to lease property in North Carolina includes the authority to enter into mineral leases. See Order at p.9.

The RDUAA Board consists of eight members, two of which are appointed by each of the Cities and Counties. Pursuant to the statutory authority conferred by the General Assembly, RDUAA regularly enters into multi-year leases without needing joinder of the City of Raleigh, City of Durham, County of Wake, and County of Durham as intended by the legislation cited above. RDUAA currently has at least 44 such leases.

The Order cited herein in currently on appeal to the North Carolina Court of Appeals, and RDUAA is defending the judgment regarding its statutory leasing authority.
STATE OF NORTH CAROLINA
COUNTY OF WAKE

THE UMSTEAD COALITION; RANDAL L. DUNN, JR.; TAMARA GRANT DUNN; WILLIAM DOUCETTE; and TORC (a/k/a TRiANGLE OFF-ROAD CYCLISTS),

Plaintiffs,

v.

RDU AIRPORT AUTHORITY and
WAKE STONE CORPORATION,

Defendants.

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
FILE NO. 19 CVS 3859

ORDER

THIS MATTER came on to be heard before the undersigned Superior Court Judge on Defendants’ Motions for Summary Judgment and on Plaintiffs’ Motion for Partial Summary Judgment and Motion for Preliminary Injunction. This Court held a hearing on the motions on September 19, 2019.1 With Plaintiffs and Defendants being represented by counsel, and after hearing all arguments, and reviewing the record proper and Court file, the Court determines that there are no genuine issues of material fact and finds the following:

UNDISPUTED FACTS

1. Plaintiff the Umstead Coalition is a North Carolina non-profit corporation that is dedicated to the appreciation, use, and preservation of the William B. Umstead State Park and the Richland Creek natural area.

2. Plaintiffs Randal L. Dunn, Jr. and Tamara Grant Dunn are residents of Wake County, North Carolina and live at 2232 Old Reedy Creek Road, which is

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1 As the Court explained at the hearing of this matter, the function of the Court is not to question the wisdom of the lease by RDUAA or whether other, better alternative uses of the property at issue exist, but rather, its function in this case is to determine whether RDUAA was entitled to lease the property without the joinder of the owning municipalities and, if so, whether RDUAA followed the proper procedures in doing so.
adjacent to property to be leased by Defendant Raleigh-Durham Airport Authority (RDUAA) for use as a quarry.

3. Plaintiff William Doucette is a resident of Wake County, North Carolina and member of the Umstead Coalition.

4. Plaintiff TORC (a/k/a Triangle Off-Road Cyclists) is a North Carolina non-profit corporation with the stated mission of ensuring the future of mountain biking in the Triangle Area of North Carolina through promotion of responsible riding, establishment and maintenance of mountain biking trails, and preservation of North Carolina's natural resources.

5. Defendant RDUAA is a municipal corporation established by the City of Raleigh, City of Durham, County of Wake, and County of Durham pursuant to Chapter 168 of the Public-Local Laws of 1939 (hereinafter, the "RDU Charter"). RDUAA's principal office is located at 1000 Trade Drive, RDU Airport, NC 27623.

6. Defendant Wake Stone is a North Carolina corporation having its principal office located at 6821 Knightdale Boulevard, Knightdale, NC 27545.

7. RDUAA controls a 105-acre parcel of land (the "Property") located off of Reedy Creek Road and adjacent to both the William B. Umstead State Park and an existing stone quarry currently operated by Wake Stone.

8. Title to the Property is vested in the City of Raleigh, City of Durham, County of Wake, and County of Durham, per the deeds recorded in the Wake County Register of Deeds in Deed Book 2416, page 433; Deed Book 2489, page 689; and Deed Book 2070, page 69.


10. RDUAA received two offers to lease or purchase the Property. One was an offer to purchase from the North Carolina Conservation Fund on behalf of William B. Umstead State Park, and the other was an offer from Wake Stone to lease the Property for quarrying.

11. RDUAA initially declined both offers on October 19, 2017.

12. On February 27, 2019, RDUAA sent out an e-mail notice that there would be a special meeting on March 1, 2019 at 9:00 a.m. to discuss a long-term lease proposal from Wake Stone to operate a rock quarry on the Property.
13. At the March 1, 2019 meeting, seven of the eight members of the RDUAA board voted to approve the proposed twenty-five-year lease of the Property to Wake Stone. The remaining member of the board abstained from voting.

14. A number of protesters were present at the March 1, 2019 meeting, but the Board did not provide any opportunity for public comment regarding the proposed lease.

15. On March 1, 2019, RDUAA and Wake Stone signed and executed a twenty-five-year lease of the Property (the “Lease”) to Wake Stone for operation of a rock quarry. The Lease also contains an option clause to extend the Lease for an additional term of ten years.

16. The Lease grants to Wake Stone, during its applicable term, the right “to have and to hold the Premises together with all privileges and appurtenances thereto . . . for the sole and only use of [Wake Stone].”

17. RDUAA did not seek the input or approval of the Cities of Raleigh and Durham and the Counties of Wake and Durham before entering into the Lease.

18. Revenue generated from the Lease is intended to help fund airport operations.

19. RDUAA is currently party to more than 40 leases of ten years or longer, and the Cities of Raleigh and Durham and the Counties of Wake and Durham have never asserted or sought approval authority over such leases.

20. The Federal Aviation Administration (FAA) directs that airport sponsors like RDUAA use their non-aviation assets (such as non-aeronautical real property) to generate revenues to subsidize aeronautical activities in order to reduce the economic impact on aviation users and the aviation public.

21. The Property was included in multiple Airport Layout Plans including the one approved by the FAA on November 20, 2017 in connection with RDUAA’s long-term development plan known as Vision 2040. That FAA-approved Airport Layout Plan designated the Property for “industrial/quarry” use.

22. RDUAA acquired the Property with RDUAA funds and no federal funds or grants from the FAA or other agency were used in the acquisition of the Property.

23. Subsequent to the filing of Plaintiffs’ complaint, the FAA also issued a letter to RDUAA informing RDUAA that the FAA would not need to provide any sort of release or approval in order for RDUAA to lease the Property.
24. There is no evidence that the Lease is inconsistent with any grant or agreement under which the airport is held.

25. Plaintiffs filed their Verified Complaint for Declaratory Judgment and Injunctive Relief on March 12, 2019 in which they assert three causes of action:

   a. Plaintiffs request declaratory judgment that RDUAA had no authority to authorize the Lease pursuant to N.C.G.S. § 63-56(f) without approval of the Cities of Raleigh and Durham and the Counties of Wake and Durham, that RDUAA violated the Open Meeting Law in N.C.G.S. § 143-318.9, and that RDUAA violated the procedures for the sale of real property in N.C.G.S. § 160A-272(b1).

   b. Plaintiffs request declaratory judgment that RDUAA violated federal and North Carolina law by approving the Lease without approval of the FAA as required by N.C.G.S. § 63-47.

   c. Plaintiffs request a Temporary Restraining Order, Preliminary Injunction, and Permanent Injunction.

26. On August 7, 2019, RDUAA filed its Motion to Dismiss and Motion for Summary Judgment. RDUAA also filed a supporting memorandum asserting that Plaintiffs' claims should be dismissed as a matter of law and that Defendants are entitled to judgment as a matter of law because RDUAA had specific statutory authority to enter into the Lease, the Lease did not violate applicable FAA laws and regulations, and RDUAA's decision to enter into the Lease was not subject to any other statutory constraints asserted by Plaintiffs.

27. On August 7, 2019, Plaintiffs also filed their Motion for Preliminary Injunction and Motion for Partial Summary Judgment. In their supporting memorandum, Plaintiffs reasserted arguments raised in their causes of action.

CONCLUSIONS OF LAW

1. Summary judgment is proper when "the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that any party is entitled to a judgment as a matter of law." N.C.G.S. § 1A-1, Rule 56(c) (2017).

2. There is no genuine dispute as to the material facts found by the Court above. Accordingly, the Court proceeds to determine whether any party is entitled to judgment as a matter of law.
3. In 1929, the General Assembly enacted An Act Authorizing Cities, Towns and Counties to Establish, Construct, Improve, Equip, Maintain and Operate Airports and/or Landing Fields (hereinafter “First N.C. Public Airport Act”). 1929 N.C. Pub. Laws ch. 87. This First N.C. Public Airport Act allowed governing bodies of any city, town and county to “jointly acquire, establish, construct, own, control, lease, equip, improve, maintain, operate, and regulate airports,” id. § 4, but it failed to provide how an airport that was jointly owned would be operated.

4. In 1939, the RDU Charter enabled the Cities of Raleigh and Durham and the Counties of Wake and Durham to create what is now known as Raleigh-Durham International Airport. The legislation provided that the governing bodies of the cities and counties appoint a board that was legislatively “vested with the authority to control, lease, maintain, improve, operate, and regulate the joint airport or landing field.” 1939 N.C. Public-Local Laws ch. 168, § 7. Section 7 further provided that the board would have “complete authority over any airport or landing field jointly acquired by the several governmental bodies represented on the board.” Id. (emphasis added).


6. The Second N.C. Public Airport Act filled the gap left by the First N.C. Public Airport Act by providing for how airports jointly operated under the Second N.C. Public Airport Act would be governed and operated. The Second N.C. Public Airport Act provided, among other things, that: (1) municipalities may by agreement jointly operate an airport, 1945 N.C. Sess. Laws ch. 490, § 9(b); (2) municipalities may create a board for the purpose of operating an airport and such a board would be vested with the powers given the municipalities, id. §§ 9(d)-(f). However, unlike the complete authority legislatively vested in the RDUAA, the municipalities could, by agreement, limit the power and authority of the board. Id. § 9(f).

8. The powers granted to the RDUAA board were further defined in 1955 when the General Assembly revised section 7 of the RDU Charter. Among other powers and responsibilities, the RDUAA was authorized “[t]o lease (without the joinder in the lease agreements of the owning municipalities, to wit, the Counties of Wake and Durham, and the Cities of Raleigh and Durham) for a term not to exceed 15 years, and for purposes not inconsistent with the grants and agreements under which the said airport is held by said owning municipalities, real or personal property under the supervision of or administered by the said Authority.” 1955 N.C. Sess. Laws ch. 1096, § 1. This included the power “[t]o operate, own, control, regulate, lease or grant to others the right to operate any airport premises, restaurants, apartments, hotels, motels, agriculture fairs, tracks, motion picture shows, cafes, soda fountains, or other businesses, amusements or concessions for a term not exceeding 15 years, as may appear to said Authority advantageous or conducive to the development of said airport.” Id.

9. The powers granted to the RDUAA board were further expanded by the legislature in a 1957 amendment that stated, in part:

   In addition to all other rights and powers [conferred in the RDU Charter], the Raleigh-Durham Airport Authority . . . is authorized and empowered to exercise the powers granted to municipalities by the terms of Article 6, Chapter 63, of the General Statutes of North Carolina concerning public airports and related facilities.


10. That power of the RDUAA to lease without joinder in the lease agreements of the owning municipalities was confirmed and expanded by a 1959 amendment that increased the authorized lease period to “a term not to exceed 40 years.” 1959 N.C. Sess. Laws ch. 755, § 1.
11. Pursuant to these provisions, RDUAA has authority to enter into the Lease with Wake Stone to operate a business that the authority finds advantageous or conducive to the development of the airport because the Lease grants to others the right to operate a business on airport property for a term shorter than 40 years for the purpose of generating revenue for the airport.

12. Plaintiffs, citing *Quinn v. Quinn*, 243 N.C. App. 374, 777 S.E.2d 121 (2015) (giving meaning to the word “otherwise”), and *State v. Lee*, 277 N.C. 242, 176 S.E.2d 772 (1970) (giving meaning to the phrase “other like weapons”), argue that the phrase in the RDU Charter “other businesses, amusements or concessions” is modified or limited by the types of business and uses immediately preceding that phrase. Effectively, Plaintiffs argue that the other businesses must be similar to restaurants, apartments, hotels, motels, agricultural fairs, tracks, motion picture shows, cafes, and soda fountains because, under the rule *ejusdem generis*,

where general words follow a designation of particular subjects or things, the meaning of the general words will ordinarily be presumed to be, and construed as, restricted by the particular designations and as including only things of the same kind, character and nature as those specifically enumerated.

*Quinn*, 243 N.C. App. at 382, 777 S.E.2d at 126 (quoting *Lee*, 277 N.C. at 244, 176 S.E.2d at 774).

However, the Court of Appeals also stated in *Quinn*:

[A] court must be guided by the fundamental rule of statutory construction that statutes in pari materia, and all parts thereof, should be construed together and compared with each other. Thus, courts must harmonize such statutes, if possible, and give effect to each, that is, all applicable laws on the same subject matter should be construed together so as to produce a harmonious body of legislation, if possible.

*Id.* at 381; 777 S.E.2d at 126 (citations omitted).

13. The original RDU Charter gave the RDUAA board complete authority over the airport. Nothing in the amendments that followed reflects an intent by the legislature to diminish that authority. Plaintiffs’ argument runs contrary to a
reasonable reading of the legislation and ignores the General Assembly’s broad grant of authority to the RDUAA board.

14. Plaintiffs also ask this Court to view the phrase “other businesses” in isolation from subsequent language in the RDU Charter in an attempt to make a comparison to the catch-all phrases at issue in Quinn and Lee. To limit “other businesses” to the preceding words “restaurants, apartments, hotels, motels, agriculture fairs, tracks, motion picture shows, cafes, soda fountains” would render the words “amusements or concessions” which follow the phrase “other businesses” redundant as surplusage, as those types of businesses specifically listed are essentially amusements and concessions. The phrase “other businesses” must be construed and viewed in light of the remainder of the sentence that follows, to wit, “other businesses, amusements or concessions for a term not exceeding 15 years, as may appear to said Authority advantageous or conducive to the development of said airport.” 1955 N.C. Sess. Laws ch. 1096, § 1. Viewed in the light of the remainder of the sentence, it is clear that the authority to lease extends to other businesses so long as the proposed business appears to the RDUAA to be advantageous or conducive to the development of the airport. This interpretation is consistent with the broad grant of authority given to the RDUAA board.²

15. Furthermore, the Court concludes that the Lease is not inconsistent with any grant or agreement under which the airport is held. The phrase “grant or agreement” must refer to the grants and agreements by which RDUAA operates an airport under the guidance and regulation, and with financial contributions of the Department of Transportation/FAA under the Federal Airport Act. The FAA has approved the industrial/quarry use designation of the Property and maintains that its approval is not necessary for RDUAA to lease the Property.

16. Because no federal funds were used to acquire the Property and because the Lease is not subject to FAA approval, the Lease does not violate any federal laws nor did RDUAA violate the section 63-47 provision that “public officers of the State, counties and cities shall enforce the rules and regulations of the Federal Aviation Administration.” N.C.G.S. § 63-47 (2017).

² To hold otherwise would first require each owning municipality to approve of the Lease, and each owning municipality would thereafter have to agree to the terms of the Lease with the remaining three owning municipalities. Such a result is not contemplated in any provision of the RDU Charter.
17. Plaintiffs argued for the first time at the hearing of this matter that the owning municipalities need not be parties to the agreement but need only approve the agreement. Nowhere is this apparent in the RDU Charter and it runs contrary to the expansive powers given to the RDUAA board by the legislature. Plaintiffs’ contention that the governing authorities of the Cities of Raleigh and Durham and Counties of Wake and Durham must approve the Lease runs contrary not only to subsections 7(c) and 7(e) of the RDU Charter as amended in 1959, which explicitly granted to RDUAA exclusive authority to lease the Property, but also runs contrary to how RDUAA has historically leased property without objection by the owning authorities. Moreover, with respect to subsection 7(e) of the RDU Charter, as amended, in order to lease to other businesses, it is only the RDU Charter that must determine that the other business is conducive or advantageous to the development of the airport.

18. Plaintiffs also are incorrect that the Lease conveys usage rights to the minerals on the Property that exceeds the property rights associated with the ordinary type of lease contemplated in the RDU Charter.

19. The term “lease” in the RDU Charter must also include mineral leases because the General Assembly has indicated its ability and willingness elsewhere in the General Statutes to exclude mineral leases from the general class of leases. See N.C.G.S. § 22-2 (2017) (delineating “contracts for leasing land for the purpose of digging for gold or other minerals, or for mining generally, of whatever duration,” and “all other leases and contracts for leasing lands exceeding in duration three years” as contracts that must “be put in writing and signed by the party to be charged therewith”). The General Assembly has made no such distinction in the RDU Charter.

20. Additionally, the Lease does not represent a profit à prendre because “the grant of a profit à prendre does not preclude the grantor from exercising a like right upon the land or granting such right to others,” State ex rel. Rohrer v. Credle, 86 N.C. App. 633, 636, 359 S.E.2d 45, 47 (1987) (quoting Builders Supplies Co. v. Gainey, 282 N.C. 261, 267, 192 S.E.2d 449, 453 (1972)), while the language of the Lease here conveys “[a] possessory interest,” which “involves the exclusive possession of a certain space,” Builders Supplies Co., 282 N.C. at 270, 192 S.E.2d at 455.

21. RDUAA is not subject to any restrictions outlined in N.C.G.S. § 63-56(f) because RDUAA is not a board formed by an agreement between two or more municipalities pursuant to N.C.G.S. § 63-56(d). It is instead an independent
creation of the General Assembly formed pursuant to the RDU Charter and its powers are provided for in that legislation.

22. The RDU Charter was not superseded by the subsequent enactment of N.C.G.S. § 63-56 because "[a] local statute enacted for a particular municipality is intended to be exceptional, and for the benefit of such municipality, and is not repealed by the enactment of a subsequent general law." Bland v. City of Wilmington, 278 N.C. 657, 663, 180 S.E.2d 813, 817 (1971) (quoting City of Charlotte v. Kavanaugh, 221 N.C. 259, 263, 20 S.E.2d 97, 99 (1942)).

23. The General Assembly confirmed that RDUAA exercises statutory authority outside of the powers of boards formed pursuant to section 63-56 when the General Assembly stated in the 1957 amendments to the RDU Charter that, "[i]n addition to all other rights and powers herein conferred, the Raleigh-Durham Airport Authority . . . is authorized and empowered to exercise the powers granted to municipalities by the terms of Article 6, Chapter 63, of the General Statutes of North Carolina concerning public airports and related facilities." 1957 N.C. Sess. Laws ch. 455, § 2.

24. RDUAA satisfied the Open Meetings Law by discussing the Lease at a meeting noticed to and open to the public, regardless of whether public comment was allowed, because the Open Meetings Law requires only that the "hearings, deliberations, and actions of [public bodies] be conducted openly." N.C.G.S. § 143-318.9; see also Sigma Constr. Co. v. Guilford Cty. Bd. of Educ., 144 N.C. App. 376, 380-81, 547 S.E.2d 178, 181 (2001).

25. RDUAA is not subject to the requirements of N.C.G.S. § 160A-272 as asserted by Plaintiffs because RDUAA is not a "city" as contemplated in that statute. See N.C.G.S. § 160A-1 (2017) ("The term 'city' does not include counties or municipal corporations organized for a special purpose.").

26. As a matter of law, RDUAA has the statutory authority independent of the Cities of Raleigh and Durham and the Counties of Wake and Durham to enter into the Lease, and therefore, summary judgment in favor of Defendants is proper.

As there are no genuine issues of material fact, Defendants are entitled to judgment as a matter of law.
IT IS THEREFORE ORDERED AND ADJUDGED:

1. That Plaintiffs’ Motion for Partial Summary Judgment is DENIED.

2. That Plaintiffs’ Motion for Preliminary Injunction is DENIED.

3. That Defendants’ Motions for Summary Judgment are GRANTED and the plaintiffs’ claims against them are hereby DISMISSED with prejudice

Signed this $\Box$ day of November, 2019.

[Signature]

The Honorable A. Graham Shirley
Superior Court Judge Presiding
CERTIFICATE OF SERVICE

I hereby certify that on this day a copy of the foregoing document was served on the persons indicated below via electronic mail and by depositing a copy thereof in the United States Mail, postage prepaid, addressed as follows:

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Counsel for Defendant Wake Stone Corporation

This the 8th day of November, 2019.

[Signature]

Kellie Z. Myers
Wake County Trial Court Administrator
PO Box 1916
Raleigh, NC 27602
kellie.z.myers@ncourts.org
Question 5. Please provide documentation that shows Wake Stone has complied with GS 74-50(b1): the applicant or operator shall make a reasonable effort, satisfactory to the Department, to notify:

(1) The chief administrative officer of each county and municipality in which any part of the permitted area is located.

(2) The owners of record of land adjoining that lies within 1,000 feet of the permit boundaries.

(3) The owners of record of land that lies directly across and is contiguous to any highway; creek, stream, river, or other watercourse; railroad track; or utility or other public right-of-way and that lies within 1,000 feet of the permit boundaries. For purposes of this subdivision, “highway” means a highway, as defined in G.S. 20-4.01(13) that has four lanes of travel or less and that has not been designated a part of the Interstate Highway System.

WSC response:

5(1). As previously mentioned, RDUAA’s Odd Fellows tract (and Wake Stone Corporation’s Triangle Quarry property) are situated completely within the limits of Wake County. No portion of either property lies within the corporate limits of the cities of Cary, Raleigh, or Morrisville. As such, “the chief administrative officer of each county and municipality in which any part of the permitted area is located” was determined to be Mr. David Ellis, County Manager for Wake County. On March 30, 2020, notification of the proposed quarry expansion was sent by Certified Mail-Return Receipt Requested to:

Mr. David Ellis, Wake County Manager
PO Box 550
Raleigh, North Carolina 27602

(copies attached)
The notification included the “NOTICE” form from the Mining Permit Application booklet and a generalize location map identifying the relevant properties. A copy of the notification letter was included in the Mining Permit Application materials filed with NCDEMLR on April 8, 2020.

5(2) and (3). Staff of Wake Stone Corporation queried land ownership records found on Wake County Tax Department web portal and determined the ownership of parcels lying within 1,000 feet of the existing and proposed permit boundary. (Copies of Tax Cards are attached.) [Note: Parcels south of Interstate Highway 40 (8 travel lanes) are excluded from the notification requirement pursuant to 74-50 (b1)(3).] Wake Stone’s adjoining property ownership research identified 6 (six) adjoining owners to whom notification letters, the “NOTICE” form, and a generalized location map were sent via Certified Mail – Return Receipt Requested. Acknowledgement of delivery (“green cards”) were received for all notification but one. USPS tracking documented that that letter was received by the addressee although the “green card” was apparently lost by the USPS. Adjoining owners requiring notification were identified as:

State of North Carolina/Umstead State Park C/O Mr. Dwayne Patterson, Director
121 West Jones Street
Raleigh, North Carolina 27699-1615
Copies of the “green cards” and the USPS tracking documentation (for Mrs. Beals) were forwarded to Ms. Judy Wehner, Assistant State Mining Specialist via email on May 4, 2020. Copies of the notification letters as mailed to the above named 7 individuals were included in the Mining Permit Modification Application submitted to NCDEMLR on April 8, 2020. (Duplicate copies of the notification letters and “green cards” returned are attached.)
### Wake County Real Estate Data

**Account Summary**

Real Estate ID 0118364 PIN # 0776275726

**Property Description**
8225 GLENWOOD AVE WILLIAM UMSTEAD STATE PARK

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<tr>
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<th>Use/Hist/Tax Relief</th>
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<td>Recycle Units 0</td>
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<tr>
<td>Heated Area 25,675</td>
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Wake County Real Estate Data
Account Summary

Real Estate ID 0068197 PIN # 0766517951

Location Address: 2232 OLD REEDY CREEK RD
Property Description: DUKE LD BM1911-75

Property Owner
DUNN, RANDAL L JR & TAMARA GRANT
(Use the Deeds link to view any additional owners)

Owner's Mailing Address
2232 OLD REEDY CREEK RD
CARY NC 27513-2111

Property Location Address
2232 OLD REEDY CREEK RD
CARY NC 27513-2111

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Wake County Real Estate Data
Ownership History

Real Estate ID 0068197 PIN # 0766517951
Location Address 2232 OLD REEDY CREEK RD
Property Description DUKE LD BM1911-75

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<th>Stamps</th>
<th>Book</th>
<th>Page</th>
<th>Date</th>
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<td>0156</td>
<td>01-01-1954</td>
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</table>

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### Wake County Real Estate Data

#### Account Summary

**Real Estate ID**: 0079738 **PIN #**: 0766528101

**Location Address**: 2300 OLD REEDY CREEK RD
**Property Description**: PT DUKE FARM TR3 BM1911-00075

---

#### Property Owner

**BEALS, BETSY CAROL**

(Use the Deeds link to view any additional owners)

---

#### Owner's Mailing Address

2335 OLD REEDY CREEK RD
CARY NC 27513-2113

---

#### Property Location Address

2300 OLD REEDY CREEK RD
CARY NC 27513-2113

---

#### Administrative Data

- **Old Map #**: 402-00000-0010
- **Map/Scale**: 0766 04
- **VCS**: 05WC900
- **City**: \[City Name\]
- **Fire District**: 23
- **Township**: CEDAR FORK
- **Land Class**: VACANT
- **ETJ**: WC
- **Spec Dist(s)**: R-40
- **Zoning**: \[Zoning Type\]
- **History ID 1**: \[History ID 1\]
- **History ID 2**: \[History ID 2\]
- **Acreage**: 1.54
- **Permit Date**: \[Permit Date\]
- **Permit #**: \[Permit #\]

---

#### Transfer Information

- **Deed Date**: 7/9/2014
- **Book & Page**: 14-E- 2279
- **Revenue Stamps**: \[Revenue Stamps\]
- **Pkg Sale Date**: \[Pkg Sale Date\]
- **Pkg Sale Price**: \[Pkg Sale Price\]
- **Land Sale Date**: 10/24/1995
- **Land Sale Price**: $15,000

---

#### Improvement Summary

- **Total Units**: 0
- **Recycle Units**: 0
- **Apt/SC Soft**: \[Apt/SC Soft\]
- **Heated Area**: \[Heated Area\]

---

#### Assessed Value

- **Land Value**: $122,260
- **Assessed**: \[Assessed\]
- **Bldg. Value**: Assessed
- **Tax Relief**
- **Land Use Value**
- **Use Value**
- **Deferment**
- **Historic Deferment**
- **Total Deferred Value**

- **Use/Hist/Tax Relief**
- **Assessed**
- **Total Value Assessed**: $122,260

---

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<th>Date</th>
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### Wake County Real Estate Data
#### Account Summary

**Real Estate ID**: 0020176 PIN #: 0766414911

**Location Address**: 0 OLD REEDY CREEK RD
**Property Description**: SURVEY EDWARDS PROP BM2006-02617

---

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<td>762 MUDHAM RD WENDELL NC 27591-8485</td>
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<th>History ID 2</th>
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<th>Permit Date</th>
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### Assessed Value

- **Land Value**: $1,099,802
- **Assessed**: $1,099,802
- **Bldg. Value**: 
- **Assessed**
- **Tax Relief**
- **Land Use Value**
- **Use Value**
- **Deferment**
- **Historic Deferment**
- **Total Deferred Value**

- **Use/Hist/Tax Relief**: 
- **Assessed**: 
- **Total Value**: $1,099,802
- **Assessed**: $1,099,802

---

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Wake County Real Estate Data
Account Summary

Real Estate ID 0102676 PIN # 0767324317

Location Address Property Description
2800 AIRPORT BLVD RALEIGH-DURHAM INTN’L AIRPORT 03-766-772

Property Owner
RALEIGH DURHAM INTERNATIONAL
(Use the Deeds link to view any additional owners)

Owner’s Mailing Address
PO BOX 80001
RALEIGH NC 27623-0001

Property Location Address
2800 AIRPORT BLVD
MORRISVILLE NC 27560-0000

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*Wake County assessed building and land values reflect the market value as of January 1, 2020, which is the date of the last county-wide revaluation. Any inflation, deflation or other economic changes occurring after this date does not affect the assessed value of the property and cannot be lawfully considered when reviewing the value for adjustment.

The January 1, 2020 values will remain in effect until the next county-wide revaluation. Until that time, any real estate accounts created or new construction built is assessed according to the 2020 Schedule of Values.

For questions regarding the information displayed on this site, please contact the Department of Tax Administration at Taxhelp@wakegov.com or call 919-856-5400.
Disclaimer: The information on this site, including but not limited to the real estate "Owner Name" and date of acquisition, is provided for informational purpose only and is gathered from public records submitted, filed and recorded with various government departments, agencies, and offices. Although every effort has been made to ensure that the information presented on this website is accurate and timely, it is not intended to replace information that could be obtained directly from any other government department, agency, or office, nor should it be used as the exclusive basis for determining ownership or date of acquisition of real property. Wake County makes no representation or warranties, express or implied, concerning the accuracy, completeness, reliability, or suitability of the information provided herein or the status of title to the subject real estate.

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For questions regarding the information displayed on this site, please contact the Department of Tax Administration at Taxhelp@wakegov.com or call 919-856-5400.
March 30, 2020

By Certified Mail

Mr. David Ellis, Wake County Manager
PO Box 550
Raleigh, North Carolina 27602

Subject: Wake Stone Corporation Triangle Quarry
Mining Permit Modification

Dear Mr. Ellis:

Pursuant to the provisions of NCGS 74-50 (b.1.) of the Mining Act of 1971, we are by this letter notifying you of our intent to submit a Mining Permit Modification Application to the Division of Energy, Mineral, and Land Resources of the North Carolina Department of Environmental Quality (NCDEMLR). These application materials will detail our plans for increasing the permitted areas and expansion of the existing Triangle Quarry onto the property governed by our Mineral Lease Agreement with the Raleigh-Durham Airport Authority (see enclosed site map). We anticipate submittal of this application to NCDEMLR on or before April 2, 2020.

Once submitted to NCDEMLR, the Mining Permit Application materials will be available for public review and comment. You may also call our corporate office at (919) 266-1100 and either Samuel T. Bratton, President and CEO or I will answer any question you may have concerning this mine site expansion.

Sincerely,

Wake Stone Corporation

[Signature]

David F. Lee
Head Geologist/Environmental Supervisor

Enclosures
NOTICE

Pursuant to provisions G.S. 74-50(b1) of The Mining Act of 1971, Notice is hereby given that

Wake Stone Corporation
(Applicant Name)

will apply on or about
(Date)

to the Division of Energy, Mineral, and Land Resources, North Carolina Department of Environmental Quality, 1612 Mail Service Center, Raleigh, North Carolina 27699-1612, for (check one):

☐ a new surface mining permit,

☒ a modification of an existing surface mining permit to add land to the permitted area; or

☐ a modification of an existing surface mining permit to add land to the permitted area with no disturbance in the area proposed. Please note that future modification(s) may be submitted by the applicant to allow disturbance within this area without re-notification of adjoining landowners.

The applicant proposes to mine

stone
(Mineral, Ore)

on
329
(Number)

acres located
(Miles)

North of Interstate 40 northwest of Cary, NC off/near road Old Reedy Creek Road
(Direction) (Nearest Town) (Number/Name)

in Wake County.

*SEE ATTACHED MAP FOR PROPOSED PERMIT BOUNDARIES AND CORRESPONDING ADJOINING LANDOWNER NAMES AND LOCATIONS*

In accordance with G.S. 74-50(b1), the mine operator is required to make a reasonable effort, satisfactory to the Department, to notify all owners of record, both public and private, of all tracts of land that are adjoining the mining permit boundary; if an adjoining tract is owned or leased by the applicant or is owned by the lessor of the mine tract, all owners of record of tracts adjoining these tracts must be notified (that are within 1,000 feet of the mining permit boundary). In addition, the mine operator must also notify the chief administrative officer of the county or municipality in which any part of the permitted area is located. Any person may file written comment(s) to the Department at the above address within thirty (30) days of the issuance of this Notice or the filing of the application for a permit, whichever is later. Should the Department determine that a significant public interest exists relative to G.S. 74-51, a public hearing will be held within 60 days of the end of the 30-day comment period specified above.

A copy of the permit application materials is on file and available for public review during normal business hours at the above listed address as well as at the appropriate regional office. For information regarding the specifics of the proposed mining activity, please contact the applicant at the following telephone number: 919-266-1100 (Sam Bratton). For information on the mining permit application review process, please contact the Mining Program staff at (919) 707-9220. Please note that the Department will consider any relevant written comments/documentation within the provisions of the Mining Act of 1971 throughout the application review process until a final decision is made on the application.

(Address/Owner of Record’s Name and Address)
David Ellis, Wake County Manager
Wake County Office
PO Box 550
Raleigh, North Carolina 27602

(Date of Issuance of this Notice/ Mailed to Address/Owner of Record)

(Name of Applicant: Include Contact Person & Company Name, if Applicable)
Wake Stone Corporation
Attn: Sam Bratton
PO Box 190
Knightdale, North Carolina 27545

(Address of Applicant)
March 30, 2020

By Certified Mail

Mr. Dwayne Patterson, Director
North Carolina State Parks
121 West Jones Street
Raleigh, North Carolina 27699-1615

Subject: Wake Stone Corporation Triangle Quarry
Mining Permit Modification

Dear Mr. Patterson:

Pursuant to the provisions of NCGS 74-50 (b.1.) of the Mining Act of 1971, we are by this letter notifying you of our intent to submit a Mining Permit Modification Application to the Division of Energy, Mineral, and Land Resources of the North Carolina Department of Environmental Quality (NCDEMLR). These application materials will detail our plans for increasing the permitted areas and expansion of the existing Triangle Quarry onto the property governed by our Mineral Lease Agreement with the Raleigh-Durham Airport Authority (see enclosed site map). We anticipate submittal of this application to NCDEMLR on or before April 2, 2020.

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Sincerely,

Wake Stone Corporation

[Signature]

David F. Lee
Head Geologist/Environmental Supervisor

Enclosures
NOTICE

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[Blank]
(Applicant Name)

will apply on or about
(Date)

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The applicant proposes to mine [stone] on [329] acres located [Miles]
(Mineral, Ore) (Number) (Miles)

North of Interstate 40 northwest of Cary, NC off/near road Old Reedy Creek Road
(Direction) (Nearest Town) (Number/Name)

in Wake County.

*SEE ATTACHED MAP FOR PROPOSED PERMIT BOUNDARIES AND CORRESPONDING ADJOINING LANDOWNER NAMES AND LOCATIONS*

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(Date of Issuance of this Notice/
Mailed to Addressee/Owner of Record)
March 30, 2020

By Certified Mail

Mr. Randall L. and Tamara G. Dunn
2232 Old Reedy Creek Road
Cary, North Carolina 27513-2111

Subject: Wake Stone Corporation Triangle Quarry
         Mining Permit Modification

Dear Mr. and Mrs. Dunn:

Pursuant to the provisions of NCGS 74-50 (b 1.) of the Mining Act of 1971, we are by this letter notifying you of our intent to submit a Mining Permit Modification Application to the Division of Energy, Mineral, and Land Resources of the North Carolina Department of Environmental Quality (NCDEMLR). These application materials will detail our plans for increasing the permitted areas and expansion of the existing Triangle Quarry onto the property governed by our Mineral Lease Agreement with the Raleigh-Durham Airport Authority (see enclosed site map). We anticipate submittal of this application to NCDEMLR on or before April 2, 2020.

Once submitted to NCDEMLR, the Mining Permit Application materials will be available for public review and comment. You may also call our corporate office at (919) 266-1100 and either Samuel T. Bratton, President and CEO or I will answer any question you may have concerning this mine site expansion.

Sincerely,

Wake Stone Corporation

David F. Lee
Head Geologist/Environmental Supervisor

Enclosures
NOTICE

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Wake Stone Corporation (Applicant Name) will apply on or about (Date)

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☐ a modification of an existing surface mining permit to add land to the permitted area with no disturbance in the area proposed. Please note that future modification(s) may be submitted by the applicant to allow disturbance within this area without re-notification of adjoining landowners.

The applicant proposes to mine stone on 329 acres located (Number) (Miles)

North of Interstate 40 northwest of Cary, NC off/near road Old Reedy Creek Road
(Direction) (Nearest Town) (Name/Number)

in Wake County.

*SEE ATTACHED MAP FOR PROPOSED PERMIT BOUNDARIES AND CORRESPONDING ADJOINING LANDOWNER NAMES AND LOCATIONS*

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(Address/Owner of Record’s Name and Address) (Name of Applicant: Include Contact Person & Company Name, if Applicable)

Randall L. and Tamara G. Dunn
2232 Old Reedy Creek Road
Cary, North Carolina 27513-2111

Wake Stone Corporation
Attn: Sam Bratton
PO Box 190
Knightdale, North Carolina 27545

(Date of Issuance of this Notice/ Mailed to Addresssee/Owner of Record) (Address of Applicant)

- 26 -
March 30, 2020

By Certified Mail

Betsy Carol Beals
2335 Old Reedy Creek Road
Cary, North Carolina 27513-2113

Subject: Wake Stone Corporation Triangle Quarry
Mining Permit Modification

Dear Mrs. Beals:

Pursuant to the provisions of NCGS 74-50 (b.1.) of the Mining Act of 1971, we are by this letter notifying you of our intent to submit a Mining Permit Modification Application to the Division of Energy, Mineral, and Land Resources of the North Carolina Department of Environmental Quality (NCDEMLR). These application materials will detail our plans for increasing the permitted areas and expansion of the existing Triangle Quarry onto the property governed by our Mineral Lease Agreement with the Raleigh-Durham Airport Authority (see enclosed site map). We anticipate submittal of this application to NCDEMLR on or before April 2, 2020.

Once submitted to NCDEMLR, the Mining Permit Application materials will be available for public review and comment. You may also call our corporate office at (919) 266-1100 and either Samuel T. Bratton, President and CEO or I will answer any question you may have concerning this mine site expansion.

Sincerely,
Wake Stone Corporation

David F. Lee
Head Geologist/Environmental Supervisor

Enclosures
NOTICE

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Wake Stone Corporation
(Applicant Name)

will apply on or about
(Date)

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The applicant proposes to mine stone on
(Mineral, Ore) 329 acres located
(Number) (Miles)

North of Interstate 40 northwest of Cary, NC off/near road Old Reedy Creek Road
(Direction) (Nearest Town) (Number/Name)

in Wake County.

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(Address/Owner of Record's Name and Address)
Betsy Carol Beals
2335 Old Reedy Creek Road
Cary, North Carolina 27513-2113

(Date of Issuance of this Notice/Mailed to Addresssee/Owner of Record)

(Name of Applicant: Include Contact Person & Company Name, if Applicable)
Wake Stone Corporation
Attn: Sam Bratton
PO Box 190
Knightdale, North Carolina 27545
(Address of Applicant)
Lloyd T. Edwards and Ellen J. Edwards White
762 Mudham Road
Wendell, North Carolina 27591

Subject: Wake Stone Corporation Triangle Quarry
Mining Permit Modification

Dear Mr. Edward and Mrs. White:

Pursuant to the provisions of NCGS 74-50 (b.1.) of the Mining Act of 1971, we are by this letter notifying you of our intent to submit a Mining Permit Modification Application to the Division of Energy, Mineral, and Land Resources of the North Carolina Department of Environmental Quality (NCDEMLR). These application materials will detail our plans for increasing the permitted areas and expansion of the existing Triangle Quarry onto the property governed by our Mineral Lease Agreement with the Raleigh-Durham Airport Authority (see enclosed site map). We anticipate submittal of this application to NCDEMLR on or before April 2, 2020.

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Sincerely,

Wake Stone Corporation

David F. Lee
Head Geologist/Environmental Supervisor

Enclosures
NOTICE

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Wake Stone Corporation
(Applicant Name)

will apply on or about __________________________ (Date)

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☒ a modification of an existing surface mining permit to add land to the permitted area; or

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The applicant proposes to mine ________ stone ________ on _______ acres located _______ (Mineral, Ore) (Number) (Miles)

North of Interstate 40 northwest of Cary, NC off/near road Old Reedy Creek Road
(Direction) (Nearest Town) (Number/Name)

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(Addresssee/Owner of Record’s Name and Address)
Lloyd T. Edwards and Ellen J. Edwards White
762 Mudham Road
Wendell, North Carolina 27591

(Date of Issuance of this Notice/Mailed to Addresssee/Owner of Record)

(Name of Applicant: Include Contact Person & Company Name, if Applicable)
Wake Stone Corporation
Attn: Sam Bratton
PO Box 190
Knightdale, North Carolina 27545
(Address of Applicant)
Mr. Michael Languth, CEO
Raleigh-Durham Airport Authority
PO Box 80001
Raleigh, North Carolina 27623-0001

Subject: Wake Stone Corporation Triangle Quarry
Mining Permit Modification

Dear Mr. Languth:

Pursuant to the provisions of NCGS 74-50 (b.1.) of the Mining Act of 1971, we are by this letter notifying you of our intent to submit a Mining Permit Modification Application to the Division of Energy, Mineral, and Land Resources of the North Carolina Department of Environmental Quality (NCDEMLR). These application materials will detail our plans for increasing the permitted areas and expansion of the existing Triangle Quarry onto the property governed by our Mineral Lease Agreement with the Raleigh-Durham Airport Authority (see enclosed site map). We anticipate submittal of this application to NCDEMLR on or before April 2, 2020.

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Sincerely,
Wake Stone Corporation

David F. Lee
Head Geologist/Environmental Supervisor

Enclosures
NOTICE

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[Blank] will apply on or about [Blank]

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☒ a modification of an existing surface mining permit to add land to the permitted area; or

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The applicant proposes to mine [Blank] on [Blank] acres located [Blank]

[Blank] stone on [Blank] (Mineral, Ore) (Number) (Miles)

North of Interstate 40 northwest of Cary, NC off/_near road Old Reedy Creek Road

(Direction) (Nearest Town) (Number/Name)

in [Blank] County.

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(Address/Owner of Record’s Name and Address) Raleigh-Durham Airport Authority Attn: Michael Landguth, CEO PO Box 80001 Raleigh, North Carolina 27623-0001

(Date of Issuance of this Notice/Mailed to Address/Owner of Record)

(Name of Applicant: Include Contact Person & Company Name, if Applicable) Wake Stone Corporation Attn: Sam Bratton PO Box 190 Knightdale, North Carolina 27545

(Address of Applicant)
March 30, 2020

By Certified Mail

Amy Neidringhaus, District Engineer
Wake County District Office
1575 Mail Service Center
Raleigh, North Carolina 27607

Subject: Wake Stone Corporation Triangle Quarry
Mining Permit Modification

Dear Ms. Neidringhaus:

Pursuant to the provisions of NCGS 74-50 (b 1.) of the Mining Act of 1971, we are by this letter notifying you of our intent to submit a Mining Permit Modification Application to the Division of Energy, Mineral, and Land Resources of the North Carolina Department of Environmental Quality (NCDEMLR). These application materials will detail our plans for increasing the permitted areas and expansion of the existing Triangle Quarry onto the property governed by our Mineral Lease Agreement with the Raleigh-Durham Airport Authority (see enclosed site map). We anticipate submittal of this application to NCDEMLR on or before April 2, 2020.

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Sincerely,

Wake Stone Corporation

David T. Lee
Head Geologist/Environmental Supervisor

Enclosures
APPLICATION FOR A MINING PERMIT

NOTICE

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Wake Stone Corporation (Applicant Name) will apply on or about _______ (Date)

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☒ a modification of an existing surface mining permit to add land to the permitted area; or

☐ a modification of an existing surface mining permit to add land to the permitted area with no disturbance in the area proposed. Please note that future modification(s) may be submitted by the applicant to allow disturbance within this area without re-notification of adjoining landowners.

The applicant proposes to mine _______ stone on _______ acres located _______ (Mineral, Ore) (Number) (Miles)

North of Interstate 40 northwest of Cary, NC off/ near road Old Reedy Creek Road (Direction) (Nearest Town) (Number/ Name)

in _______ Wake County.

*SEE ATTACHED MAP FOR PROPOSED PERMIT BOUNDARIES AND CORRESPONDING ADJOINING LANDOWNER NAMES AND LOCATIONS*

In accordance with G.S. 74-50(b1), the mine operator is required to make a reasonable effort, satisfactory to the Department, to notify all owners of record, both public and private, of all tracts of land that are adjoining the mining permit boundary; if an adjoining tract is owned or leased by the applicant or is owned by the lessor of the mine tract, all owners of record of tracts adjoining these tracts must be notified (that are within 1,000 feet of the mining permit boundary). In addition, the mine operator must also notify the chief administrative officer of the county or municipality in which any part of the permitted area is located. Any person may file written comment(s) to the Department at the above address within thirty (30) days of the issuance of this Notice or the filing of the application for a permit, whichever is later. Should the Department determine that a significant public interest exists relative to G.S. 74-51, a public hearing will be held within 60 days of the end of the 30-day comment period specified above.

A copy of the permit application materials is on file and available for public review during normal business hours at the above listed address as well as at the appropriate regional office. For information regarding the specifics of the proposed mining activity, please contact the applicant at the following telephone number: 919-266-1100 (Sam Bratton). For information on the mining permit application review process, please contact the Mining Program staff at (919) 707-9220. Please note that the Department will consider any relevant written comments/documentation within the provisions of the Mining Act of 1971 throughout the application review process until a final decision is made on the application.

(Addresssee/Owner of Record’s Name and Address)

Amy Neidringhaus, District Engineer
NC DOT Div. 5 Wake Co. Dist. Office
1575 Mail Service Center
Raleigh, North Carolina 27607

(Date of Issuance of this Notice/ Mailed to Addresssee/Owner of Record)

(Name of Applicant: Include Contact Person & Company Name, if Applicable)

Wake Stone Corporation
Attn: Sam Bratton
PO Box 190
Knightdale, North Carolina 27545

(Address of Applicant)
AFFIDAVIT OF NOTIFICATION

I, Samuel T. Bratton, an applicant, or an agent, or employee of an applicant, for a new Mining Permit, or a modification of an existing Mining Permit to add land to the permitted area, from the N.C. Department of Environmental Quality, being first duly sworn, do hereby attest that the following are all known owners of record, both public and private, of all tracts of land that are adjoining the mining permit boundary (including where an adjoining tract is owned or leased by the applicant or is owned by the lessor of the mine tract, all owners of record of tracts adjoining these tracts, that are within 1,000 feet of the mining permit boundary) and that notice of the pending application has been caused to be mailed, by certified or registered mail, return receipt requested, to said owners of record at their addresses shown below, such notice being given on a form provided by the Department:

(Adjoining Landowner Name)  
Michael Languth, CEO Raleigh-Durham Airport  
Lloyd T. Edwards  
Betsy Carol Beals  
Randall L. and Tamara G. Dunn  
Dwayne Patterson – NC State Parks  
Amy Neidringhaus – NC DOT  
Raleigh, North Carolina  
Wendell, North Carolina  
Cary, North Carolina  
Cary, North Carolina  
Raleigh, North Carolina  
Raleigh, North Carolina

I do also attest that the following individual is the chief administrative officer of the county or municipality in which any part of the permitted area is located and that notice of the pending application has been caused to be mailed, by certified or registered mail, return receipt requested, to said office at the following address:

(Chief Administrative Officer Name)  
[i.e.: City Manager, County Manager, Mayor, etc.]  
David Ellis, Wake County Manager  
(Raleigh, North Carolina)

The above attestation was made by me while under oath to provide proof satisfactory to the Department that a reasonable effort has been made to notify all known owners of record, both public and private, of all tracts of land that are adjoining the mining permit boundary (including where an adjoining tract is owned or leased by the applicant or is owned by the lessor of the mine tract, all owners of record of tracts adjoining these tracts, that are within 1,000 feet of the mining permit boundary) and the chief administrative officer of the county or municipality in which any part of the permitted area is located in compliance with N.C.G.S. 74-50(b1) and 15A NCAC 5B .0004(d). I understand that it is the responsibility of the applicant to retain the receipts of mailing showing that the above notices were caused to be mailed and to provide them to the Department upon request.

Signature of Applicant or Agent

Date 3/31/20

If person executing Affidavit is an agent or employee of an applicant, provide the following information:

Name of applicant: Samuel T. Bratton

Title of person executing Affidavit: President and CEO

I, Michael E. Hancock, a Notary Public of the County of Wake, State of North Carolina, do hereby certify that Samuel T. Bratton appeared before me this day and under oath acknowledged that the above Affidavit was made by him/her.

Witness my hand and notarial seal this 31st day of March, 2020.

Notary: Affidavit made 4/7/20

Expiration: 30
Judy-
Attached are the "green cards" for the required notifications to adjoining owners and the Wake County Manager. As I mentioned on the phone earlier today, the green card for the Beals notification was apparently lost in the mail. I tracked the original and have included documentation that it was delivered on April 2\textsuperscript{nd}.

-David

David F. Lee
Geologist/Environmental Supervisor
Wake Stone Corporation
PO Box 190
Knightdale, North Carolina  27545
Office: 919-266-1100, ext. 134
website:  \url{www.wakestonecorp.com}
Cell:  919-369-3449
Home:  919-553-4666
Tracking Number: 70072560000053073337

Your item was delivered to an individual at the address at 11:52 am on April 2, 2020 in CARY, NC 27513.

☑ Delivered
April 2, 2020 at 11:52 am
Delivered, Left with Individual
CARY, NC 27513

Text & Email Updates
Tracking History
Product Information

See Less ▲

Can't find what you’re looking for?
Go to our FAQs section to find answers to your tracking questions.
Question 6. Please provide the actual estimated emissions of PM100, PM10, and PM2.5, from the crushing and processing plant for each of last five years.

WSC response:

The table below gives the actual estimated emissions for the last five calendar years (2015-2019) for PM$_{100}$, PM$_{10}$, and PM$_{2.5}$. These estimated emissions are calculated by using generally accepted emission factors from EPA (AP-42, Section 11) for crushing, screening, and conveying of crushed stone processing operations. A material balance (total throughput for each piece of equipment) is generated using engineering best estimates based on typical flow through the processing plant and actual tons of each product produced for a given year (calculation spreadsheets attached). It is important to note that these numbers are utilized by regulatory authorities to determine permitting requirements and do not represent impacts on air quality at or near the boundary of a permitted facility. In fact, if criteria pollutant emissions (such as PM$_{10}$) are below 5 tons per year, a facility is considered a “very small source” and is eligible for exemption from state air permitting. Facilities with emissions of 5 tons to 25 tons per year are still considered “small sources” and are eligible for registration in lieu of permitting. Only operations with emissions of 25 tons per year or more of criteria pollutants are required to be permitted under the North Carolina Division of Air Quality. Wake Stone has elected to voluntarily maintain its North Carolina Air Permit.

<table>
<thead>
<tr>
<th>Actual Estimated Emissions</th>
<th>Calendar Year</th>
<th>PM$_{100}$ (tons)</th>
<th>PM$_{10}$ (tons)</th>
<th>PM$_{2.5}$ (tons)</th>
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<tbody>
<tr>
<td></td>
<td>2015</td>
<td>5.83</td>
<td>2.1</td>
<td>0.25</td>
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<td>2016</td>
<td>9.06</td>
<td>3.27</td>
<td>0.39</td>
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<td>2017</td>
<td>9.46</td>
<td>3.41</td>
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<td>2018</td>
<td>6.26</td>
<td>2.26</td>
<td>0.27</td>
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<td>2019</td>
<td>5.42</td>
<td>1.96</td>
<td>0.24</td>
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<tr>
<td>20 x 36 Belt Box and 62&quot; x 36&quot; (Primary low) Crusher</td>
<td>B8 F 150</td>
<td>1,050,662</td>
<td>577,089</td>
<td>7/10</td>
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<tr>
<td>Lippmann 40&quot; x 102&quot; (Primary low) Crusher</td>
<td>C1 620</td>
<td>577,089</td>
<td>7/10</td>
<td>0.010000</td>
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<tr>
<td>Symons HD 8 1/2 B.C. Cone Crusher</td>
<td>C1 550</td>
<td>442,127</td>
<td>537</td>
<td>0.010000</td>
</tr>
<tr>
<td>Symons 7 1/2 B.C. Cone Crusher</td>
<td>C3 300</td>
<td>235,448</td>
<td>287</td>
<td>0.010000</td>
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<tr>
<td>Symons 7 3/4 B.C. Cone Crusher</td>
<td>C4 400</td>
<td>267,888</td>
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<td>0.010000</td>
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<td>6 x 10 - 2D Screen - 8' X 10'</td>
<td>S1 100</td>
<td>566,387</td>
<td>785</td>
<td>0.020000</td>
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<td>16 x 20 - 2D Screen - ID S2</td>
<td>S2 800</td>
<td>311,166</td>
<td>252</td>
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<td>18 x 30 - 2D Screen - ID S3</td>
<td>S2B 800</td>
<td>311,166</td>
<td>252</td>
<td>0.020000</td>
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<td>16 x 30 - 2D Binning Screen - ID S3</td>
<td>S3 800</td>
<td>267,888</td>
<td>217</td>
<td>0.010000</td>
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Footnotes:
1. Process equipment as detailed in Air Permit No. 656.
2. Material Balance determined by applying actual 2015 total plant production information by product size to applicable process equipment in the production line. This information is an engineering best estimate based on typical plant flow patterns.
3. Generally accepted emission factors as published in AP-42, Section 11, Table 11.9.2-2. Application/use of "control" emission factors is justified based on the industry source testing sponsored by the National Stone Sand and Gravel Association.
4. In cooperation with the USEPA. Actual plant operation is with all control devices operating in order to comply with the opacity standards of NSPS.
5. For the purpose of estimating emissions, the 6" x 8" attritor grinding mill at the primary crusher is treated as a source and the controlled emissions factor for screens is utilized in the calculations.
6. Likewise, the 60 Ton surge box and 25 ton sand bins are treated as conveyor transfer points and the controlled emissions factor for conveyors is utilized in the calculations.
<table>
<thead>
<tr>
<th>Process Equipment¹</th>
<th>ID No.</th>
<th>Capacity (t/h)</th>
<th>Material Balance²</th>
<th>Published¹¹</th>
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<td>AP-42 Emission</td>
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<td>PM-10 Emission</td>
<td>PM-2.5 Emission</td>
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</table>

1. Process Equipment as detailed in Air Permit No. 4366.
2. Material Balance determined by applying actual 2016 total plant production information by product type to applicable process equipment in the production line. This information is an engineering best estimate based on typical plant flow patterns.
3. Generally accepted emission factors as published in AP-42, Section 11, Table 11.18-2. Application of the "controlled" emission factors is justified based on the industry source testing sponsored by the National Stone Sand and Gravel Association in cooperation with the USEPA. Actual plant operation is within control devices operating in order to comply with the specific standards of NSPS.
4. For the purpose of estimating emissions, the 60 x 60' vibrating feeder area is treated as a source and the controlled emissions factor for conveyors is utilized in the calculations.
5. In the absence of, no emissions
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<tr>
<td></td>
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<td>Actual 2017</td>
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<td>PM-2.5</td>
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<td>Emissions (Tons)</td>
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<table>
<thead>
<tr>
<th>Opening Total Throughput:</th>
<th>3,903,220</th>
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</thead>
<tbody>
<tr>
<td>Screening Total Throughput:</td>
<td>3,950,560</td>
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</tbody>
</table>

**Primary Plant Hours of Operation** 3,416
**Secondary Plant Hours of Operation** 1,047

**Total Actual PM-10 Emissions (Tons)**

<table>
<thead>
<tr>
<th>ID No.</th>
<th>Capacity (tph)</th>
<th>Material Balance</th>
<th>Emission Factors</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>14&quot; x 14&quot; Re-work bin</td>
<td>203</td>
<td>34,070</td>
<td>0.000040</td>
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</tbody>
</table>

**Footnotes**

1. Process Equipment as detailed in Air Permit No. 4366.
2. Material Balance determined by applying actual 2017 total plant production information by product size to applicable process equipment in the production line. This information is an engineering best estimate based on typical plant flow patterns.
3. Generally accepted emission factors as published in AP-42, Section 1, Table 11, 12.2-1. Application of "corrected" emission factors is justified based on the industry source test data in AP-42 Section 11.6.5-1.
4. For the purposes of estimating emissions, the 0.4" X 0.4" slotting grid feed at the primary crusher is treated as a nascent and the controlled emissions factor for secondary is utilized in the calculations.
5. For wet processes, no emissions.

**Primary Plant Emissions**

- **Primary Plant Omissions (Tons)**
- **Secondary Plant Omissions (Tons)**

**Total Actual PM-10 Emissions (Tons)**

- **Total Actual PM-2.5 Emissions (Tons)**

**Emission Source (ES) Facilities Total**

- **Emission Source (ES) Cranes Total**
- **Emission Source (ES) Conveyors Total**
<table>
<thead>
<tr>
<th>Process Equipment</th>
<th>ID No.</th>
<th>Capacity (tons/hr)</th>
<th>Material Balance</th>
<th>Emission Factors</th>
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</thead>
<tbody>
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<td>Published*1</td>
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<td>AP-42 Emission</td>
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<td>Factor for PM-10</td>
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Primary Plant Hours of Operation: 934 Secondary Plant Hours of Operation: 1,311

Footnotes:
1. Process equipment as detailed in AI Emis No. 4366
2. Material Balance determined by applying actual 2018 total plant production information to applicable process equipment in the production line. This information is an engineering base estimate based on typical plant flow patterns.
3. Generally assumed emission factors as published in AP-42, Section 11, Table 11.19-5.2. Application of "controlled" emission factors is permitted based on the industry source testing sponsored by the National Stone and Granite Association in cooperation with the USEPA. Actual plant operation is with all controls devices operating in order to comply with the specific standards of NSPS.
4. For the purpose of emissions analysis, the 52 x 37 opening existing quasi fan stalls the primary crusher is modeled as a source and the coarse emissions factor for a conveyor is utilized in the calculations.
5. Wet process, no emissions
<table>
<thead>
<tr>
<th>Process Equipment</th>
<th>ID No.</th>
<th>Capacity (tph)</th>
<th>Actual 2019 (tph)</th>
<th>TPS (cal.)</th>
<th>AP-42 Emission Factor (in lb/hr)</th>
<th>PM/TSP Emission</th>
<th>PM-10 Emission</th>
<th>Actual PM-2.5 Emission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lippmann 50” x 62” Primary Impact Crusher</td>
<td>C1</td>
<td>664,236</td>
<td>755</td>
<td>5000</td>
<td>0.001000</td>
<td>0.000400</td>
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<tr>
<td>Lippmann 50” x 62” Secondary Impact Crusher</td>
<td>C2</td>
<td>555,660</td>
<td>547</td>
<td>5000</td>
<td>0.001000</td>
<td>0.000400</td>
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<tr>
<td>Symons 7” Std. Cone Crusher</td>
<td>C3</td>
<td>591,465</td>
<td>582</td>
<td>5000</td>
<td>0.001000</td>
<td>0.000400</td>
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<tr>
<td>Symons 7” S. B. Cone Crusher</td>
<td>C4</td>
<td>800</td>
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<td>0.000400</td>
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<tr>
<td>S x 16” X 32” Screen - ID 96</td>
<td>S1</td>
<td>800</td>
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<td>5000</td>
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<td>0.000400</td>
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<tr>
<td>S x 20” X 32” Screen - ID 52</td>
<td>S2</td>
<td>800</td>
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<td>5000</td>
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<tr>
<td>S x 26” X 32” Screen - ID 53</td>
<td>S3</td>
<td>800</td>
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<td>5000</td>
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Primary Plant Hours of Operation: 850
Secondary Plant Hours of Operation: 1,030

Emission Factors

- PM-10 Emission Factors
  - Total PM-10 Emissions (Tons) = 5.42
  - PM-10 Emission Factor (in lb/hr) = 0.000400

- PM-2.5 Emission Factors
  - Total PM-2.5 Emissions (Tons) = 1.56
  - PM-2.5 Emission Factor (in lb/hr) = 0.000300

- Emission Source (ES) Cranes
  - Emission Source (ES) Cranes Total = 1.199521
  - Emission Source (ES) Cranes Emission Factor (in lb/hr) = 0.000432

- Emission Source (ES) Conveyors
  - Emission Source (ES) Conveyors Total = 2.703710
  - Emission Source (ES) Conveyors Emission Factor (in lb/hr) = 0.000358

Formulas:
1. Process equipment as detailed in Air Permit No. 4366
2. Material balance determined by applying actual 2019 and plant production information by product type to applicable process equipment in the production line. This information is in engineering hours based on typical plant flow patterns.
3. 100% of the selected emission factors are quantified for all sources included in the calculation.
4. For the purpose of estimating emissions, the 6" x 9" vibrating screen feeder at the primary crusher is rated as a source and the corrected emission factor for screens is utilized in the calculation.
5. The process is not an emissions source.
Question 7.  Please provide for last 5 years, by year, the number of blasts per year of shot(s) (sic) greater than 5-holes, and the average duration of shots.

WSC response:

<table>
<thead>
<tr>
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Average Duration: 247.83673 Milliseconds
Question 8. Please provide a description of the Company's dust suppression activities at the current and proposed mine sites.

WSC response:
WSC's Triangle Quarry is covered under NC Division of Air Quality Permit No. 04386/R15 which details our responsibilities for management of fugitive dust emissions generated from the stone mining and processing activities at the site. At the currently operating quarry WSC utilizes a variety of industry standard methods for control and management of fugitive dust emissions.

Pit operations, haul roads, and stockpile yard areas
In preparation of blasts areas, WSC utilizes down-hole hammer percussion rock drills equipped with water injection devices for control of drill-generated dust. WSC uses an 8,000-gallon capacity water truck for application of wet suppression sprays to active mine areas, haul roads, and customer travel areas within the stockpile yard area. The water truck is also used to wet blasted rock muck piles in the pit prior to loading for transport to the primary crushing station in the pit. Muck piles are typically wet 2-3 times per day during pit loading activities. Water is applied to in-pit haul roads and customer travel areas on the stockpile yard area throughout the operational day. Water spray application typically occurs once or twice per hour, or more frequently on an as-needed basis. Two fill-up stations are available for use by the water truck operator, one at the -40’ elevation in the pit and one on the lower stockpile yard. Utilization of two fill-up stations improves efficiency and turn-around times due to the haul road distances and stockyard areas requiring water application.

Customer entrance road and paved office parking areas
WSC utilizes a sprinkler system installed along the customer entrance road (Star Lane) to minimize/control fugitive dust emissions from being generated by customer truck during ingress and egress. The 8,000-gallon water truck is also utilized periodically for application of additional dust suppression sprays to the entrance road, and in periodic washing of the paved road and parking areas. Additionally, a contracted sweeper service performs weekly sweeping operations on Star Lane and the immediately adjacent portion of North Harrison Avenue.

Processing plant dust control measures
Wet suppression spray devices are utilized throughout the primary and secondary stone processing plants. Within the in-pit primary production plant, spray devices are located at:

- Truck dump hopper,
- Feed opening of the primary (jaw) crusher,
- At the tail end of Conveyor #1 beneath the primary crusher,
- On the 8’X16’ scalping screen,
- At the feed opening of the 7’ Standard Cone secondary crusher,
- At the tail end of Conveyor #3 beneath the secondary cone crusher, and on
- The transfer to Conveyor #4.
In the secondary processing plant, wet suppression spray devices are utilized at:

- The feed and discharge areas of the 7’ tertiary and quaternary crushers, and
- On Conveyors C, F, G, J, and M.

Additionally, variable height radial stacking conveyors are used for stockpiling of unwashed products (ABC and Screenings). Use of variable height stackers allows operations staff to monitor and minimize product drop heights from the conveyor to the stockpile, thereby minimizing the opportunity for generation of fugitive dust emissions. Water spray devices at the discharge end of these conveyors further reduce emissions.

**Vegetative controls**

Vegetated earthen berms are in place along the common boundary with Umstead State Park and along portions of I-40. These berms are densely vegetated with pine and other tree species. In addition to providing visual screening of the operation, the placement of these vegetated berms aid in containment of fugitive dust emissions.

**RDUAA Odd Fellows tract expansion area**

Control of fugitive dust on the Odd Fellows tract pit expansion site will be by application of water sprays to all active excavation and travel areas. The water truck will be utilized as needed during initial land clearing/grubbing activities, during overburden removal activities, and during the construction of the proposed perimeter earthen berms. Exposed soil areas will be minimized during all phases of site development. Establishment of temporary and permanent vegetative cover will be employed in as timely a manner as practicable during all phases of site development to minimize the extent of soil areas exposed to wind erosion and traffic generated dust.
Question 9. Please provide the following information for the proposed bridge over Crabtree Creek:

a. Design and construction sequencing details.
b. Design considerations for wildlife passage along the Crabtree Creek corridor.
c. A stormwater and sediment control management plan for run-on to and runoff from the bridge.

WSC response:

9.a. Bridge Design and Construction Sequence

Design of the proposed bridge across Crabtree Creek has been contracted to the engineering design firm Michael Baker International (MBI). MBI is well respected in the field of bridge design engineering. Preliminary bridge design has been completed. Final engineering and development of construction drawings will be completed upon receipt of the requested Mining Permit Modification. Following are the basic design consideration for the proposed bridge:

- Provide an engineered bridge design to safely support loaded 65-ton capacity mine haul trucks.
- Provide sufficient bridge width to provide for two-way traffic for mine haul trucks.
- Design the bridge and bridge approaches such that there will be minimal disturbance to the Neuse Riparian Buffer alongside Crabtree Creek.
- Design the bridge such that no support structure is required within Crabtree Creek and such that end bents are placed outside of the 100-year floodway fringe.
- Design the bridge with no through-deck (“scupper”) drains, and at a longitudinal gradient that provides positive drainage across the bridge to the depleted Triangle Quarry pit.

As illustrated on the attached drawings, MBI has provided an initial bridge design that satisfies these design considerations. The bridge will consist of poured-in-place concrete end bents (placed outside the floodway fringe). The end bents will be set atop poured-in-place concrete footings. The concrete footings will be supported by driven steel piles. Once the end bents and associated wing walls are in place, compacted fill will be placed to proposed grade, and precast concrete beams set in place to complete the bridge support structure. Following placement of the 72” Modified Bulb Tee beams, stay-in-place corrugated metal forms will be installed to allow pouring of the 1’-3” thick solid concrete bridge deck. Concrete barrier rails and concrete median barrier will be poured-in-place following bridge deck slab installation.

Bridge Construction Sequence

- Flag clearing limits for bridge approaches, end bents, and wing walls.
- Clear and grub flagged area for bridge approaches, end bents, and wing walls.
- Install perimeter silt fencing/reinforced silt fencing/silt fence outlets and temporary basins #3 (and associated culvert and diversion channels) and #7 as illustrated on the E&SC Plan sheets.
- Excavate area required for foundations/footings. Remove spoil to suitable storage areas.
- Install driven HP 12 X 53 steel piles to refusal.
- Install forms for placement of concrete foundations/footings.
- Place concrete in foundations.
- Remove concrete forms from foundations once cured.
- Install forms for placement of concrete in end bents, pour end bents, and strip forms once cured.
- Install forms for placement of concrete in wing walls, pour wing walls, and strip forms once cured.
- Backfill approach areas behind end bents and wing walls.
- Set precast concrete beams.
- Form, pour, and strip concrete bridge deck.
- Form, pour, and strip concrete barrier rails and median barrier.
- Form, pour, and strip east end and west end approach slabs.
- Grade final approaches to provide positive drainage to the depleted Triangle Quarry pit.
- Install permanent seeding/establish ground cover on disturbed areas.

9.b. Design considerations for wildlife passage along the Crabtree Creek corridor
In designing the bridge such that end bents are to be placed outside of the Crabtree Creek Floodway Fringe, suitable wildlife passage zones will be maintained along both banks of Crabtree Creek. The bridge design as discussed above and as illustrated on the accompanying preliminary design drawings provides 10-12’ of overhead clearance and 14-18’ of width for wildlife passage. With no support structure required within the creek, passage of aquatic organisms will be unaffected by the bridge.

9.c. A stormwater and sediment control management plan for run-on to and runoff from the bridge.
Temporary basin #3, temporary basin #7, and associated diversions and culverts will be constructed prior to bridge construction. Once the end bent and wing walls are complete on the south end (east side of Crabtree Creek) of the bridge, the approach area will be filled and compacted to final grade to provide drainage to temporary basin #7 during the remainder of bridge construction. Once the perimeter retaining wall on either side of the bridge is complete, the entire perimeter area, including the bridge approach, will be graded to provide positive drainage to the existing quarry pit. Once the end bent and wing walls on the west side of the Crabtree Creek are completed, the approach area between the wing walls will be filled and compacted with a -0.5% grade from the end bent back to temporary basin #3 for the for the remainder of bridge construction. Once the bridge deck and barrier rails are completed, the approach area on the north end (west side of Crabtree Creek) of the bridge will be brought to final grade to provide positive drainage across the bridge to the existing quarry pit. However, all areas north of the wing walls will be graded to provide positive drainage to temporary basin #3 until such time as pit development in the expansion area allows for capture, treatment, and discharge to the existing pit.
Question 10. Please provide the following information for any proposed night-time production:
   a. A description and explanation of any planned fixed or mobile lighting.
   b. Submit a plan to reduce light pollution above current ambient levels.

WSC response:
Night-time Light Pollution Mitigation Plan
Wake Stone Corporation has no plans to operate the existing quarry or expansion pit beyond the hours of daylight to dusk. As such, no fixed or mobile lighting are proposed or anticipated. Typical production day hours at the Triangle Quarry are 06:30 AM to 6:00 PM. Should such night-time activities be necessary, mobile light towers will be utilized only in the immediate work area. Such mobile light sources will be directed towards the immediate work area in a manner to reduce or prevent elevation of ambient light conditions beyond the permitted area.

Question 11. Please provide the following information for any proposed night-time maintenance:
   a. A description and explanation of any planned fixed or mobile lighting.
   b. Submit a plan to reduce light pollution above current ambient levels.

WSC response:
Night-time Maintenance Activity Light Pollution Mitigation Plan
At the current time, Wake Stone Corporation does not anticipate the need to perform night-time maintenance activities. Time for Preventative Maintenance (PM) activities are included in weekly production schedules. Should such night-time activities be necessary, mobile light towers will be utilized only in the immediate work area. Such mobile light sources will be directed towards the repair or maintenance work area in a manner to reduce or prevent elevation of ambient light conditions beyond the permitted area.
**Question 12.** *Please conduct an aquatic survey for the Atlantic pigtoe mussel in Crabtree Creek within the project area of the proposed mine pit. We recommend consulting with the US Fish and Wildlife Service for appropriate field survey methodologies.*

WSC response:
Wake Stone Corporation contracted with the firm Alderman Environmental Services (AES) for completion of the required freshwater mussel survey. On August 26, 2020 AES completed a survey of Crabtree Creek. The survey was designed to target the Atlantic pigtoe mussel (*Fusconaia masoni*), but all freshwater mussel species encountered were documented and population densities estimated. The team of three biologist from AES surveyed Crabtree Creek from a point 400 meters downstream of the eastern property boundary/permit boundary of the existing Triangle Quarry to the discharge tailrace of the Lake Crabtree dam upstream of the North Cary Water Reclamation Plant effluent discharge point (a stream length of 3,700 meters +/-). Although four individual freshwater mussel species were documented, no representatives (living or dead) of the Atlantic pigtoe (*Fusconaia masoni*) were located. A report prepared by AES summarizing their findings is attached.
Alderman Environmental Services, Inc.

30 August 2020

PROJECT: Wake Stone Corporation Freshwater Mussel Surveys Within Crabtree Creek, Wake County, North Carolina

TARGET SPECIES: Atlantic Pigtoe (*Fusconaia masoni*)

Staff: Joseph D. Alderman  
John M. Alderman  
Dr. Logan Williams

STATION 200826.1jda

LOCATION: Reach 1; see associated map at end of report

SURVEY DATE: 26 August 2020

SITE COMMENTS: Excellent survey conditions: water very low and clear to slightly turbid within the surveyed perennial stream; stream size and patches of substrate appropriate for the Atlantic Pigtoe; extremely strong effluent odor from North Cary Water Reclamation Facility; only common, more pollution tolerant mussel species documented

HABITAT FOR SURVEY REACH 1

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<td>BEAVER ACTIVITY:</td>
<td>Evidence (gnawed sticks)</td>
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WINDTHROW: Low
TEMPORARY POOLS: None
CHANNEL WIDTH: 20 meters
BANK HEIGHT: Up to 3 meters
BANK STABILITY: Some erosion/undercutting
BUFFER WIDTH: Wide
RIPARIAN VEGETATION: Wooded, shrub-brush
LAND USE: Urbanizing
PERCENT COVER: 50
VISIBILITY: Clear to slightly turbid
WATER LEVEL: Low
WEATHER: Hot; Sun-Cloud

TECHNIQUES AND SURVEY TIME:

TECHNIQUES: Visual, tactile
SURVEY TIME: 2 person-hours

DOCUMENTED MUSSEL TAXA:

*Elliptio complanata* – 29 live, shells uncommon
*Utterbackia imbecillis* – 2 live

OTHER DOCUMENTED TAXA:

*Corbicula fluminea* - abundant
STATION 200826.2jda

LOCATION: Reach 2; see associated map at end of report

SURVEY DATE: 26 August 2020

SITE COMMENTS: Excellent survey conditions: water very low and clear to slightly turbid within the surveyed perennial stream; stream size and patches of substrate appropriate for the Atlantic Pigtoe; extremely strong effluent odor from North Cary Water Reclamation Facility; only common, more pollution tolerant mussel species documented

HABITAT FOR SURVEY REACH 1

| WATERBODY TYPES: | Stream |
| FLOW: | Run, riffle, slack |
| RELATIVE DEPTH: | Shallow |
| DEPTH (%<2 FEET): | 50 |
| SUBSTRATE: | Clay, organics, woody debris, silt, sand, **pebble**, **gravel**, cobble, boulder, bedrock; substrates varied by reach |
| COMPACTNESS: | Normal, unconsolidated, and compact |
| SAND/GRAVEL BARS: | Present |
| WOODY DEBRIS: | Average |
| BEAVER ACTIVITY: | Evidence (gnawed sticks) |
| WINDTHROW: | Moderate |
| TEMPORARY POOLS: | None |
| CHANNEL WIDTH: | 20 meters |
| BANK HEIGHT: | Up to 3 meters |
| BANK STABILITY: | Some erosion/undercutting |
| BUFFER WIDTH: | Wide |
| RIPARIAN VEGETATION: | Wooded, shrub-brush |
| LAND USE: | Urbanizing |
| PERCENT COVER: | 50 |
| VISIBILITY: | Clear to slightly turbid |
| WATER LEVEL: | Low |
| WEATHER: | Hot; Sun-Cloud |

TECHNIQUES AND SURVEY TIME:

| TECHNIQUES: | Visual, tactile |
| SURVEY TIME: | 9.75 person-hours |
DOCUMENTED MUSSEL TAXA:

*Elliptio complanata* – 529 live, shells uncommon
*Elliptio angustata* – 3 live
*Elliptio icterina* – 1 live, 1 shell
*Utterbackia imbecillis* – 4 live, 1 shell

OTHER DOCUMENTED TAXA:

*Corbicula fluminea* - abundant

BIOLOGICAL CONCLUSION

The Atlantic Pigtoe (*Fusconaia masoni*) has been documented within Crabtree Creek downstream from the project area during past decades; however, there have been no documented occurrences of the species within the Crabtree Creek Subbasin since 2003. Since 2003, there have been significant increases in urbanization within the subbasin resulting in significant increases in point and nonpoint pollution. For project planning purposes, the Biological Conclusion is “No Effect on the Atlantic Pigtoe.”
Question 13. Please provide a noise study that evaluates the potential for noise impacts to William B. Umstead State Park (Umstead Park). The protocol for the study must be approved by the Mining Program before the study is conducted.

WSC response:
Wake Stone Corporation has contracted with the firm WSP USA, Inc. to develop a noise study protocol acceptable to the Mining Program staff of NCDEMLR. A modified study protocol was accepted by DEMLR on November 5, 2020. A final report will be submitted to NCDEMLR upon completion of the noise study.
Question 14. Please provide the following information concerning the berm along the northern and western portions of the Odd Fellows tract:

a. How long will it take to construct the screening berm?
b. When will construction of the screening berm begin?
c. How will the berm be vegetated, including the number and type of trees to be planted?
d. What is the long-term maintenance plan for the vegetated berms?

WSC response:

As proposed, the visual screening berms will require placement, rough shaping, and final grading of approximately 85,000 cubic yards of fill material. We anticipate this process will take on the order of 2 months to complete. Construction of the perimeter berms will be initiated as early as possible in the site development activities. It is our intention to have the berms in place and stabilized with vegetation as soon as is possible.

Once the bridge across Crabtree Creek is in place (a process that is estimated to take upwards of one year to complete), site access will be established to allow internal mobilization of the grading equipment necessary for the initial overburden removal and berm construction activities. Our plan is to utilize the fill material generated during initial pit stripping and grading of the 280’ elevation staging area in the construction of the perimeter berms. Berm construction will begin at the eastern end of the berm illustrated along the boundary with Umstead Park and progress to the west to the northeast corner of the Dunn property. For the berm proposed along Old Reedy Creek Road, construction will progress from the southwest terminus back to the northeast along Old Reedy Creek Road and progress around the Dunn tract for connection at the northeast corner of the Dunn tract.

As berm segments are brought to final lines and grades, seasonally appropriate grasses will be planted for surface stabilization. Pursuant to the suggestions of the NC Wildlife Resources Commission during their review of the application, native warm season grasses will be utilized to the extent practicable. Strict use of native warm season grasses is not likely due to the seeding difficulties associated with those grasses. Native warm season grass seeds tend to be “fluffy”/bearded, and for successful establishment typically require placement by specialized planting equipment (warm season grass drill). Such equipment (drills) cannot be operated on steep slopes such as berms. Our primary goal will be the timely establishment of grass cover to prevent erosion on the newly established berm slopes, with a secondary goal of utilizing native warm season grasses where appropriate.

Once berm slopes are adequately stabilized with grasses and require no further grading or other slope repair activities, installation of tree species may occur. In the past, Wake Stone Corporation has successfully employed loblolly pine plantings on berm slopes to augment the visual and noise buffering provided by such earthen structures. Loblolly pine seedlings experience rapid growth, and when planted at a spacing of 10’ along rows 7’ apart in a staggered pattern along berm slopes (approx. 620 seedlings/acre), provide tremendous visual screening value in just a few years. Wake Stone anticipates installing loblolly pine plantings (as bare root seedlings) within the first or second dormant season following successful establishment of grass cover. It is anticipated that loblolly pines will be planted on both internal and external slopes of the berms. We also anticipate a certain amount of natural
regeneration by native hardwoods due to the proximity of existing mature mixed pine and hardwood
trees throughout the Odd Fellows tract an on adjoining Umstead Park property.

Throughout the life of the quarry expansion project, berm slopes will be monitored and repaired as
necessary. Dense vegetative cover will be maintained. Diseased, dead, or damaged trees will be
removed and/or replaced as necessary to retain esthetically pleasing vegetative cover, particularly on
those external slopes that will potentially be visible to the public.
Question 15. Please provide additional information regarding screening for the following locations:

a. Future reserve section – The operation would be visible to I-40 and parts of Old Reedy Creek Road.

b. East side of the proposed pit – Pit operations may be visible from Umstead Park.

WSC response:

a) The future reserve area will not be logged or cleared as part of this permit action, and therefore provides 1000-1400 feet of undisturbed vegetation between Interstate 40 and the southern end of Old Reedy Creek Road from any proposed mining activity. In addition, the I-40 right of way provides an additional 100-200 feet of dense vegetation, and the topography rises sharply above I-40. The dense, mature hardwood and pine vegetation on this slope rises well above the line of sight for any proposed mining activity. The photo below clearly illustrates that there is no need for additional screening in this area. However, conditions will be evaluated again at such time as a mining permit modification application is submitted to impact the future reserves, and additional berming and/or vegetative screening will be considered at that time if warranted.

View looking northeast from Old Reedy Creek Road bridge over I-40
b) On the east side of the proposed pit, additional undisturbed dense vegetation exists on both sides of Foxcroft Lake. Additionally, the topographic ridge east of Foxcroft Lake and the ridge across Crabtree Creek on the existing mine site (which extends 50 feet vertically above creek level) provide attenuation of line-of-site views from Umstead State Park. These buffered areas provide complete screening for most of the Park. The only area of the park with the potential for visibility into the mining operation is the small area immediately to the northeast of Foxcroft Lake along the property boundary. The photos below illustrate the dense vegetation on either side of Foxcroft Lake. The west side of the lake will have a 50’+ undisturbed buffer, and the topography rises 10-18 feet in elevation in this buffer. It is also important to note that initial stripping and pit development will be in the area west of Foxcroft Lake, which will very quickly put all mining activity in this area below grade and behind a cut-slope that will essentially act as an already vegetated, undisturbed visual and noise attenuating berm. If upon clearing the area west of Foxcroft Lake it is determined that operations are visible from the park, additional screening could be added in the form of dense evergreen vegetation or fabric screening on the proposed security fence.

Photo Locations
Photo 1: View looking southwest across Foxcroft Lake from Umstead Park boundary
Photo 2: View looking southwest toward Foxcroft Lake approximately 45 feet from property boundary
Photo 3: View looking southwest toward Foxcroft Lake approximately 165 feet from property line
Example of fence fabric that could be used for visual screening
Question 16. Please provide a certification from a qualified professional engineer that the geological structure with retaining walls left between Crabtree Creek and the pits will not breach, fail, or overtop in a major storm event.

WSC response:
As part of the due diligence activities undertaken during the planning phase of this quarry expansion project, Wake Stone examined published flood elevation data for Crabtree Creek available through the National Flood Insurance Program. Panel 0766 of Flood Insurance Rate Map (FIRM) Number 3720076600J provides engineering estimates of the “100-Year Flood” (1% Annual Chance Flood) water surface elevation for the portion of Crabtree Creek situated between the existing Triangle Quarry Pit and the Odd Fellows Tract. Surveyed channel cross sections illustrated on the FIRM place the 100-Year Flood elevation for Crabtree Creek at elevation 266.6’ MSL just upstream of the I-40 overpass bridges and elevation 261.3’ MSL at the location of Wake Stone’s proposed bridge crossing. As discussed elsewhere in the application materials, the proposed bridge was designed in such a manner as to prevent the need for placement of any portion of the bridge support structures within the channel of Crabtree Creek, within the regulatory “floodway”, or within the “floodway fringe”. The bridge deck is to be placed at elevation 280’ MSL +/- (see response to Question #9 above).

All proposed pit development planning for the Odd Fellows Tract expansion (as illustrated on Site Plan maps and Erosion and Sediment Control Plan maps submitted as part of the Mining Permit Modification Application) utilized the 100-year flood elevation as the design flood elevation. All development activities have been designed in such a manner as to provide protection against potential future flooding events – all activities planned will be located well above the reported 100-year flood elevation for Crabtree Creek. The minimum existing land surface elevation near any proposed development activities occurs along the south side of the proposed pit in the vicinity of Skimmer Sediment Basin No. 4, where the basin embankment will be constructed. The base flood elevation of Crabtree Creek in this area is estimated to be elevation 264’ MSL +/- (based on interpolation of data provided on FIRM Map 3720076600J). Construction of the basin embankment (which is designed to serve as a future perimeter roadway) at a planned width of 18’ and crest elevation of 272’ MSL provides an additional 8’ of freeboard above 100-year flood elevation. Once this basin is decommissioned following overburden removal activities, the embankment will remain as an elevated pit perimeter roadway for passenger vehicles. As such, the roadway will provide flood protection throughout the life of the operation and during post-reclamation usage of the property.

The existence of Lake Crabtree immediately upstream of the project area provides protection against potential future flooding events. Lake Crabtree was constructed in 1987 under the Watershed Protection and Flood Prevention Act of 1954. Multiple public agencies participated in construction of the flood control project (the Wake County Board of Commissioners, the Wake and Durham Soil and Water Conservation Districts, and Soil Conservation Service of the U.S. Department of Agriculture). The water surface area of the lake is approximately 520 acres at an average normal pool elevation of 276’ MSL (as indicated by published Wake County GIS LIDAR and NOAA LIDAR topographic mapping). The 100-year flood pool area for the lake encompasses approximately 1,150 acres, with a total flood storage of 6,915 acre-feet (information bronze plaque posted at the lake dam). The 100-year base flood elevation for Lake Crabtree is indicated to be at elevation 282.6’ MSL (FIRM Number 3720076600J),
Panels 0766 and 0765). The trapezoidal emergency spillway for the lake has a crest elevation of 284.25' MSL (according to published NOAA LIDAR mapping). Lake Crabtree is designed to store the 100-year flood event without activation of the emergency spillway. Based on the flood protection provided by Lake Crabtree and the vertical (elevation) and lateral setback distances designed into quarry related development activities, Wake Stone is confident that flood breaching of the existing or proposed pit walls will not occur.

Signature: Jared K. Miedema P. E.

Date: 10-27-20
**Question 17.** Please provide a determination from the Division of Waste Management, that the disposal of surplus overburden from the proposed modification area and pit into the existing pit is acceptable.

**WSC response:**
Wake Stone Corporation contacted Mr. Jason Watkins of the North Carolina Division of Waste Management concerning placement of overburden from the expansion pit into the depleted Triangle Quarry pit. Mr. Watkins has responded via email that such mining refuse is specifically excluded from the current statutory definition of solid waste provided in G.S. 130A-290(35) and is covered by the North Carolina Mining Act (G.S. 74-46 through 74-68). Mr. Watkins states that “As long as the overburden material in question isn’t a hazardous waste, it meets the Mining Act definition of mining refuse, and complies with all other conditions of any DEMLR issued mining permit, it would be outside Solid Waste Section regulatory authority”. *(See attached email chain between David F. Lee of Wake Stone Corporation and Jason Watkins of the Division of Waste Management.)*

It is Wake Stone Corporation’s belief that overburden removed from the expansion site constitutes mining “refuse” as defined in G.S. 74-49. (14). “Refuse” means all waste soil, rock, mineral, scrap, tailings, slimes, and other material directly connected with the mining, cleaning, and preparation of substances mined…”. Any other waste materials generated during the mining and processing activities, that do not fit the definition of mining refuse are/will be disposed of/recycled off-site through accepted waste management procedures.
Mr. Lee,

Regarding the placement of the future generated overburden material into/onto the existing pit property for reclamation or other reuse, we offer the following response to your inquiry:

The current statutory definition of solid waste \textsc{130A-290(35)} specifically excludes: 

"(e) Mining refuse covered by the North Carolina Mining Act, G.S. 74-46 through 74-68 and regulated by the North Carolina Mining Commission (as defined under G.S. 143B-293.1). However, any specific mining waste that meets the criteria for hazardous waste under RCRA shall also be a solid waste for the purposes of this Article."

As long as the overburden material in question isn’t a hazardous waste, it meets the Mining Act definition of mining refuse, and complies with all other conditions of any DEMLR issued mining permit, it would be outside Solid Waste Section regulatory authority. The improper management or disposal of the material in question could subject this determination to re-evaluation.

Hope this helps. Let me now if you need anything additional.
Question 18. Please provide a comprehensive archaeological survey conducted by an experienced archaeologist on the Odd Fellows tract. We recommend consulting with the NC Office of State Archaeology Review for guidance on field methodologies.

WSC response:
Wake Stone Corporation retained the services of Archaeological Consultants of the Carolinas, Inc. (ACC) for completion of the required comprehensive archaeological survey. ACC coordinated their study protocol with staff of the NC DNCR Office of State Archaeology (OSA) and remained in contact with staff of OSA throughout the fieldwork portion of the survey. A report detailing ACC’s findings is attached.
7 October 2020

Ms. Renee Gledhill-Early  
Environmental Review Coordinator  
North Carolina Department of Cultural Resources  
109 East Jones Street, 2nd Floor  
Raleigh, NC 27601

RE: Archaeological Survey of the Oddfellows Tract, Wake County, North Carolina, (GS 20-0841) - SHPO Submission Materials

Dear Renee:

Please find enclosed one (1) bound copy of the draft report entitled *Archaeological Survey of the Oddfellows Tract, Wake County, North Carolina*, for your review. A disc containing a digital copy of the report, as well as the archaeological site forms, is also enclosed.

We are requesting review of this document on behalf of our clients, the Wake Stone Corporation. Please don’t hesitate to call me at (919) 553-9007 if you have any questions about this project. I look forward to receiving your comments.

Sincerely,

Dawn Reid  
President

Enclosures:  
1 Bound Report  
1 CD
Archaeological Survey of the Oddfellows Tract
Wake County, North Carolina

GS 20-0841

Archaeological Consultants of the Carolinas, Inc.
October 2020
Archaeological Survey of the
Oddfellows Tract
Wake County, North Carolina

GS 20-0841

Prepared for

Wake Stone Corporation
Knightdale, North Carolina

Prepared by

Bobby Southerlin
Principal Investigator

Luan Thanh Cao
Archaeologist

Michael O’Neal
Archaeologist

and

Brooke Brilliant
Lab Director

Archaeological Consultants of the Carolinas, Inc.
October 2020
Management Summary

Between 12 and 20 August 2020, Archaeological Consultants of the Carolinas, Inc., conducted an archaeological survey of the Oddfellows tract located in Wake County, North Carolina. This investigation was conducted on behalf of the Wake Stone Corporation. This survey was requested by the North Carolinas State Historic Preservation Office (SHPO) in a letter dated 7 May 2020. The goals of this investigation were to identify all archaeological resources located within the project tract, assess those resources for eligibility to the National Register of Historic Places (NRHP), and advance management recommendations, as appropriate.

The project tract is approximately 105 acres (42.5 ha) in size and is located south of the Raleigh-Durham Airport (RDU). The tract is bounded by Old Reedy Creek Road on the northwest, Umstead State Park on the north, and Crabtree Creek on the southeast and southwest. The tract is primarily characterized by a mixed pine and hardwood forest. A small pond is present in the eastern portion of the tract, and several trails extend throughout the tract.

Background research was conducted at the Office of State Archaeology (OSA) located in Raleigh and included a review of archaeological site forms, cultural resource reports, and historic maps of the project area. No previously recorded archaeological sites are located in the project tract. A review of the Office of Survey and Planning’s website (HPOWEB) was also consulted to determine the presence of any recorded architectural resources within the project tract. None are present in the project tract.

Prior to beginning field work, factors such as soil drainage and topography were used to define portions of the project tract that had high potential for the presence of archaeological deposits. These areas total approximately 35 acres (14.2 ha) and include ridge tops, knolls, and ridge toes. Shovel tests were excavated at 30-meter intervals along parallel transects spaced 30 meters apart in high potential areas. The remaining 70 acres (28.3 ha) were considered to have low archaeological potential. Low potential areas were surveyed by pedestrian walkover and judgmentally placed shovel tests. All areas of exposed ground surface, including the cleared trails, were inspected for cultural remains.

Five archaeological sites (31WA2327 through 31WA2331) were identified during this investigation (Table i.1). These sites include two prehistoric sites and three historic sites. The prehistoric components are of an unknown age. The historic components date to the twentieth century. These resources have been adequately documented during this investigation and determined to be unlikely to yield significant data pertaining to the prehistory or history of the area. All identified archaeological sites are recommended not eligible for the NRHP. As no significant archaeological sites will be impacted by the proposed development, clearance to proceed is recommended.

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<td>Middle 20th century recreation area</td>
<td>Not Eligible</td>
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<tr>
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<td>Unknown prehistoric lithic scatter</td>
<td>Not Eligible</td>
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<td>31WA2331</td>
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Chapter 1. Introduction

Between 12 and 20 August 2020, Archaeological Consultants of the Carolinas, Inc., conducted an archaeological survey of the Oddfellows tract located in Wake County, North Carolina. This investigation was conducted on behalf of the Wake Stone Corporation. This survey was requested by the North Carolinas State Historic Preservation Office (SHPO) in a letter dated 7 May 2020. The goals of this investigation were to identify all archaeological resources located within the project tract, assess those resources for eligibility to the National Register of Historic Places (NRHP), and advance management recommendations, as appropriate. Mr. Bobby Southerlin served as Principal Investigator. Mr. Luan Cao served as Field Director. He was assisted by Ms. Abigail McCoy and Mr. Robert Jordan. The project was conducted over 12 person days.

Project Tract

The project tract is located south of the Raleigh-Durham Airport (RDU) near the western boundary of Wake County (Figure 1.1). The tract measures approximately 105 acres (42.5 ha) in size and is bounded by Old Reedy Creek Road on the northwest, Umstead State Park on the north, and Crabtree Creek on the southeast and southwest (Figure 1.2). The tract is primarily characterized by a mixed pine and hardwood forest (Figure 1.3). A small pond is present in the eastern portion of the tract (Figure 1.4). Metavolcanic and quartz outcrops are present in several areas within the tract, particularly along Crabtree Creek (Figures 1.5 and 1.6). An extensive network of walking and bicycle trails is present throughout the tract (Figure 1.7). Figure 1.8 presents a view of the Crabtree Creek frontage. An aerial view of the project tract is presented in Figure 1.9.

Methods of Investigation

This investigation consisted of four separate tasks: Background Research, Field Investigations, Laboratory Analysis, and Report Production. Each of these tasks is described below.

Background Research. Background research began with a review of archaeological site forms, maps, and reports on file at the Office of State Archaeology (OSA) in Raleigh, North Carolina, as well as the Office of Survey and Planning’s website (HPOWEB). This review served to identify previously recorded resources in the project tract and its vicinity, in addition to providing data on the prehistoric and historical context of the project tract.
Background research also included a review of available historic aerals, historic maps including the 1871 Map of Wake County, 1914 Wake County soil map, and 1938 Wake County highway map, and USGS topographic maps dating between 1943 and 2002. In addition, we were able to identify details of the project area using aerial photographs from 1938, 1959, and the 1970s. Background research also included a chain of title review. In addition, communications with the Independent Order of Odd Fellows Sir Walter Raleigh Lodge 411 were established to understand land use during their ownership of part of the tract.

Field Investigations. Close-interval contour topographic maps, Light Detecting and Ranging (LiDAR) images, and soil data of the survey area were consulted prior to initiation of fieldwork. These data were used to identify portions of the tract with high potential for the presence of archaeological remains prior to commencement of fieldwork. Approximately 35 acres (14.2 ha) within the project tract were defined as having high potential. These areas were comprised of uplands and ridge toes adjacent to drainages and wetlands. Figure 1.10 presents a map showing the defined high potential areas and the locations of shovel tests. The remaining 70 acres (28.3 ha) were considered to have low archaeological potential. Low potential areas were surveyed by pedestrian walkover and judgmentally placed shovel tests. All areas of exposed ground surface, including the cleared trails, were inspected for cultural remains.
Figure 1.3. General view of the woods bordering Umstead State Park, facing north.

Figure 1.4. View of the pond in the eastern part of the tract, facing south.
Figure 1.5. View of the metavolcanic outcrop in the project tract, facing northwest.

Figure 1.6. View of the quartz outcrop in the project tract, facing west.
Figure 1.7. View of portion of trail in the project tract, facing southeast.

Figure 1.8. General view of bank along Crabtree Creek and bike trail, facing northeast.
Excavated shovel tests measured approximately 30 centimeters in diameter and were excavated to 10 centimeters into subsoil or to the water table. Shovel test fill was screened through 0.25-inch wire mesh. Details of artifacts and soils for each shovel test were recorded in field notebooks. Artifacts were collected and placed in plastic bags labeled with the date, field site number, grid point locations (i.e., shovel test/transect or north/east coordinate), depth of artifacts, and initials of the excavator. To delineate archaeological resources, a combination of surface inspection and short interval (15-meter) shovel testing was used.

A site is defined as an area containing one or more artifacts within a 30-meter (98 ft) or less diameter of surface exposure or where surface or subsurface cultural features are present. Artifacts and/or features less than 50 years in age would not be considered a site without a specific research or management reason. Site settings were photographed with a digital camera. Sketch maps were produced in the field showing the locations of shovel tests and surface finds. The location of each site was recorded using a Trimble Pathfinder Global Positioning System (GPS) unit and relayed onto project maps. Field investigations also included metal detection at selected archaeological sites. A Fisher F-75 metal detector was used. Metal detection hits were recorded with the Trimble GPS unit.

Figure 1.9. Aerial view of the project tract.
Site significance is based on the site’s ability to contribute to our understanding of past lifeways, and its subsequent eligibility for listing on the NRHP. Department of Interior regulations (36 CFR Part 60) established criteria that must be met for an archaeological site or historic resource to be considered significant, or eligible for the NRHP (Townsend et al. 1993). Under these criteria, a site can be defined as significant if it retains integrity of “location, design, setting, materials, workmanship, feeling, and association” and if it \( A \) is associated with events that have made a significant contribution to the broad pattern of history; The primary goals of this field investigation were to identify archaeological resources and evaluate their potential research value or significance. Although the determination of the site significance is made by the SHPO, whenever possible, sufficient data is gathered to allow us to make a significance recommendation. Sites that exhibit little or no further research potential are recommended not eligible for the NRHP, and no further investigation is proposed. Sites for which insufficient data could be obtained at the survey level are considered unassessed and preservation or more in-depth investigation is advocated. It is rare for ample data to be recovered at the survey level of investigation to definitively determine that a site meets NRHP eligibility criteria. However, when this occurs, the site is recommended eligible for the NRHP. Again, preservation of the resource is advocated. If preservation is not possible, mitigation options (e.g., data recovery) would need to be considered.

**Laboratory Analysis.** All recovered cultural material was processed in the Clayton laboratory facilities of ACC. All artifacts were washed and allowed to thoroughly air dry. A provenience number, based on artifact contexts (i.e., grid coordinate, depth, etc.), was assigned to each positive excavation.
Within each provenience, individual artifacts or artifact classes were then assigned a catalog number. Artifacts were cataloged based on specific morphological characteristics such as material in the case of lithics, and decoration and temper type in the case of prehistoric ceramics.

Diagnostic prehistoric artifacts were compared to published type descriptions (e.g., Charles and Moore 2018; Coe 1964; Herbert 2009; Oliver 1999; Peck 1982; Sassaman 1993; Ward and Davis 1999; and Whatley 2002;) and cataloged by type when possible. Lithics artifacts were examined in detail and classified by artifact type and raw material.

Historic artifacts were identified by color, material of manufacture (e.g., ceramics), type (e.g., slipware), form (e.g., bowl, plate), method of manufacture (e.g., molded), period of manufacture (e.g., 1780-1820), and intended function (e.g., tableware). Historic artifacts with established manufacture date ranges were categorized using Aultman et al. (2016), Brown (1982), Feldhues (1995), Florida Museum of Natural History (FLMNH; 2009), Majewski and O’Brien (1987), Noël Hume (1969), and South (1977, 2004). Artifact descriptions, counts, and weights were recorded, and all diagnostic and cross-mended artifacts were labeled with a solution of Acryloid B-72 and acid-free permanent ink.

All artifacts were placed in acid-free resealable plastic bags with acid-free labels listing the provenience and field identification information. Upon acceptance of the final project report, all analysis sheets, field notes, photographs, maps, and artifacts will be prepared according to federal guidelines and submitted to OSA for final curation.

Report Production. Report production involved the compilation of all data gathered during the previous tasks. This report includes a discussion of the investigation methods, background findings, field survey results, and management recommendations. Each individual site is discussed and shown on a variety of project maps. The data obtained from laboratory analyses, background research, and field investigations is included in the site discussions. Finally, the report includes an assessment of the NRHP eligibility of each archaeological site recorded during this investigation.
Chapter 2. Environmental and Cultural Overview

Environmental Overview

Wake County is located in central North Carolina and encompasses 864 square miles (2,238 square km; Cawthorn 1970). The county is bounded by Chatham, Durham, Franklin, Granville, Harnett, and Johnston counties. The majority of Wake County falls within the Piedmont physiographic province (Figure 2.1); the project area is located in the Piedmont. The southeastern portion of the county lies on the Fall Line separating the Piedmont from the Coastal Plain. Rolling hills dissected by intermittent and perennial streams are the most frequent landforms within this transitional area. The average elevation of the county is 140.8 meters above mean sea level (amsl; Cawthorn 1970). Elevations in the project tract range from 91.5 to 106.7 meters amsl.

![Physiographic Provinces of North Carolina](image)

**Figure 2.1.** Physiographic map of North Carolina showing the location of the project area.

Drainages

The project area falls within the Neuse River watershed (Figure 2.2). The Neuse River flows from the Falls Lake Reservoir through the Piedmont and Coastal Plain, emptying into Pamlico Sound. Numerous small streams and creeks extend through Wake County. The southern and eastern portions of the project tract front Crabtree Creek, a tributary of the Neuse River. Crabtree Creek begins in Cary and empties into the Neuse River near Anderson Point Park in east Raleigh. The creek is known for frequent flooding due to its often restricted floodplain, and development in Wake County has increased storm runoff resulting in flooding.
Soils

There are five soil types present in the project tract (Table 2.1; Figure 2.3). Well-drained soils account for 86.6 percent of the project tract with Nanford silt loam being the most prevalent soil type, followed by Georgeville silt loam. Well-drained and moderately well-drained soils on slopes less than 15 percent are generally considered to have high potential for the presence of archaeological remains. Chewacla and Wehadkee soils are somewhat poorly drained and are present in 13.4 percent of the tract (USDA 2020). This soil type, along with well-drained soils with greater than 15 percent slope, was viewed as having low archaeological potential.

Table 2.1. Summary of Soils Present in the Project Tract (USDA 2020).

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Description</th>
<th>Percent Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chewacla and Wehadkee soils (ChA)</td>
<td>Somewhat poorly drained, 0-2% slope, forms on floodplains</td>
<td>13.4</td>
</tr>
<tr>
<td>Georgeville silt loam (GeB, GeC)</td>
<td>Well drained, 2-10% slope, forms on interfluvess</td>
<td>21.5</td>
</tr>
<tr>
<td>Herndon silt loam (HrC)</td>
<td>Well drained, 6-10% slope, forms on interfluvess</td>
<td>3.8</td>
</tr>
<tr>
<td>Nanford silt loam (NaD, NaE)</td>
<td>Well drained, 10-25% slope, forms on interfluvess</td>
<td>61.1</td>
</tr>
<tr>
<td>Wilkes loam (WkF)</td>
<td>Well drained, 15-30% slope, forms on interfluvess</td>
<td>0.1</td>
</tr>
</tbody>
</table>
Climate

Like most of central North Carolina, the climate of Wake County is temperate, characterized by relatively mild winters and warm summers. Average temperatures range from the upper 40s Fahrenheit (F) in the winter to the mid-70s F in the summer.

Geology

The Piedmont was formed by volcanic activity and is composed of sedimentary, igneous, and metamorphic rock irregularly distributed through the region (Ward 1983). The major geologic formation within the project area is the Carolina Terrane. The Carolina Terrane is a 370-kilometer long band of volcanic and metamorphic rock associated with oceanic volcanic islands dating to 540 to 630 million years ago. Metamorphic rock within the project tract include Big Lake-Raven Rock schist, Sycamore Lake greenstone, and Reedy Creek metagranodiorite (NCGS 1985; Figure 2.4). These materials have been mined for agricultural and industrial purposes. Other metavolcanic materials, particularly rhyolite from the Uwharrie Mountains region, have been used during prehistoric times for the production of stone tools.

Figure 2.3. Map showing the soils present in the project tract.
Cultural Overview

The cultural history of North America can be divided into two general eras: Prehistoric and Historic. The Prehistoric Era is extensive. It includes at least 12,000 years of Native American groups and cultures present prior to the arrival of Europeans. The Historic Era, in comparison, is relatively brief. This era refers to a time of exploration and initial European settlement on the continent through the colonization, industrialization and emergence of the modern era. Fine-grained chronological and cultural subdivisions are defined within these eras to permit discussions of particular events and the lifeways of North America’s prehistoric inhabitants. The following discussion summarizes the various periods of prehistoric and historic occupation in the project vicinity.

Prehistoric Overview

*Paleoindian Period (12,000 - 8,000 BC).* The Paleoindian Period refers to the earliest human occupations of the New World, the origins and age of which remain a subject of debate. The most accepted theory dates the influx of migrant bands of hunter-gatherers to approximately 12,000 years ago. This time period corresponds to the exposure of a land bridge connecting Siberia to the North American continent during the last ice age (Driver 1998; Jackson et al. 1997). Research conducted over the past few decades has begun to cast doubt on this theory.
In the past two decades, investigations at Paleoindian sites have produced radiocarbon dates predating 12,000 years. The Monte Verde site in South America has been dated to 10,500 BC (Dillehay 1997; Meltzer et al. 1997). In North America, the Meadowcroft Rockshelter in Pennsylvania had deposits dating to 9,500 BC. Current research conducted at the Topper Site indicates occupations dating between 15,000 and 19,000 (or more) years ago (Goodyear 2006). Two sites, 44SM37 and Cactus Hill, in Virginia have yielded similar dates. One contentious point about these early sites is that the occupations predate what has been recognized as the earliest New World culture, Clovis. Artifacts identified at pre-Clovis sites include flake tools and blades, prismatic blades, bifaces, and lanceolate-like points (Adovasio et al. 1998; Goodyear 2006; Johnson 1997; McAvoy and McAvoy 1997; McDonald 2000).

The major artifact marker for the Clovis period is the Clovis lanceolate-fluted point (Gardner 1974, 1989; Griffin 1967). First identified in New Mexico, Clovis fluted points have been recovered throughout the United States. However, most of the identified Clovis points have been found in the eastern United States (Ward and Davis 1999). Most Clovis points have been recovered from surface contexts, although some sites (e.g., Cactus Hill and Topper sites) have contained well-defined subsurface Clovis contexts.

The identification of pre-Clovis sites, higher frequencies of Clovis points on the east coast of the United States (the opposing side of the continent where the land bridge was exposed during the last glaciation), and the lack of predecessors to the Clovis point type has led some researchers to hypothesize other avenues of New World migration (see Bonnichsen et al. 2006). These alternative migration theories contend that the influx of people to the Americas occurred prior to the ice-free corridor 12,000 years ago and that multiple migration episodes took place. These theories include overland migrations similar to the one presumed to have occurred over the Bering land bridge and water migrations over both the Atlantic Ocean and the Pacific rim (see Stanford 2006). Coastal migration theories envision seafaring people using boats to make the journey, evidence for which has not been identified (Adovasio and Page 2002).

In the southeastern United States, Clovis was followed by smaller fluted and nonfluted lanceolate spear points, such as Dalton and Hardaway point types, that are characteristic of the later Paleoindian Period (Goodyear 1982). The Hardaway point, first described by Coe (1964), is seen as a regional variant of Dalton (Oliver 1985; Ward 1983).

Most Paleoindian materials occur as isolated surface finds in the eastern United States (Ward and Davis 1999); this indicates that population density was extremely low during this period and that groups were small and highly mobile (Meltzer 1988). It has been noted that group movements were probably well-scheduled, and that some semblance of territories was maintained to ensure adequate arrangements for procuring mates and maintaining population levels (Anderson and Hanson 1988).

O’Steen (1996) analyzed Paleoindian settlement patterns in the Oconee River valley in northeastern Georgia and noted a pattern of decreasing mobility throughout the Paleoindian period. Sites of the earliest portion of the period seem to be restricted to the floodplains, while later sites were distributed widely in the uplands, showing an exploitation of a wider range of environmental resources. If this pattern holds true for the Southeast in general, it may be a result of changing environments trending toward increased deciduous forest and decreasing availability of Pleistocene megafauna and the consequent increased reliance on smaller mammals for subsistence; population growth may have also been a factor.

Paleoindian tools have been found all across North Carolina. Nine Paleoindian points have been documented from Wake County. Eight Clovis point or Clovis variants have been identified, as well as a Redstone point (Daniel 2000).
**Archaic Period (8000 - 1000 BC)**. The Archaic period has been the focus of considerable research in the Southeast. Sites dating to this period are ubiquitous in the North Carolina Piedmont (Coe and McCormick 1970). Two major areas of research have dominated: (1) the development of chronological subdivisions for the period based on diagnostic artifacts, and (2) the understanding of settlement/subsistence trends for successive cultures.

Coe’s excavations at several sites in the North Carolina Piedmont established a chronological sequence for the period based on diagnostic projectile points. The Archaic period has been divided into three subperiods: Early (8000 - 6000 BC), Middle (6000 - 3500 BC), and Late (3500 - 1000 BC) (Coe 1964). Coe defined the Early Archaic subperiod based on the presence in site assemblages of Palmer and Kirk Corner Notched projectile points. More recent studies have defined other Early Archaic corner notched points, such as Taylor, Big Sandy, and Bolen types. Generally similar projectile points (e.g., LeCroy points), but with commonly serrated edges and characteristic bifurcated bases, have also been identified as representative of the Early Archaic subperiod (Broyles 1981; Chapman 1985). The Early Archaic points of the North Carolina Piedmont are typically produced with metavolcanic material, although occasional chert, quartz, or quartzite examples have been recovered.

Claggett et al. (1982) use a settlement/subsistence typology developed by Binford (1980), to classify late Paleoindian and Early Archaic populations as “logistical.” Logistical task groups, in this definition, target a particular resource or set of subsistence or technological resources for collection and use at a residential base camp. Their analysis identifies an increase in residential mobility beginning in the Early Archaic and extending into the Middle Archaic (Claggett et al. 1982). Early Archaic peoples transitioned from logistical orientation to foraging. Foraging refers to a generalized resource procurement strategy enacted in closer proximity to a base camp. Subsistence remains recovered from Early Archaic sites in southern Virginia include fish, turtle, turkey, small mammals, and deer, as well as a wide variety of nuts (McAvoy and McAvoy 1997).

Sassaman (1983) hypothesizes that actual group residential mobility increased during the Middle Archaic although it occurred within a more restricted range. Range restriction is generally a result of increased population in the Southeast and crowding with group territories (Sassaman 1983); this increase in population led to increasing social fluidity during the Middle Archaic and a lower need for scheduled aggregation for mate exchange. In Sassaman’s view, technology during the Middle Archaic is highly expedient; this is reflected in an almost exclusive use of local resources, especially lithic material.

The appearance/introduction of Stanly points, a broad-bladed stemmed form defines the transition to the Middle Archaic subperiod. These were followed by Morrow Mountain points, which are characteristically manufactured from quartz, and have been recovered from numerous small sites throughout Virginia, the Carolinas, and Georgia. Guilford points, also often made of quartz, follow Morrow Mountain in the Middle Archaic sequence. Morrow Mountain and Guilford points were the most frequently recovered projectile point types in the Jordan Lake survey area (Coe and McCormick 1970). The latter were typically found on low knolls or ridge toes overlooking perennial streams (Autry 1976).

The hallmark of the Late Archaic subperiod is the Savannah River Stemmed point (Coe 1964). This large, broad-bladed and stemmed point type is found widely over the eastern United States and in nearly every setting during the Jordan Lake survey (Autry 1976). It is associated with Late Archaic occupations in the mountains and uplands as well as at coastal middens sites of the period. Also, the earliest ceramics produced in North America are associated with the Late Archaic subperiod and date to around 2000 BC. These ceramics are Stallings Island Fiber Tempered and are primarily a coastal phenomenon, stretching from northern Florida to southern North Carolina.
Sites of the later phases of the Archaic are generally larger and more complex than earlier sites (Caldwell 1952; Coe 1952; Griffin 1952; Lewis and Kneberg 1959). These sites are typically in riverine settings within the Piedmont and are hypothesized to reflect greatly increased sedentism during the Late Archaic, with a focus on fish, shellfish, and floodplain resources. Small Late Archaic sites in the uplands of the Piedmont are interpreted as logistical collection and hunting camps (Anderson and Joseph 1988). Abbott et al. (1986) have speculated that an increase in population during the Late Archaic led to a restriction in resource ranges and an increase in trade networks.

**Woodland Period (1000 BC - 1450 AD).** A transition between the preceramic Archaic cultures and the Woodland cultures has been identified by Oliver (1985). Stemmed point types, like the Gypsy triangular point, continue in the Early Woodland subperiod (1000 BC - 300 AD). Other cultural expressions of the Early Woodland are the ceramics and projectile points of the Badin culture. These points are generally crude triangulars while the ceramics are heavily tempered and undecorated. Unlike Oliver, Miller (1962) noted little change in the cultural makeup of groups at the Archaic/Woodland transition other than the addition of pottery. Coe (1964), although noting a stratigraphic break between Archaic and Woodland occupations, also describes little technological or subsistence change other than ceramics.

Ceramic technology evolved from Badin styles into the Yadkin Phase wares during the Middle Woodland subperiod (300 BC - 1000 AD). Yadkin ceramics have crushed quartz temper and are either cord marked or fabric impressed. Occasionally, Yadkin ceramics contain grog (i.e., crushed fired clay) temper, suggesting the influence of coastal populations who more commonly utilized grog temper in their ceramics (Coe 1964). Yadkin phase projectile points differ from the Badin styles in that they reflect significantly better workmanship (Coe 1964) and are more suited to the newly adopted bow and arrow technology. The introduction of the bow and arrow necessitated significant changes in hunting strategies, allowing for more independent procurement of animals rather than the group hunts generally associated with spear hunting. Horticulture was still in its infancy during this period, so subsistence strategies remained focused on hunting animals and gathering wild plants.

The Late Woodland subperiod (1000 – 1450 AD) in the study area is represented by the Uwharrie Phase. The Uwharrie Phase projectile points have small triangular forms. Uwharrie ceramics are heavily tempered with crushed quartz and are predominantly net impressed with scraped interiors (Eastman 1996). Although they continued to hunt and gather wild plants, agriculture began to supplement, and later dominate, Native American subsistence strategies. Corn, beans, squash, and fruit were cultivated with the aid of stone hoes and wooden implements, and settlement patterns indicate conditions favorable to agriculture were significant to decision-making (Hantman and Klein 1992; Ward 1983).

**Historic Indian / Protohistoric Period**

Spain initiated the exploration of the southeastern United States in the hopes of preserving their claims to American lands west of the Treaty of Tordesillas line of demarcation. Hernando de Soto (1539-1543) and Juan Pardo (1566-1568) led military expeditions into the western Piedmont and mountains of North Carolina during the mid-sixteenth century (Hudson 1990, 1994). These parties visited Indian villages near the present-day towns of Charlotte, Lincolnton, Hickory, and Maiden (Hargrove 1998). The Spanish also built garrisons in the vicinity of Marion and Salisbury (Hargrove 1998). Recent work at the Berry site in Burke County identified the remains of the Spanish garrison of Xualla (also called Joara) visited by de Soto in the 1540s and Juan Pardo in the 1560s. Spanish presence in the Carolinas could not be sustained despite their best attempts to establish a permanent presence with interior outposts and coastal settlements. Mounting pressure from hostile Native Americans and English privateers also contributed to their withdrawal to St. Augustine in 1587 (South 1980). Diseases introduced by these explorers wrought
disastrous effects on contemporary Native American peoples. Populations collapsed and entire communities disappeared (Fossett 1976).

Sir Walter Raleigh heavily promoted England’s interest in the New World. In 1585 Raleigh used his position in the court of Queen Elizabeth I to secure backing to outfit an English attempt at colonizing the Atlantic coast (Powell 1989). Although this effort failed, Raleigh’s single-minded ambition led to establishment of a colony on the James River in 1607 (Noël Hume 1994).

The first years of settlement at Jamestown were hampered by disastrous mismanagement resulting in starvation, loss of life, and hostilities with neighbouring Powhatan. In 1624 the Crown revoked the Virginia Company’s charter and established a royal government (Noël Hume 1994). Preoccupied with the civil war between Royalist and Parliamentarian forces in the 1640s, these authorities showed little interest in North Carolina until the 1650s. During this period traders, hunters, trappers, rogues, and tax evaders began living in the area around the Albemarle Sound in northeastern North Carolina (Powell 1989). Even then, North Carolina was becoming notorious as a refuge for the independent and self-reliant.

**Historic Overview**

Charles II was restored to the throne in 1660 and distributed rewards to loyal Royalist supporters (Powell 1989). Seven supporters were awarded the charter to establish a proprietary colony south of Virginia. The boundaries of this deed were set to include the Albemarle Sound settlement of Charles Town south to the frontier of Spanish-held La Florida. Proprietors maintained control over a single Carolina until 1712, when the colonies were separated. After a popular South Carolina uprising in 1719, the proprietors forfeited control of that colony to the Crown. That divestment forced the Proprietors’ sale of their North Carolina charter to King George II in 1729.

John Lederer, a German doctor, was the first recorded European explorer to visit the project area. In 1669, Lederer was commissioned by the governor of Virginia to find a westward route to the Pacific Ocean (Cumming 1958). Lederer traveled through Virginia south to present day Camden, South Carolina. During this trip, he visited with several Native American tribes, including the Catawba and Waxhaw. The Catawba Indians are historically linked to the Catawba River Valley in North and South Carolina. Inspired by Lederer, John Lawson traveled from Charleston, South Carolina through the North Carolina Piedmont to Pamlico Sound. Lawson’s 1700-1701 excursion followed a well-established Native American trading path that passed near present day Charlotte, Concord, and Salisbury (Lawson 1967). Lawson’s journey took him through Esaw, Sugaree, Catawba, and Waxhaw territory, four tribes who would soon come into close contact with European colonists.

The principle economic focus of the Carolinas during the early colonial era was the Indian trade. This trade revolved around the exchange of European manufactured goods and alcohol for skins and captives. It drew Native American groups into an Atlantic economy and had the added effect of increasing intertribal hostilities. Itinerant traders based in Charleston (South Carolina), and Virginia vied for clients among the North Carolina Piedmont settlements.

Severe fighting between North Carolinian settlers and Tuscarora Indians broke out in 1711 after the death of the colony’s Surveyor General (John Lawson) at the hands of the Tuscarora (Powell 1989). The war ended in 1712, leaving the Carolina colonies in dire financial straits. These conditions persisted until the Lords Proprietors were forced to sell their holdings in the Carolinas to the Crown in 1729 (Powell 1989).

As the number of settlers began to multiply in the Northeast, many began to look to the wilderness of the South and the West to build new lives. German and Scotch-Irish settlers first walked the Indian
footpaths connecting present-day Pennsylvania and Georgia (Rouse 2001). In 1744, a series of treaties allowed the colonies to formally take over the trail, then known as the Warrior Path, from the Five Nations of the Iroquois (NCOAH 2004; Rouse 2001). Dubbed the Great Wagon Road settlers from northern colonies used the route to populate the farmlands and new towns of the Carolinas and Georgia well into the 1800's.

Few settlers resided in the central Piedmont prior to 1748. In just a few years, this population dramatically increased and in 1752 it was determined that a new county government was needed. Land grants were issued to new settlers arriving via the Great Wagon Road. Predominantly Scots-Irish and German, these settlers established farms along the major streams and engaged in cultivation of staples and cash crops. For most of the eighteenth century, land grants and farm sizes were modest. The first English and Scotch-Irish settlers in Wake County received land grants ranging from 100 to 640 acres (40.5-259 ha; Murray 1983). Land holdings were typically small yeoman farmsteads interspersed with a few large plantations (Powell 1989). By mid-century, farmsteads, grist mills, churches, court houses, and taverns dotted the landscape. Joel Lane, a well-known and politically active plantation owner, operated a tavern in what was then western Johnston County. Lane’s tavern would become the site of Wake County’s first courthouse (Murray 1983).

Wake County was formed in 1771 from portions of Cumberland, Johnston, and Orange counties. It was named for Margaret Wake, the wife of William Tryon who was the Royal Governor of North Carolina at the time. This same period was the height of the Regulator Movement, a period of antagonism between the affluent settled east and the frontier west. North Carolina’s citizens were unable to have their grievances effectively addressed by a centralized government dominated by wealthy merchants and plantation aristocrats. By 1768, much of the back country was in open revolt against increased taxes and oppressive local officials. The creation of Wake County was one of the reforms carried out by Governor Tryon in the wake of the rebellion (Murray 1983).

At the beginning of the Revolutionary War, a local Committee of Safety was raised from the citizens of Wake County. The Committee of Safety was supported by the Wake militia which maintained a muster ground near Woodward’s Mill on Middle Creek (Murray 1983). An army camp operated at Wake Courthouse throughout the war. The recruitment and training of soldiers, provisioning the army, and raids against local Tory enclaves were the focus of the county’s war effort. Tory troops led by Colonel David Fanning continued small scale military operations in the Cumberland-Orange-Wake County area until the surrender of the British Army at Yorktown in 1781 (Fanning 1861; Rankin 1959).

New Bern continued to be the capital of the state for several years after the British defeat. As early as 1779, Wake County was being considered as a potential site for a new state capital. In 1792, after several years of political wrangling, the General Assembly ratified its decision to locate the state capital in Wake County (Murray 1983). The city was named Raleigh after Sir Walter Raleigh, the colony’s sixteenth century benefactor. Soon after, it was decided that the plantation of Joel Lane would make a suitable site for the new capital. The first town lots were sold in June of 1792. Revenues from the real estate sale were used to construct the first statehouse, which opened on December 30, 1794 (Murray 1983).

The formation of the capital city did little to alter the rural character of Wake County. The slow pace of urban development in the county is reflected in the fact that the next town did not incorporate until 1837 (Murray 1983). Local commerce was dominated by the exchange of farm produce for manufactured goods. Important food and cash crops during this period included corn, sweet potatoes, wheat, peas, beans, cotton, and tobacco. Subsistence farming dominated the economic landscape (Lally 1994). This arrangement ensured a steady flow of country people into Raleigh for both business and pleasure. A county
market house was constructed in Raleigh before the end of the century to facilitate trade between city dwellers and the rural community (Murray 1983).

The first three decades of the nineteenth century saw a concerted effort to develop the county’s infrastructure. However, poor maintenance of existing roads was a problem well into the twentieth century and was made worse by the frequent flooding of Crabtree and Walnut creeks. Road improvement projects were limited to the significant highways which carried mail service and passenger stages (Murray 1983).

Dependable access to regional markets was not achieved until the coming of the railroads during the middle 1800s. The 86-mile long Raleigh and Gaston Railroad was completed in 1840. This line, together with the Wilmington and Weldon Railroad, opened up northern markets to planters and commercial farmers. Access to the Petersburg market encouraged the expansion of cotton and tobacco production by slave holders, who attained a measure of prosperity during this period. Nevertheless, most of the county’s farm families continued the subsistence farming traditions of their pioneer ancestors (Lally 1994).

The poor quality of the transportation system in the Wake County area resulted in the sporadic development of the area’s industrial potential prior to 1850. Throughout much of antebellum period manufacturing was limited to “looms, leather, and liquor” (Murray 1983:136). Grist mills and cotton gins were common. These small-scale commercial enterprises produced commodities for local consumption. Limited iron manufacturing and a few paper mills were operating in the county by the end of the 1850s.

On the eve of the Civil War, the county’s population of 20,370 people resided in Raleigh, on 1,410 farms in the surrounding countryside, and in the developing communities of Wake Forest, Rolesville, Wakefield, Eagle Rock, Holly Springs, Cary, and Morrisville (Murray 1983).

North Carolina separated from the Union in May 1861 and ratified the constitution of the Confederate States of America. Camps, hospitals, and supply depots were soon in operation at several locations in Wake County. By the end of 1861, Wake County had the facilities to manufacture bayonets, uniforms, and ammunition. The capital city of Raleigh was fully enclosed by light earthworks with cannon emplacements by 1863. Military operations by the residents of Wake County were largely confined to guard duty and occasional forays into the countryside to round up deserters. This changed in April 1865, when General William T. Sherman’s Union forces advanced on the county, meeting Confederate troops under the command of General Joseph Johnston. The city of Raleigh was evacuated, and skirmishing continued along roads and railroad lines west of Raleigh for several weeks. It is estimated that more than 100,000 Union troops camped in and around Raleigh during that period. On April 29, 1865, several corps of Sherman’s army departed Raleigh for Virginia, bringing a close to the military operations in Wake County (Murray 1983).

The post-Civil War period was a time of distress for many of the farmers in rural Wake County. The end of slavery resulted in the collapse of the plantation economic system. It was replaced by a new labor system based on share cropping and cash rents (Powell 1989). Under the sharecropping system, the landowner retained ownership of the crop while the sharecropper provided the labor to work the land. The tools, seeds, housing, fuel, draft animals, and other essentials were supplied by the landowner. Typically, the crop was split between both parties, although most small farmers preferred the rent system as it allowed them to retain control of the crop.

This new agricultural system resulted in the intensification of cash cropping (Powell 1989). The tenant was encouraged to squeeze production out of marginal lands leading to erosion and soil depletion across the state. The act of “settling up” at the end of the harvest season often left the tenant cash poor.
leading to a cycle of debt peonage, which was difficult to escape. During the postwar decades, farms became smaller and more dispersed (Murray 1983; Powell 1989).

Figure 2.5 shows the project vicinity in 1871. Significant advances in the development of North Carolina’s industrial base occurred after 1870. For example, by 1880 49 textile mills were operating in the state (Powell 1989). This represents a substantial increase in industrial capacity over that which existed in 1860. By the 1890s, furniture and tobacco factories dotted the Piedmont landscape. In Wake County, the Falls of the Neuse Manufacturing Company continued to produce paper until near the end of the century, when it was converted to textile production (Lally 1994). Although small scale manufacturing entities, such as sawmills, grist mills, and distilleries, flourished, Wake County remained largely rural well into the twentieth century.

![Figure 2.5](image1.png)

**Figure 2.5.** Map showing the project tract in Cedar Fork Township on an 1871 map of Wake County (Bevers 1871).

The collapse of the cotton market in the 1920s and the Depression of the 1930s resulted in rapid pre-World War II urbanization (Murray 1983). The economic importance of the county has grown since the middle twentieth century. Much of this growth has occurred in the public sector, which provides statewide government services, and as a result of the success of the Research Triangle Park, a regionally important center for technology-based industries (Powell 1989).
By the late 1800s, poor farming practices in the North Carolina Piedmont had impacted many area, depleting soils of nutrients and creating serious erosion. During the years of the Great Depression, farmers along Crabtree Creek made the situation worse by attempting to grow cotton on already worn out land. In 1934, approximately 5,000 acres of submarginal land was bought by federal and state agencies to develop a recreation area. The Civilian Conservation Corps (CCC) and the Works Progress Administration helped construct four camps with day use and picnic facilities. The park, known as the Crabtree Creek Recreation Area, was opened to the public in 1937. The state purchased the park and built more facilities in the 1940s. In 1950, more than 1,000 acres of the park were set aside to establish Reedy Creek State Park, a separate park for African Americans. Within a few years, Crabtree Creek Recreation Area was renamed Umstead State Park, in honor of the conservation efforts of former Governor William Bradley Umstead. In 1966, the two parks were merged to form William B. Umstead State Park (Moss 1995; N.C. Parks n.d.).

In 1995, William B. Umstead State Park was listed on the National Register of Historic Places as the Crabtree Creek Recreational Demonstration Area (Moss 1995). This resource was determined to have areas of significance for the period between 1933 and 1943 related to: Architecture; Landscape Architecture; Entertainment/Recreation; Political/Government; and Conservation. Moss (1995; Section 8 Page 11) notes:

The William B. Umstead State Park Historic District has local significance as a recreational demonstration area established by the federal government to reclaim depleted natural resources and provide public recreation facilities. The planned and reclaimed landscape, is the result of one of President Franklin D. Roosevelt's most successful human conservation efforts, while the rustic architecture the men of the CCC and the WPA constructed is representative of the rising popularity of parks, organized camping, and motoring to and from natural settings that was facilitated by automobiles and the boom in park and parkway construction.

Another important development in the project vicinity is the Raleigh-Durham International Airport (RDU). The Raleigh-Durham Aeronautical Authority was first chartered in 1939, and its name was changed to the Raleigh-Durham Airport Authority (RDUAA) in 1945. During World War II, in 1942, the airport was taken over by the U. S. government, and the Raleigh-Durham Army Airfield was established in 1943. By 1946 1,223 acres had been acquired by RDUAA (No Author 2020a), and it has been, and continues to be, an important factor in the growth of the Research Triangle region.
Chapter 3. Background Research Results

Cultural Resources Background Research Results

Background research was conducted at the North Carolina Office of State Archaeology (OSA) in Raleigh. No archaeological sites have been recorded in the project tract. Seven previously recorded sites are located within 1.6 kilometers of the project tract (Figure 3.1; Table 3.1). Sites 31WA104 through 31WA108 were recorded by Ham and Watson (1975). Site 31WA104 is an unknown prehistoric lithic scatter. Artifacts recovered from this site include quartz debitage and bifaces. Site 31WA105 is a concrete spring house with an iron wheel hub, barrel hoops and a mason jar observed on the ground surface. Site 31WA107 is a unknown prehistoric scatter of quartz and metavolcanic flakes. Site 31WA108 is an unknown prehistoric scatter of quartz and rhyolite debitage. The site was purported to be the remains of a quarry site overlooking Crabtree Creek (Ham and Watson 1975:20). All four of these sites were considered not eligible for the National Register of Historic Places (NRHP).

Figure 3.1. Map showing the previously recorded sites in the project vicinity (1993 Cary, NC USGS 7.5-minute topographic quadrangle).
Table 3.1. Summary of Previously Recorded Site in the Project Vicinity.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Description</th>
<th>NRHP Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>31WA104</td>
<td>Unknown Prehistoric Lithic Scatter</td>
<td>Not Eligible</td>
</tr>
<tr>
<td>31WA105</td>
<td>Late 19th – Early 20th Century Springhouse</td>
<td>Not Eligible</td>
</tr>
<tr>
<td>31WA107</td>
<td>Unknown Prehistoric Quartz Quarry Site</td>
<td>Not Eligible</td>
</tr>
<tr>
<td>31WA108</td>
<td>Unknown Prehistoric Lithic Scatter, Late 19th -20th Century Artifact Scatter</td>
<td>Not Eligible</td>
</tr>
<tr>
<td>31WA141</td>
<td>Unknown Historic Artifact Scatter with Pits</td>
<td>Unassessed</td>
</tr>
<tr>
<td>31WA156</td>
<td>Unknown Prehistoric Lithic Scatter</td>
<td>Unassessed</td>
</tr>
<tr>
<td>31WA1459</td>
<td>19th – 20th Century Mill Remains</td>
<td>Unassessed</td>
</tr>
</tbody>
</table>

Site 31WA141 is an unknown historic site recorded during a survey of the Raleigh Durham Airport (Hall and Littleton 1978). Little data is provided on the site in the report aside from noting the collection of one bottle fragment and one miscellaneous concretion. The site map provided on the site form indicates the presence of pits at the site, but no description of the size or function of the pits is provided. No further work was recommended for this site; however, its NRHP eligibility remains unassessed.

Site 31WA156 was recorded in 2003 based on a private artifact collection. This prehistoric site yielded unifacial tools, but no specific details regarding the number or tool types is provided on the site form. This site has not been evaluated for NRHP eligibility.

Site 31WA1459 was recorded by students from Western Carolina University in 1975. This site is the remnants of a mill consisting of a breeched stone dam and mill stones. These remains are associated with the Company Mill Dam in Umstead State Park. The mill stones have been mounted for a public interpretation display. The site was not assessed for NRHP eligibility, and evaluation of the site and archival research were advocated.

There are 16 previously recorded historic resources within a 1.6-kilometer radius of the project tract (Figure 3.2; Table 3.2). Eleven of these resources are located within William B. Umstead State Park. The park itself is a NRHP Listed Historic District recorded as Crabtree Creek Recreational Demonstration Area. Recorded as Resource WA0721, the district includes CCC buildings, administrative and recreational buildings, a cemetery, mill remains, and the park entrance from Interstate 40. The NRHP eligibility status of the different elements of the district is noted as Survey Only (SO) on HPOWEB, indicating they are not eligible for the NRHP. However, some of these resources may be contributing elements to the significance of Umstead Park as a historic district.

Resource 0733, a circa 1900 house, and Resource WA2255, the Williams House, have both been destroyed. Likewise, Bridge No. 322 (Resource WA5068), located along Old Reedy Creek Road and crossing Crabtree Creek, was destroyed after the road was slightly rerouted and a new bridge constructed. Resource WA7189, the Floyd Sorrell House, is a 1910 side gable traditional/vernacular house. Resource WA7190 is a circa 1970 side gable Colonial Revival house. These houses are not eligible for the NRHP and listed as Survey Only.
Figure 3.2. Map showing the historic resources recorded in the project vicinity (1993 Cary, NC USGS 7.5 minute topographic quadrangle).
Table 3.2. Summary of Historic Resources in the Project Vicinity.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
<th>NRHP Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA0721</td>
<td>Umstead State Park/ Crabtree Creek Recreational Demonstration Area</td>
<td>Listed</td>
</tr>
<tr>
<td>WA0722</td>
<td>CCC Buildings – Umstead State Park Buildings</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA0733</td>
<td>John McGee Farm (Gone)</td>
<td>Destroyed</td>
</tr>
<tr>
<td>WA2255</td>
<td>Williams House (Gone)</td>
<td>Destroyed</td>
</tr>
<tr>
<td>WA4124</td>
<td>Old Middle Hillsboro Road (Umstead State Park)</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA4125</td>
<td>Reedy Creek Office – Administration Area (Umstead State Park)</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA4126</td>
<td>Reedy Creek – Ranger’s Residence (Umstead State Park)</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA4129</td>
<td>Reedy Creek Picnic Area (Umstead State Park)</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA4130</td>
<td>Reedy Creek Picnic Area and Shelter (Umstead State Park)</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA4132</td>
<td>Company Mill Trail (Umstead State Park)</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA4133</td>
<td>Old Mill Road Trace (Umstead State Park)</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA4135</td>
<td>Interstate 40 Entrance (Umstead State Park)</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA4187</td>
<td>Young and King Family Cemeteries (1 of 2; Umstead State Park)</td>
<td>Destroyed</td>
</tr>
<tr>
<td>WA5068</td>
<td>Bridge No. 322 (Gone)</td>
<td>Destroyed</td>
</tr>
<tr>
<td>WA7189</td>
<td>Floyd Sorrell House (1910)</td>
<td>Survey Only</td>
</tr>
<tr>
<td>WA7190</td>
<td>House (1970)</td>
<td>Survey Only</td>
</tr>
</tbody>
</table>

Chain of Title

Prior to the present ownership of the project tract by the County of Wake, County of Durham, City of Durham, and City of Raleigh, under the management of Raleigh-Durham Airport Authority, it was comprised of four separate parcels owned by Blanchard, Barnes, Collins, and the Sir Walter Lodge No. 411 Independent Order of Odd Fellows (Figure 3.3). The Blanchard, Barnes, and Collins tracts were once part of the C.L. Duke farm (Figure 3.4).

Blanchard Parcel

The Blanchard Parcel was originally about 50 acres with a portion of overlapping with the now I-40 and running southwest across it. The small portion a part of the project tract, 0.0146 acres, was deeded to the counties and cities in 1972.

<table>
<thead>
<tr>
<th>Date</th>
<th>Grantor</th>
<th>Grantee</th>
<th>Description</th>
<th>Book/Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/16/1972</td>
<td>Bernard B. Blanchard and Charles F. Blanchard, her husband; Geraldine M. Carney and Charles B. Carney, her husband</td>
<td>City of Raleigh, City of Durham, County of Wake, and County of Durham</td>
<td>0.0146 Acres</td>
<td>2054-313</td>
</tr>
<tr>
<td>8/13/1959</td>
<td>Kate J. Rogers (Mrs. W.F. Rogers), Widower</td>
<td>Bernard B. Blanchard and Geraldine M Carney</td>
<td>50 Acres</td>
<td>1376-265</td>
</tr>
<tr>
<td>3/30/1949</td>
<td>Max Collins, Sr. and wife, Gladys Collins</td>
<td>W.F. Rogers</td>
<td>50 Acres</td>
<td>1019-217</td>
</tr>
</tbody>
</table>
Figure 3.3  Map showing the four original parcels comprising the project tract.

Figure 3.4.  1911/1913 Plat map showing project tract parcels in relationship to the C.L. Duke farm tracts.
Max Collins, Sr. was a barber in Maysville, North Carolina through 1935, moving to Cary by 1940 according to census data. Census records list Kate J. Rogers as a dressmaker through 1940. Her husband, Walter, was the manager of a tobacco warehouse in Fuquay Varina prior to his death in 1957.

Barnes Parcel

Similar to the Blanchard Parcel, the Barnes Parcel was originally 15 acres from the Collins in 1952 with a portion of that original acreage overlapping with I-40.

<table>
<thead>
<tr>
<th>Date</th>
<th>Grantor</th>
<th>Grantee</th>
<th>Description</th>
<th>Book/Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/1/1972</td>
<td>Charles B. Barnes and wife, Ada Barnes</td>
<td>City of Raleigh, City of Durham, County of Wake, and County of Durham</td>
<td>Tract 2/Parcel B, 7.9386 Acres</td>
<td>2070-69</td>
</tr>
</tbody>
</table>

Collins Parcel

Max Collins, Sr., and wife, Gladys Collins, acquired 87.5 acres from the Palmer family in 1947. During the 40s and 50s, Mr. Collins sold portions of this tract creating the Blanchard, Barnes, and a portion of the Odd Fellows tract. The remaining 12.5 acres was passed down through his descendants.

<table>
<thead>
<tr>
<th>Date</th>
<th>Grantor</th>
<th>Grantee</th>
<th>Description</th>
<th>Book/Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/XX/1977</td>
<td>Max Collins, Jr., and Wife, Melba W. Collins; Frederick McDaniel Collins, divorced; Ruffin B. Holder, and wife, Ednabel C. Holder</td>
<td>County of Wake, County of Durham, City of Raleigh, City of Durham, c/o Raleigh-Durham Airport</td>
<td>12.52254 acres</td>
<td>2489/689</td>
</tr>
<tr>
<td>10/3/1947</td>
<td>O.A. Palmer and wife, Julie W. Palmer</td>
<td>Max Collins and wife, Gladys Collins</td>
<td>87.5 acres</td>
<td>974-494</td>
</tr>
</tbody>
</table>

Florence Perkins Tucker (1838-1909) was the widow of Major Rufus Sylvester Tucker who died in 1894. Rufus Sylvester Tucker was the son of Ruffin and Lucinda Tucker. Ruffin was a prominent merchant in Wake County during the early nineteenth century. Rufus, along with his two brothers, inherited his father’s business upon his death in 1851 and continued their father’s success. Rufus entered the Confederate army in April 1861 as a captain. He was appointed by then Governor John Ellis to be quartermaster and commissary for the Raleigh post. Rufus mustered into the Wake Rangers, Company I, 41st Regiment in February 1862. He received a mention for distinguished gallantry in the Battle of Washington in September 1862 and was subsequently promoted to major. In 1863, he was appointed assistant adjutant general, serving General Daniel G. Fowle and Brigadier General R.C. Gatlin until he left the military in 1863. In 1864, he was elected principal clerk in the House of Commons and was considered as a gubernatorial possibility in 1888, although he never ran. After the war he devoted himself to his mercantile business, expanding its operations until it became the leading dry goods house in the state. He
turned his business over to his son-in-law, James Boylan, in 1883 and turned to agriculture operating a valuable plantation in Pitt County and developing 540 acres in northwest Raleigh, known as Camp Mangum, into one of the finest farms in the state. Camp Mangum had previously been a Confederate training ground and is today the campus of Meredith College. He gifted Tucker Hall, Raleigh's first public amusement building, to the city in 1867. The building was dedicated by former Governor David L. Swain.

Rufus Tucker was active in forming the Raleigh Chamber of Commerce and was chosen its first president in 1887. He served as director and president of the Institution for the Deaf, Dumb and Blind at Raleigh, and was a director of the North Carolina, Raleigh and Gaston, Raleigh and Augusta, and Carolina Central Railroads, in addition to being the largest private stockholder in the Atlantic and North Carolina Railroad. With his very considerable agricultural and real estate holdings, Tucker was reputed to be Raleigh's wealthiest citizen at the time of his death in 1894 (Hatcher 1996). Both he and Florence are buried in Oakwood Cemetery in Raleigh.

**Sir Walter Lodge No. 411 Independent Order of Odd Fellows Parcel**

The Odd Fellows parcels, containing 83.79242 acres, was combined from 68 acres from the Capital Development Company and the remainder, 15 acres, from Max Collins. No information could be found on Lusetto Blake or J.P.H. Adams. Paschal B. Price was a cooper by trade in 1880 but is listed as a carpenter on census records for 1900, shortly before he sold the property. Deeds for property transfers of this parcel occurring in 1949, 1955, and 1958 refer to the property as formerly part of the C.L. Duke farm. Rufus and Florence Tucker acquired their property, the Collins parcel, from C.L. and J.A. Duke, who acquired it from Asa Blake, presumably through a colonial land grant.

### Collins Portion

<table>
<thead>
<tr>
<th>Date</th>
<th>Grantor</th>
<th>Grantee</th>
<th>Description</th>
<th>Book/Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/7/1976</td>
<td>Sir Walter Lodge No. 411 Independent Order of Odd Fellows, Incorporated</td>
<td>City of Raleigh, City of Durham, County of Wake, County of Durham</td>
<td>83.79242 Acres</td>
<td>2416-433</td>
</tr>
<tr>
<td>10/3/1947</td>
<td>O.A. Palmer and wife, Julie W. Palmer</td>
<td>Max Collins and wife, Gladys Collins</td>
<td>87.5 Acres</td>
<td>974-494</td>
</tr>
</tbody>
</table>

### Capital Development Company Portion

<table>
<thead>
<tr>
<th>Date</th>
<th>Grantor</th>
<th>Grantee</th>
<th>Description</th>
<th>Book/Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/1/1958</td>
<td>C.O. Weaver and wife, Nella D. Weaver</td>
<td>Capital Development Company</td>
<td>68 Acres</td>
<td>1324-400</td>
</tr>
<tr>
<td>7/31/1958</td>
<td>C.O. Weaver and wife, Nella D. Weaver</td>
<td>Babcock Lumber Company</td>
<td>Timber Rights to the 68 Acres</td>
<td>1329-620</td>
</tr>
<tr>
<td>7/31/1958</td>
<td>Cyrus Thompson and wife Annie McE. Thompson</td>
<td>C.O. Weaver and wife, Nella D. Weaver</td>
<td>68 Acres</td>
<td>1324-355</td>
</tr>
</tbody>
</table>
The Independent Order of Odd Fellows (IOOF) is a charitable organization whose goals are to “visit the sick, relieve the distressed, bury the dead, educate the orphans, and protect the widows” (Powell 2006). Although beginning in Europe in the seventeenth century, it was organized in the United States in 1805. Over the years, the Sir Walter Raleigh Lodge has acquired large tracts of land and a number of buildings in Raleigh. These include the Odd Fellows building (Commerce Building) which was built as the Grand Lodge of the IOOF in 1923 and designed by Atlanta architect G. Lloyd Preacher. It was Raleigh’s first tall office building. Office space in the skyscraper was also rented out with the proceeds supporting the IOOF orphanages (RHDC 2020). The building was sold in 2004. Their landholdings, such as the parcel within the project tract, were often used for recreational activities.

### Joyner Parcel

<table>
<thead>
<tr>
<th>Date</th>
<th>Grantor</th>
<th>Grantee</th>
<th>Description</th>
<th>Book/Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/20/1984</td>
<td>Stephen Wynn Joyner and wife, Linda Lee Joyner</td>
<td>Raleigh-Durham Airport Authority</td>
<td>1.00330 acres</td>
<td>3295-80</td>
</tr>
<tr>
<td>2/16/1984</td>
<td>Isaac D. Lee and wife, Virginia K. Lee</td>
<td>Stephen Wynn Joyner and wife, Linda Lee Joyner</td>
<td>Correction Deed</td>
<td>3247-624</td>
</tr>
<tr>
<td>12/6/1983</td>
<td>Isaac D. Lee and wife, Virginia K. Lee</td>
<td>Stephen Wynn Joyner and wife, Linda Lee Joyner</td>
<td>1 acre</td>
<td>3212-584</td>
</tr>
<tr>
<td>6/20/1958</td>
<td>Annie Lee Baker and husband, Hubert Baker, Charles King, and Virginia Lee and husband, Isaac Lee</td>
<td>Virginia Lee</td>
<td>1 acre</td>
<td>1320-102</td>
</tr>
</tbody>
</table>

The Raleigh Durham International Airport is governed by the Raleigh Durham Airport Authority which was established in 1939. An eight-member board manages the airport’s day-to-day operations. Two board members are each appointed by Wake County, the city of Raleigh, Durham County, and the city of Durham. The number of passengers served has increased 55 percent since 2011. To address this growth, the airport plans to invest over 2 billion dollars in the next 10 years on facility expansion (No Author 2020b).

### Historic Map Review

A review of historic maps was conducted to see if any structures or houses were present in the project tract. The earliest indication of any houses or structures in the project tract is from 1911 when the property was part of the C. L. Duke Farm. A structure is shown on the property plat (see Figure 3.4) in the approximate location of archaeological site 31WA2327 (discussed below). This structure can also be seen on the 1914 soil survey map of Wake County (Figure 3.5).
The 1938 Wake County highway map shows the project tract in relation to the recently established Crabtree Creek Recreation Area. Several structures appear to be within or in the vicinity of the tract, but the map scale limits the reliability of precisely plotting them. A 1938 aerial photograph of the tract shows a single structure in the tract, the same one shown on the 1911 plat and 1914 soil survey map (Figure 3.6).

An aerial photograph from 1959 shows the same structure present, and it appears that the tract was recently logged. A clearing shown on this aerial is in the location of archaeological site 31WA2329 (discussed below) and is the location of a small logging sawmill. Another aerial photograph from 1971 shows that an additional structure has been added next to the original structure dating back to the 1911 plat, as well as several small outbuildings. However, on the east side of the tract, a pond and dam have been constructed, and a structure is shown just west of the pond. Figure 3.7 presents these aerial views. A 1964 topographic map of the project area does not show the pond and structure, indicating they were constructed between 1964 and 1971. Figure 3.8 shows details of the tract on USGS topographic maps from 1943 and 1971.
Figure 3.6. 1938 highway map of Wake County showing structures present in the project tract.
Figure 3.7  Aerials from 1938, 1959, and 1971 showing land use changes in tract.
Figure 3.8. Topographic maps from 1964 (top) and 1973 (bottom) showing structures present in the project tract.
Chapter 4. Field Survey Results

This archaeological survey resulted in the comprehensive examination of the 105-acre (42.5-ha) Oddfellows tract. Survey coverage is shown in Figure 4.1. The survey methods consisted of excavating shovel tests at 30-meter intervals along parallel transects spaced 30 meters apart in areas deemed to have high archaeological potential. Low potential areas were surveyed through pedestrian walkover.

![LiDAR map showing survey coverage in the project tract.](image)

Figure 4.1. LiDAR map showing survey coverage in the project tract.

Five archaeological sites, 31WA2327 through 31WA2331, were identified during this survey (Figure 4.2; Table 4.1). These sites include one prehistoric site, two historic sites, and two sites with both prehistoric and historic components. Prehistoric remains date to unknown periods, and historic components date between the nineteenth and twentieth centuries. Due to the severe disturbance to these sites, they are not likely to contribute significantly to our understanding of the prehistory and history of the region. They are all recommended not eligible for the NRHP. The sites are described individually below.
Figure 4.2. Map showing the identified archaeological sites in the project tract (1993 Cary, NC USGS 7.5-minute topographic quadrangle).

Table 4.1. Summary of Identified Archaeological Sites in the Project Tract.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Description</th>
<th>NRHP Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>31WA2327</td>
<td>20th century house site</td>
<td>Not Eligible</td>
</tr>
<tr>
<td>31WA2328</td>
<td>20th century logging operation</td>
<td>Not Eligible</td>
</tr>
<tr>
<td>31WA2329</td>
<td>20th century recreation area</td>
<td>Not Eligible</td>
</tr>
<tr>
<td>31WA2330</td>
<td>Unknown prehistoric lithic scatter</td>
<td>Not Eligible</td>
</tr>
<tr>
<td>31WA2331</td>
<td>Unknown prehistoric lithic scatter</td>
<td>Not Eligible</td>
</tr>
</tbody>
</table>
Site 31WA2327

Site Type: Historic House Site  
Component: 20th Century  
NRHP Recommendation: Not Eligible

Site 31WA2327 is a historic house complex located in the western edge of the project tract, fronting Old Reedy Creek Road. The site is situated on a ridge top that slopes southeast towards Crabtree Creek. The vegetation of the site area consists of mixed hardwoods and pine woods but cedar, black walnut, and beech trees were noted in the site vicinity. Understory vegetation consisted of moderate weed and briar undergrowth. Surface visibility was generally poor except along a bike trail bisecting the site. However, with minimal clearing, structural features were readily identifiable.

A structure is shown in this location as early as 1911 when the property was part of the C.L. Duke Farm (see Figure 3.4). This structure is also shown on the 1914 Wake County soil map (see Figure 3.5). A review of USGS topographic maps and aerial photographs shows that a second structure and several outbuildings were added sometimes between 1964 and 1971. We found foundation elements of the older structure, referred to as Building 1 in this discussion. The later structure is our Building 2. A small agricultural plot is shown surrounding these structures in the 1938, 1959, and 1971 aerial photographs (Figure 4.3).

A total of 48 shovel tests were excavated at 15-meter intervals at this site. The site boundary, measuring 120 by 60 meters were established from two positive shovel tests and the remains of four buildings and general surface debris (Figure 4.4). A typical soil profile is shown in Figure 4.5. This profile consisted of a topsoil zone (0-10 centimeters below surface [cmbs]) of dark brown (10YR3/2) silt loam. Beneath this, at a depth of 10-20 cmbs, was reddish yellow (7.5YR6/6) loamy clay overlying red (2.5YR4/8) clay subsoil. All artifacts were found in the topsoil zone.

Although foundation remains of multiple structures were found, artifacts were only found in two shovel tests and a single surface find in a bike path. The two positive shovel tests are both in the vicinity of Building 1. Twenty-nine artifacts and .9 grams of charcoal was collected during field investigations (Table 4.2). The artifact assemblage includes ceramics (n=3), glass (n=14), metal (n=7), asbestos siding (n=1), terra cotta drainage pipe (n=2), and plastic (n=2) fragments. Some of these artifact types have a long span of manufacture, possibly extending back into the nineteenth century. In addition, both machine cut and wire nails were collected from the site, indicators of nineteenth and twentieth century activities, respectively.

Building 1 is the remains of a dwelling measuring 40 by 35 feet overall. This is the original structure at 31WA2327 shown on the 1911 plat and the 1914 soil survey map. Figure 4.6 through Figure 4.9 show details of Building 1. The original mass of the dwelling, measuring 35 by 15 feet, is outlined by brick piers and a one stretcher wide continuously running foundation between the piers. The remains also include a set of concrete stairs. The additional extends southeast from the original mass running the full width extending 25 feet. The addition is also set the same foundation. Within the interior of the dwelling is a brick scatter, and a concrete and brick scatter, probably the remains of a chimney.

Building 2 is the remains of a building measuring 30 by 20 feet. It is defined by concrete block footers at the corners with a continuous concrete partition block foundation running between the footers. Building 3 is the remains of an outbuilding measuring 12 by 10 feet. It is defined by a continuous concrete block foundation. Two concrete blocks extending outward 8 feet away are likely footers to a shed overhang. Building 4 is the remains of an outbuilding, likely a shed, measuring 15 by 10 feet. It is a plywood shed set on concrete block footers.
Figure 4.3. View of 1938 (top), 1959 (middle) and 1971 (bottom) aerial views of 31WA2327.
Figure 4.4. Plan map and foundation details of 31WA2327.
Figure 4.5. View of a representative soil profile at 31WA2327.

<table>
<thead>
<tr>
<th>Artifact Content</th>
<th>Description</th>
<th>Quantity/Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ceramics:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ironstone, undecorated</td>
<td>post 1840$^1$</td>
<td>1</td>
</tr>
<tr>
<td>Whiteware, undecorated</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Stoneware, Bristol glazed/slipped</td>
<td>popular post 1880s$^2$</td>
<td>1</td>
</tr>
<tr>
<td><em>Glass:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottle glass, brown</td>
<td>1 base with knurling, post 1940$^3$</td>
<td>4</td>
</tr>
<tr>
<td>Bottle glass, clear</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Bottle glass, green</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Bottle glass, light green</td>
<td>frosted</td>
<td>1</td>
</tr>
<tr>
<td>Tableware glass, milkglass</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><em>Metal:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolt, Iron</td>
<td>hex bolt</td>
<td>1</td>
</tr>
<tr>
<td>Nails/nail fragments, cut</td>
<td>dominant 1810-1890$^4$</td>
<td>2</td>
</tr>
<tr>
<td>Nails/nail fragments, wire</td>
<td>common post 1890$^4$</td>
<td>4</td>
</tr>
<tr>
<td><em>Organic:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charcoal</td>
<td></td>
<td>0.1g</td>
</tr>
<tr>
<td><em>Other:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asbestos cement siding fragment</td>
<td>popular 1920s-1970s$^5$</td>
<td>1</td>
</tr>
<tr>
<td>Drainage pipe fragments, terra cotta</td>
<td>with possible limestone or shell aggregate</td>
<td>2</td>
</tr>
<tr>
<td>Plastic fragment</td>
<td>burned</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total** 29/0.1g

Figure 4.6. View of general setting at 31WA2327, facing north.

Figure 4.7. View of front steps and chimney rubble pile at Structure 1, at 31WA2327, facing north.
Figure 4.8. View of intact and displaced foundation piers at Structure 1 at 31WA2327, facing east.

Figure 4.9. View of rear steps at Structure 1 at 31WA2327, facing south.
In summary, 31WA2327 appears to have been first occupied during the early twentieth or possibly the late nineteenth century. Maps and aerial photographs reveal a single house surrounded by a small field/pasture was here until at least 1964. However, by 1971 a second house and several outbuildings are present. Structural remnants of four structures were identified during field investigations, including the foundation of the original house (Building 1), as well as three of the later structures. Artifacts were found in proximity to the original structure, but surprisingly, none were found in proximity to the more recent structures. Based on the results of our field investigations, it is not likely that 31WA2327 can contribute new or significant information about twentieth century occupations in the tract beyond the survey level of evaluation and the site is recommended not eligible for the NRHP.

### Site 31WA2328

| Site Type: | Possible Scouts recreation area |
| Component: | Middle 20th Century |
| NRHP Recommendation: | Not Eligible |
| UTM Coord 17N (NAD83): | 3968593 N 700987 E |
| Landform: | Side slope |
| Soil Type: | Nanford silt loam/Chewacla and Wehadkee soils |

Site 31WA2389 is a historic site located in the eastern part of the survey tract. This site is associated with middle twentieth century recreational activities. The site includes three main loci: a pond and dam, a shelter and grill area, and a picnic table and fire pit.

A review of twentieth century aerial photographs shows this setting as woodlands in 1938 and was logged in 1958 or 1959. However, by 1964 a pond and structure are shown on the USGS topographic map and are clearly visible on a 1971 aerial photograph (Figure 4.10). This recreation area was constructed during the period of ownership of the Independent Order of Odd Fellows. Attempts were made to contact representatives of the Independent Order of Odd Fellows to see if they had records of past ownership and land use. Mr. Vincent Doria was contacted. He is the current Treasurer and former State Grand Master for the Independent Order of Odd Fellows. Mr. Vincent was aware that the Independent Order of Odd Fellows once owned the property. He said that they were heavily involved with Scout groups back then and had granted permission for camping and jamboree activities. He said that until about 2007 there was a close connection between the Independent Order of Odd Fellows and Scouting groups. He was unsure exactly when the pond and recreation area were constructed, but our background research indicates the pond and recreation area was built during their ownership of the property. Mr. Doria said he was not aware of any other Odd Fellows functions or activities associated with the property.

Overall dimensions for 31WA2327 are approximately 180 by 200 meters (Figure 4.11). The pond encompasses approximately 1.5 acres. There is a shelf/ledge bordering the pond allowing for easy access for fishing and swimming. The dam is at the southern end of the pond, about 100 meters upslope from Crabtree Creek. Figure 4.12 and Figure 4.13 show views of the pond.

The remains of the structure consist of a rectangular asphalted area measuring 20 by 40 feet (Figure 4.14). Three poles associated with the shelter are still standing. Just to the west of the asphalt pad are two metal grills (Figure 4.15). These are made from tire rims and mounted on a segment of angle iron. Approximately 150 feet west is a wood picnic table and a stone ring fire pit (Figure 4.16). Additional scattered stone ring fire pits are scattered in the project area, but when metal detected only modern glass and aluminum items were found.

Limited metal detecting was conducted in this area. Aluminum container debris was common, but wire nails were also identified. A single shovel test was excavated in the site vicinity, revealing an eroded soil profile, consisting of a thin layer of humus overlaying red (2.5YR4/8) clay (Figure 4.17).
Figure 4.10. Aerial photograph from 1971 showing 31WA2328.

Figure 4.11. Plan map of shelter area and grills at 31WA2329.
Figure 4.12. View of dam at south end of pond at 31WA2328, facing northeast.

Figure 4.13. View towards dam from back of pond at 31WA2328, facing southeast.
Figure 4.14. View of shelter area and asphalt pad at 31WA2328, facing southeast.

Figure 4.15. View of two grills made from tire rims at 31WA2328, facing southeast.
Figure 4.16. View of stone firepit ring and wood picnic table at 31WA2328, facing south.

Figure 4.17. View of eroded soil profile at 31WA2328.
Site 31WA2328 is the remains of a recreational area created when the property was owned by the Independent Order of Odd Fellows. The site is a simple recreational facility with a shelter, pond, and a primitive camping area. The site was created sometime after 1964, thus it barely has the 50-year age requiring evaluation. The area was used by Scouting groups for camping and jamboree activities and is an example of one of the many ways the Independent Order of Odd Fellows provided for the community. However, there are no significant events or unique characteristics linked to the site. For this reason, 31WA2328 is recommended not eligible for the NRHP and no additional evaluation is recommended.

Site 31WA2329

Site Type: Historic Logging operation
Component: Middle 20th Century
NRHP Recommendation: Not Eligible
UTM Coord 17N (NAD83): 3968811 N 701216 E
Landform: Side slope
Soil Type: Nanford silt loam

Site 31WA2329 is a historic site associated with middle twentieth century logging operations at the Odd Fellows tract. The site is located in the central part of the tract, on the side slope. A review of historic aerial photographs shows that this area was woodlands in 1938, some areas appearing as remnant fields or pasture. The 1959 aerial photograph shows the area as recently logged, with a dendritic pattern of logging trails visible. At the location of 31WA2329 is an obvious clearing, but no details are discernable. Archaeological evidence of sawmill activities was identified at this location.

This property was owned by the Independent Order of Odd Fellows between 1958 and 1976. Prior to the sale of the land to the Odd Fellows the timber rights were specifically sold to Babcock Lumber Company (7/31/1985, DB1329:P620). The 1959 aerial photograph shows the area has been logged and location of 31WA2329 appears as a bare clearing, surrounded by logging trails and logged woodlands (Figure 4.18). However, no sheds or structures are visible in the photograph.

There are two loci at the site (Figure 4.19 and Figure 4.20). Locus 1 is a large rectangular pit surrounded by an earthen berm. Locus 2 is about 50 feet to the south of Locus 1. Locus 2 is the location of a smaller rectangular pit. Artifact scatters are associated with both loci. The overall site dimensions are approximately 50 meters northwest-southeast by 40 meters northeast-southwest (Figure 4.21).

Locus 1 is a pit feature surrounded by an earthen berm (Figure 4.22). The feature measures about 45 feet north-south by 20 feet east-west. From the top of the berm to the base of the pit is about 5 feet. The interior of the Locus 1 pit, the berm, and surrounding areas were metal detected. While metal detecting, several surface finds were noted, including a distinctive Pepsi Cola bottle from circa 1951-1957, a glass bottle, a glass jar fragment, and two metal can fragments. Seventeen metal detection hits were collected from Locus 1, representing about 50 percent of the hits detected at the site. Table 4.3 summarizes artifacts collected from Locus 1. The most common items are wire nails (n=8), can fragments (n=2), and unidentified iron fragments. Also collected were an iron bolt, a cotter pin, a saw tooth, a piece of wire, and a spoon fragment. Figure 4.23 shows glass containers and metal cans not collected.

The pit feature at Locus 2 is smaller than at Locus 1, measuring approximately 3 by 1 meter in area and about 50 centimeters deep (see Figure 4.22). However, a similar number of artifacts were found by metal detection here as at Locus 1. Table 4.4 summarizes the artifacts from Locus 2. Most of the items are wire nails (n=7) and can fragments (n=6). Additional items include a small hoe, two chain links, an unidentified copper alloy item, and an unidentified iron item. One of the chain links is of particular interest. It is rectangular in shape and is common at portable sawmills and logging operations. This is part of a drag chain used to clear the sawdust away from the machinery.
Figure 4.18. General view of 31WA2329 on 1959 aerial photograph.

Figure 4.19. General view of Locus 1 at 31WA2329, facing northwest.
It was determined that metal detection instead of shovel tests would be used to recover artifacts from 31WK2329. Metal detection was conducted in the immediate vicinity of the two loci, and within a 10-meter surrounding area. However, two shovel tests were excavated at 31WA2329 to examine the soil profile (Figure 4.24 and Figure 4.25). Neither shovel test yielded artifacts. A shovel test excavated at the bottom of the Locus 1 pit revealed a soil profile consisting of an upper zone of reddish yellow (10YR6/8) silt loam. This zone is likely associated with erosional deposition after the site was abandoned. Beneath this was an approximately 10 centimeters thick layer of strong brown (7.5YR5/6) silt loam. At the base of this zone was a dark organic band, possibly the remains of decayed wood. Below this was undisturbed yellowish red (5YR5/6) saprolitic silt loam. A shovel test excavated upslope from the Locus 1 pit showed a shallow (0-10 cmbs) upper soil zone consisting of brown (10YR5/3) silt loam overlaying yellowish red (5YR5/8) clay.

Site 31WK2329 is the remains of a middle twentieth century portable sawmill. The area was probably logged by the Babcock Lumber Company in 1958. However, the features and artifacts found at the site suggest some limited sawmill activity. The artifacts collected from the site indicate a structure or structures was once present covering the two loci, probably simple pole sheds. An open shed-like structure would have been sufficient to protect the logging/sawmill machinery. Artifacts confirming that sawmill operations occurred include a rectangular sawdust drag chain link and a saw tooth cover.

Logging and lumber practices offered one way that money could be made from the submarginal land in the project vicinity. Partially intact pit features and representative artifacts were found during the archaeological survey, but it is unlikely that this site can contribute new and significant information beyond the survey level of evaluation. For this reason, 31WA2329 is recommended not eligible for the NRHP and no further evaluation is warranted.
Figure 4.21 Plan map of 31WA2329.
Figure 4.22. Close-up view of Locus 1 and 2 pit features at 31WA2329.
Table 4.3 Summary of Historic Artifacts Collected from Site 31WA2329, Locus 1.

<table>
<thead>
<tr>
<th>Artifact Content</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass</td>
<td>Bottle glass, clear: Pepsi bottle with ACL, manufactured from 1951-1957⁴</td>
<td>1</td>
</tr>
<tr>
<td>Metal</td>
<td>Bolt head, Iron: square head</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Can fragments, Iron:</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Hair pin cotter, iron: remnants of red paint present, possibly used with a hitch</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Nails, wire: common post 1890²</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Saw tooth, iron: insertable tooth for circular saw</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Unidentified form, iron: wire-like fragment</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Unidentified hardware, iron: 1 possible bolt fragment or square U-bolt; 1 possible label holder for machine or drawer</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Utensil fragment, iron: spoon bowl fragment, likely stainless steel, post 1921³</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

¹Stoddard 2003; ²IMACS 2001; ³Magid 2010

Table 4.4 Summary of Historic Artifacts Collected from Site 31WA2329, Locus 2.

<table>
<thead>
<tr>
<th>Artifact Content</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal</td>
<td>Can fragments, iron:</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Chain links iron: 1 bend close type, 1 sawdust drag chain type</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Hoe, iron: small, blade approx. 5” wide</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Nails, wire: common post 1890¹</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Unidentified form, copper alloy: possible hardware</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Unidentified form, iron: likely can fragment</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

¹IMACS 2001
Figure 4.23. View of surface artifacts found at Locus 1, 31WA2329.
Figure 4.24. View of the soil profile inside the Locus 1 pit feature at 31WA2329.

Figure 4.25. View of the general soil profile at 31WA2329 upslope from the Locus 1 pit.
Site 31WA2330

Site Type: Lithic Scatter
Component: Unknown Prehistoric Scatter
NRHP Recommendation: Not Eligible

UTM Coord 17N (NAD83): 3968323 N 701064 E
Landform: Floodplain
Soil Type: Chewacla and Wehadkee soils

Site 31WA2330 is an unknown prehistoric lithic scatter located in the southeastern corner of the project tract. The site is located in a floodplain setting bordering Crabtree Creek (Figure 4.26 and Figure 4.27). The site is situated on a small sandy levee, with Crabtree to the south and a narrow back-swamp at the base of the deep slope to the north. The vegetation in the site area consisted of mixed hardwoods and pine with light understory vegetation. The site was first identified when several quartz flakes were found on the ground surface in a bike trail that passes through the site.

A total of seven shovel tests were excavated at 15-meter intervals at 31WA2330. The site boundary, measuring approximately 15 meters in diameter, was defined by a light scatter of quartz artifacts. The soils at 31WA2330 consisted of a topsoil zone (0-20 cmbs) of brown (7.5YR4/3) sandy loam. Beneath this, to a depth of 55 centimeters was reddish yellow (7.5YR6/8) loamy sand. The deepest soil zone (55-75 cm+ was strong brown (7.5YR5/8) sandy clay. The soil profile is shown in Figure 4.28.

![Figure 4.26. Plan map of 31WA2330.](image)

A total of eight artifacts were recovered from the site. All artifacts were quartz flake fragments and no diagnostic artifacts were found at the site. All artifacts were recovered from the surface along the bike path.

Site 31WA2330 is the remains of a prehistoric lithic scatter in the flood plain of Crabtree Creek. All of the artifacts collected are nondiagnostic lithic debitage, and none were found in subsurface contexts. There is no exposure of quartz outcrops in the site vicinity, and there was no surface cortex on any of the artifacts indicating the items were the result of reducing stream cobbles. The chances of intact feature or
Figure 4.27. View of setting at 31WA2330, facing west.

Figure 4.28. View of soil profile at 31WA2330.
Site contexts is considered low, and no evidence of preserved organic remains (bone and charcoal) was found. For these reasons we feel that 31WA2330 is not likely to yield new or significant information beyond the survey level of evaluation about prehistoric settlement in the North Carolina Piedmont and the site is recommended not eligible for the NRHP.

Site 31WA2331

<table>
<thead>
<tr>
<th>Site Type</th>
<th>Lithic Scatter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td>Unknown Prehistoric Scatter</td>
</tr>
<tr>
<td>NRHP Recommendation</td>
<td>Not Eligible</td>
</tr>
<tr>
<td>UTM Coord 17N (NAD83)</td>
<td>3968526 N 700709 E</td>
</tr>
<tr>
<td>Landform</td>
<td>Floodplain</td>
</tr>
<tr>
<td>Soil Type</td>
<td>Nanford silt loam</td>
</tr>
</tbody>
</table>

Site 31WA2331 is a prehistoric lithic scatter located in the center-western portion of the project tract. The site is situated on a ridge top and extends southeast down a ridge toe and onto the floodplain of Crabtree Creek (Figure 4.29). The vegetation in the site area consisted of mixed hardwoods and pine with light understory vegetation. A bike trail passes through the site; along the trail surface visibility is very good (75-100%).

A total of 57 shovel tests were excavated at 15-meter intervals at the site. The site boundary, measuring approximately 150 meters northwest-southeast by 40 meters northeast-southwest, was defined by one shovel test and three surface collection points (Figure 4.30). Soil stratigraphy consisted of 10 to 15 centimeters of brown (10YR 5/3) silt loam overlying yellowish red (5YR 5/7) silty clay (Figure 4.31). The soil had quartz rocks common, and an exposure of quartz bedrock was present on the southeastern part of the site. However, it did not look as if the quartz exposure had been used by prehistoric inhabitants due to the fractured nature of the material.

![View of ridgetop at 31WA2331, facing southeast.](image)

A total of 26 lithic artifacts were collected from 31WK2331 (Table 4.5). Only one of these, a quartz core, was from a subsurface context and the rest were surface finds from along the bike trails that cross the site. The only non-quartz artifact was a projectile point blade fragment of a good quality metavolcanic
rhyolite. The flaking pattern indicates the tool was made by a skilled flintknapper, possibly during the Archaic Period. The remainder of the artifacts are quartz flakes and flake fragments. The quartz outcrop within the site boundary is a translucent variety. This material will produce sharp edges but would be unsuitable for manufacturing bifacial tools. Most of the quartz flakes are more of a milky quartz, indicating that the artifacts found at the site may not be related to the raw material naturally occurring within the site boundary.
Table 4.5  Summary of Prehistoric Artifacts Collected from 31WA2331.

<table>
<thead>
<tr>
<th>Artifact Content</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lithics:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projectile point fragment</td>
<td>shape and flaking suggest Early Archaic</td>
<td>1</td>
</tr>
<tr>
<td>Core, quartz</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Flakesflake fragments, quartz</td>
<td>1 with possible use wear</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>

None of the quartz artifacts had cobble cortex indicating that creek cobbles were being used. The southern part of the site follows a long narrow ridge toe down to the edge of Crabtree Creek. At the very base of this landform is an outcrop of metavolcanic material. The material is not suitable for flintknapping stone tools.

Site 31WA2331 is a prehistoric site consisting of a sparse scatter of quartz artifacts and a single metavolcanic projectile point fragment. Despite the presence of an exposure of quartz material within the site boundaries (Figure 4.32), there is no indication that quarrying activities took place at the site. The eroded setting has little potential for the presence of intact features or buried cultural zones. Site 31WA2331 is unlikely to contribute new or significant information about prehistoric settlement in the Crabtree Creek watershed and is recommended not eligible for the NRHP.
Between 12 and 20 August 2020, Archaeological Consultants of the Carolinas, Inc., conducted an archaeological survey of the Oddfellows tract located in Wake County, North Carolina. This investigation was conducted on behalf of the Wake Stone Corporation. This survey was requested by the North Carolinas State Historic Preservation Office (SHPO) in a letter dated 7 May 2020. The goals of this investigation were to identify all archaeological resources located within the project tract, assess those resources for eligibility to the National Register of Historic Places (NRHP), and advance management recommendations, as appropriate.

Background research was conducted at the Office of State Archaeology (OSA) located in Raleigh and included a review of archaeological site forms, cultural resource reports, and historic maps of the project area. No previously recorded archaeological sites are located in the project tract. A review of the Office of Survey and Planning’s website (HPOWEB) was also consulted to determine the presence of any recorded architectural resources within the project tract. None are present in the project tract.

Prior to beginning field work, factors such as soil drainage and topography were used to define portions of the project tract that had high potential for the presence of archaeological deposits. These areas total approximately 35 acres (14.2 ha) and include ridge tops, knolls, and ridge toes. Shovel tests were excavated at 30-meter intervals along parallel transects spaced 30 meters apart in high potential areas. The remaining 70 acres (28.3 ha) were considered to have low archaeological potential. Low potential areas were surveyed by pedestrian walkover and judgmentally placed shovel tests. All areas of exposed ground surface were inspected for cultural remains.

Figure 4.32. View of an outcrop of low quality quartz on side slope at 31WA2331, facing northwest.
Five archaeological sites (31WA2327 through 31WA2331) were identified during this investigation. These sites include two prehistoric sites and three historic sites. The prehistoric components are of an unknown age. The historic components date to the twentieth century. These resources have been adequately documented during this investigation and determined to be unlikely to yield significant data pertaining to the prehistory or history of the area. All identified archaeological sites are recommended not eligible for the NRHP. As no significant archaeological sites will be impacted by the proposed development, clearance to proceed is recommended.
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Moss, Helen P.

Miller, Carl F.

Murray, Elizabeth Reed

No Author

Oddfellows Tract
Wake County, North Carolina

Nöel Hume, Ivor


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Whatley, John S.

Wilson, Richa and Kathleen Snodgrass
Appendix A. Artifact Catalog and PPK Report
## Artifact Catalog

### Odd Fellows

**Site Number** 31WA2327

<table>
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<th>Description</th>
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<tbody>
<tr>
<td>1.1</td>
<td>1</td>
<td>m1</td>
<td>3</td>
<td>8.4</td>
<td>Nail Wire (Post 1890)</td>
<td>2 roofing nails</td>
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<tr>
<td></td>
<td>2</td>
<td>m2</td>
<td>1</td>
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<td>Nail Fragment Wire (Post 1890)</td>
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<tr>
<td></td>
<td>3</td>
<td>m3</td>
<td>1</td>
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<td>Nail Cut (1810-1890)</td>
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<tr>
<td></td>
<td>4</td>
<td>m4</td>
<td>1</td>
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<td>Nail Fragment Cut (1810-1890)</td>
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<tr>
<td></td>
<td>5</td>
<td>m5</td>
<td>1</td>
<td>31.3</td>
<td>Metal Bolt Iron</td>
<td>hex bolt</td>
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<tr>
<td></td>
<td>6</td>
<td>m6</td>
<td>2</td>
<td>6.6</td>
<td>Plastic</td>
<td>burned</td>
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<tr>
<td></td>
<td>7</td>
<td>eb7</td>
<td>1</td>
<td>0.1</td>
<td>Charcoal</td>
<td></td>
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<tr>
<td></td>
<td>8</td>
<td>m8</td>
<td>1</td>
<td>0.8</td>
<td>Other Historic</td>
<td>asbestos cement siding</td>
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<tr>
<td></td>
<td>9</td>
<td>m9</td>
<td>3</td>
<td>4.9</td>
<td>Brown Bottle Glass</td>
<td>2 body fragments, 1 base fragment with khurling (post 1940, Lindsey 2020)</td>
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<tr>
<td></td>
<td>10</td>
<td>m10</td>
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<tr>
<td></td>
<td>11</td>
<td>m11</td>
<td>1</td>
<td>2.6</td>
<td>Light Green Flat Glass</td>
<td>frosted</td>
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<tr>
<td></td>
<td>12</td>
<td>m12</td>
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<td>28.1</td>
<td>Clear Bottle Glass</td>
<td>6 body fragments</td>
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<tr>
<td>2.1</td>
<td>p13</td>
<td>1</td>
<td>17.7</td>
<td>Undecorated Ironstone Ceramic</td>
<td>base fragment</td>
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<tr>
<td></td>
<td>p14</td>
<td>1</td>
<td>1</td>
<td>Undecorated Whiteware Ceramic</td>
<td>body fragment</td>
<td></td>
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<tr>
<td></td>
<td>p15</td>
<td>2</td>
<td>48.5</td>
<td>Other Ceramic</td>
<td>terra cotta drainage pipe fragments with possible limestone or shell aggregate</td>
<td></td>
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<tr>
<td></td>
<td>m16</td>
<td>1</td>
<td>3.6</td>
<td>Clear Bottle Glass</td>
<td>body fragment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>m17</td>
<td>1</td>
<td>1.7</td>
<td>Brown Bottle Glass</td>
<td>body fragment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>m18</td>
<td>1</td>
<td>1.4</td>
<td>Milkglass Tableware</td>
<td>rim fragment</td>
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<th>Description</th>
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</thead>
<tbody>
<tr>
<td>3.0</td>
<td>p19</td>
<td>1</td>
<td>16.8</td>
<td>Bristol Glazed/Slipped Stoneware Ceramic</td>
<td>body fragment</td>
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**Site Number** 31WA2329

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<tr>
<td>1.1</td>
<td>m1</td>
<td>1</td>
<td>8</td>
<td>Nail Wire (Post 1890)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>m2</td>
<td>1</td>
<td>14.6</td>
<td>Nail Wire (Post 1890)</td>
<td>clenched</td>
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<tr>
<td></td>
<td>m3</td>
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<td>14.8</td>
<td>Nail Wire (Post 1890)</td>
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**Site Number** 31WA239

Page 1 of 4
### Artifact Catalog

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<tbody>
<tr>
<td>m4</td>
<td>m5</td>
<td>1</td>
<td>53.7</td>
<td>Metal Hoe Iron</td>
<td>small hoe, blade is 5” wide</td>
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Site 2, MD 14

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<tr>
<td>m5</td>
<td>m6</td>
<td>2</td>
<td>31.4</td>
<td>Metal Unidentified Form Copper Alloy</td>
<td>possible hardware, slightly concave fragment</td>
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Site 2, MD 23

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<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>m6</td>
<td>m7</td>
<td>1</td>
<td>13.7</td>
<td>Nail Wire (Post 1980)</td>
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Site 2, MD 25

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<tr>
<td>m7</td>
<td>m8</td>
<td>1</td>
<td>5</td>
<td>Utensil Iron</td>
<td>spoon bowl fragment, likely stainless steel (post 1921, Magid 2010)</td>
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**Provenience Number:** 8.1  
Site 2, MD 17

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<th>Comments</th>
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<tbody>
<tr>
<td>m8</td>
<td>m9</td>
<td>1</td>
<td>4.3</td>
<td>Nail Wire (Post 1980)</td>
<td>insertable saw tooth for circular saw</td>
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**Provenience Number:** 9.1  
Site 2, MD 7

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<tbody>
<tr>
<td>m9</td>
<td>m10</td>
<td>1</td>
<td>454</td>
<td>Clear Bottle Glass</td>
<td>Pepsi bottle, wave style, ACL with single dot, base embossed with &quot;1478/16 A/enircled B/S 57/T?EMPO?ROL?; manufactured b/t 1951 and 1957, likely 1957 according to date code (Stoddard 2003)</td>
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**Provenience Number:** 10.0  
Site 2, surface

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<tbody>
<tr>
<td>m10</td>
<td>m11</td>
<td>1</td>
<td>6.8</td>
<td>Nail Wire (Post 1980)</td>
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Site 2, MD 10

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</thead>
<tbody>
<tr>
<td>m11</td>
<td>m12</td>
<td>1</td>
<td>6</td>
<td>Nail Wire (Post 1980)</td>
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**Provenience Number:** 12.1  
Site 2, MD 08

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<tbody>
<tr>
<td>m12</td>
<td>m13</td>
<td>6</td>
<td>3</td>
<td>Metal Other Iron</td>
<td>can fragments</td>
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**Provenience Number:** 13.1  
Site 2, MD 24

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<tr>
<td>m13</td>
<td>m14</td>
<td>1</td>
<td>17</td>
<td>Nail Wire (Post 1980)</td>
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Site 2, MD 1

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<tr>
<td>m14</td>
<td>m15</td>
<td>1</td>
<td>23.4</td>
<td>Metal Hardware Iron</td>
<td>hair pin cotter with remnants of red paint, possibly used with hitch</td>
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**Provenience Number:** 15.1  
Site 2, MD 18

Page 2 of 4
<table>
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<th>Site, MD 9</th>
<th>Site, MD 5</th>
<th>Site, MD 27</th>
<th>Site, MD 13</th>
<th>Site, MD 2</th>
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<td>23.1</td>
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<td>26.1</td>
<td>27.1</td>
<td>28.1</td>
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<tr>
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<td>m16</td>
<td>m17</td>
<td>m18</td>
<td>m19</td>
<td>m20</td>
<td>m21</td>
<td>m22</td>
<td>m23</td>
<td>m24</td>
<td>m25</td>
<td>m26</td>
<td>m27</td>
<td>m28</td>
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<td>15.6</td>
<td>3</td>
<td>6.6</td>
<td>46.3</td>
<td>7.3</td>
<td>6.6</td>
<td>1.5</td>
<td>63.6</td>
<td>23.1</td>
<td>18.5</td>
<td>15.6</td>
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<tr>
<td>Description</td>
<td>Nail Wire (Post 1890)</td>
<td>Nail Wire (Post 1890)</td>
<td>Metal Unidentified Form Iron</td>
<td>Nail Wire (Post 1890)</td>
<td>Metal Hardware Iron</td>
<td>Nail Wire (Post 1890)</td>
<td>Nail Wire (Post 1890)</td>
<td>Nail Wire (Post 1890)</td>
<td>Metal Unidentified Form Iron</td>
<td>Metal Hardware Iron</td>
<td>Metal Hardware Iron</td>
<td>Nail Wire (Post 1890)</td>
<td>Nail Wire (Post 1890)</td>
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<tr>
<td>Comments</td>
<td>likely can fragment</td>
<td>bend close type chain link</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>wire like</td>
<td>round stock bent in &quot;C&quot; shape, possible fragment of bolt or square U-bolt</td>
<td>square bolt head, body broken off</td>
<td>possible label holder for machine or drawer</td>
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### Artifact Catalog

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<tbody>
<tr>
<td>1.0</td>
<td>Site 4, N500 E500, surface</td>
<td>Metal Hardware Iron</td>
<td>chain link for sawdust drag chain</td>
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<td>Site 5, N425 E590, surface</td>
<td>Quartz Flake/Flake Fragment</td>
<td>1 with possible use wear</td>
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<td>Site 5, N500 E500, 0-15 cm</td>
<td>Quartz Flake/Flake Fragment</td>
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<tr>
<td>4.0</td>
<td>Site 5, surface find</td>
<td>Metavolcanic P. Point Fragment</td>
<td>distal blade and tip fragment, shape and flaking suggest Early Archaic, but not diagnostic without base</td>
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## PPK Fragment Report

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<td>Comments</td>
<td>distal body and tip fragment; shape and flaking suggest Early Archaic; weathered</td>
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Appendix B. Artifact Photographs
Figure B.1. A sample of artifacts collected from site 31WA2327
Figure B.2. A sample of artifacts collected from site 31WA2329.
Figure B.3. Quartz flakes/flake fragments collected from site 31WA2330.

Figure B.4. A sample of artifacts collected from site 31WA2331.
Appendix C. Resume of Principal Investigator
BOBBY GERALD SOUTHERLIN  
Archaeological Consultants of the Carolinas, Inc.  
121 East First Street  
Clayton, NC  27520  
Office (919) 553-9007  Fax (919) 553-9077  
Email: bobbysoutherlin@archcon.org

EDUCATION  
M.A. in Anthropology, University of Georgia, 1993. 
B.A. in Anthropology, University of South Carolina, 1988.

AREAS OF SPECIALIZATION  
Archaeological Field Investigation Methods  
Material Culture Replication (lithics and ceramics)  
Vertebrate Faunal Analysis

PROFESSIONAL ORGANIZATION MEMBERSHIP  
Society for American Archaeology  
Southeastern Archaeological Conference  
North Carolina Archaeological Society (Life Member)  
North Carolina Archaeological Council  
Society for Georgia Archaeology (Life Member)  
Georgia Council of Professional Archaeologists  
Archaeological Society of South Carolina (Life Member)

PROFESSIONAL POSITIONS  
CEO, Archaeological Consultants of the Carolinas, Inc.  
Senior Archaeologist, Principal Investigator, Field Director, Zooarchaeologist

Cultural Resource Surveys (Phase I) and Archaeological Site Testing (Phase II)  
• Utility Corridors for ANR Pipeline Company (Detroit), Georgia Power Company (Atlanta), Duke Power Company (Charlotte), Oglethorpe Power Corporation, and Transco Pipeline Company (Houston).

• Transportation Corridors for Georgia Department of Transportation (Atlanta), South Carolina Department of Transportation (Columbia)

• Development Tracts for Consolidated Government of the City of Columbus/Muscogee County (Georgia), Macon County (North Carolina), U.S. Corps of Engineers (Savannah and Mobile Districts), U.S. Forest Service (South Carolina), South Carolina Electric and Gas Company (Columbia), and various private developers (Georgia and South Carolina)

Archaeological Data Recovery (Phase III) – Representative Examples  
• Yemassee Indian occupations at the Chechessee Old Field sites (38BU1605 and 38BU1609) for the Chechessee Creek Club

• Three prehistoric sites (38HR243, 38HR254, and 38HR258) in Horry County, South Carolina for Tidewater Plantation and Golf Club (Myrtle Beach, S.C.)

• Two Prehistoric sites (38LX50 and 38LX141) in Lexington County, South Carolina for the South Carolina Department of Transportation

• The Callawassie Burial Mound and Village site (38BU19) in Beaufort County, South Carolina

• Two prehistoric sites (9FL203 and 9FL206) in Floyd County, Georgia for the Georgia Department of Transportation
Experience at Military Facilities
• Fort Jackson, SC; Camp Lejeune, NC; Robbins Air Force Base, GA; Fort Benning, GA; Hurlbert Field, FL; Coastal Systems Station Panama City, FL; Naval Air Station Pensacola, FL; Fort Buchanan, Puerto Rico; Milan Army Ammunition Plant, TN

Federal Energy Regulatory Commission Related Investigations
• Georgia Power Company: Flint River Hydroelectric Project
• Duke Energy: Shoreline Surveys at Lake James and Lake Norman North Carolina and Fishing Creek Lake, South Carolina
• Crisp County Power Commission: Lake Blackshear, Georgia

SELECTED PUBLICATIONS AND PAPERS PRESENTED*

Reid, Dawn and Bobby Southerlin
2015 *Archaeological Survey of the Tubbs Solar Farm Tract, Lenoir County, North Carolina.* Archaeological Consultants of the Carolinas, Clayton, NC.

Southerlin, Bobby
2014 *An Archaeological Assessment of the Piedmont Natural Gas Vulcan Quarry Relocation Lines, Mecklenberg County, North Carolina.* Archaeological Consultants of the Carolinas, Clayton, NC.

Southerlin, Bobby, Dawn Reid, Brooke Brilliant, and George Price

Southerlin, Bobby
2013 *Faunal Analysis of Remains from the Simkins House, Columbia, South Carolina.* Archaeological Consultants of the Carolinas, Clayton, NC.

Tibbetts, Rachel, Brooke Brilliant, Dawn Reid, and Bobby Southerlin
2012 *Archaeological Survey of Part One of the Macedonia II Analysis Area, Francis Marion National Forest* (prepared for USFS). Archaeological Consultants of the Carolinas, Clayton, NC.

Southerlin, Bobby

Reid, Dawn, Michael K. O’Neal, Rachel Tibbetts, and Bobby Southerlin
2010 *Phase II Archaeological Testing of Six Sites at the Northwest Regional Water Reclamation Facility Tract, Onslow County, North Carolina* (prepared for ARCADIS). Archaeological Consultants of the Carolinas, Clayton, NC.

Reid, Dawn, April Montgomery, Michael K. O’Neal, Rachel Tibbetts, and Bobby Southerlin

* A full listing of individual projects and publications is available upon request
**NORTH CAROLINA ARCHAEOLOGICAL SITE FORM VIII**  
Office of State Archaeology/Division of Archives & History

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<td>MAP NORTHING: 3968616</td>
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<td>14. RECORDED W/ GPS?: 1 - Yes</td>
<td>GPS DATA POST-PROCESSED?: 1 - Yes</td>
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<td>1. OSA</td>
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<td>2.</td>
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<tr>
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<tr>
<td>21. ARTIFACT INVENTORY ATTACHED: 1 - Yes</td>
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<td>22. BIBLIOGRAPHIC REFERENCE #S:</td>
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<tr>
<td>23. RECOMMENDATIONS:</td>
<td>1 - No Further Work</td>
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<tr>
<td>24. GEOGRAPHIC SITUATION: 12 - Hill or Ridgetop</td>
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<tr>
<td>25. ELEVATION/DEPTH: 350 FT. AMSL</td>
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<tr>
<td>26. SLOPE PERCENT: 8% LOW 0 % HIGH</td>
<td>SLOPE FACE DIRECTION: 4 - Southeast</td>
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</table>
27. SOIL/BOTTOM COMPOSITION: 8 - Silty Loam
28. NRCS SOIL TYPE CODE: Georgeville silt loam
29. MODERN VEGETATION: 4 - Forested
30. DISTANCE TO WATER/FROM SHORE: 100 (Meters)
31. NEAREST PERMANENT WATER TYPE: 2 - River, Creek, Stream
32. DRAINAGE BASIN: 9 - Neuse
33. SITE SIZE: 6 - 5001-10,000 sq. m./5981-11,960 sq. yds.
34. GROUND VISIBILITY: LOW 0 %
35. UNDERWATER VISIBILITY (FEET):
36. SITE CONDITION: 11 - Totally Destroyed
37. PERCENT DESTROYED: 5 - 76% - 100%
38. DESTRUCTION CAUSES: 9 - Other

INVESTIGATIONS
39. COLLECTION MADE: 1 - Yes
40. COLLECTION STRATEGY: 1 - Controlled
41. AREA COVERED IN CONTROLLED COLLECTION: 10000 (SQ. M.)
42. TEST MADE: 1 - Yes
43. TESTING METHODS: 3 - Shovel Test 48 STPs, 2 positive
44. EXCAVATION DATE: 
45. INSTITUTION EXCAVATING: ACC

PREHISTORIC SITE INFORMATION
45. CULTURAL COMPONENT(S):
46. SITE FUNCTION(S):
47. MIDDEN:
48. LITHICS: [ ] 1 Hafted Bifaces/Projectile Pts.  [ ] 6 Primary Debitage
[ ] 2 Bifaces  [ ] 7 Secondary Debitage
[ ] 3 Unifacial Tools  [ ] 8 Tertiary Debitage
[ ] 4 Other Unifacial Tools  [ ] 9 Ground Or Pecked Stone
[ ] 5 Cores  [ ] 10 Shatter
[ ] 99 Other

49. TOOL TYPES AND FREQUENCIES: 

<table>
<thead>
<tr>
<th>#</th>
<th>Tool Type</th>
<th>#</th>
</tr>
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<tr>
<td>31</td>
<td>Ppt. (Triangular)</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Ppt. Frag.(Notched/Stemmed)</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Ppt. Frag. (Triangular)</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Ppt. Frag. Indeterminate</td>
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</tr>
<tr>
<td>35</td>
<td>End Scraper (Type I)</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>End Scraper (Type II)</td>
<td></td>
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<tr>
<td>37</td>
<td>End Scraper (Type III)</td>
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<tr>
<td>38</td>
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</tr>
<tr>
<td>39</td>
<td>Side Scraper (Type II)</td>
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</tr>
<tr>
<td>40</td>
<td>Side Scraper (Type III)</td>
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</tr>
<tr>
<td>41</td>
<td>Pointed Scraper</td>
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<td>Site #: 3IWA2327</td>
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<tr>
<td>------------------</td>
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<tr>
<td>12 - Stanly Stemmed</td>
<td>42 - Oval Scraper</td>
<td></td>
</tr>
<tr>
<td>13 - Morrow Mtn. I Stemmed</td>
<td>43 - Pisgah Triangular</td>
<td></td>
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<tr>
<td>14 - Morrow Mtn. II Stemmed</td>
<td>44 - Haywood Triangular</td>
<td></td>
</tr>
<tr>
<td>15 - Guilford Lanceolate</td>
<td>45 - Garden Creek Triangular</td>
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<tr>
<td>16 - Halifax Side-Notched</td>
<td>46 - Copena Triangular</td>
<td></td>
</tr>
<tr>
<td>17 - Savannah River Stemmed</td>
<td>47 - Connestee Triangular</td>
<td></td>
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<tr>
<td>18 - Sm. Savannah R. Stemmed</td>
<td>48 - Madison</td>
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<tr>
<td>19 - Gypsy Stemmed</td>
<td>49 - South Appalachian Pentagonal</td>
<td></td>
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<tr>
<td>20 - Swannanoa Stemmed</td>
<td>50 - Transylvania Triangular</td>
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</tr>
<tr>
<td>21 - Badin Crude Triangular</td>
<td>51 - Otarre</td>
<td></td>
</tr>
<tr>
<td>22 - Yadkin Large Triangular</td>
<td>52 - Plott</td>
<td></td>
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<tr>
<td>23 - Roanoke Large Triangular</td>
<td>53 - Big Sandy</td>
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</tr>
<tr>
<td>24 - Uwharrie Triangular</td>
<td>54 - MacCorkle</td>
<td></td>
</tr>
<tr>
<td>25 - Caraway Triangular</td>
<td>55 - Bradley Spike</td>
<td></td>
</tr>
<tr>
<td>26 - Clarksville Small Triangular</td>
<td>56 - Swansboro</td>
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<tr>
<td>27 - Pee Dee Pentagonal</td>
<td>57 - Yadkin-Eared</td>
<td></td>
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<tr>
<td>28 - Randolph Stemmed</td>
<td>58 - Piscataway</td>
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<tr>
<td>29 - Ppt. (Notched)</td>
<td>59 - Roanin-Eared</td>
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<td>30 - Ppt. (Stemmed)</td>
<td>60 - Swansboro</td>
<td></td>
</tr>
<tr>
<td>99 - Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

50. OTHER MISCELLANEOUS ITEMS:
- □ 1 Human Bone Or Teeth
- □ 2 Non-Human Bone Or Teeth
- □ 3 Antler
- □ 4 Unworked Marine/River Shell
- □ 5 Worked Marine/River Shell
- □ 6 Turtle Shell
- □ 7 C-14 Sample(s)
- □ 8 Pollen Sample(s)
- □ 9 Phytolith Sample(s)
- □ 10 T-L Sample(S)
- □ 11 Sediment Sample(s)
- □ 12 Wood
- □ 13 Fiber
- □ 14 Fabric
- □ 15 Fire-Cracked Rock
- □ 99 Other

PREHISTORIC CERAMICS:

51. CERAMIC TEMPER:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5
- □ 6
- □ 7
- □ 8
- □ 9
- □ 10

52. SURFACE TREATMENT:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5
- □ 6
- □ 7
- □ 8
- □ 9
- □ 10

53. TYPE NAME:
- □ 1

HISTORIC SITE INFORMATION

54. PERIOD OF OCCUPATION BEGIN: 5 - 20th Century
55. Refined Date From: 1911
56. Historic Affiliation: 0 - Unknown
57. Historic Definition: 1 - Domestic
58. Site Type/Feature: 51 - Home/Residence remains of outbuildings

(Note: If response 58 is #65, Water Vessel, Complete Items 59 – 76, and applicable items from historic artifacts)
**VESSEL INFORMATION**

59. DATA SOURCE:

60. PRIMARY HULL CONSTRUCTION:  
   DETAIL:

61. HULL FASTENINGS:  
   DETAIL:

62. HULL DESIGN/CONSTRUCTION DETAILS:

63. WRECKAGE DIMENSIONS: LENGTH: FEET  WIDTH: FEET  DEPTH: FEET  
   HOW DETERMINED:

64. ESTIMATED ORIGINAL DIMENSIONS: LENGTH: FEET  WIDTH: FEET  DEPTH: FEET  
   HOW DETERMINED:

65. ESTIMATE OF ORIGINAL VESSEL REMAINING:  
   %

66. MEANS OF PROPULSION: PRIMARY:  SECONDARY:  DETAILS:

67. SAIL POWERED:  NUMBER OF MASTS:  OBSERVABLE REMAINS:  
   SAIL CONFIGURATION (IF POSSIBLE TO DETERMINE):  DETAILS:

68. ENGINE POWERED:  MECHANISM:  DETAILS:  
   ENGINE NUMBER:  TYPE:  FUEL:  
   BOILER NUMBER:  TYPE:

69. ALTERNATE MEANS OF POWER (IF ANY):  DETAILS:

70. CAUSE OF LOSS:  DETAILS:

71. COUNTRY OF CONSTRUCTION (IF KNOWN):

72. ARTIFACT CATEGORIES OBSERVED:
   - Cargo
   - Ordnance
   - Ship’s Equipment
   - Personal Effects
   - Other

73. PURPOSE OF CRAFT:  DETAILS:

74. TYPE OF VESSEL:

75. VESSEL DESCRIPTION:

76. VISIT HISTORY (DATE, ORGANIZATION, PURPOSE, RESULTS):

**HISTORIC ARTIFACTS**

77. ACTIVITIES GROUP:  
   - 1 - Construction Tools  
   - 2 - Farm Tools  
   - 3 - Toys  
   - 4 - Fishing Gear  
   - 5 - Colonial-Indian Pottery  
   - 6 - Storage Items  
   - 7 - Ethnobotanical  
   - 8 - Associated With Stable Or Barn  
   - 9 - Other
### AGRICULTURE:

- 1 - Farm Tool
- 2 - Assoc. w/ Stable/Barn
- 3 - Fencing Material
- 9 - Other

### ARCHITECTURAL GROUP:

- 1 - Window Glass
- 4 - Construction Hardware
- 2 - Nails
- 5 - Door Lock Parts
- 3 - Spikes
- 9 - Other drain pipe fragments, siding

### ARMS GROUP:

- 1 - Musket Balls, Shot, Sprue
- 2 - Gun Flints, Gunspalls
- 3 - Gun Parts, Bullet Molds
- 9 - Other

### CLOTHING GROUP:

- 1 - Buckles
- 2 - Thimbles
- 3 - Buttons
- 4 - Scissors
- 5 - Straight Pins
- 6 - Hook & Eye Fasteners
- 7 - Bale Seals
- 8 - Glass Beads
- 9 - Other

### HISTORIC MISCELLANEOUS:

- 1 - Bone Fragment
- 2 - Furniture Hardware
- 3 - Button Manufacturing Blanks
- 4 - Silversmithing Debris
- 9 - Other

### KITCHEN GROUP:

- 1 - Ceramics
- 2 - Wine Bottle
- 3 - Case Bottle
- 4 - Tumbler
- 5 - Pharmaceutical Bottle
- 6 - Glassware
- 7 - Tableware
- 8 - Kitchenware
- 9 - Other bottle glass

### MILITARY OBJECTS:

- 1 - Swords
- 2 - Insignia
- 3 - Bayonets
- 4 - Artillery Shot & Shell
- 9 - Other

### PERSONAL ITEMS:

- 1 - Coins
- 2 - Keys
- 3 - Personal Items
- 9 - Other

### PIPES:

- 1 - Tobacco Pipe
- 2 - Stub-Stemmed Pipes
- 3 - Pipe Stems
- 9 - Other

### TEMPORALLY DIAGNOSTIC ARTIFACTS:

### COMMENTS

88. **OWNER/TENANT INFORMATION:** Property managed by RDU Authority

89. **DIRECTIONS TO SITE:** Site is located on east side of Old Reedy Creek Road ~100 meters north of its intersection with I-40 in Cary, NC

90. **RESEARCH POTENTIAL:** None

91. **EXPLANATION OF RECOMMENDATIONS:** This site is the remains of a 20th century farm complex that has been razed. It is not a unique site type and lacks any architectural integrity.

92. **EXCAVATION RESULTS:**

93. **EXPLANATION OF IMPACTS:**

94. **TESTING RESULTS:** 2 of 48 shovel tests yielded artifacts; others were recovered from the ground surface. Push piles are abundant.

95. **FEATURE DESCRIPTION:** foundation remains

96. **OTHER IMPORTANT ARTIFACT TYPES:**

97. **HISTORIC CERAMIC TYPES:** ironstone, whiteware, stoneware

98. **HISTORIC SITE DESCRIPTION:** Remains of 20th century farmstead
99. COMMENTS:

100. NATIONAL REGISTER STATUS:
101. NATIONAL REGISTER CRITERION:
102. DATE ON NATIONAL REGISTER:
103. TYPE OF FORM:
104. RECORDER STATUS:
105. FORM RELIABILITY:
106. LOCATIONAL RELIABILITY:
107. FORM DATA CHECKED BY: DATE:
### Artifact Catalog

#### Odd Fellows

**Site:** 31WA2327

**Provenience Number:** 1.1  
*Site 1, N500 E485, 0-20 cm*

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<thead>
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<th>Specimen Number</th>
<th>Quantity</th>
<th>Weight (g)</th>
<th>Description</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>m1</td>
<td>3</td>
<td>8.4</td>
<td>Nail Wire (Post 1890)</td>
<td>2 roofing nails</td>
</tr>
<tr>
<td>2</td>
<td>m2</td>
<td>1</td>
<td>5.3</td>
<td>Nail Fragment Wire (Post 1890)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>m3</td>
<td>1</td>
<td>5.5</td>
<td>Nail Cut (1810-1890)</td>
<td></td>
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<tr>
<td>4</td>
<td>m4</td>
<td>1</td>
<td>5.1</td>
<td>Nail Fragment Cut (1810-1890)</td>
<td></td>
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<tr>
<td>5</td>
<td>m5</td>
<td>1</td>
<td>31.3</td>
<td>Metal Bolt Iron</td>
<td>hex bolt</td>
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<tr>
<td>6</td>
<td>m6</td>
<td>2</td>
<td>6.6</td>
<td>Plastic</td>
<td>burned</td>
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<tr>
<td>7</td>
<td>eb7</td>
<td>1</td>
<td>0.1</td>
<td>Charcoal</td>
<td></td>
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<tr>
<td>8</td>
<td>m8</td>
<td>1</td>
<td>0.8</td>
<td>Other Historic</td>
<td>asbestos cement siding</td>
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<tr>
<td>9</td>
<td>m9</td>
<td>3</td>
<td>4.9</td>
<td>Brown Bottle Glass</td>
<td>2 body fragments, 1 base fragment with khurling (post 1940, Lindsey 2020)</td>
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<tr>
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<th>Specimen Number</th>
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<td>10</td>
<td>m10</td>
<td>1</td>
<td>3.7</td>
<td>Green Bottle Glass</td>
<td>1 body fragment</td>
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<tr>
<td>11</td>
<td>m11</td>
<td>1</td>
<td>2.6</td>
<td>Light Green Flat Glass</td>
<td>frosted</td>
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<tr>
<td>12</td>
<td>m12</td>
<td>6</td>
<td>28.1</td>
<td>Clear Bottle Glass</td>
<td>6 body fragments</td>
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**Provenience Number:** 2.1  
*Site 1, N500 E500, 0-10 cm*

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<tr>
<td>1</td>
<td>p13</td>
<td>1</td>
<td>17.7</td>
<td>Undecorated Ironstone Ceramic</td>
<td>base fragment</td>
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<tr>
<td>2</td>
<td>p14</td>
<td>1</td>
<td>1</td>
<td>Undecorated Whiteware Ceramic</td>
<td>body fragment</td>
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<tr>
<td>3</td>
<td>p15</td>
<td>2</td>
<td>48.5</td>
<td>Other Ceramic</td>
<td>terra cotta drainage pipe fragments with possible limestone or shell aggregate</td>
</tr>
<tr>
<td>4</td>
<td>m16</td>
<td>1</td>
<td>3.6</td>
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<td>body fragment</td>
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<tr>
<td>5</td>
<td>m17</td>
<td>1</td>
<td>1.7</td>
<td>Brown Bottle Glass</td>
<td>body fragment</td>
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<tr>
<td>6</td>
<td>m18</td>
<td>1</td>
<td>1.4</td>
<td>Milkglass Tableware</td>
<td>rim fragment</td>
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**Provenience Number:** 3.0  
*Site 1, General Surface*

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<tr>
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<td>p19</td>
<td>1</td>
<td>16.8</td>
<td>Bristol Glazed/Slipped Stoneware Ceramic</td>
<td>body fragment</td>
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1. STATE SITE NUMBER: 31WA2328
2. SITE/VESSEL NAME(S):
3. OTHER SITE NUMBER:
4. INSTITUTION ASSIGNING: ACC, Inc. CODE: 113
5. PROJECT SITE NUMBER: Site 02
6. SITE COMPONENT: 2 - Historic 7. SITE REMAINS: B - Above-ground Remains

SITE LOCATION INFORMATION

8. COUNTY: Wake
9. QUAD MAP: 1993 Cary, NC MAP CODE:
10. BODY OF WATER:
11. COORDINATE SYSTEM: 1 - UTM MAP UNITS: 1 - Meter
12. MAP ZONE: 2 - 17 MAP DATUM: 1 - NAD 83
13. MAP EASTING: 700987 MAP NORTHING: 3968593
14: RECORDED W/ GPS?: 1 - Yes GPS DATA POST-PROCESSED?: 1 - Yes

***ATTACH USGS MAP AND ANY ADDITIONAL SITE MAPS***

15. DATE RECORDED: 8/20/20 RECORDED BY: Bobby Southerlin
17. PROJECT TRACKING NUMBER(S): GS20-0841
18. CODING DATE: CODED BY:
19. CURATION FACILITY:
   1. OSA
   2. 
   3. 
20. ACCESSION NUMBER:
   1. not yet rec'd
   2. 
   3. 
21. ARTIFACT INVENTORY ATTACHED: 2 - No
22. BIBLIOGRAPHIC REFERENCE #S:
23. RECOMMENDATIONS: 1 - No Further Work

ENVIRONMENTAL INFORMATION

24. GEOGRAPHIC SITUATION: 1 - Floodplain 21 - Toe Slope or Ridge Slope
25. ELEVATION/DEPTH: 350 FT. AMSL
26. SLOPE PERCENT: LOW 0 % 8 % SLOPE FACE DIRECTION: 4 - Southeast
27. SOIL/BOTTOM COMPOSITION: 8 - Silty Loam

28. NRCS SOIL TYPE CODE: Nanford silt loam

29. MODERN VEGETATION: 4 - Forested

30. DISTANCE TO WATER/FROM SHORE: 0 (Meters)

31. NEAREST PERMANENT WATER TYPE: 8 - Pond

32. DRAINAGE BASIN: 9 - Neuse

33. SITE SIZE: 8 - 25,001-50,000 sq. m./29,901-59,800 sq. yds.

34. GROUND VISIBILITY: LOW 0 %
35. UNDERWATER VISIBILITY (FEET):
36. SITE CONDITION: 99 - Other
37. PERCENT DESTROYED: 3 - 26% - 50%
38. DESTRUCTION CAUSES:

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<th>INVESTIGATIONS</th>
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<tr>
<td>39. COLLECTION MADE: 2 - No</td>
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<td>40. COLLECTION STRATEGY:</td>
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<td>41. AREA COVERED IN CONTROLLED COLLECTION: 40000 (SQ. M.)</td>
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<tr>
<td>42. TEST MADE: 1 - Yes</td>
</tr>
<tr>
<td>43. TESTING METHODS: 9 - Other shovel tests to expose soil only; site area metal detected</td>
</tr>
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<td>44. EXCAVATION DATE:</td>
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<td>45. INSTITUTION EXCAVATING: ACC</td>
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<tr>
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<td>45. CULTURAL COMPONENT(S):</td>
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<th>46. SITE FUNCTION(S):</th>
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<tr>
<td>47. MIDDEN:</td>
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<tr>
<td>48. LITHICS:</td>
</tr>
<tr>
<td>5 - Unifacial Tools</td>
</tr>
<tr>
<td>6 - Bifaces</td>
</tr>
<tr>
<td>7 - Projectile Pts.</td>
</tr>
<tr>
<td>8 - Ground Or Pecked Stone</td>
</tr>
<tr>
<td>9 - Core</td>
</tr>
<tr>
<td>10 - Shatter</td>
</tr>
<tr>
<td>11 - Other</td>
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<table>
<thead>
<tr>
<th>49. TOOL TYPES AND FREQUENCIES:</th>
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<tbody>
<tr>
<td>1 - Clovis</td>
</tr>
<tr>
<td>2 - Hardaway Blade</td>
</tr>
<tr>
<td>3 - Hardaway-Dalton</td>
</tr>
<tr>
<td>4 - Hardaway Side-Notched</td>
</tr>
<tr>
<td>5 - Palmer Corner Notched</td>
</tr>
<tr>
<td>6 - Kirk Corner-Notched</td>
</tr>
<tr>
<td>7 - St. Albans Side Notched</td>
</tr>
<tr>
<td>8 - LeCroy Bifurcated Stem</td>
</tr>
<tr>
<td>9 - Kanawha Stemmed</td>
</tr>
<tr>
<td>10 - Kirk Serrated</td>
</tr>
<tr>
<td>11 - Kirk Stemmed</td>
</tr>
<tr>
<td>12 - Other</td>
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North Carolina Archaeological Site Form VIII
<table>
<thead>
<tr>
<th>North Carolina Archaeological Site Form VIII</th>
<th>Site #: 3IWA2328</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 - Stanly Stemmed</td>
<td>42 - Oval Scraper</td>
</tr>
<tr>
<td>13 - Morrow Mtn. I Stemmed</td>
<td>43 - Pisgah Triangular</td>
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<td>14 - Morrow Mtn. II Stemmed</td>
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<td>60 - Swansboro</td>
</tr>
<tr>
<td></td>
<td>99 - Other</td>
</tr>
</tbody>
</table>

50. OTHER MISCELLANEOUS ITEMS:

- ✔ 1 Human Bone Or Teeth
- 2 Non-Human Bone Or Teeth
- 3 Antler
- 4 Unworked Marine/River Shell
- 5 Worked Marine/River Shell
- 6 Turtle Shell
- 7 C-14 Sample(s)
- 8 Pollen Sample(s)
- 9 Phytolith Sample(s)
- 10 T-L Sample(S)
- 11 Sediment Sample(s)
- 12 Wood
- 13 Fiber
- 14 Fabric
- 15 Fire-Cracked Rock
- 99 Other

PREHISTORIC CERAMICS:

51. CERAMIC TEMPER: 52. SURFACE TREATMENT: 53. TYPE NAME:

1. 1. 1.
2. 2. 2.
3. 3. 3.
4. 4. 4.
5. 5. 5.
6. 6. 6.
7. 7. 7.
8. 8. 8.
9. 9. 9.
10. 10. 10.

HISTORIC SITE INFORMATION

54. PERIOD OF OCCUPATION BEGIN: 5 - 20th Century PERIOD OF OCCUPATION END: 5 - 20th Century
55. REFINED DATE FROM: 1964 REFINED DATE TO: 2007
56. HISTORIC AFFILIATION: 0 - Unknown
57. HISTORIC DEFINITION: 99 - Other
58. SITE TYPE/FEATURE: 99 - Other remains of scout recreation area

(Note: If response 58 is #65, water vessel, complete items 59 - 76, and applicable items from historic artifacts)
VESSEL INFORMATION

59. DATA SOURCE:

60. PRIMARY HULL CONSTRUCTION: DETAIL:

61. HULL FASTENINGS: DETAIL:

62. HULL DESIGN/CONSTRUCTION DETAILS:

63. WRECKAGE DIMENSIONS: LENGTH: FEET WIDTH: FEET DEPTH: FEET
   HOW DETERMINED:

64. ESTIMATED ORIGINAL DIMENSIONS: LENGTH: FEET WIDTH: FEET DEPTH: FEET
   HOW DETERMINED:

65. ESTIMATE OF ORIGINAL VESSEL REMAINING: %

66. MEANS OF PROPULSION: PRIMARY: SECONDARY: DETAILS:

67. SAIL POWERED: NUMBER OF MASTS: OBSERVABLE REMAINS:
   SAIL CONFIGURATION (IF POSSIBLE TO DETERMINE):
   DETAILS:

68. ENGINE POWERED: MECHANISM: DETAILS:
   ENGINE NUMBER: TYPE: FUEL:
   BOILER NUMBER: TYPE:

69. ALTERNATE MEANS OF POWER (IF ANY): DETAILS:

70. CAUSE OF LOSS: DETAILS:

71. COUNTRY OF CONSTRUCTION (IF KNOWN):

72. ARTIFACT CATEGORIES OBSERVED: 
   □ Cargo
   □ Ordnance
   □ Ship’s Equipment
   □ Personal Effects
   □ Other

73. PURPOSE OF CRAFT: DETAILS:

74. TYPE OF VESSEL:

75. VESSEL DESCRIPTION:

76. VISIT HISTORY (DATE, ORGANIZATION, PURPOSE, RESULTS):

HISTORIC ARTIFACTS

77. ACTIVITIES GROUP: 
   □ 1 - Construction Tools
   □ 2 - Farm Tools
   □ 3 - Toys
   □ 4 - Fishing Gear
   □ 5 - Colonial-Indian Pottery
   □ 6 - Storage Items
   □ 7 - Ethnobotanical
   □ 8 - Associated With Stable Or Barn
   □ 9 - Other

North Carolina Archaeological Site Form VIII
78. AGRICULTURE:  
- 1 - Farm Tool  
- 2 - Assoc. w/ Stable/Barn  
- 3 - Fencing Material  
- 9 - Other

79. ARCHITECTURAL GROUP:  
- 1 - Window Glass  
- 2 - Nails  
- 3 - Spikes  
- 4 - Construction Hardware  
- 5 - Door Lock Parts  
- 9 - Other

80. ARMS GROUP:  
- 1 - Musket Balls, Shot, Sprue  
- 2 - Gun Flints, Gunspalls  
- 3 - Gun Parts, Bullet Molds  
- 9 - Other

81. CLOTHING GROUP:  
- 1 - Buckles  
- 2 - Thimbles  
- 3 - Buttons  
- 4 - Scissors  
- 5 - Straight Pins  
- 6 - Hook & Eye Fasteners  
- 7 - Bale Seals  
- 8 - Glass Beads  
- 9 - Other

82. HISTORIC MISCELLANEOUS:  
- 1 - Bone Fragment  
- 2 - Furniture Hardware  
- 3 - Button Manufacturing Blanks  
- 4 - Silversmithing Debris  
- 9 - Other

83. KITCHEN GROUP:  
- 1 - Ceramics  
- 2 - Wine Bottle  
- 3 - Case Bottle  
- 4 - Tumbler  
- 5 - Pharmaceutical Bottle  
- 6 - Glassware  
- 7 - Tableware  
- 8 - Kitchenware  
- 9 - Other

84. MILITARY OBJECTS:  
- 1 - Swords  
- 2 - Insignia  
- 3 - Bayonets  
- 4 - Artillery Shot & Shell  
- 9 - Other

85. PERSONAL ITEMS:  
- 1 - Coins  
- 2 - Keys  
- 3 - Personal Items  
- 9 - Other

86. PIPES:  
- 1 - Tobacco Pipe  
- 2 - Stub-Stemmed Pipes  
- 3 - Pipe Stems  
- 9 - Other

87. TEMPORALLY DIAGNOSTIC ARTIFACTS:

88. OWNER/TENANT INFORMATION: Property managed by RDU Authority

89. DIRECTIONS TO SITE: Site is located at end of unpaved road extending east from Old Reedy Creek Road, includes a pond

90. RESEARCH POTENTIAL: None

91. EXPLANATION OF RECOMMENDATIONS: This site is the remains of a modern day Boy Scout recreation area. It has not been recently maintained and is largely overgrown.

92. EXCAVATION RESULTS:

93. EXPLANATION OF IMPACTS:

94. TESTING RESULTS: Metal detecting identified nails, UID metal, and modern debris - none of which was collected.

95. FEATURE DESCRIPTION: pond, picnic area, grills, fire pit

96. OTHER IMPORTANT ARTIFACT TYPES:

97. HISTORIC CERAMIC TYPES:

98. HISTORIC SITE DESCRIPTION: Remains of mid to late 20th century recreation area

99. COMMENTS: This recreation area was developed when the Odd Fellows owned they property. They allowed the Boy...
Scouts to use the property

100 – 107: OFFICE OF STATE ARCHAEOLOGY USE ONLY

100. NATIONAL REGISTER STATUS:
101. NATIONAL REGISTER CRITERION:
102. DATE ON NATIONAL REGISTER:
103. TYPE OF FORM:
104. RECORDER STATUS:
105. FORM RELIABILITY:
106. LOCATIONAL RELIABILITY:
107. FORM DATA CHECKED BY: DATE:
1. STATE SITE NUMBER: 31WA2329
2. SITE/VESSEL NAME(S):
3. OTHER SITE NUMBER:
4. INSTITUTION ASSIGNING: ACC, Inc.  CODE: 113
5. PROJECT SITE NUMBER: Site 03
6. SITE COMPONENT: 2 - Historic  7. SITE REMAINS: A - No Above-ground Remains

**SITE LOCATION INFORMATION**

8. COUNTY: Wake
9. QUAD MAP: 1993 Cary, NC  MAP CODE:
10. BODY OF WATER:
11. COORDINATE SYSTEM: 1 - UTM  MAP UNITS: 1 - Meter
12. MAP ZONE: 2 - 17  MAP DATUM: 1 - NAD 83
13. MAP EASTING: 701216  MAP NORTING: 3968811
14. RECORDED W/ GPS?: 1 - Yes  GPS DATA POST-PROCESSED?: 1 - Yes

***ATTACH USGS MAP AND ANY ADDITIONAL SITE MAPS***

15. DATE RECORDED: 8/20/20  RECORDED BY: Bobby Southerlin
17. PROJECT TRACKING NUMBER(S): GS20-0841
18. CODING DATE:  CODED BY:
19. CURATION FACILITY:
   1. OSA
   2. 
   3. 
20. ACCESSION NUMBER:
   1. not yet rec'd
   2. 
   3. 
21. ARTIFACT INVENTORY ATTACHED: 1 - Yes
22. BIBLIOGRAPHIC REFERENCE #S:
23. RECOMMENDATIONS: 1 - No Further Work

**ENVIRONMENTAL INFORMATION**

24. GEOGRAPHIC SITUATION: 10 - Upland or Talus Slope
25. ELEVATION/DEPTH: 350 FT. AMSL
26. SLOPE PERCENT: LOW 0 %  HIGH 10 %  SLOPE FACE DIRECTION: 4 - Southeast
27. SOIL/BOTTOM COMPOSITION: 8 - Silty Loam
28. NRCS SOIL TYPE CODE: Nanford silt loam
29. MODERN VEGETATION: 4 - Forested
30. DISTANCE TO WATER/FROM SHORE: 120 (Meters)
31. NEAREST PERMANENT WATER TYPE: 2 - River, Creek, Stream
32. DRAINAGE BASIN: 9 - Neuse
33. SITE SIZE: 5 - 601-5000 sq. m./719-5980 sq. yds.
34. GROUND VISIBILITY: LOW 0 %
35. UNDERWATER VISIBILITY (FEET):
36. SITE CONDITION: 11 - Totally Destroyed
37. PERCENT DESTROYED: 5 - 76% - 100%
38. DESTRUCTION CAUSES: 3 - Land Clearing 6 - Erosion

### INVESTIGATIONS

39. COLLECTION MADE: 1 - Yes
40. COLLECTION STRATEGY: 1 - Controlled
41. AREA COVERED IN CONTROLLED COLLECTION: 4000 (SQ. M.)
42. TEST MADE: 1 - Yes
43. TESTING METHODS: 3 - Shovel Test 9 - Other metal detection conducted across both loci
44. EXCAVATION DATE:

45. INSTITUTION EXCAVATING: ACC

### PREHISTORIC SITE INFORMATION

45. CULTURAL COMPONENT(S):

46. SITE FUNCTION(S):

47. MIDDLE:

48. LITHICS:

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<tr>
<td>1</td>
<td>Hafted Bifaces/Projectile Pts.</td>
<td>1</td>
<td>6</td>
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<tr>
<td>2</td>
<td>Bifaces</td>
<td>2</td>
<td>7</td>
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<tr>
<td>3</td>
<td>Unifacial Tools</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Other Unifacial Tools</td>
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<td>5</td>
<td>Cores</td>
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<td>6</td>
<td>Primary Debitage</td>
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<td>11</td>
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<tr>
<td>7</td>
<td>Secondary Debitage</td>
<td>7</td>
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<tr>
<td>8</td>
<td>Tertiary Debitage</td>
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<tr>
<td>9</td>
<td>Ground Or Pecked Stone</td>
<td>9</td>
<td>14</td>
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<tr>
<td>10</td>
<td>Shatter</td>
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49. TOOL TYPES AND FREQUENCIES:

<table>
<thead>
<tr>
<th>Tool Type</th>
<th>Count</th>
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<th>Count</th>
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<tbody>
<tr>
<td>1 - Clovis</td>
<td>31</td>
<td>Ppt. (Triangular)</td>
<td>31</td>
</tr>
<tr>
<td>2 - Hardaway Blade</td>
<td>32</td>
<td>Ppt. Frag.(Notched/Stemmed)</td>
<td>32</td>
</tr>
<tr>
<td>3 - Hardaway-Dalton</td>
<td>33</td>
<td>Ppt. Frag. (Triangular)</td>
<td>33</td>
</tr>
<tr>
<td>4 - Hardaway Side-Notched</td>
<td>34</td>
<td>Ppt. Frag. Indeterminate</td>
<td>34</td>
</tr>
<tr>
<td>5 - Palmer Corner Notched</td>
<td>35</td>
<td>End Scraper (Type I)</td>
<td>35</td>
</tr>
<tr>
<td>6 - Kirk Corner-Notched</td>
<td>36</td>
<td>End Scraper (Type II)</td>
<td>36</td>
</tr>
<tr>
<td>7 - St. Albans Side Notched</td>
<td>37</td>
<td>End Scraper (Type III)</td>
<td>37</td>
</tr>
<tr>
<td>8 - LeCroy Bifurcated Stem</td>
<td>38</td>
<td>Side Scraper (Type I)</td>
<td>38</td>
</tr>
<tr>
<td>9 - Kanawha Stemmed</td>
<td>39</td>
<td>Side Scraper (Type II)</td>
<td>39</td>
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<tr>
<td>10 - Kirk Serrated</td>
<td>40</td>
<td>Side Scraper (Type III)</td>
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<tr>
<td>11 - Kirk Stemmed</td>
<td>41 - Pointed Scraper</td>
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<td>12 - Stanly Stemmed</td>
<td>42 - Oval Scraper</td>
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50. OTHER MISCELLANEOUS ITEMS:

1. Human Bone Or Teeth
2. Non-Human Bone Or Teeth
3. Antler
4. Unworked Marine/River Shell
5. Worked Marine/River Shell
6. Turtle Shell
7. C-14 Sample(s)
8. Pollen Sample(s)
9. Phytolith Sample(s)
10. T-L Sample(s)
11. Sediment Sample(s)
12. Wood
13. Fiber
14. Fabric
15. Fire-Cracked Rock
99. Other

51. CERAMIC TEMPER:

52. SURFACE TREATMENT:

53. TYPE NAME:

54. PERIOD OF OCCUPATION BEGIN: 5 - 20th Century
55. Refined Date From: 1958
56. HISTORIC AFFILIATION:
57. HISTORIC DEFINITION:
58. SITE TYPE/FEATURE: 63 - Saw Mill/Lumber Yard remains of temporary logging operation

59. HISTORIC SITE INFORMATION

North Carolina Archaeological Site Form VIII
VEssel information

59. DATA SOURCE:

60. PRIMARY HULL CONSTRUCTION:/detail:

61. HULL FASTENINGS:/detail:

62. HULL DESIGN/CONSTRUCTION DETAILS:

63. WRECKAGE DIMENSIONS: LENGTH: FEET WIDTH: FEET DEPTH: FEET
HOW DETERMINED:

64. ESTIMATED ORIGINAL DIMENSIONS: LENGTH: FEET WIDTH: FEET DEPTH: FEET
HOW DETERMINED:

65. ESTIMATE OF ORIGINAL VESSEL REMAINING: %

66. MEANS OF PROPULSION: PRIMARY: SECONDARY: DETAILS:

67. SAILPOWERED: NUMBER OF MASTS: OBSERVABLE REMAINS:
SAIL CONFIGURATION (IF POSSIBLE TO DETERMINE):
DETAILS:

68. ENGINEPOWERED: MECHANISM: DETAILS:
ENGINE NUMBER: TYPE:
BOILER NUMBER: TYPE:

69. ALTERNATE MEANS OF POWER (IF ANY): DETAILS:

70. CAUSE OF LOSS: DETAILS:

71. COUNTRY OF CONSTRUCTION (IF KNOWN):

72. ARTIFACT CATEGORIES OBSERVED: Cargo
Ordnance
Ship’s Equipment
Personal Effects
Other

73. PURPOSE OF CRAFT: DETAILS:

74. TYPE OF VESSEL:

75. VESSEL DESCRIPTION:

76. VISIT HISTORY (DATE, ORGANIZATION, PURPOSE, RESULTS):

HISTORIC ARTIFACTS

77. ACTIVITIES GROUP:

1 - Construction Tools
2 - Farm Tools
3 - Toys
6 - Storage Items
7 - Ethnobotanical
8 - Associated With Stable Or Barn

(NOTE: IF RESPONSE 58 IS #65, WATER VESSEL, COMPLETE ITEMS 59 – 76,
AND APPLICABLE ITEMS FROM HISTORIC ARTIFACTS)
88. OWNER/TENANT INFORMATION: Property managed by RDU Authority

89. DIRECTIONS TO SITE: Site is located at the head of a drainage extending off of Crabtree Creek, approximately 0.5 km east of Old Reedy Creek Road and 0.4 km north of I-40

90. RESEARCH POTENTIAL: None

91. EXPLANATION OF RECOMMENDATIONS: This site is the remains of a temporary logging operation; artifacts associated with portable logging machinery were recovered and pits indicating the placement of the portable saw were identified.

92. EXCAVATION RESULTS: 2 shovel tests were excavated to expose soil profiles; entire site area and a 10-m buffer was metal detected. Items associated with logging machinery were recovered.

93. EXPLANATION OF IMPACTS:

94. TESTING RESULTS: Metal detecting identified nails, UID metal, a hoe, bolt and cotter pin, a saw tooth, and chain links, as well as modern debris

95. FEATURE DESCRIPTION: 2 pits
96. OTHER IMPORTANT ARTIFACT TYPES:

97. HISTORIC CERAMIC TYPES:

98. HISTORIC SITE DESCRIPTION: Remains of mid to late 20th century temporary logging operation

99. COMMENTS:

100 – 107: OFFICE OF STATE ARCHAEOLOGY USE ONLY

100. NATIONAL REGISTER STATUS:

101. NATIONAL REGISTER CRITERION:

102. DATE ON NATIONAL REGISTER:

103. TYPE OF FORM:

104. RECORDER STATUS:

105. FORM RELIABILITY:

106. LOCATIONAL RELIABILITY:

107. FORM DATA CHECKED BY: DATE:
Artifact Catalog
Odd Fellows

### Site: 31WA2329

<table>
<thead>
<tr>
<th>Provenience Number</th>
<th>Site</th>
<th>Description</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1.1</td>
<td>Site 2, MD 21</td>
<td>Nail Wire (Post 1890)</td>
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<tr>
<td>2.1</td>
<td>Site 2, MD 22</td>
<td>Nail Wire (Post 1890)</td>
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<td>3.1</td>
<td>Site 2, MD 16</td>
<td>Nail Wire (Post 1890)</td>
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<td>4.1</td>
<td>Site 2, MD 15</td>
<td>Metal Hoe Iron</td>
<td>small hoe, blade is 5&quot; wide</td>
</tr>
<tr>
<td>5.1</td>
<td>Site 2, MD 14</td>
<td>Metal Unidentified Form Copper Alloy</td>
<td>possible hardware, slightly concave fragment</td>
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<td>6.1</td>
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<td>Nail Wire (Post 1890)</td>
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<td>7.1</td>
<td>Site 2, MD 25</td>
<td>Utensil Iron</td>
<td>spoon bowl fragment, likely stainless steel (post 1921, Magid 2010)</td>
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<td>8.1</td>
<td>Site 2, MD 17</td>
<td>Metal Hardware Iron</td>
<td>insertable saw tooth for circular saw</td>
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<td>9.1</td>
<td>Site 2, MD 7</td>
<td>Nail Wire (Post 1890)</td>
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<tr>
<td>10.0</td>
<td>Site 2, surface</td>
<td>Clear Bottle Glass</td>
<td>Pepsi bottle, wave style, ACL with single dot, base embossed with &quot;1478/16 A/enircled B/S 57/T?EMPO?ROL?: manufactured b/t 1951 and 1957, likely 1957 according to date code (Stoddard)</td>
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<td>11.1</td>
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## Artifact Catalog
### Odd Fellows

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<th>Comments</th>
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</tr>
<tr>
<td>13.1</td>
<td>Site 2, MD 24</td>
<td>Nail Wire (Post 1890)</td>
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</tr>
<tr>
<td>14.1</td>
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<td>Metal Other Iron</td>
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<td>16.1</td>
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<td>Metal Hardware Iron</td>
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</tr>
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<td>23.1</td>
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<td>Metal Unidentified Form Iron</td>
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### Table

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<tr>
<td>1 m11</td>
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<td>15.3</td>
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<td>15.6</td>
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<td>1 m23</td>
<td>1.5</td>
<td>Nail Wire (Post 1890)</td>
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### Notes
- Metal Other Iron: Metal can fragments
- Metal Unidentified Form Iron: Likely metal can fragment
- Metal Hardware Iron: Hair pin cotter with remnants of red paint, possibly used with hitch
- Bend close type chain link
- Wire like
# Artifact Catalog

## Odd Fellows

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<tr>
<th>Provenience Number</th>
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<th>Catalog Number</th>
<th>Specimen Number</th>
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<th>Weight (g)</th>
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<td>1</td>
<td>m24</td>
<td>1</td>
<td>63.6</td>
<td>Metal Hardware Iron</td>
<td>round stock bent in &quot;C&quot; shape, possible fragment of bolt or square U-</td>
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<td>Metal Hardware Iron</td>
<td>square bolt head, body broken off</td>
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<td>possible label holder for machine or drawer</td>
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<td>m27</td>
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<td>2, MD 20</td>
<td>1</td>
<td>m28</td>
<td>2</td>
<td>11.9</td>
<td>Metal Other Iron</td>
<td>can fragments</td>
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<td></td>
<td></td>
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<td>1</td>
<td>m29</td>
<td>1</td>
<td>64.4</td>
<td>Metal Hardware Iron</td>
<td>chain link for sawdust drag chain</td>
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1. STATE SITE NUMBER: 31WA2330
2. SITE/VESSEL NAME(S):
3. OTHER SITE NUMBER:
4. INSTITUTION ASSIGNING: ACC, Inc.  CODE: 113
5. PROJECT SITE NUMBER: Site 04
6. SITE COMPONENT: 1 - Prehistoric
7. SITE REMAINS: A - No Above-ground Remains

SITE LOCATION INFORMATION

8. COUNTY: Wake
9. QUAD MAP: 1993 Cary, NC  MAP CODE:
10. BODY OF WATER:
11. COORDINATE SYSTEM: 1 - UTM  MAP UNITS: 1 - Meter
12. MAP ZONE: 2 - 17  MAP DATUM: 1 - NAD 83
13. MAP EASTING: 701064  MAP NORTING: 3968323
14. RECORDED W/ GPS?: 1 - Yes  GPS DATA POST-PROCESSED?: 1 - Yes

***ATTACH USGS MAP AND ANY ADDITIONAL SITE MAPS***

15. DATE RECORDED: 8/20/20  RECORDED BY: Bobby Southerlin
17. PROJECT TRACKING NUMBER(S): GS20-0841
18. CODING DATE:
19. CURATION FACILITY: 20. ACCESSION NUMBER:  ORDER:
1. OSA 1. not yet rec'd 1.
2.
3.

21. ARTIFACT INVENTORY ATTACHED: 1 - Yes
22. BIBLIOGRAPHIC REFERENCE #'S:
23. RECOMMENDATIONS: 1 - No Further Work

ENVIRONMENTAL INFORMATION

24. GEOGRAPHIC SITUATION: 1 - Floodplain
25. ELEVATION/DEPTH: 330 FT. AMSL
26. SLOPE PERCENT: LOW 0 %  HIGH 10 %  SLOPE FACE DIRECTION: 5 - South
Site #: 31WA2330

27. SOIL/BOTTOM COMPOSITION: 5 - Sandy Loam
28. NRCS SOIL TYPE CODE: Chewacla and Wedhakee
29. MODERN VEGETATION: 4 - Forested
30. DISTANCE TO WATER/FROM SHORE: 10 (Meters)
31. NEAREST PERMANENT WATER TYPE: 2 - River, Creek, Stream
32. DRAINAGE BASIN: 9 - Neuse
33. SITE SIZE 4 - 101-600 sq. m./121-718 sq. yds.
34. GROUND VISIBILITY: LOW 0 %
35. UNDERWATER VISIBILITY (FEET):
36. SITE CONDITION: 11 - Totally Destroyed
37. PERCENT DESTROYED: 5 - 76% - 100%
38. DESTRUCTION CAUSES: 6 - Erosion

INVESTIGATIONS

39. COLLECTION MADE: 1 - Yes
40. COLLECTION STRATEGY: 1 - Controlled
41. AREA COVERED IN CONTROLLED COLLECTION: 1000 (SQ. M.)
42. TEST MADE: 1 - Yes
43. TESTING METHODS: 3 - Shovel Test
44. EXCAVATION DATE: 45. INSTITUTION EXCAVATING: ACC

PREHISTORIC SITE INFORMATION

45. CULTURAL COMPONENT(S): Lithic
46. SITE FUNCTION(S): 1 - Limited Activity
47. MIDDEN:
48. LITHICS: 1 Hafted Bifaces/Projectile Pts.  6 Primary Debitage
          2 Bifaces                7 Secondary Debitage
          3 Unifacial Tools        8 Tertiary Debitage
          4 Other Unifacial Tools  9 Ground Or Pecked Stone
          5 Cores                  10 Shatter
                                 99 Other

49. TOOL TYPES AND FREQUENCIES:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tr>
<td>#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Clovis</td>
<td>31</td>
</tr>
<tr>
<td>2</td>
<td>Hardaway Blade</td>
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<tr>
<td>3</td>
<td>Hardaway-Dalton</td>
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<tr>
<td>4</td>
<td>Hardaway Side-Notched</td>
<td>34</td>
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<tr>
<td>5</td>
<td>Palmer Corner Notched</td>
<td>35</td>
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<tr>
<td>6</td>
<td>Kirk Corner-Notched</td>
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</tr>
<tr>
<td>7</td>
<td>St. Albans Side Notched</td>
<td>37</td>
</tr>
<tr>
<td>8</td>
<td>LeCroy Bifurcated Stem</td>
<td>38</td>
</tr>
<tr>
<td>9</td>
<td>Kanawha Stemmed</td>
<td>39</td>
</tr>
<tr>
<td>10</td>
<td>Kirk Serrated</td>
<td>40</td>
</tr>
<tr>
<td>11</td>
<td>Kirk Stemmed</td>
<td>41</td>
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North Carolina Archaeological Site Form VIII
### Prehistoric Ceramics

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<th>4</th>
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<th>7</th>
<th>8</th>
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<th>10</th>
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<tbody>
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<td>51. Ceramic Temper:</td>
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<td>2.</td>
<td>3.</td>
<td>4.</td>
<td>5.</td>
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<td>9.</td>
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<tr>
<td>52. Surface Treatment:</td>
<td>1.</td>
<td>2.</td>
<td>3.</td>
<td>4.</td>
<td>5.</td>
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<tr>
<td>53. Type Name:</td>
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<td>6.</td>
<td>7.</td>
<td>8.</td>
<td>9.</td>
</tr>
</tbody>
</table>

### Historic Site Information

54. Period of Occupation Begin: 
55. Refined Date From: 
56. Historic Affiliation: 
57. Historic Definition: 
58. Site Type/Feature:

*(Note: If response 58 is #65, Water Vessel, Complete Items 59 – 76, and applicable items from Historic Artifacts)*
VESSEL INFORMATION

59. DATA SOURCE:

60. PRIMARY HULL CONSTRUCTION: DETAIL:

61. HULL FASTENINGS: DETAIL:

62. HULL DESIGN/CONSTRUCTION DETAILS:

63. WRECKAGE DIMENSIONS: LENGTH: FEET WIDTH: FEET DEPTH: FEET HOW DETERMINED:

64. ESTIMATED ORIGINAL DIMENSIONS: LENGTH: FEET WIDTH: FEET DEPTH: FEET HOW DETERMINED:

65. ESTIMATE OF ORIGINAL VESSEL REMAINING: %

66. MEANS OF PROPULSION: PRIMARY: SECONDARY: DETAILS:

67. SAIL POWERED: NUMBER OF MASTS: OBSERVABLE REMAINS: SAIL CONFIGURATION (IF POSSIBLE TO DETERMINE): DETAILS:

68. ENGINE POWERED: MECHANISM: DETAILS:
   ENGINE NUMBER: TYPE: FUEL:
   BOILER NUMBER: TYPE:

69. ALTERNATE MEANS OF POWER (IF ANY): DETAILS:

70. CAUSE OF LOSS: DETAILS:

71. COUNTRY OF CONSTRUCTION (IF KNOWN):

72. ARTIFACT CATEGORIES OBSERVED: Cargo
    Ordnance
    Ship’s Equipment
    Personal Effects
    Other

73. PURPOSE OF CRAFT: DETAILS:

74. TYPE OF VESSEL:

75. VESSEL DESCRIPTION:

76. VISIT HISTORY (DATE, ORGANIZATION, PURPOSE, RESULTS):

HISTORIC ARTIFACTS

77. ACTIVITIES GROUP: 1 - Construction Tools 6 - Storage Items
   2 - Farm Tools 7 - Ethnobotanical
   3 - Toys 8 - Associated With Stable Or Barn
   4 - Fishing Gear 9 - Other
   5 - Colonial-Indian Pottery

North Carolina Archaeological Site Form VIII
78. AGRICULTURE:  
- 1 - Farm Tool
- 2 - Assoc. w/ Stable/Barn
- 3 - Fencing Material
- 9 - Other

79. ARCHITECTURAL GROUP:  
- 1 - Window Glass
- 2 - Nails
- 3 - Spikes
- 4 - Construction Hardware
- 5 - Door Lock Parts
- 9 - Other

80. ARMS GROUP:  
- 1 - Musket Balls, Shot, Sprue
- 2 - Gun Flints, Gunspalls
- 3 - Gun Parts, Bullet Molds
- 9 - Other

81. CLOTHING GROUP:  
- 1 - Buckles
- 2 - Thimbles
- 3 - Buttons
- 4 - Scissors
- 5 - Straight Pins
- 6 - Hook & Eye Fasteners
- 7 - Bale Seals
- 8 - Glass Beads
- 9 - Other

82. HISTORIC MISCELLANEOUS:  
- 1 - Bone Fragment
- 2 - Furniture Hardware
- 3 - Button Manufacturing Blanks
- 4 - Silversmithing Debris
- 9 - Other

83. KITCHEN GROUP:  
- 1 - Ceramics
- 2 - Wine Bottle
- 3 - Case Bottle
- 4 - Tumbler
- 5 - Pharmaceutical Bottle
- 6 - Glassware
- 7 - Tableware
- 8 - Kitchenware
- 9 - Other

84. MILITARY OBJECTS:  
- 1 - Swords
- 2 - Insignia
- 3 - Bayonets
- 4 - Artillery Shot & Shell
- 9 - Other

85. PERSONAL ITEMS:  
- 1 - Coins
- 2 - Keys
- 3 - Personal Items
- 9 - Other

86. PIPES:  
- 1 - Tobacco Pipe
- 2 - Stub-Stemmed Pipes
- 3 - Pipe Stems
- 9 - Other

87. TEMPORALLY DIAGNOSTIC ARTIFACTS:

88. OWNER/TENANT INFORMATION: Property managed by RDU Authority

89. DIRECTIONS TO SITE: Site is located in the floodplain of Cradtree Creek, 0.8 km east of Old Reedy Creek Road

90. RESEARCH POTENTIAL: None

91. EXPLANATION OF RECOMMENDATIONS: This site is a light scatter of non-diagnostic quartz debitage along a bike trail.

92. EXCAVATION RESULTS: 7 shovel tests were excavated but all artifacts recovered from ground surface.

93. EXPLANATION OF IMPACTS:

94. TESTING RESULTS:

95. FEATURE DESCRIPTION:

96. OTHER IMPORTANT ARTIFACT TYPES:

97. HISTORIC CERAMIC TYPES:

98. HISTORIC SITE DESCRIPTION:

99. COMMENTS:
100. NATIONAL REGISTER STATUS:
101. NATIONAL REGISTER CRITERION:
102. DATE ON NATIONAL REGISTER:
103. TYPE OF FORM:
104. RECORDER STATUS:
105. FORM RELIABILITY:
106. LOCATIONAL RELIABILITY:
107. FORM DATA CHECKED BY: DATE:
Artifact Catalog  
Odd Fellows  

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<thead>
<tr>
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<th>1.0</th>
<th>Site 4, N500 E500, surface</th>
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<td>Specimen Number ml</td>
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</tr>
<tr>
<td>Quantity 8</td>
<td></td>
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</tr>
<tr>
<td>Weight (g) 39.2</td>
<td></td>
<td>Description Quartz Flake/Flake Fragment</td>
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1. STATE SITE NUMBER: 31WA2331
2. SITE/VESSEL NAME(S):
3. OTHER SITE NUMBER:
4. INSTITUTION ASSIGNING: ACC, Inc. CODE: 113
5. PROJECT SITE NUMBER: Site 05
6. SITE COMPONENT: 1 - Prehistoric
7. SITE REMAINS: A - No Above-ground Remains

---

**SITE LOCATION INFORMATION**

8. COUNTY: Wake
9. QUAD MAP: 1993 Cary, NC MAP CODE:
10. BODY OF WATER:
11. COORDINATE SYSTEM: 1 - UTM MAP UNITS: 1 - Meter
12. MAP ZONE: 2 - 17 MAP DATUM: 1 - NAD 83
13. MAP EASTING: 701709 MAP NORTING: 3968526
14. RECORDED W/ GPS?: 1 - Yes GPS DATA POST-PROCESSED?: 1 - Yes

***ATTACH USGS MAP AND ANY ADDITIONAL SITE MAPS***

15. DATE RECORDED: 8/20/20 RECORDED BY: Bobby Southerlin
17. PROJECT TRACKING NUMBER(S): GS20-0841
18. CODING DATE: CODED BY:

19. CURATION FACILITY: 20. ACCESSION NUMBER: ORDER:
1. OSA 1. not yet rec'd 1.
2. 2. 2.
3. 3. 3.

21. ARTIFACT INVENTORY ATTACHED: 1 - Yes
22. BIBLIOGRAPHIC REFERENCE #'S:
23. RECOMMENDATIONS: 1 - No Further Work

---

**ENVIRONMENTAL INFORMATION**

24. GEOGRAPHIC SITUATION: 1 - Floodplain
25. ELEVATION/DEPTH: 350 FT. AMSL
26. SLOPE PERCENT: LOW 0 % HIGH 10 % SLOPE FACE DIRECTION: 5 - South
27. SOIL/BOTTOM COMPOSITION: 8 - Silty Loam
28. NRCS SOIL TYPE CODE: Nanford
29. MODERN VEGETATION: 4 - Forested
30. DISTANCE TO WATER/FROM SHORE: 10 (Meters)
31. NEAREST PERMANENT WATER TYPE: 2 - River, Creek, Stream
32. DRAINAGE BASIN: 9 - Neuse
33. SITE SIZE: 6 - 5001-10,000 sq. m./5981-11,960 sq. yds.
34. GROUND VISIBILITY: LOW 0 %
35. UNDERWATER VISIBILITY (FEET):
36. SITE CONDITION: 11 - Totally Destroyed
37. PERCENT DESTROYED: 5 - 76% - 100%
38. DESTRUCTION CAUSES: 6 - Erosion
39. COLLECTION MADE: 1 - Yes
40. COLLECTION STRATEGY: 1 - Controlled
41. AREA COVERED IN CONTROLLED COLLECTION: 7000 (SQ. M.)
42. TEST MADE: 1 - Yes
43. TESTING METHODS: 3 - Shovel Test
44. EXCAVATION DATE: 
45. INSTITUTION EXCAVATING: ACC
46. SITE FUNCTION(S): 1 - Limited Activity
47. MIDDEN:
48. LITHICS:

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<th>Hafted Bifaces/Projectile Pts.</th>
<th>Bifaces</th>
<th>Unifacial Tools</th>
<th>Other Unifacial Tools</th>
<th>Cores</th>
<th>Primary Debitage</th>
<th>Secondary Debitage</th>
<th>Tertiary Debitage</th>
<th>Ground Or Pecked Stone</th>
<th>Shatter</th>
<th>Other</th>
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49. TOOL TYPES AND FREQUENCIES:

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<tr>
<th>#</th>
<th>1 - Clovis</th>
<th>2 - Ppt. (Triangular)</th>
<th>32 - Ppt. Frag. (Notched/Stemmed)</th>
<th>33 - Ppt. Frag. (Triangular)</th>
<th>34 - Ppt. Frag. Indeterminate</th>
<th>35 - End Scraper (Type I)</th>
<th>36 - End Scraper (Type II)</th>
<th>37 - End Scraper (Type III)</th>
<th>38 - Side Scraper (Type I)</th>
<th>39 - Side Scraper (Type II)</th>
<th>40 - Side Scraper (Type III)</th>
<th>41 - Pointed Scraper</th>
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### NORTH CAROLINA ARCHAEOLOGICAL SITE FORM VIII

#### Site #: 3IWA2331

<table>
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<th>Site #</th>
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<td>- Stanly Stemmed</td>
<td>12 - Stanly Stemmed</td>
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<tr>
<td>14</td>
<td>- Morrow Mtn. II Stemmed</td>
<td>14 - Morrow Mtn. II Stemmed</td>
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<tr>
<td>15</td>
<td>- Guilford Lanceolate</td>
<td>15 - Guilford Lanceolate</td>
</tr>
<tr>
<td>16</td>
<td>- Halifax Side-Notched</td>
<td>16 - Halifax Side-Notched</td>
</tr>
<tr>
<td>17</td>
<td>- Savannah River Stemmed</td>
<td>17 - Savannah River Stemmed</td>
</tr>
<tr>
<td>18</td>
<td>- Sm. Savannah R. Stemmed</td>
<td>18 - Sm. Savannah R. Stemmed</td>
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<td>19</td>
<td>- Gypsy Stemmed</td>
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<td>- Swannanoa Stemmed</td>
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<tr>
<td>21</td>
<td>- Badin Crude Triangular</td>
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<td>22</td>
<td>- Yadkin Large Triangular</td>
<td>22 - Yadkin Large Triangular</td>
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<td>- Roanoke Large Triangular</td>
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<td>24</td>
<td>- Uwharrie Triangular</td>
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<td>- Caraway Triangular</td>
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<td>26</td>
<td>- Clarksville Small Triangular</td>
<td>26 - Clarksville Small Triangular</td>
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<td>27</td>
<td>- Pee Dee Pentagonal</td>
<td>27 - Pee Dee Pentagonal</td>
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<td>28</td>
<td>- Randolph Stemmed</td>
<td>28 - Randolph Stemmed</td>
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<td>29</td>
<td>- Ppt. (Notched)</td>
<td>29 - Ppt. (Notched)</td>
</tr>
<tr>
<td>30</td>
<td>- Ppt. (Stemmed)</td>
<td>30 - Ppt. (Stemmed)</td>
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<tr>
<td></td>
<td></td>
<td>99 - Other</td>
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</table>

#### OTHER MISCELLANEOUS ITEMS:

| 1     | Human Bone Or Teeth | 9 Phytolith Sample(s) |
| 2     | Non-Human Bone Or Teeth | 10 T-L Sample(s) |
| 3     | Antler | 11 Sediment Sample(s) |
| 4     | Unworked Marine/River Shell | 12 Wood |
| 5     | Worked Marine/River Shell | 13 Fiber |
| 6     | Turtle Shell | 14 Fabric |
| 7     | C-14 Sample(s) | 15 Fire-Cracked Rock |
| 8     | Pollen Sample(s) | 99 Other |

#### PREHISTORIC CERAMICS:

<table>
<thead>
<tr>
<th>51. CERAMIC TEMPER:</th>
<th>52. SURFACE TREATMENT:</th>
<th>53. TYPE NAME:</th>
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<tbody>
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<td>10.</td>
<td>10.</td>
<td>10.</td>
</tr>
</tbody>
</table>

#### HISTORIC SITE INFORMATION

| 54. PERIOD OF OCCUPATION BEGIN: | PERIOD OF OCCUPATION END: |
| 55. REFINED DATE FROM: | REFINED DATE TO: |
| 56. HISTORIC AFFILIATION: | |
| 57. HISTORIC DEFINITION: | |
| 58. SITE TYPE/FEATURE: | |

(Note: If response 58 is #65, Water Vessel, complete items 59 – 76, and applicable items from Historic Artifacts)
VESSEL INFORMATION

59. DATA SOURCE:

60. PRIMARY HULL CONSTRUCTION: DETAIL:

61. HULL FASTENINGS: DETAIL:

62. HULL DESIGN/CONSTRUCTION DETAILS:

63. WRECKAGE DIMENSIONS: LENGTH: FEET WIDTH: FEET DEPTH: FEET HOW DETERMINED:

64. ESTIMATED ORIGINAL DIMENSIONS: LENGTH: FEET WIDTH: FEET DEPTH: FEET HOW DETERMINED:

65. ESTIMATE OF ORIGINAL VESSEL REMAINING: %

66. MEANS OF PROPULSION: PRIMARY: SECONDARY: DETAILS:

67. SAIL POWERED: NUMBER OF MASTS: OBSERVABLE REMAINS:
SAIL CONFIGURATION (IF POSSIBLE TO DETERMINE):
DETAILS:

68. ENGINE POWERED: MECHANISM: DETAILS:
ENGINE NUMBER: TYPE: FUEL:
BOILER NUMBER: TYPE:

69. ALTERNATE MEANS OF POWER (IF ANY): DETAILS:

70. CAUSE OF LOSS: DETAILS:

71. COUNTRY OF CONSTRUCTION (IF KNOWN):

72. ARTIFACT CATEGORIES OBSERVED: Cargo Ordnance Ship’s Equipment Personal Effects Other

73. PURPOSE OF CRAFT: DETAILS:

74. TYPE OF VESSEL:

75. VESSEL DESCRIPTION:

76. VISIT HISTORY (DATE, ORGANIZATION, PURPOSE, RESULTS):

HISTORIC ARTIFACTS

77. ACTIVITIES GROUP: 1 - Construction Tools 6 - Storage Items 2 - Farm Tools 7 - Ethnobotanical 3 - Toys 8 - Associated With Stable Or Barn 4 - Fishing Gear 9 - Other 5 - Colonial-Indian Pottery
78. AGRICULTURE:  
- 1 - Farm Tool  
- 2 - Assoc. w/ Stable/Barn  
- 3 - Fencing Material  
- 9 - Other

79. ARCHITECTURAL GROUP:  
- 1 - Window Glass  
- 2 - Nails  
- 3 - Spikes  
- 4 - Construction Hardware  
- 5 - Door Lock Parts  
- 9 - Other

80. ARMS GROUP:  
- 1 - Musket Balls, Shot, Sprue  
- 2 - Gun Flints, Gunspalls  
- 3 - Gun Parts, Bullet Molds  
- 9 - Other

81. CLOTHING GROUP:  
- 1 - Buckles  
- 2 - Thimbles  
- 3 - Buttons  
- 4 - Scissors  
- 5 - Door Lock Parts  
- 6 - Hook & Eye Fasteners  
- 7 - Bale Seals  
- 8 - Glass Beads  
- 9 - Other

82. HISTORIC MISCELLANEOUS:  
- 1 - Bone Fragment  
- 2 - Furniture Hardware  
- 3 - Button Manufacturing Blanks  
- 4 - Silversmithing Debris  
- 9 - Other

83. KITCHEN GROUP:  
- 1 - Ceramics  
- 2 - Wine Bottle  
- 3 - Case Bottle  
- 4 - Tumbler  
- 5 - Pharmaceutical Bottle  
- 6 - Glassware  
- 7 - Tableware  
- 8 - Kitchenware  
- 9 - Other

84. MILITARY OBJECTS:  
- 1 - Swords  
- 2 - Insignia  
- 3 - Bayonets  
- 4 - Artillery Shot & Shell  
- 9 - Other

85. PERSONAL ITEMS:  
- 1 - Coins  
- 2 - Keys  
- 3 - Personal Items  
- 9 - Other

86. PIPES:  
- 1 - Tobacco Pipe  
- 2 - Stub-Stemmed Pipes  
- 3 - Pipe Stems  
- 9 - Other

87. TEMPORALLY DIAGNOSTIC ARTIFACTS:

### COMMENTS

88. OWNER/TENANT INFORMATION: Property managed by RDU Authority

89. DIRECTIONS TO SITE: Site is located in the floodplain of Cradtree Creek, 320 m east of Old Reedy Creek Road

90. RESEARCH POTENTIAL: None

91. EXPLANATION OF RECOMMENDATIONS: This site is a light scatter of non-diagnostic quartz debitage and one metavolcanic PPK blade fragment; majority of artifacts from surface of bike trail; no intact deposits, no diagnostics.

92. EXCAVATION RESULTS: 57 shovel tests were excavated; 2 yielded artifacts.

93. EXPLANATION OF IMPACTS: Area has been impacted by flooding and erosion

94. TESTING RESULTS:

95. FEATURE DESCRIPTION:

96. OTHER IMPORTANT ARTIFACT TYPES:

97. HISTORIC CERAMIC TYPES:

98. HISTORIC SITE DESCRIPTION:

99. COMMENTS: Quartz outcrop in site area
100. NATIONAL REGISTER STATUS:  
101. NATIONAL REGISTER CRITERION:  
102. DATE ON NATIONAL REGISTER:  
103. TYPE OF FORM:  
104. RECORDER STATUS:  
105. FORM RELIABILITY:  
106. LOCATIONAL RELIABILITY:  
107. FORM DATA CHECKED BY:    DATE:
Artifact Catalog
Odd Fellows

<table>
<thead>
<tr>
<th>Site</th>
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<tr>
<th>Provenience Number</th>
<th>Site, Provenience</th>
<th>Catalog Number</th>
<th>Specimen Number</th>
<th>Quantity</th>
<th>Weight (g)</th>
<th>Description</th>
<th>Comments</th>
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<tr>
<td>1.0</td>
<td>Site 5, N395 E605, surface</td>
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<td>m1</td>
<td>19</td>
<td>83.2</td>
<td>Quartz Flake/Flake Fragment</td>
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<td>2.0</td>
<td>Site 5, N425 E590, surface</td>
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<td>m2</td>
<td>5</td>
<td>36.6</td>
<td>Quartz Flake/Flake Fragment</td>
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<td>3.1</td>
<td>Site 5, N500 E500, 0-15 cm</td>
<td>3</td>
<td>m3</td>
<td>1</td>
<td>136.1</td>
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<td>4.0</td>
<td>Site 5, surface find</td>
<td>4</td>
<td>a4</td>
<td>1</td>
<td>20.2</td>
<td>Metavolcanic P. Point Fragment</td>
<td></td>
</tr>
</tbody>
</table>

Comments:
1 with possible use wear

*distal blade and tip fragment, shape and flaking suggest Early Archaic, but not diagnostic without base*
Question 19. Please provide a certified plan, designed by a qualified professional engineer, detailing how and when flow from Crabtree Creek into the existing or proposed pit from fractures in the rock would be addressed.

WSC response:
During the due diligence investigations for the potential quarry expansion project on RDUAA's Odd Fellows tract, Wake Stone Corporation contracted with Groundwater Management Associates, Inc. (GMA) to provide a hydrogeological evaluation of the existing and proposed quarry sites. GMA devised and implemented a groundwater evaluation designed to:

- Estimate the extent of the groundwater cone of depression resulting from approximately 40 years of pit development at the Triangle Quarry. This effort allowed GMA to estimate the extent of the cone of depression that might develop in response to pit development of the RDUAA tract, and
- Address potential interactions between surface water flow occurring in Crabtree Creek and groundwater seepage into the existing and proposed quarry pits.

Based on measurements taken of static groundwater levels in available domestic and monitoring wells, GMA generated a groundwater surface contour map depicting the interpreted groundwater elevations beneath the existing and proposed quarry sites. GMA also conducted field measurements of Crabtree Creek stream flow, and through use of accepted instrumentation, and the velocity-area technique, calculated stream discharge (Q) at three surface water monitoring stations in the project vicinity. GMA's measured stream gauging data provided no evidence of measurable losses from Crabtree Creek adjacent to the active quarry pit.

GMA also made site visits to the active quarry pit (individually and in the presence of DEMLR and DWR personnel) in order to observe characteristic of the crystalline bedrock mass being mined, including indications of groundwater seepage into the existing pit. Based on their observations made during site visits, GMA noted that "the quarry pit did not indicate local wetting or other indications of significant preferential flow of groundwater into the pit..." and "the active mine pit at the Triangle Quarry exhibits a remarkably dry mine face." In their summary report, GMA states "It was especially notable that the mine face closest to Crabtree Creek along the western and northern portions of the pit exhibited only minimal wetness or groundwater seepage into the pit." Additionally, GMA researched estimated groundwater recharge rates anticipated for piedmont terrain crystalline bedrock and Wake Stone Corporation's reported pit sump withdrawal data. When GMA factored estimated stormwater runoff for the active pit catchment area against reported sump withdrawal volumes, they concluded "it is evident the groundwater flow contribution into the pit from outside the active mine must be very small."

The above noted GMA observations concerning the small degree of groundwater influx into the Triangle Quarry pit through fractures in the bedrock corroborate the conditions experienced by Wake Stone Corporation throughout the systematic development of the Triangle Quarry pit over the past 38 years. As evidenced by examination of bedrock cores collected during exploration drilling activities on the RDUAA tract, bedrock fabric and fracture patterns within the bedrock proposed for mining in the new pit are like those exposed in the Triangle Quarry pit. Based on these observations, Wake Stone Corporation anticipates potential groundwater influx into the proposed new pit will be similar in nature
and volume to that experienced in the active Triangle Quarry pit. As such, it is impossible for us to predict "how and when flow from Crabtree Creek into the existing or proposed pit from fractures in the rock would be addressed." Our observations and experiences throughout the history of the development of the Triangle Quarry pit, when coupled with the observations and conclusions drawn by GMA in their *Hydrogeologic Evaluation of the Triangle Quarry*, give us great confidence that significant groundwater influx into either pit is not likely to occur. Wake Stone Corporation is a very responsible quarry operator. In attempting to respond to this question and provide the DEMLR with the information you requested, we can assure you that should anomalous groundwater influx (suggestive of connectivity to Crabtree Creek) be experienced while developing the new quarry pit, we will respond accordingly and to the degree necessary to mitigate concerns for loss of Crabtree Creek flow into either pit. Mitigative measures could include pressure injection of grouting materials into fracture zones in the bedrock if proven warranted.

Signature: [Signature]

Jared K. Miedema P. E.

Date: 10-27-20

[Seal]

P. E. Seal