SUNROCK®
CAROLINA SUNROCK LLC

Scott Martino
Manager Environmental Compliance
200 Horizon Drive, Suite 100
Raleigh, NC 27615

May 7. 2020

Mrs. Judy Wehner
Assistant State Mining Specialist
Department of Environmental Quality
Division of Energy, Mineral, and Land Resources – Land Quality Section
1612 Mail Service Center
Raleigh, NC 27699-1612

RE: Carolina Sunrock LLC – Prospect Hill Quarry and Distribution Center
1238 Wrenn Road
Prospect Hill, Caswell County, North Carolina 27314

Hand Delivered

Dear Mrs. Wehner:

The purpose of this letter is to provide you and your department the additional information pertaining to Carolina Sunrock LLC's initial application for a mining permit as requested per your letter dated November 21, 2019. Enclosed with this letter and summarized below is our response to your request for additional information:

1. **Provide proof such as copies of the signed return receipts from certified mail that the following adjoining land owners have been properly notified.**

   Attached to this letter in Appendix A are the proof of notifications for Bethel UMC, Philip & Susan Allen, Sara Cook, Richard and Jerry Cates, Georgia P. Lewis, William & Donna Brown, William Morris & Rita Hudgins, and Susan Hester.

   At the time of the notification mailings (August 29, 2019), Scott Wilson-Houghtallen was not the current property owner of Parcel 0133-003. The property owner at that time was Nationstar Mortgage LLC which acquired the property on June 28, 2019. In addition, it should be noted that this property was also recently sold (10-31-2019) and is now owned by 272 Properties LLC. The mine maps have been updated to indicate the current property owners. See Appendix A, notification sent to 272 Properties LLC .

   Proof of notifications of Phillip & Susan Allen and C.S. Painter Lands are not required as they were past owners of land adjoining the proposed mining permit boundary. All references to these two former landowners on the associated mine maps have been removed to avoid further confusion. The current property owners of the two parcels in question are Edward Dougherty and Etree LLC, both of whom were notified and proof of notifications have been previously provided.

2. **North Carolina Department of Cultural Resources (DCR) Comments**

   Carolina Sunrock retained Archaeological Consultants of the Carolinas, Inc. (a licensed archeological consulting firm within the State of North Carolina) to conduct a Phase I Archaeological Investigation in order to address DCR's comments. The study was submitted directly to DCR for review and has been approved. Please find the attached approval letter dated March 11, 2020 from DCR's State Historical Preservation Office in Appendix B.

During a site visit with the DCR representatives and our consultants on January 2, 2020, a single cemetery was identified. This cemetery was fully delineated by our consultants and subsequently surveyed. The location of the cemetery and its appropriate buffers have been depicted on all applicable maps. In addition to the undisturbed buffers, a fence with signage will be placed around the perimeter of the cemetery to ensure it will not be disturbed.

Please note that the unanticipated discovery plan requested in DCR's approval letter has been prepared by our consultant and was submitted to DCR on April 24, 2020. Any correspondence we receive from DCR regarding acceptance of this plan will be forwarded to your office for inclusion in the project file.

3. North Carolina Wildlife Resources Commission (WRC) Comments

Carolina Sunrock contracted with Pilot Environmental in order to conduct a threatened and endangered (T&E) species assessment for our proposed project. The results of this T&E species assessment are attached to this letter in Appendix C.

In summary, the consultant verified that there are no known records of protected listed species located within 3-miles of the proposed facility.

Carolina Sunrock and its licensed consultants have evaluated WRC's recommendations to minimize impacts to aquatic and terrestrial wildlife resources and offer the following responses to WRC's itemized recommendations in its September 27, 2019 memo to DEMLR as follows:

1. All plans have been revised and there are no longer any proposed direct impacts to jurisdictional features. Thus, no 404/401 permitting actions are required at this time. Additionally, Carolina Sunrock's licensed geologic consultant, Piedmont Geologic updated its hydrogeological assessment report, to include a plan to install and monitor a network of shallow and deep observation wells, and to evaluate the potential influence of pit dewatering on both the overburden and bedrock portions of the site aquifer (provided in Appendix D).

   In summary, most of the onsite drainage features are upland features formed solely due to topographical relief and poor land management practices. Flows in these features are ephemeral in nature, fed by precipitation and related percolation through the vadose zone (unsaturated zone above the water table), not hydraulically connected to the site aquifer, and, thus, not expected to be impacted through quarry dewatering. Three quasi-perennial streams ("quasi-perennial" since 7Q10 values are zero for all three) are present on site: Sugartree Creek and two unnamed streams. Little, if any, reduction in average flow for Sugartree Creek, which makes up approximately 90% of the total streamflow for all three water bodies, is expected based on modeling of projected quarry dewatering rates versus streamflow rates. Any effects on streamflow for the unnamed streams through quarry dewatering will be gradual, and not expected, in conjunction with planned stream replenishment procedures, to substantially alter the normal stream hydrological makeup.

2. There are no documented cases of the crayfish within our project area. As noted above all proposed site development plans have been revised and there are no longer any proposed direct impacts to jurisdictional features. As stated above, and addressed by our licensed geological consultant's revised hydrogeological assessment report, pit-dewatering will have minimal if any impacts to jurisdictional surface water features.

3. All plans have been revised and there are no longer any proposed direct impacts to jurisdictional features. Thus, no 404/401 permitting actions are required at this time.

4. As initially submitted, and further clarified in the attached revised plans, surface water runoff from all three of the proposed overburden disposal areas will be collected by engineered diversions and collected and treated within engineered sediment basins, that have been designed using a 50-year storm event criteria. These measures are depicted on the attached revised plans as highlighted below:
    a. ODA-1: Construct Basins 8 and 9
    b. ODA-2: Construct Basins 10 and 11
    c. ODA-3: Construct Basins 50, 52, 53, 54, and 55

5. Carolina Sunrock has incorporated the planting of hickories into its revised reclamation plans as detailed on Sheet 6.

6. In order to comply with the erosion and sedimentation control requirements under the NC Mining Act of 1971 and the groundcover expectations of DEMLR, our seeding schedule contains seeding mixtures, rates and dates commonly used by the construction and mining industries as outlined within the NCDEQ Erosion and Sediment Control Planning and Design Manual. However, Carolina Sunrock has incorporated WRC's alternative native mixes and pollinator habitat recommendations into our reclamation plans as detailed on Sheet 6.

7. WRC's recommendation that water quality be monitored downstream of the discharge point is a requirement of the NPDES 200 discharge permit that Carolina Sunrock must obtain prior to initiating land disturbing activities at the proposed mine site.

8. All plans have been revised and there are no longer any proposed direct impacts to jurisdictional features. Thus, no 404/401 permitting actions are required at this time.

4. US Army Corps of Engineers (COE) Jurisdictional Determination

Please find attached in Appendix E a copy of the approved jurisdictional determination for the project area. All approved features along with undisturbed buffers are displayed in all previously submitted and current set of plans.

It should also be noted that the proposed mining operation, as indicated in the attached set of plans, will have no direct impacts to any jurisdictional features at this time. In our original submittal, we were seeking minor jurisdictional impact (nationwide) permitting associated with the original site entrance location and a single creek crossing to access Overburden Disposal Area 1. However, after consultation with NCDOT and DEMLR's Winston Salem Regional Office, we have modified our plans to avoid these minor jurisdictional impacts by relocating the site entrance, proposing bridge spans to cross creeks, and adding phasing to various aspects of site development avoiding impacts to all streams, wetlands and their associated buffers. Therefore, without direct impacts to any jurisdictional stream and wetland features, Carolina Sunrock is no longer required to obtain additional permitting from the COE or DWR's 401 Water Quality Certification Program at this time.

5. **North Carolina Division of Water Resources' (DWR) Groundwater Management Branch Comments**

In order to address DWR's comments, Carolina Sunrock met with both Michael Bauer & Nat Wilson of DWR on November 5, 2019 to discuss their comments and to clarify that Carolina Sunrock previously submitted a groundwater monitoring plan in its initial application, which proposes the installation and monitoring of perimeter monitoring wells in addition to the monitoring wells installed as part of the hydrogeological study. As a result of the meeting, Carolina Sunrock has made the proposed monitoring well locations more visible on the associated plans. In addition, the monitoring well locations are also provided within the attached revised hydrogeological study in Appendix D. We have also updated our facility phasing and clearly depicted their installation prior to mining and pit dewatering activities, including monthly monitoring for the life of the project.

We have also developed a residential water supply well mitigation plan/adverse impact letter, which is included in the provided revised study.

6. **NPDES Permitting**

Carolina Sunrock is required to obtain and comply with the following general permits, upon the construction and operation of the individual facilities.

- NPDES 2000 – General Permit Mining
- NPDES 1600 – General Permit Asphalt Manufacturing
- NPDES 1400 – General Permit Concrete Manufacturing

In addition, we have withheld our NPDES 2000 application in order to ensure symmetry between this submittal and the submittal for the NPDES permit as many of the requirements for both permits (Mining & NPDES) are the same. Now that we believe we have addressed your and other agencies' concerns and/or questions with the attached updated mining plans, we intend to submit the NPDES 2000 application within the coming weeks and will provide proof of submittal confirmation to your office as requested.

The general permits for both the asphalt and concrete manufacturing facilities are only required to be obtained prior to construction of the facilities at this site. As you may be aware, we are concurrently permitting a standalone asphalt and concrete facility at another location in Caswell County which we fully intend to construct and operate before constructing similar facilities on this mine site. In addition, we also have a second standalone asphalt and concrete facility location, which has been inactive but fully permitted since 2016. Thus, we have no plans at this time for the construction or operation of the asphalt and concrete facilities at this quarry site. Should this change, we will notify your office when the applications for these facilities are submitted.

In addition to the above, we have revised our sediment and erosion control plans, as requested by DEMLR's Winston Salem Regional Office. All storm water basin designs and associated construction and maintenance details, as highlighted within this submittal as well as the initial submittal, were designed using a 50-year design storm, skimmers, and baffles. In order to address process water in association with the washing of the produced aggregate, we proposed a closed loop settling pond system (see Sheet 7d) to ensure there is no discharge of process water to surface water features. In addition, it should be noted that there are no chemical additives involved in the process of producing aggregate products. We have also revised our plans to include a separate pit dewatering pond (see Sheet 7G). This additional pond has been designed using a 50-year design storm, skimmer, and baffles in order to discharge over time to ensure compliance with NPDES 2000 7Q10 stipulations for pit dewatering discharge to surface water. Lastly, this pond will be utilized on an as needed basis during significant storm events that inundate the open pit operations, as all other groundwater/storm

water captured within the open pit will be utilized within the closed loop process water system as make-up water.

Lastly, as required as part of the NPDES 2000 general stormwater permit application for mining operations and to demonstrate compliance with the permit and protection of surface water features, a pumping and aquifer monitoring plan has been prepared and is included within the revised hydrogeological assessment in Appendix D and shown on Carolina Sunrock's Sheet 5D. As highlighted within the revised hydrogeological assessment report, there is minimal if any impact anticipated to surface water features in association with pit-dewatering. However, to obtain a better understanding of the site groundwater regime and how it may respond to pit dewatering, Carolina Sunrock and Piedmont Geologic have developed this detailed pump and monitoring plan that includes the installation of observation wells in the overburden and bedrock aquifer zones that will be monitored at least two months prior to pit dewatering activities and monthly thereafter. The plan also includes stream gage data collection points where the central unnamed tributary and Sugartree Creek both enter and exit the mine property to capture stream flow characteristics before and during mining activities. It should be noted that Carolina Sunrock does not intend to install stream gages in the northern unnamed tributary as it is located outside of the estimated zone of hydraulic influence from pit dewatering as noted in Appendix D.

7. NCDEQ Air Quality Permit

As you may know, we have applied for an Air Quality Permit for this facility and it is currently open for public review and comment. A copy of the draft permit may be found on DEQ's website at the following link: https://deq.nc.gov/news/press-releases/2020/02/26/postponed-public-hearing-draft-air-quality-permits-carolina-sunrock. Unfortunately, due to the Covid-19 pandemic, Carolina Sunrock's air quality permit application and its associated public hearing have been placed on hold by the Division of Air Quality.

We are confident we will obtain the necessary air quality permit because our proposed facility has been designed to fully comply with all applicable air quality standards and practices. As such, upon completion of the air quality permit application review process and issuance of the permit, we will provide your office a copy of our air permit for this facility.

8. Roxboro Lake

Please find as Appendix F, a copy of the mining permit application review comments from the Division of Parks & Recreation indicating that there are no public parks or recreational areas within 5-miles of our facility. This determination clearly indicates that although Roxboro Lake is located within 3-miles of our proposed project, Roxboro Lake is not established or managed as a public park or recreational area.

For clarification, the lake is owned by the City of Roxboro. The City utilizes Roxboro Lake as a backup water supply for their residents. Carolina Sunrock has been in contact with City of Roxboro officials throughout our design process. Carolina Sunrock has designed undisturbed buffers along all streams and wetlands, overdesigned all erosion and sediment control measures and stormwater management devices using a 50-year design storm instead of the 25-year design storm required by DEMLR. Carolina Sunrock has optimized designed water recycle systems, which significantly reduce the amount of storm water runoff within onsite drainages and streams. We will continue to provided other safeguards to meet or exceed water quality standards in drainages and streams set forth in the required NPDES 2000 general stormwater permit. Based on our discussions and designs presented to the City of Roxboro, they have concluded that our proposed actives would have minimal if any impacts to Roxboro Lake. Please see attached City of Roxboro Memo (Appendix G).

9. North Carolina Geological Survey Comments

Please find attached Appendix H, a copy of the review comments issued by the North Carolina Geological Survey noting that arsenic (not asbestos) could naturally occur and be present in the mafic rocks at the site. If arsenic was naturally present within the bedrock, the metal would have appeared within the groundwater samples collected and analyzed as part of the hydrogeological assessment, which it did not. Groundwater analytical results are provided within the revised hydrogeologic study provided in Appendix D.

However, based on your request, we subcontracted with Subhorizon Geologic Resources (SGR), a licensed geological firm, to address the possible occurrence of asbestos and radon at the facility. SGR's report is provided in Appendix I. Additionally, it should be noted that asbestos potential is explored via initial geologic assessment of not just Carolina Sunrock's proposed facility but all quarries because its presence disqualifies the potential geologic resource for production as it will not meet rigorous aggregate industry quality standards.

10. DEMLR's Winston-Salem Regional Office Sediment and Erosional Control Plan Comments

On January 7, 2020, Carolina Sunrock and its consultants met with the Winston Salem regional office to address and fully understand their comments on our initial set of plans. All of their questions and requested information have been addressed within the updated plans included in this submittal, with the exception of those itemized and summarized below:

1. We recognize and acknowledge that our facility is within a high quality watershed and have designed our surface water runoff control and treatment measures to ensure compliance with all applicable water quality standards and regulations.
2. The updated plans included in this submittal demonstrate no direct impacts to jurisdictional features.
13. All debris and waste generated onsite and regulated by the Division of Waste Management will be disposed of offsite by a licensed contractor at the appropriate licensed disposal facility for each specific material.
15. There is no current or proposed access onto our property for use by the general public or residents surrounding Roxboro Lake. Our property is and has been posted for no trespassing.
19. As specified within our original application submittal on page 8, Carolina Sunrock does not anticipate the need to utilize any flocculants. However, if such treatment is needed, flocculants from the NCDEQ approved list will be tested for applicability. Following testing and product selection, Carolina Sunrock will notify the department under a separate letter.
22. All plans have been revised and there are no longer any proposed direct impacts to jurisdictional features. Thus, no 404/401 permitting actions are required at this time.
24. The proposed ESC measures are not intended to treat any process water from the proposed asphalt and concrete facilities. As stated in our initial plans, as well as in these updated plans, Carolina Sunrock proposes a closed loop water recycle system in order to treat and recycle process water developed by these facilities' operational practices. It should also be noted that asphalt facilities do not produce process water in their operation. Our proposed concrete manufacturing facility like many others utilizes recycling process water systems to continually maintain equipment and for actual concrete production. Any ESC measures that must remain to treat storm water runoff from the asphalt and concrete facilities have been designed and engineered to fully comply with NPDES 14000 and 16000 applicable permit restrictions and guidance.
25. All plans have been revised and there are no longer any proposed direct impacts to jurisdictional features. Thus, no 404/401 permitting actions are required at this time.
26. The original creek crossing to Overburden Disposal Area 1 was provided in the original submittal and was included on Sheet 7e, which included all necessary details. However, as stated

previously, we have revised our plans to include no direct jurisdictional impacts. Thus, these plans now provide for bridge crossings at two stream locations as detailed on Sheets 7E and 7F.

27. A detailed construction sequence covering all aspects of site development has been provided on revised Sheet 5. It should be noted that all applicable permits will be obtained prior to any corresponding development per the mining permit conditions, with the exception of the two NPDES permits associated with concrete and asphalt facilities which are not required until these facilities are built at a later date.
28. As stated above, a separate pit dewatering pond has been designed and added to the attached plans with a controlled outlet in order to comply with the 7Q10 flow requirements of the receiving stream and as required in the NPDES 2000 permit. In addition, all stormwater runoff control measures and the process water and settling ponds used as part of the closed loop process water system are completely separate treatment systems so that process water is not comingled with stormwater runoff.
29. Similar to our original submittal, Carolina Sunrock has provided detailed mine development plans that closely coordinate with the supplemental sediment and erosion control plan designed by the Timmons Group, an engineering consulting firm. Notes have been added to both Carolina Sunrock's and Timmons' plans to ensure that all plans are reviewed together in their entirety to provide a full depiction of Sunrock's mine development intentions. Carolina Sunrock and Timmons have carefully reviewed all ESC comments provided by DEMLR, which have been fully and accurately depicted in the attached plans.

Thank you for the opportunity to address your and other agency comments provided on our initial application submittal. Please feel free to contact me if you or your department have any further questions.

Thank you for your assistance.

Sincerely,
Carolina Sunrock, LLC

Scott Martino
Manager Environmental Compliance

Figures	Appendices
1. Mine Permit Maps Sheets 3 through 7G a. Sheet 3 – Property Survey & Permit Boundary b. Sheet 4 – Existing Site Conditions & Proposed Buffers c. Sheet 5 – Initial Mine Map d. Sheet 5A – Initial Mine Map 1"-175' e. Sheet 5B – Initial Mine Map 1"-175' f. Sheet 5C – Initial Mine Map 1"-175' g. Sheet 6 – Reclamation Map h. Sheet 7A – Typical Permit Boundary Berm Construction & Borrow Pit Cross-Section i. Sheet 7B – Open Pit Cross-Sections j. Sheet 7C – Overburden Disposal Area Cross-Sections k. Sheet 7D – Plant Makeup Water Pond & Typical Plant Settling Pond Cross Sections l. Sheet 7E – Creek Crossing-1 Details m. Sheet 7F – Creek Crossing-2 Details n. Sheet 7G – Pit Dewatering Pond Details **2.** Erosion Control Report by Timmons Group a. Sediment & Erosion Control Report & Calculations b. Plan Details Sheet 0.00 through DA1.0	**A.** Surrounding Parcel Notifications **B.** North Carolina Department of Natural and Cultural Resources-State Historic Preservation Office Correspondence **C.** Pilot Environmental Preliminary Federal/State Threatened and Endangered Species Assessment **D.** Piedmont Geological Revised Hydrogeological Study Report **E.** USACE Jurisdictional Approval **F.** North Carolina Department of Natural and Cultural Resources - Division of Parks & Recreation Correspondence **G.** City of Roxboro Correspondence **H.** North Carolina State Geological Survey Correspondence **I.** Subhorizon Geologic Resources – Radon and Naturally Occurring Asbestos Potential Report

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Appendix A

Surrounding Parcel Notifications

SUNROCK®
CAROLINA SUNROCK LLC
200 Horizon Drive, Suite 100
Raleigh, NC 27615

Parcel 133 016

CERTIFIED MAIL

7015 0640 0007 8085 0898

7

NEOPOST FIRST-CLASS MAIL
08/29/2019
US POSTAGE $007.30⁰
ZIP 27615
041M11299227

unCL

AH 9-31-19 N2

2nd AH 9/5/19 CAM/K.C.

Sun Rock
200 Horizon Dr, Suite 100
Raleigh, NC 27615

R.T.S.
9/16/19 - Unclaimed / CAM

ASPHALT CONCRETE AGGREGATES CONTRACTING

7204593

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Bethel United Methodist Church
2541 Ridgeville Road
Prospect Hill, NC 27314

9590 9401 0072 5071 0459 32

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

Parcel 133 016

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

USPS Tracking®

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Parcel: 0133-016
Bethel United Methodist Church

Track Another Package +

Tracking Number: 70150640000780850898

Remove X

Your item has been delivered to the original sender at 12:06 pm on September 18, 2019 in RALEIGH, NC 27615.

Feedback

Delivered

September 18, 2019 at 12:06 pm
Delivered, To Original Sender
RALEIGH, NC 27615

Tracking History

September 18, 2019, 12:06 pm
Delivered, To Original Sender
RALEIGH, NC 27615
Your item has been delivered to the original sender at 12:06 pm on September 18, 2019 in RALEIGH, NC 27615.

September 17, 2019, 7:43 pm
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

September 17, 2019, 9:38 am
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

September 17, 2019, 1:21 am
Departed USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

September 16, 2019, 8:35 am
Unclaimed/Being Returned to Sender
PROSPECT HILL, NC 27314

August 31, 2019, 12:20 pm
Notice Left (No Authorized Recipient Available)
PROSPECT HILL, NC 27314

August 31, 2019, 7:59 am
Arrived at Unit
PROSPECT HILL, NC 27314

August 30, 2019, 9:47 am
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

Feedback

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Nationstar Mortgage LLC
Attn: Mr. Cooper
8950 Cypress Waters BLVD
Coppell, TX 75019

9590 9401 0072 5071 0263 99

2. Article Number (Transfer from service label)

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X Allen Van Cunningham ☐ Agent ☐ Addres

B. Re Allen Mallison Cunningham C. Date of Deli

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express
☐ Registered Mail™
☐ Registered Mail Restr Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmati
☐ Signature Confirmati Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Rece

UNITED STATES POSTAL SERVICE

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

• Sender: Please print your name, address, and ZIP+4® in this box•

Carolina Sunrock LLC
ATTN: Scott Martino
200 Horizon Drive Suite 100
Raleigh, NC 27615

USPS TRACKING#

Note Parcel ID
133 003

9590 9401 0072 5071 0263 99

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FAQs >

Parcel: 0133-003
Nationstar Mortgage LLC

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Tracking Number: 70150640000780851000

Remove X

Your item was delivered at 8:09 am on September 4, 2019 in COPPELL, TX 75019.

Feedback

Delivered

September 4, 2019 at 8:09 am
Delivered
COPPELL, TX 75019

Tracking History

September 4, 2019, 8:09 am
Delivered
COPPELL, TX 75019
Your item was delivered at 8:09 am on September 4, 2019 in COPPELL, TX 75019.

September 4, 2019, 7:52 am
Arrived at Unit
COPPELL, TX 75019

September 3, 2019, 5:03 am
Departed USPS Regional Facility
COPPELL TX DISTRIBUTION CENTER

September 2, 2019, 2:35 pm
Arrived at USPS Regional Facility
COPPELL TX DISTRIBUTION CENTER

September 2, 2019
In Transit to Next Facility

August 30, 2019, 9:01 pm
Departed USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

August 30, 2019, 9:43 am
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

August 29, 2019, 10:54 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Feedback

Product Information

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Go to our FAQs section to find answers to your tracking questions.

FAQs

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FAQs >

Track Another Package +

Parcel: 0133 003
272 Properties LLC

Tracking Number: 70150640000780851246

Remove X

Your item was delivered at 12:27 pm on December 4, 2019 in BURLINGTON, NC 27215.

Feedback

Delivered

December 4, 2019 at 12:27 pm
Delivered
BURLINGTON, NC 27215

Get Updates ∨

Text & Email Updates ∨

Tracking History ∧

December 4, 2019, 12:27 pm
Delivered

BURLINGTON, NC 27215
Your item was delivered at 12:27 pm on December 4, 2019 in BURLINGTON, NC 27215.

December 3, 2019, 12:31 pm
Notice Left (No Authorized Recipient Available)
BURLINGTON, NC 27217

December 3, 2019, 7:10 am
Out for Delivery
BURLINGTON, NC 27215

December 3, 2019, 6:44 am
Arrived at Unit
BURLINGTON, NC 27215

December 2, 2019
In Transit to Next Facility

November 29, 2019, 8:42 pm
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

November 27, 2019, 3:37 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Feedback

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Go to our FAQs section to find answers to your tracking questions.

FAQs

Feedback

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CAROLINA SUNROCK LLC
200 Horizon Drive, Suite 100
Raleigh, NC 27615

CERTIFIED MAIL
7015 0640 0007 8087 6386

NEOPOST
08/29/2019
US POSTAGE $007.30⁰
FIRST-CLASS MAIL
ZIP 27615
041M11299227

RTS

FWD

Sara
312

NIXIE 274 DE 1 8/09/19
RETURN TO SENDER
NOT DELIVERABLE AS ADDRESSED
UNABLE TO FORWARD
BC: 27615494725 2040N259141-01715

Moved

27712

9-9-19
fwd
VTF

ASPHALT CONCRETE AGGREGATES CONTRACTING

7202656

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Sara C. Cook
312 Mason Road
Durham, NC 27712

9590 9401 0072 5071 0265 66

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053

Domestic Return Receipt

USPS Tracking®

FAQs >

Parcel: 0147-001
MS: Sara Cook

Track Another Package +

Tracking Number: 70150640000780876386

Remove X

Your item was delivered to an individual at the address at 12:17 pm on September 20, 2019 in RALEIGH, NC 27615.

Feedback

Delivered

September 20, 2019 at 12:17 pm
Delivered, Left with Individual
RALEIGH, NC 27615

Tracking History

September 20, 2019, 12:17 pm
Delivered, Left with Individual
RALEIGH, NC 27615
Your item was delivered to an individual at the address at 12:17 pm on September 20, 2019 in RALEIGH, NC 27615.

September 20, 2019, 8:50 am
Arrived at Unit
RALEIGH, NC 27615

September 19, 2019
In Transit to Next Facility

September 16, 2019, 10:16 am
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

September 8, 2019, 1:46 pm
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

September 7, 2019, 9:29 am
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

September 6, 2019, 8:52 pm
Departed USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

September 6, 2019, 12:48 pm
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

September 4, 2019, 9:34 am
Forwarded

Feedback

DURHAM, NC

September 4, 2019, 8:29 am
Arrived at Unit
DURHAM, NC 27712

August 30, 2019, 11:01 pm
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

August 29, 2019, 10:53 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Feedback

Product Information

See Less

Can't find what you're looking for?

Go to our FAQs section to find answers to your tracking questions.

FAQs

CERTIFIED MAIL

SUNROCK

CAROLINA SUNROCK LLC

200 Horizon Drive, Suite 100
Raleigh, NC 27615

7015 0640 0007 8085 0423

NEOPOST FIRST-CLASS MAIL
10/02/2019
US POSTAGE $007.45⁰
ZIP 27615
041M11299227

Sun Rock
200 Horizon Drive, Ste 100
Raleigh, NC 27615

R.T.S. — CAM

10/12/19 - N.S.N

RALEIGH PBDC 27676
THU 03 OCT 2019PM
AFSN100 #8

ASPHALT CONCRETE AGGREGATES CONTRACTING

7202664

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Cook
206 Beaver Falls Dr.
Prospect Hill NC 27314

9590 9401 0072 5071 0266 41

2. Article Number *(Transfer from service label)*

7015 0640 0007 8085 0423

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

USPS Tracking®

FAQs >

Parcel; 0147-001
Ms. Sara Cook

Track Another Package +

Tracking Number: 70150640000780850423

Remove X

Your item has been delivered to the original sender at 2:46 pm on October 15, 2019 in RALEIGH, NC 27615.

Feedback

Delivered

October 15, 2019 at 2:46 pm
Delivered, To Original Sender
RALEIGH, NC 27615

Tracking History

October 15, 2019, 2:46 pm
Delivered, To Original Sender
RALEIGH, NC 27615
Your item has been delivered to the original sender at 2:46 pm on October 15, 2019 in RALEIGH, NC 27615.

October 15, 2019
In Transit to Next Facility

October 15, 2019, 9:14 am
Arrived at Unit
RALEIGH, NC 27615

October 14, 2019, 10:51 pm
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

October 13, 2019, 10:07 am
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

October 12, 2019, 10:13 pm
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

October 12, 2019, 8:46 am
No Such Number
PROSPECT HILL, NC 27314

October 12, 2019, 7:58 am
Available for Pickup
PROSPECT HILL, NC 27314

October 12, 2019, 7:57 am
Arrived at Unit

Feedback

PROSPECT HILL, NC 27314

October 3, 2019, 11:36 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Product Information

See Less

Feedback

Can't find what you're looking for?

Go to our FAQs section to find answers to your tracking questions.

FAQs

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Richard & Jerry Cates
1985 Andrews Store RD.
Pittsboro, NC 27312

9590 9402 5297 9154 7821 80

2. Article Number (Transfer from service label)

7015 0640 0007 8085 1253

COMPLETE THIS SECTION ON DELIVERY

A. Signature
x Lynne Cates
☐ Agent
☐ Address

B. Received by (Printed Name)
Lynne Cates

C. Date of Delive
11-2-21

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No
Parcel: 147 009

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Delivery Restricted Delivery
☐ Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restri Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmatio
☐ Signature Confirmatio Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Recei

USPS TRACKING #

9590 9402 5297 9154 7821 80

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

United States
Postal Service

* Sender: Please print your name, address, and ZIP+4® in this box*

Carolina Sunrock LLC
ATTN: Scott Martino
200 Horizon Drive Suite 100
Raleigh, NC 27615

USPS Tracking®

FAQs >

Track Another Package +

Parcel: 0147-009
Mr. Richard & Jerry Cates

Tracking Number: 70150640000780851253

Remove ×

Your item was delivered to an individual at the address at 10:55 am on November 22, 2019 in PITTSBORO, NC 27312.

Feedback

Delivered

November 22, 2019 at 10:55 am
Delivered, Left with Individual
PITTSBORO, NC 27312

Get Updates ∨

Text & Email Updates

Tracking History

November 22, 2019, 10:55 am
Delivered, Left with Individual

PITTSBORO, NC 27312
Your item was delivered to an individual at the address at 10:55 am on November 22, 2019 in PITTSBORO, NC 27312.

November 22, 2019, 9:04 am
Out for Delivery
PITTSBORO, NC 27312

November 22, 2019, 8:53 am
Arrived at Unit
PITTSBORO, NC 27312

November 22, 2019, 2:25 am
Departed USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

November 21, 2019, 7:49 am
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

November 21, 2019, 2:11 am
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

November 20, 2019, 11:55 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Feedback

Product Information

See Less

Can't find what you're looking for?

Go to our FAQs section to find answers to your tracking questions.

FAQs

Feedback

USPS Tracking®

FAQs >

Track Another Package +

Parcel: 147-009
Mr. Richard & Jerry Cates

Tracking Number: 70150640000780850805

Remove ×

Your package is moving within the USPS network and is on track to be delivered to its final destination. It is currently in transit to the next facility.

Feedback

In-Transit

September 4, 2019
In Transit to Next Facility

Tracking History

September 4, 2019
In Transit to Next Facility
Your package is moving within the USPS network and is on track to be delivered to its final destination. It is currently in transit to the next facility.

August 31, 2019, 3:35 am
Depart USPS Regional Facility

GREENSBORO NC DISTRIBUTION CENTER

August 30, 2019, 9:47 am
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

August 29, 2019, 10:54 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Product Information

Feedback

See Less

Can't find what you're looking for?

Go to our FAQs section to find answers to your tracking questions.

FAQs

UNITED STATES POSTAL SERVICE
GREENSBORO
NC 274
03 SEP '19
PM 6 L

First-Class Mail
Postage & Fees Pa
USPS
Permit No. G-10

Sender: Please print your name, address, and ZIP+4® in this box

Carolina Sunrock LLC
ATTN: Scott Martino
200 Horizon Drive Suite 100
Raleigh, NC 27615

USPS TRACKING#

Parcel ID
147 023

5-434725

9590 9401 0072 5071 0460 90

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Georgia & Mr. Lewis Gates
708 Oakdale Drive
Hillsboro, NC 27278

9590 9401 0072 5071 0460 90

2. Article Number (Transfer from service label)

7015 0640 0007 8087 6423

PS Form 3811, April 2015 PSN 7530-02-000-9053

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Dan Lewis
☐ Agent
☐ Addressee

B. Received by (Printed Name)
Dan Lewis
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

HILLSBOROUGH, NC
SEP - 3 2019
27278

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

Domestic Return Receipt

USPS Tracking®

FAQs >

Parcel: 0147-023
Ms. Georgia T Gravitte
Mr. Jeffrey Gates

Track Another Package ×

7015 0640 0007 8087 6423

Track

Feedback

Tracking Number: 70150640000780851253

Remove X

Your item was delivered to an individual at the address at 10:55 am on November 22, 2019 in PITTSBORO, NC 27312.

Delivered

November 22, 2019 at 10:55 am
Delivered, Left with Individual
PITTSBORO, NC 27312

Get Updates

Text & Email Updates

Tracking History

November 22, 2019, 10:55 am
Delivered, Left with Individual
PITTSBORO, NC 27312
Your item was delivered to an individual at the address at 10:55 am on November 22, 2019 in PITTSBORO, NC 27312.

November 22, 2019, 9:04 am
Out for Delivery
PITTSBORO, NC 27312

November 22, 2019, 8:53 am
Arrived at Unit
PITTSBORO, NC 27312

November 22, 2019, 2:25 am
Departed USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

November 21, 2019, 7:49 am
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

November 21, 2019, 2:11 am
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Feedback

November 20, 2019, 11:55 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Product Information

See Less

Can't find what you're looking for?

Go to our FAQs section to find answers to your tracking questions.

FAQs

Feedback

SUNROCK

CAROLINA SUNROCK LLC
200 Horizon Drive, Suite 100
Raleigh, NC 27615

CERTIFIED MAIL
7015 0640 0007 8087 6447

NEOPOST FIRST-CLASS MAIL
08/29/2019
US POSTAGE $007.30⁰
ZIP 27615
041M11299227

parcel
0147-008

NIXIE 274 DE 1 0010/02/19
RETURN TO SENDER
NOT DELIVERABLE AS ADDRESSED
UNCLAIMED 88014

Sun Rock
200 Horizon Drive, Ste 100
Raleigh, NC 27615

Bend & Peel

AH
9-3-19
DD

2nd AH
9-8-19
GL

GAM - R.T.S
9/18/19
UNCLAIMED

ASPHALT CONCRETE AGGREGATES CONTRACTING

7204605

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. & Ms. William N & Donna H Brown
971 Goose Creek Road
Prospect Hill, NC 27314

9590 9401 0072 5071 0460 52

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053

Domestic Return Receipt

USPS Tracking®

FAQs >

Parcel: 0147-008
Mr & Ms. William & Donna Brown

Track Another Package +

Tracking Number: 70150640000780876447

Remove ×

Your item has been delivered to the original sender at 12:17 pm on October 8, 2019 in RALEIGH, NC 27615.

Feedback

Delivered

October 8, 2019 at 12:17 pm
Delivered, To Original Sender
RALEIGH, NC 27615

Tracking History

October 8, 2019, 12:17 pm
Delivered, To Original Sender
RALEIGH, NC 27615
Your item has been delivered to the original sender at 12:17 pm on October 8, 2019 in RALEIGH, NC 27615.

October 8, 2019, 7:29 am
Arrived at Unit
RALEIGH, NC 27615

October 7, 2019
In Transit to Next Facility

October 4, 2019, 10:16 am
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

October 3, 2019, 12:14 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

October 2, 2019, 9:07 pm
Departed USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

October 2, 2019, 2:01 pm
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

October 1, 2019, 3:41 pm
Unclaimed/Being Returned to Sender
PROSPECT HILL, NC 27314

September 3, 2019, 12:59 pm
Notic eft (No Authorized Recipient Available)

Feedback

PROSPECT HILL, NC 27314

September 3, 2019, 8:29 am
Available for Pickup
PROSPECT HILL, NC 27314

September 3, 2019, 8:13 am
Arrived at Unit
PROSPECT HILL, NC 27314

August 29, 2019, 10:53 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Feedback

Product Information

See Less

Can't find what you're looking for?

Go to our FAQs section to find answers to your tracking questions.

FAQs

CERTIFIED MAIL

CAROLINA SUNROCK LLC
200 Horizon Drive, Suite 100
Raleigh, NC 27615

7015 0640 0007 8087 6430

Parcel
147 024

NEOPOST FIRST-CLASS MAIL
08/29/2019
US POSTAGE $007.30⁰
ZIP 27615
041M11299227

NIXIE 274 DE 1 0010/02/19
RETURN TO SENDER
NOT DELIVERABLE AS ADDRESSED
UNABLE TO FORWARD

...K
...orizon Drive, Ste. 100
...aleigh, NC 27615

1st Att
9-3-19

2nd Att
9-8-19
GL

Unc. R.T.S
9/18/19

UNCLAIMED

ASPHALT CONCRETE AGGREGATES CONTRACTING

7204606

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Parker Pruitt & Ms. Rita Hudgins
950 Goose Creek Road
Prospect Hill, NC 27314

9590 9401 0072 5071 0460 69

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

USPS Tracking®

FAQs >

Parcel: 0147-024

Mr. William Morris
Ms. Rita Hudgins

Track Another Package +

Tracking Number: 70150640000780876430

Remove ✕

Your item has been delivered to the original sender at 12:17 pm on October 8, 2019 in RALEIGH, NC 27615.

Feedback

Delivered

October 8, 2019 at 12:17 pm
Delivered, To Original Sender
RALEIGH, NC 27615

Tracking History

October 8, 2019, 12:17 pm
Delivered, To Original Sender
RALEIGH, NC 27615
Your item has been delivered to the original sender at 12:17 pm on October 8, 2019 in RALEIGH, NC 27615.

October 8, 2019, 7:29 am
Arrived at Unit
RALEIGH, NC 27615

October 7, 2019
In Transit to Next Facility

October 4, 2019, 10:16 am
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

October 3, 2019, 12:14 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

October 2, 2019, 9:07 pm
Departed USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

October 2, 2019, 2:01 pm
Arrived at USPS Regional Facility
GREENSBORO NC DISTRIBUTION CENTER

October 1, 2019, 3:41 pm
Unclaimed/Being Returned to Sender
PROSPECT HILL, NC 27314

September 3, 2019, 12:59 pm
Notic ft (No Authorized Recipient Available)

Feedback

PROSPECT HILL, NC 27314

September 3, 2019, 8:29 am
Available for Pickup
PROSPECT HILL, NC 27314

September 3, 2019, 8:13 am
Arrived at Unit
PROSPECT HILL, NC 27314

August 29, 2019, 10:53 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Feedback

Product Information

See Less

Can't find what you're looking for?

Go to our FAQs section to find answers to your tracking questions.

FAQs

UNITED STATES POSTAL SERVICE
NC 275
04 SEP '19
PM 5 L

First-Class Mail
Postage & Fees Pai
USPS
Permit No. G-10

* Sender: Please print your name, address, and ZIP+4® in this box*

Carolina Sunrock LLC
ATTN: Scott Martino
200 Horizon Drive Suite 100
Raleigh, NC 27615

USPS TRACKING#

Parcel ID
6149 003
6933

9590 9401 0072 5071 0461 06

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Robert & Ms. Susan Hester
592 Newton Pleasant Loop Road
Hurdle Mills, NC 27541

9590 9401 0072 5071 0461 06

2. Article Number (Transfer from service label)

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X
☐ Agent
☐ Addressee

B. Received by (Printed Name)
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

HURDLE MILLS NC 27541
SEP - 4 2019
USPS

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053

Domestic Return Receipt

USPS Tracking®

FAQs >

Parcel: 0148-003
Parcel: 6938
Mr. Robert & Susan Hester

Track Another Package +

Tracking Number: 70150640000780876416

Remove X

Your item was delivered at 1:01 pm on September 4, 2019 in HURDLE MILLS, NC 27541.

Feedback

Delivered

September 4, 2019 at 1:01 pm
Delivered
HURDLE MILLS, NC 27541

Tracking History

September 4, 2019, 1:01 pm
Delivered
HURDLE MILLS, NC 27541
Your item was delivered at 1:01 pm on September 4, 2019 in HURDLE MILLS, NC 27541.

August 31, 2019, 11:31 am
Notice Left (No Authorized Recipient Available)
HURDLE MILLS, NC 27541

August 31, 2019, 8:02 am
Arrived at Unit
TIMBERLAKE, NC 27583

August 30, 2019, 8:40 pm
Departed USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

August 29, 2019, 10:53 pm
Arrived at USPS Regional Facility
RALEIGH NC DISTRIBUTION CENTER

Feedback

Product Information

See Less

Can't find what you're looking for?

Go to our FAQs section to find answers to your tracking questions.

FAQs

Feedback

SUNROCK®
CAROLINA SUNROCK LLC

Appendix B

North Carolina Department of Natural and Cultural Resources Correspondence

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of Archives and History
Deputy Secretary Kevin Cherry

March 11, 2020

Michael O'Neal
Archaeological Consultants of the Carolinas
121 East First Street
Clayton, NC 27520

michaeloneal@archcon.org

Re: Prospect Hill Quarry, Caswell County, ER 19-2783

Dear Mr. O'Neal,

Thank you for your February 5, 2020, letter transmitting the final report for the above-referenced undertaking. We have reviewed the report and offer the following comments.

We concur that the following properties are not eligible for the National Register for the reasons outlined in the report:

- Sites 31CS85-31CS120 do not have the potential to contain significant information pertinent to prehistory or history.

Site 31CS108 is a historic cemetery that is ineligible for the National Register but will be avoided by the project. We have accepted the submitted document as the final compliance report and concur that no further archaeological investigation is needed for this undertaking. Our office would like to review the Plan for Unanticipated Discoveries of Human Remains developed for the proposed quarry project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-814-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.
Sincerely,

Renee Gledhill-Earley

Ramona Bartos, Deputy
for State Historic Preservation Officer

SUNROCK®
CAROLINA SUNROCK LLC

Appendix C

Federal/State Threatened and Endangered Species Assessment

PILOT ENVIRONMENTAL, INC

January 6, 2020

Mr. Alexander Culpepper
Carolina Sunrock
200 Horizon Drive, Suite 100
Raleigh, North Carolina 27615

Reference: Preliminary Federal/State Threatened and Endangered Species Assessment
Prospect Hill Quarry and Distribution Center
Approximate 585-Acre Tract
Ridgeville Road
Prospect Hill, Caswell County, North Carolina
Pilot Project 5263

Dear Mr. Culpepper:

Pilot Environmental, Inc. (Pilot) is pleased to submit this report of a Preliminary Federal/State Threatened and Endangered Species Assessment for the approximate 585-acre tract located east of Ridgeville Road in Prospect Hill, Caswell County, North Carolina. A U.S. Geological Survey (USGS) Topographic Map (Drawing 1) and an aerial photograph (Drawing 2) showing the site boundary are included as attachments.

Background

Congress passed the Endangered Species Act (ESA) in 1973. The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the U.S. Fish and Wildlife Service (USFWS) and the Commerce Department's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of the Commerce Departments NMFS are mainly marine wildlife. Under the ESA, federally protected species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments.

The North Carolina Endangered Species Act (G.S. Chapter 113, Article 25) prohibits the taking of state listed species. "North Carolina Endangered" means any native or once native species whose existence is a viable component of the State's fauna is determined by the Wildlife Resource Commission to be in jeopardy. "North Carolina Threatened" means any native or once native species which is likely to become an endangered species within the foreseeable future

throughout all or a significant portion of its range. The North Carolina Endangered Species Act is administered by the North Carolina Wildlife Resources Commission (NCWRC)

Scope of Services

Pilot was contracted to perform a Preliminary Federal/State Threatened and Endangered Species Assessment for the approximate 585-acre tract located east of Ridgeville Road in Prospect Hill, Caswell County, North Carolina. The site consists of the entirety or portions of the parcels identified by the Caswell County Geographical Information System (GIS) as Parcel Identifications (PIDs) 0133 005, 0133 002, and 0133 045. The site is being evaluated for proposed development with a mining and distribution center on the central and eastern portions of the site. The purpose of this preliminary threatened and endangered species assessment is to identify the potential for impact to federally/state listed threatened and endangered species. The scope of services included a review of available literature and data. Consultation with the USFWS and the NCWRC is outside the scope of these services.

Site Reconnaissance

Pilot personnel conducted the site visit on November 13, 2019. The site contains wooded land, recently timbered land, and agricultural fields. The fields were cultivated with tobacco, soybeans and corn. Mixed grasses/weed transition zones are present between the agricultural fields, compacted soil farm roads and wooded land.

Mature wooded vegetative buffers are located adjacent to some stream/wetlands throughout the site. The wooded land consists of mature mixed pine/hardwoods that are dominated by loblolly pine, beech, oak species, hickory species and maple. The vegetative buffers have relative open overstory with sporadic mature tree species. Mid and understory vegetation is moderately dense to very dense.

Planted loblolly pine stands, estimated to be less than five to seven years in age, are located on the central and northern portions of the site. Dense low-lying herbaceous vegetation is present within the pine stands. Dominant species observed include broom sedge, dogfennel, blackberry, horseweed, goldenrod, muscadine grape, various hardwood saplings and other low-lying grass/weed species.

The remainder of the site was timbered within the previous two to three years. Dense herbaceous vegetation, with similar species as the immature pine stands, are present within the recently timbered areas.

Pilot was provided with a wetland delineation completed by others. Based on the wetland delineation, jurisdictional streams and wetlands are located throughout the site and several streams are also located throughout the site. It is our understanding that representatives of the U.S. Army Corps of Engineers (USACE) have confirmed stream/wetland locations and

designations in the field, but to date has yet to issue a USACE Jurisdictional Determination (JD) for the site. Drawing 3 shows the results from the wetland delineation survey provided by others.

Federally Listed Threatened and Endangered Species

Database and Literature Review

The project location was entered into the USFWS Information for Planning and Conservation (IPaC) online mapping system to obtain a resource list of federally protected species and designated or proposed critical habitat that may be affected by the project. The IPaC Resources Trust Report is included as an attachment. Pilot also reviewed the USFWS Endangered Species Database to identify federally protected species in Caswell County, North Carolina.

Additionally, Pilot reviewed the North Carolina Natural Heritage Program's Geographic Information System (GIS) natural resources data layer that includes the locations of documented known federal and state listed endangered and threatened species within the Hydrologic Unit Code, (HUC) 03010104 (Drawings 4 and 5), that contains the site. The following federally and state listed species were identified:

Category	Common Name	Scientific Name	Federal Status	State Status	Distance from Site (river miles)	Distance from Site (aerial miles)
Fish	Roanoke Logperch	*Percina rex*	E	E	Upgradient Watershed	4
Bivalve	James Spinymussel	*Parvaspina collina*	E	E	Upgradient Watershed	7
Bivalve	Triangle Floater	*Alasmidonta undulata*		T	Upgradient Watershed	7
Bivalve	Creeper	*Strophitus undulatus*		T	47	7
Bivalve	Green Floater	*Lasmigona subviridis*		E	47	16
Bivalve	Brook Floater	*Alasmidonta varicose*		E	59	26
Bivalve	Notched Rainbow	*Villosa constricta*		T	25	6
Bivalve	Atlantic Pigtoe	*Fusconaia masoni*		E	59	13
Vascular Plant	Prairie Blue Wild Indigo	*Baptisia aberrans*		E	n/a	5
Vascular Plant	Buffalo Clover	*Trifolium reflexum*		T	n/a	3
Vascular Plant	American Bittersweet	*Celastrus scandens*		E	n/a	7
Vascular Plant	Narrow-leaved Smooth Aster	*Symphyotrichum concinnum*		T	n/a	7
Vascular Plant	Virginia Spiderwort	*Tradescantia virginiana*		T	n/a	6
Vascular Plant	Tall Larkspur	*Delphinium exaltatum*		E	n/a	6
Vascular Plant	Dwarf Chinquapin Oak	*Quercus prinoides*		E	n/a	17
Vascular Plant	Veined Skullcap	*Scutellaria nervosa*		E	n/a	18

E – Endangered T – Threatened

Species/Habitat Description

Roanoke Logperch (*Percinia rex*)

Description: The Roanoke logperch is a large darter (up to 165 millimeters (mm) total length) with 8-11 vertical lateral blotches, dark green "worm-like" markings interspersed between dorsal saddles, speckled fins with the first dorsal fin having an orange band (particularly vivid in males), and a bulbous snout. Spawning occurs in April or May in deep runs over gravel and small cobble, and logperch typically bury their eggs with no subsequent parental care. Larval drift is likely an important dispersal and recolonization mechanism. Roanoke logperch mature at 2-3 years of age and commonly live five to six years. Roanoke logperch actively feed during the warmer months by utilizing their snout to overturn gravel to forage on benthic aquatic macroinvertebrates. Generally, the logperch exist in low-density populations.

Habitat: Roanoke logperch typically inhabit medium-to-large sized warm, clear streams and small rivers of moderate to low gradient. Adults usually occupy riffles, runs, and pools containing sand, gravel, or boulders that are free of silt. Young-of-year congregate in mixed-species schools in shallow habitat underlain by sand and gravel along stream margins.

Conclusion: The site is located outside of the watershed range of this species within Caswell County. Therefore, we have made a determination of no effect for this species.

James Spinymussel (*Parvaspina collina*)

Description: The James spinymussel is a small freshwater mussel slightly less than three inches in length. Adults have a dark brown shell with prominent growth rings and occasionally, short spines on each valve. Young mussels have a shiny yellow shell with or without one to three short spines. Like other freshwater mussels, this species is a filter feeder. It feeds on plankton collected from water that is passed over its gills. Reproduction occurs sexually. Females carry eggs in their gills. During spawning, the male releases sperm into the water column and the sperm is taken into the female through the gills. The resulting larvae (known as glochidia) are released from the female into the water column and must attach to a fish host to survive. While attached to the fish host, development of the glochidia continues. Once metamorphosis is complete, the juvenile mussel drops off the fish host and continues to develop on the stream bottom. Known fish hosts for this species include the bluehead chub (*Nocomis leptocephalus*), rosyside dace (*Clinostomus funduloides*), blacknose dace (*Rhinichthys atratulus*), mountain redbelly dace (*Phoxinus oreas*), rosefin shiner (*Lythrurus ardens*), satinfin shiner (*Cyprinella analostana*), central stoneroller (*Campostoma anomalum*), and swallowtail shiner (*Notropis procne*).

Habitat: Suitable habitat for this species includes free-flowing streams with a variety of flow regimes. The James spinymussel is found in a variety of substrates that are free from silt.

Conclusion: The site is located outside of the watershed range of this species within Caswell County. Therefore, we have made a determination of no effect for this species.

Triangle Floater (*Alasmidonta undulata*)

Description: The triangle floater is a small mussel, usually less than 60 mm in length and has somewhat of a triangular appearance. The shell is subtriangular to subovate and inflated, giving the mussel a swollen appearance. The anterior end is thicker and rounded, with a rounded ventral margin. The posterior ridge is poorly defined and rounded with a compressed posterior slope. The periostracum (outer covering) is smooth and coloration can vary from yellowish-green (juveniles) to nearly black (adults). Rays are typically dark green and radiate from the beaks but can be obscured in older, darker adult shells. Lateral teeth are vestigial, appearing only as indistinct bumps parallel to the hinge line.

Habitat: The triangle floater is frequently found in streams and rivers in sand and gravel substrates. It is the only Alasmidonta species that can tolerate standing water typical of ponds, lakes, and canals. Confirmed host fishes for the triangle floater include the blacknose dace, common shiner, fallfish, largemouth bass, longnose dace, pumpkinseed, slimy sculpin, white sucker, central stoneroller, fantail darter, northern hogsucker, and rosyface shiner.

Conclusion: The site is located outside of the watershed range of this species. Therefore, we have made a determination of no effect for this species. Therefore, it is our opinion that the proposed development will have a low probability of impacting this species.

Creeper (*Strophitus undulatus*)

Description: The creeper is a small freshwater mussel that rarely exceeds 75mm in length. The shape is subovate to subtrapezoidal and usually has a blunt posterior end. The shells are slightly inflated, thin, and fragile. Beaks are barely elevated above the hinge line. Sculpturing on the beak is usually coarse and prominent, but this feature is often only evident in animals with little shell erosion. The surface of the shell is often rough due to prominent growth lines. The periostracum may be yellow or greenish-brown in young animals, and brown or black in older animals. Fine green shell rays may be evident toward the posterior slope, particularly in young animals or light-colored adults. Hinge teeth are almost entirely absent; pseudocardinal teeth appear as an indistinct swollen area of the nacre below the beak. Lateral teeth are absent. The nacre is white or bluish-white, and it is dull-yellow or greenish toward the beak cavity. Feet may be a very pale orange in color, but this trait is variable.

Habitat: In northeastern North America, the creeper inhabits small to large rivers. Preferred habitats include low-gradient river reaches with sand and gravel substrates and low to moderate water velocities, although they can occur within a broader range of habitat conditions. They often inhabit small impoundments of run-of-river dams that retain some amount of flow. Streams and rivers that are productive, cool to warm-water environments with diverse fish assemblages

are most likely to support the species. Creepers are generally sparse or absent in headwater streams and high-gradient river reaches.

Conclusion: There are streams on the site that could potentially contain habitat for the creeper. The closest documented occurrence of this species is approximately 47 river miles down-gradient from the site. Based on the distance from the site, it is our opinion that the proposed development will have a low probability of impacting this species.

Green Floater (*Lasmigona subviridis*)

Description: The green floater can grow to 60–65 mm in length. This freshwater bivalve exhibits a somewhat compressed to slightly inflated thin shell that is sub-rhomboid to subovate in shape. The periostracum is yellow, tan, dark green, or brown with dark green rays, and the nacre is white or light blue and sometimes pink near the beaks. The height to width ratio is greater than 0.48 and the beaks are low compared to the line of the hinge. There are two true lamellate pseudocardinal teeth and one relatively small interdental tooth in the left valve, as well as one long and thin lateral tooth in the right valve.

Habitat: The green floater usually occurs in streams, small rivers, and canals of low to medium gradient with slow pools and eddies, fine gravel and sand bottom, and mid-range calcium concentrations. It cannot tolerate either flooding or droughts.

Conclusion: There are streams on the site that could potentially contain habitat for the green floater. The closest documented occurrence of this species is approximately 47 river miles from the site. Therefore, it is our opinion that the proposed development will have a low probability of impacting this species.

Brook Floater (*Alasmidonta varicose*)

Description: The shell of the brook floater is oblong, long and rhomboid with the anterior margin abruptly curved the ventral margin long and gently concave centrally. Growth ridges are marked by concentric ridges. The outer surface is generally smooth except on the posterior slope; it is yellowish, greenish or covered with dark greenish rays in juveniles. The outer sur-face becomes brownish with rays partially obscured or almost black in adults. The inner shell surface is whitish or bluish-white often with salmon, pink or purple in the beak cavity. Maximum shell length for this species is 70 mm (2.8 inches).

Habitat: The brook floater is found in high relief streams among boulders in sand.

Conclusion: There are streams on the site that could potentially contain habitat for the brook floater. The closest documented occurrence of this species is approximately 59 river miles from the site. Therefore, it is our opinion that the proposed development will have a low probability of impacting this species.

Notched Rainbow (*Villosa contricta*)

Description: The notched rainbow is a small mussel rarely exceeding 40 mm. Males and females differ in their shell morphology. In males, the longer end of the shell as measured from the umbo to the margin. In a live animal, the siphons extend from this end is curved from anterior to posterior producing an oval shape; while, in females, the posterior end is expanded to accommodate the marsupium. Also, in females, a sulcus is present which ends as a distinct notch along the posterio-ventral margin. In young individuals, the periostracum is golden brown with green rays, and although it may remain so in some populations, generally turns to black with age. There are two pseudocardinal teeth in each valve; however, the anterior tooth in the right valve is not well developed. The lateral teeth are well developed; two in the left valve, one in the right valve. The nacre is typically white to bluish-white and iridescent.

Habitat: The notched rainbow favors habitat that has a clean, sand floor among rocks in the shallows of a smaller, often upland stream, though it will occur in rivers and in mud. In North Carolina, this species is found in streams with sand/gravel substrates, often in stable banks among tree root mats.

Conclusion: There are streams on the site that could potentially contain habitat for the creeper. The closet documented occurrence of this species is approximately 25 river miles from the site. Based on the distance from the site, it is our opinion that the proposed development will have a low probability of impacting this species.

Atlantic Pigtoe (*Fusconaia masoni*)

Description: The shell of the Atlantic pigtoe is a chunky, rhombus shape, like that of a pig's hoof/toe. There is a distinct posterior ridge. The outer surface of the shell is yellow to dark brown and parchment-like, while the inner layer is iridescent blue to salmon, white, or orange. Although larger specimens exist, the Atlantic pigtoe rarely exceeds 2 inches in length. Young individuals may have greenish rays across the entire shell surface. When collected fresh, the interior surface (nacre) in the shell tends to be salmon colored and sometimes iridescent. Atlantic pigtoe has interlocking hinge "teeth" on the inside of the shell to help keep the two valves in proper alignment.

Habitat: The preferred habitat of the Atlantic pigtoe is coarse sand and gravel, and rarely in silt and detritus. Historically, the best populations existed in small creeks to larger rivers with excellent water quality, where flows were sufficient to maintain clean, silt-free substrates.

Conclusion: There are streams on the site that could potentially contain habitat for the Atlantic pigtoe. The closest documented occurrence of this species is approximately 59 river miles from the site. Therefore, it is our opinion that the proposed development will have a low probability of impacting this species.

Prairie Blue Wild Indigo (*Baptisia aberrans*)

Description: Blue wild indigo is a native, perennial, deep rooted warm season legume which reproduces by seed or rhizomes. The leaves are alternate and trifoliate. The plant is erect, rising from a branched root system which has root tubercles. It branches at the top with the flowers in an erect short terminal raceme at the pinnacle. The stems are stout and glabrous. It may grow up to 5 feet tall and 3 feet wide. Normally, it is about 3 feet tall and 2 feet wide. The flowers are hermaphroditic, about 1 inch long and may range in color from light blue to deep purple. The fruit is an inflated hardened pod from 1 to 3 inches long and from 1/2 to 1 inch in diameter. When mature the pods contain a number of small seeds, which are loose.

Habitat: Larger populations can be found along tree lines, bordering forested riparian areas and in open prairies or native hay meadows. It does not grow well in shaded habitats. It prefers gravelly, sandy or well-drained loamy soils. It withstands prolonged droughts.

Conclusion: While there is suitable habitat for the prairie blue wild indigo on the site, the closest known occurrence of this species is approximately 5 miles from the site. Based on the distance from the site and site conditions, it is our opinion that the proposed development will have a low probability of impacting this species.

Buffalo Clover (*Trifolium reflexum*)

Description: Buffalo clover is a perennial species with leaves divided into three leaflets. The flower heads are about 1-inch wide, white, and grow on stems that are 2 to 8 inches long. Each flower head has two large opposite leaves below it on the flowering stem. Buffalo clover flowers from late spring to early summer.

Habitat: Buffalo clover requires periodic disturbance and a somewhat open habitat to successfully flourish, but it cannot tolerate full-sun, full-shade, or severe disturbance. Historically running buffalo clover was found in rich soils in the ecotone between open forest and prairie. Those areas were probably maintained by the disturbance caused by bison. Today, the species is found in partially shaded woodlots, mowed areas (lawns, parks, cemeteries), and along streams and trails.

Conclusion: While there is suitable habitat for buffalo clover on the site, the closest known occurrence of this species is approximately 3 miles from the site. Based on the distance from the site and site conditions, it is our opinion that the proposed development will have a low probability of impacting this species.

American Bittersweet (*Celastrus scandens*)

Description: American bittersweet is a deciduous, woody vine in the Staff-tree family (Celastraceae), known for its showy fruits in the fall and early winter. It reaches 6 to 9 meters or more in height, with stems up to 10 cm in diameter. American bittersweet is generally dioecious, with functional male and female flowers on separate plants. Orange or red capsules open when mature to expose red arils that surround the seeds. The fruits are poisonous to humans but palatable to birds, which are the primary dispersers of the seeds.

Habitat: American bittersweet prefers open to patchy light conditions and is often found in woodland edges, thickets, roadsides, and rarely in the forest understory. This woody vine is a climber that can twine into the canopy foraging for light. Although this species was collected historically from a range of habitats, several recent records have been from rocky slopes and powerlines in areas with mafic bedrock.

Conclusion: While there is suitable habitat for American bittersweet on the site, the closest known occurrence of this species is approximately 7 miles from the site. Based on the distance from the site and site conditions, it is our opinion that the proposed development will have a low probability of impacting this species.

Narrow-leaved Smooth Aster (*Symphyotrichum concinnum*)

Description: A blue to purple-rayed perennial aster with slightly clasping leaves. The leaves are narrower and less evidently glaucous than those of Aster laevis. The principal leaves are often slightly clasping or are petiolate and are usually less than 2.5 centimeters wide and more than five times as long as wide (including petiole). The inflorescence is more diffusely branched, with more numerous and smaller bracts and the heads are mostly long- pedunculate.

Habitat: Documented habitats include a diabase barren at woods edge, dry roadbank, floodplain and alluvial woods, wooded slope, a dry, artificial clearing and in mafic soil. Populations are small, with the largest population having about 20 plants.

Conclusion: While there is suitable habitat for the narrow-leaved smooth aster on the site, the closest known occurrence of this species is approximately 7 miles from the site. Based on the distance from the site and site conditions, it is our opinion that the proposed development will have a low probability of impacting this species.

Virginia Spiderwort (*Tradescantia virginiana*)

Description: Virginia spiderwort is a perennial plant that reaches up to 2½ feet tall and is unbranched, except for 1 or 2 small side stems near the inflorescence. The central stem is round and glabrous, although scattered long hairs may occur where the leaves wrap around the stems, or a little below. The leaves are dark green or olive green, up to 12" long and 1" across, with parallel venation and smooth margins. They are linear to broadly linear, but wider at the base and narrowing to a pointed tip. They often bend downward toward the middle.

Habitat: Virginia spiderwort can typically be found in moist to mesic black soil prairies, sand prairies, savannas, thickets, openings and edges of woodlands, sandstone cliffs, and powerline clearances through woodland areas. This plant usually doesn't stray far from areas with trees and shrubby vegetation.

Conclusion: While there is suitable habitat for Virginia spiderwort on the site, the closest known occurrence of this species is approximately 6 miles from the site. Based on the distance from the site and site conditions, it is our opinion that the proposed development will have a low probability of impacting this species.

Tall Larkspur (*Delphinium exaltatum*)

Description: Tall larkspur is an herbaceous perennial member of the Buttercup Family (Ranunculaceae). Larkspurs have distinctive flowers with four blue petals and one sepal elongated into a slender spur, which gives the plant its name. The leaves are deeply lobed into irregular segments. Tall larkspur blooms in late summer and grows two to six feet, while dwarf larkspur, which blooms in early spring, grows only 8 to 30 inches high.

Habitat: Tall larkspur grows on dry, open southwest-facing slopes with limestone soils. Its range extends from southern Pennsylvania, west to Ohio, and south to North Carolina, Tennessee and Missouri.

Conclusion: Suitable habitat for tall larkspur is not located on the site and the closest known occurrence of this species is approximately 6 miles from the site. Based on the distance from the site and site conditions, it is our opinion that the proposed development will have a low probability of impacting this species.

Dwarf Chinquapin Oak (*Quercus prinoides*)

Description: Dwarf chinquapin oak is a shrub or small tree, usually growing in multi-stemmed clumps or thickets. The leaves are alternate, simple, leathery, grow about 1½–4 inches long with 4–8 teeth per side, a vein running to each tooth. Their upper surface is green, shiny, smooth and their lower surface is much paler, velvety-hairy and turns red in autumn. The bark is brownish-

gray, smooth, with horizontal pores that develops into flat, scaly, checkered ridges with shallow furrows. Twigs are reddish-brown and hairy, becoming gray and smooth.

Habitat: This species occurs in open woods, on glades, prairies, thickets, and along bluffs. It can be difficult to manage in prairies due to its tendency to from thickets. Periodic burning helps keep it and other woody plants from dominating prairies.

Conclusion: While there is suitable habitat for dwarf chinquapin oak on the site, the closest known occurrence of this species is approximately 17 miles from the site. Based on the distance from the site and site conditions, it is our opinion that the proposed development will have a low probability of impacting this species.

Veined Skullcap (*Scutellaria nervosa*)

Description: Veined skullcap, also known as veiny skullcap, is a flowering plant of the mint family (Lamiaceae). It is native to the eastern United States. It has hairless stems and bears sessile ovate leaves which sometimes have toothed margins. The flowers are tubular and range from white to blue in color.

Habitat: This species is typically found in alluvial, floodplain forests.

Conclusion: While there is suitable habitat for veined skullcap on the site, the closest known occurrence of this species is approximately 18 miles from the site. Based on the distance from the site and site conditions, it is our opinion that the proposed development will have a low probability of impacting this species.

Conclusions and Opinions

This preliminary threatened and endangered species assessment has revealed that it is not likely for the proposed development of the site to impact federally and state protected species. If additional information concerning federally and state listed threatened and endangered species, agency involvement, or proposed site development becomes available that makes a material difference in our findings and conclusions, Pilot reserves the right to revise the conclusions and opinions found within this report.

Closing

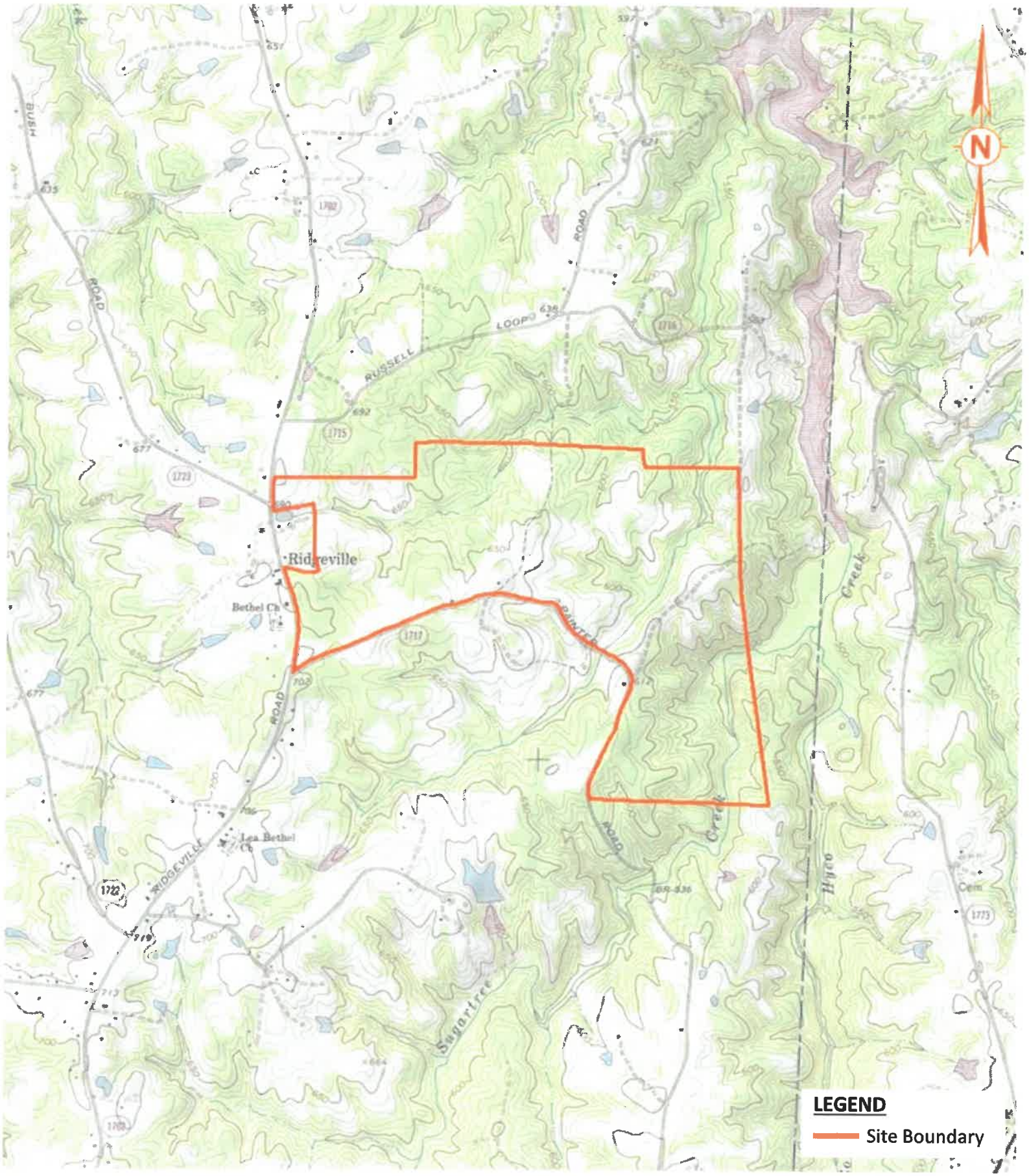
We appreciate the opportunity to provide our services to you. Please contact us at (336) 310-4527 if you have questions or require additional information.

Sincerely,

Spencer C. Burnett
Project Manager

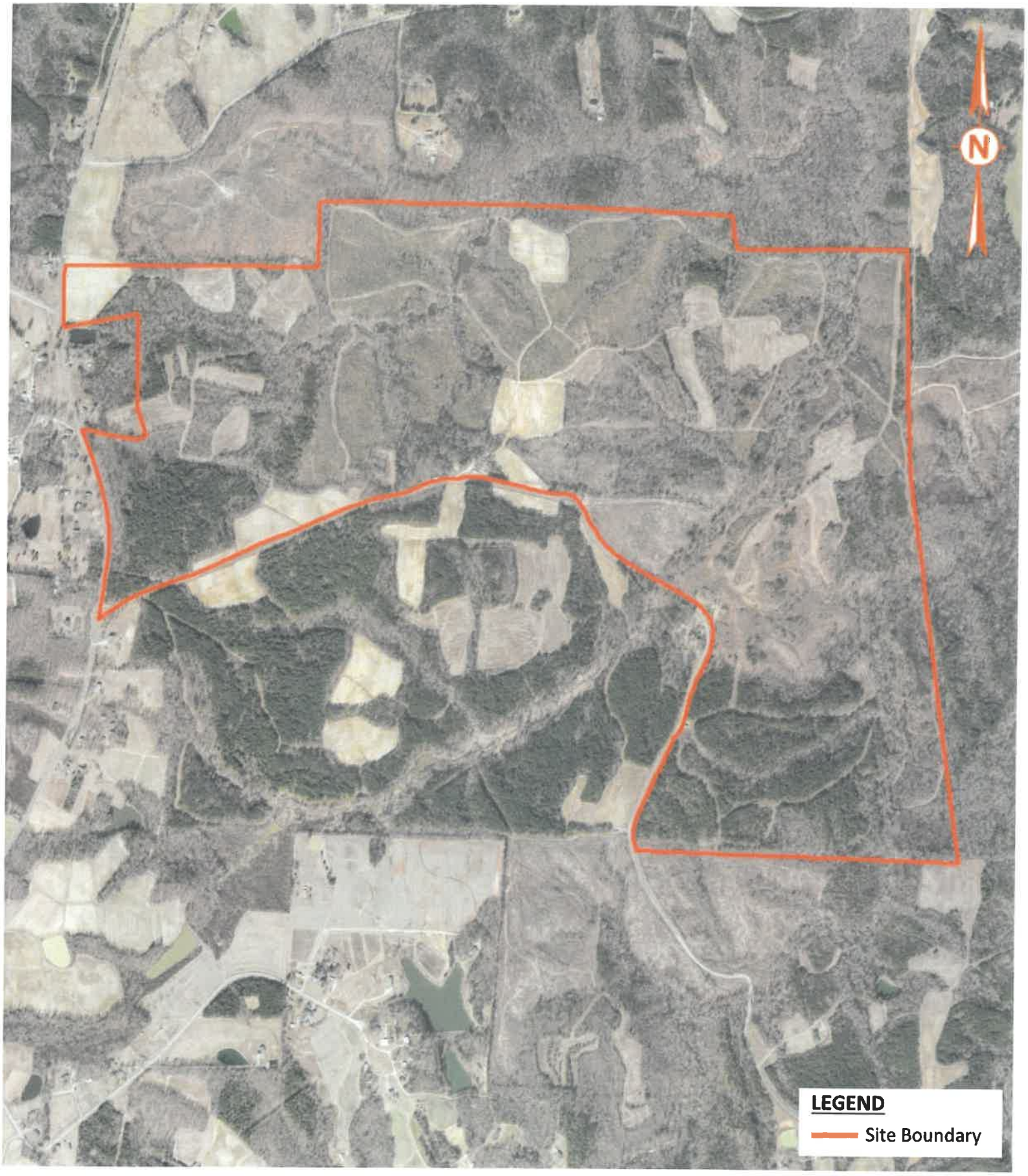
Bradley S. Luckey, PWS
Senior Project Manager

Attachments: Drawing 1 – USGS Topographic Map
Drawing 2 – Aerial Photograph
Drawing 3 – Wetland Map
Drawing 4 – Threatened & Endangered Aquatic Species
Drawing 5 – Threatened & Endangered Upland Species
IPaC Report



Drawing 1
USGS Topographic Map
Ridgeville, NC Quadrangle
Scale: 1" = 2,000'

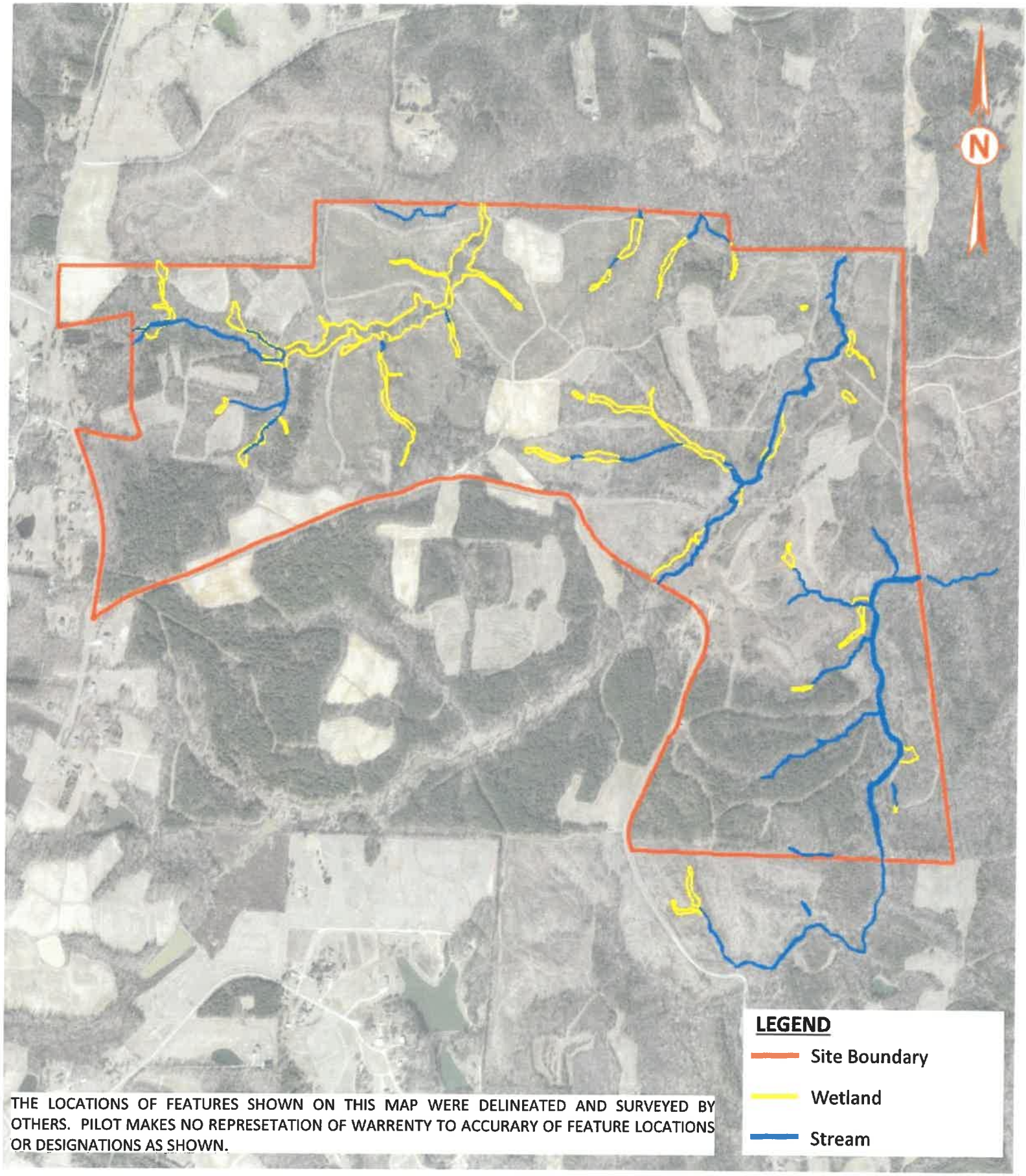
USGS Topographic Map
Prospect Hill Quarry
Approximate 585-Acre Tract
Prospect Hill, Caswell County, NC
Pilot Project 5263



Drawing 2
2018 ESRI Satellite Imagery
Scale: 1" = 1,100'

PILOT
PILOT ENVIRONMENTAL, INC

Aerial Photograph
Prospect Hill Quarry
Approximate 585-Acre Tract
Prospect Hill, Caswell County, NC
Pilot Project 5263

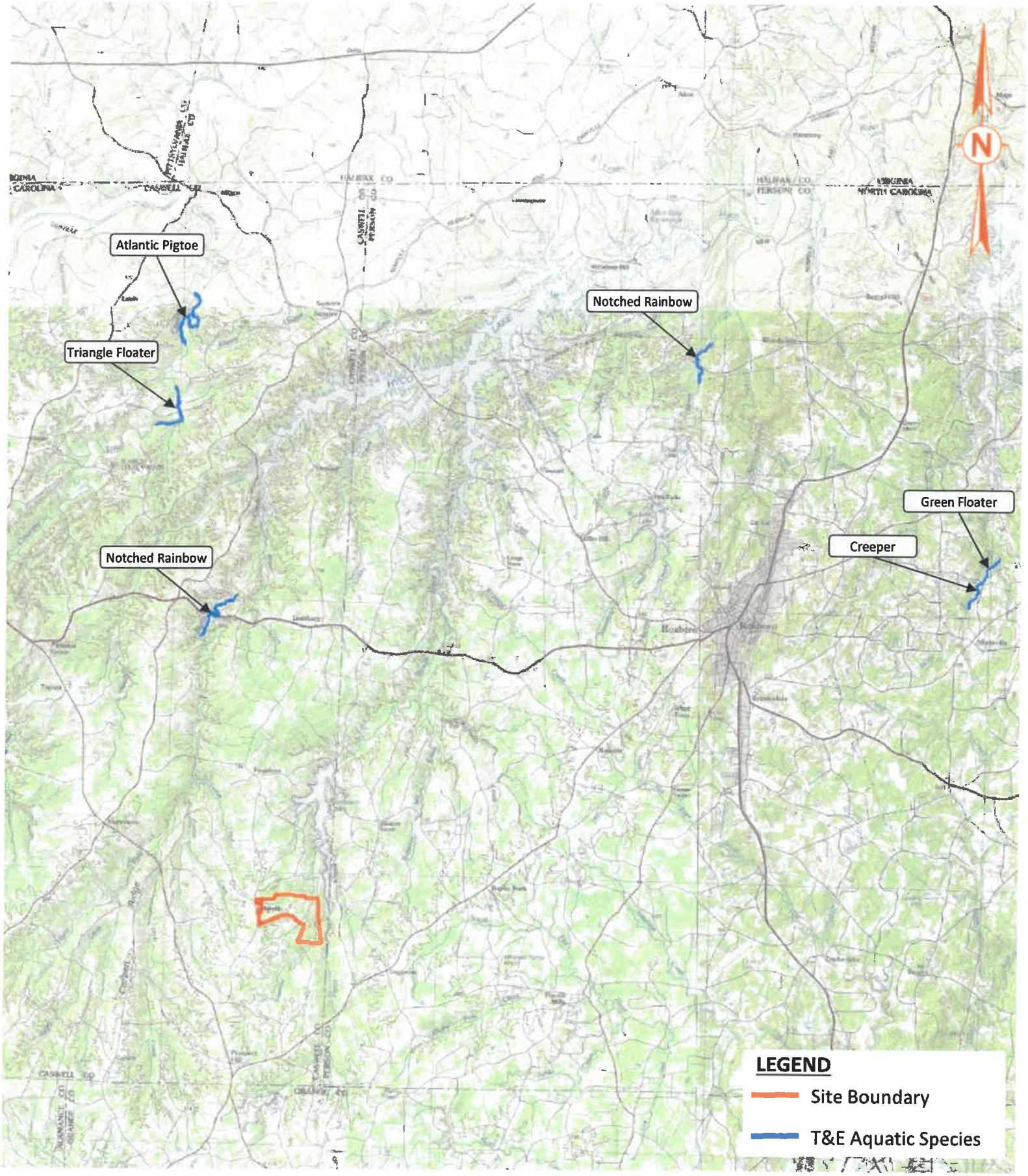


THE LOCATIONS OF FEATURES SHOWN ON THIS MAP WERE DELINEATED AND SURVEYED BY OTHERS. PILOT MAKES NO REPRESETATION OF WARRENTY TO ACCURARY OF FEATURE LOCATIONS OR DESIGNATIONS AS SHOWN.

Drawing 3
ESRI Satellite Imagery
& Stream/Wetland Survey
Completed by Others
Scale: 1" = 1,100'

PILOT
PILOT ENVIRONMENTAL, INC

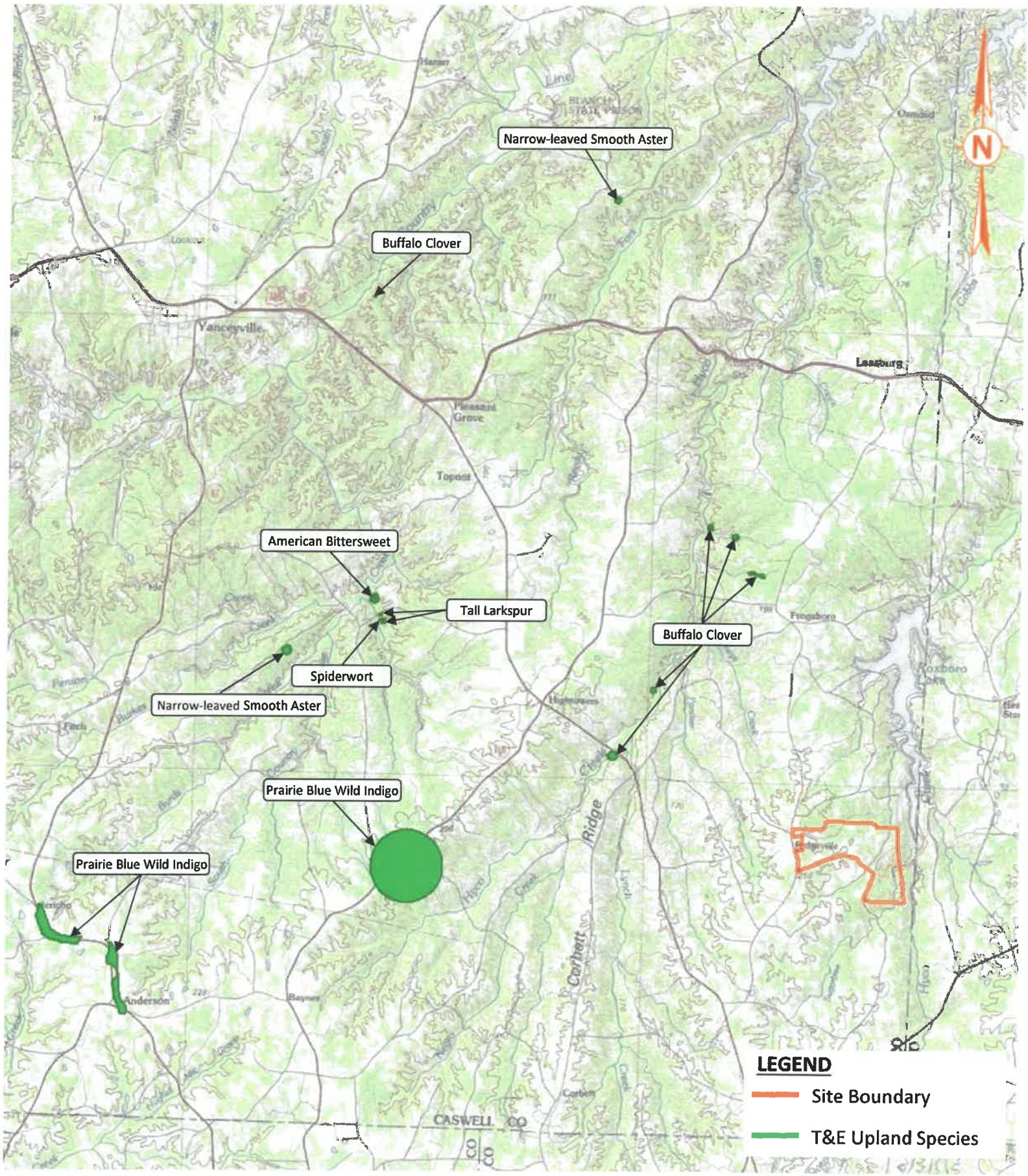
Wetland Map
Prospect Hill Quarry
Approximate 585-Acre Tract
Prospect Hill, Caswell County, NC
Pilot Project 5263



Drawing 4
NC Natural Heritage Program's
T&E Species Data Layer,
National Geographic Society
Topographic Map
1" = 15,000'

PILOT ENVIRONMENTAL, INC

Threatened & Endangered Aquatic Species
Prospect Hill Quarry
Approximate 585-Acre Tract
Prospect Hill, Caswell County, NC
Pilot Project 5263



Drawing 5
NC Natural Heritage Program's
T&E Species Data Layer,
National Geographic Society
Topographic Map
Scale: 1" = 9,000'

Threatened & Endangered Upland Species
Prospect Hill Quarry
Approximate 585-Acre Tract
Prospect Hill, Caswell County, NC
Pilot Project 5263

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Phone: (919) 856-4520 Fax: (919) 856-4556

In Reply Refer To:
Consultation Code: 04EN2000-2020-SLI-0351
Event Code: 04EN2000-2020-E-00809
Project Name: 5263 - Prospect Hill Quarry

December 13, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The species list generated pursuant to the information you provided identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally-protected species list, information on the species' life histories and habitats and information on completing a biological assessment or

evaluation and can be found on our web page at http://www.fws.gov/raleigh. Please check the web site often for updated information or changes

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally-protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

Not all Threatened and Endangered Species that occur in North Carolina are subject to section 7 consultation with the U.S Fish and Wildlife Service. Atlantic and shortnose sturgeon, sea turtles,when in the water, and certain marine mammals are under purview of the National Marine Fisheries Service. If your project occurs in marine, estuarine, or coastal river systems you should also contact the National Marine Fisheries Service, http://www.nmfs.noaa.gov/

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office. If you have any questions or comments, please contact John Ellis of this office at john_ellis@fws.gov.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
(919) 856-4520

Project Summary

Consultation Code: 04EN2000-2020-SLI-0351

Event Code: 04EN2000-2020-E-00809

Project Name: 5263 - Prospect Hill Quarry

Project Type: MINING

Project Description: The site is an approximate 585-acre tract located in Caswell County that is proposed for quarry development.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/36.29782431799977N79.16003799601106W

Counties: Caswell, NC

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Clams

NAME	STATUS
James Spinymussel *Pleurobema collina* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2212	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

SUNROCK®
CAROLINA SUNROCK LLC

Appendix D

Revised Hydrogeological Study Report

PIEDMONT GEOLOGIC
SMART EARTH SOLUTIONS

6003-145 Chapel Hill Rd.
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REVISED HYDROGEOLOGICAL STUDY REPORT

Proposed Quarry Site
Wrenn Road
Prospect Hill, Caswell County, North Carolina

Prepared For:

Carolina Sunrock LLC
200 Horizon Drive, Suite 100
Raleigh, North Carolina 27615

Prepared by:

Piedmont Geologic, P.C.
6003 Chapel Hill Road, Suite 145
Raleigh, North Carolina 27607

May 7, 2020

Piedmont Geologic, P.C. is a professional corporation licensed to practice Geology (C-216) and Engineering (C-3104) in North Carolina.

REPORT CERTIFICATION

This *Revised Hydrogeological Study Report* for the Carolina Sunrock – Caswell County property has been prepared or reviewed by the following persons.

PREPARED BY:

Jonathan D. Murphrey
Printed Name

Signature

May 7, 2020
Date

Seal

REVIEWED BY:

Peter J. Dressel
Printed Name

Signature

May 7, 2020
Date

Seal

A. Scott Andres
Printed Name

Signature

May 7, 2020
Date

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1.0 INTRODUCTION AND SITE BACKGROUND INFORMATION

This document presents a revised hydrogeological study report for the proposed Carolina Sunrock ("Sunrock") quarry site located off Wrenn Road in Prospect Hill, Caswell County, North Carolina (the "site"). The *Hydrogeological Study Report*, dated August 14, 2019, prepared by Piedmont Geologic (the "August 2019 report") presented the results of field efforts completed from April-May 2019 and related data evaluations. The purpose of the study was to evaluate hydrogeological parameters for the site and the potential hydrological effects on local water-supply wells, the sole sources of local potable and non-potable water supplies, that could result from quarrying operations (i.e., dewatering of the quarry), such as decreased groundwater supply/production, or even dry wells.

The August 2019 report was submitted by Sunrock in August 2019 to the North Carolina Department of Environmental Quality (NCDEQ), Division of Energy, Mineral and Land Resources (DEMLR) as part of Sunrock's site mining permit application. Following submittal, Sunrock received a response letter (*RE: Proposed Prospect Hill Quarry and Distribution Center*) from DEMLR dated November 21, 2019 (the "November 2019 DEMLR letter", Appendix A), outlining and summarizing concerns with the proposed quarrying operation noted by various regulatory reviewers, and including copies of the associated reviewer memoranda and correspondence.

The November 2019 DEMLR letter referenced comments provided by the NCDEQ, Division of Water Quality (DWQ), Groundwater Management Branch (GWMB) via a September 25, 2019 memorandum from Mr. Michael Bauer (GWMB) to Ms. Wehner (the "September 2019 GWMB memorandum"). The September 2019 GWMB memorandum noted potential adverse effects on groundwater supplies and nearby water-supply wells that could result from the planned quarry pit dewatering. In order to monitor these potential effects, GWMB recommended that a series of observation wells be installed around the site perimeter and that the wells be gauged on a routine basis beginning at least two months prior to initiation of any site dewatering activities. GWMB also requested an adverse-impact statement letter from Sunrock stating the steps the company will take should the dewatering activities impact existing offsite water-supply wells. Finally, GWMB concluded by noting that since the planned site operations will result in excess of 100,000 gallons of groundwater withdrawals per day, Sunrock will need to register the water withdrawals with DWQ.

The November 2019 DEMLR letter referenced, in bullet point number five, the above comments provided by GWMB. The letter correctly noted the concerns raised by GWMB with respect to potential impacts to offsite water supply wells, as well as their request of an adverse impact statement letter to address those potential impacts. The letter also stated that the 2019 pumping tests would need to be re-performed due to

"inaccuracies in the pumping test procedures", and with the re-performed pumping tests including "unfiltered testing of the wells for all of the metals on the sample results sheets submitted with the hydrogeological study". The letter implied that these comments were attributed to GWMB; however, there are no mentions of these statements in the September 2019 GWMB memorandum. Furthermore, the groundwater samples collected during the 2019 pumping tests and submitted for laboratory analysis of metals *were*, in fact, unfiltered, despite not being directly stated as such on the chain of custodies (standard operating procedures would call for making a note on the chain of custody only if the sample were filtered during collection).

The request by DEMLR for re-performance of the site pumping test would appear to have been prompted, not by the appropriate State regulatory authority (i.e., GWMB), but by a letter submitted to DEMLR by a neighbor of the site that included third-party commentary (Summit Envirosolutions letter, dated October 24, 2019) regarding the August 2019 report. We take exception to the use of Summit Envirosolutions comments to guide a regulatory decision by DEMLR as the comments' author, Mr. John Dustman, is not licensed in North Carolina to practice either geology or engineering, as required by State laws and regulations (Summit Envirosolutions is based in Minnesota). Looking beyond this obvious disqualifying factor, the comments/conclusions contained in the Summit Envirosolutions letter should not be considered for any regulatory purpose as the associated arguments are based on unsubstantiated assumptions, careless speculation, and a conspicuous absence of any apparent significant understanding of hydrogeological conditions associated with the Appalachian Piedmont physiographic province.

We recognize that there were minor deviations from ideal procedures for the 2019 pumping tests, namely the short-term pumping disruptions that were necessary to safely maintain the site power supply. However, we also know from experience that perfect execution of any/all field procedure under field conditions cannot always be achieved, nor is it generally expected nor certainly required. As would be expected from the seasoned professional, pumping test data during the minor periods of disruption were easily filtered from the overall data set, resulting in a wholly suitable database for further analysis.

Although we disagree that the 2019 site pumping test was invalid, in support of this revised report submittal, we have completed additional pumping test data analysis, including analysis of groundwater potentiometric-surface elevation data recorded during the recovery phases of the tests. The recovery data are free of noise caused by slight variations in pumping rates observed during the drawdown phase of the test, nor are recovery data impacted by delayed drainage from the water table as are drawdown data. Aquifer hydraulic properties derived from the recovery data are representative, avoid effects of storage in the well bore and disturbed zones around the well bores, and, importantly, are similar in value to those calculated from the combined pumping- and drawdown-phase data.

The design plans submitted in Sunrock's initial application package to DEMLR called for totals depths of approximately 500-feet for both proposed quarry pits, whereas the updated plans propose revised depths to approximately 300-feet below grade. In addition, the new proposed overall lateral footprints of the quarry pits have likewise decreased. The new plan for quarry development calls for progression over several different phases, with the northern proposed quarry pit ("Pit A") being mined to completion in around 30 years, followed by initiation of mining at the southern proposed quarry pit ("Pit B"), which is expected to provide around 50 years of production. These design modifications will substantially reduce potential impacts to any offsite water-supply wells as a result of quarry-dewatering operations. In response, the hydrogeological models as presented in the 2019 report have been updated to reflect these design modifications. As was the case for the 2019 report, the revised hydrogeological study results presented herein indicate little to no expected adverse effects to area water-supply wells from the future quarry operations.

In support of this revised report effort, Piedmont Geologic retained Mr. Alan S. (Scott) Andres, a noted hydrogeology expert from the Delaware Geological Survey and the University of Delaware who specializes in hydrogeological studies for the Appalachian Piedmont and Coastal Plain physiographic provinces and has over 35 years of related academic and applied scientific experience. Mr. Andres assisted in the augmented analyses of pumping-test data, assessment of potential impacts to surface water presented herein, and provided key insights to upgrade the resulting hydrogeological models.

The remainder of this document presents site background information, information regarding pumping well and observation well installations, methods and results of the April-May 2019 pumping tests, evaluations of hydrogeological parameters, details of a proposed groundwater monitoring/mitigation plan for the planned dewatering operations, and conclusions.

2.0 SITE DESCRIPTION AND GEOLOGIC/HYDROGEOLOGIC SETTING

2.1 Site Description

The site location and layout are shown in Figures 1 and 2, respectively. The site occupies approximately 630 acres and is bounded to the south by Wrenn Road, to the west by Ridgeville Road, and to the north and east by undeveloped wooded lands. Roxboro Lake is located northeast of the site. The site has historically been utilized primarily for agricultural purposes (i.e., farmland), and is composed of a mixture of agricultural fields and woodlands. A majority of wooded areas at the site were clear-cut for timber harvesting around late-2018.

Based on preliminary geologic investigations completed by Sunrock, two potential quarrying areas have been identified, and were the focus of the hydrogeologic study. Area 1 (within the proposed location of Pit A), situated in the northeastern portion of the site, and Area 2 (within the proposed location of Pit B), situated in the east-central portion of the site (and south of Area 1), are both currently comprised of agricultural fields and woodlands. A total of three streams are present at the site: an unnamed stream ("unnamed stream 1") is situated near the central portion of the site and trends roughly south-southwest to north-northeast (bisecting Area 1 and Area 2), a second unnamed stream ("unnamed stream 2") is situated in the northwestern portion of the site property and trends roughly west-southwest to east-northeast, and Sugartree Creek is located approximately 1,200-feet southeast of Area 2 and trends roughly south to north. The USGS topographic map (Figure 1) indicates that unnamed stream 1 and Sugartree Creek are perennial streams, while unnamed stream 2 is an intermittent stream. All three streams flow to the north-northeast, towards South Hyco Creek, with the two unnamed streams converging at a location approximately 1,500-feet north of the northeastern property boundary.

Regional topographic slope at the Sunrock site is towards the northeast. The study areas are of roughly equal elevations (approximately 600-feet above mean sea level), with the unnamed stream bisecting the two areas at elevations ranging from approximately 550- to 580-feet above mean sea level.

2.2 Site Geologic/Hydrogeologic Setting

The site is located in the Piedmont physiographic province, which is characterized by moderately level interstream areas separated by broad valleys. Bedrock in Prospect Hill, North Carolina is mapped within the Carolina Slate Belt lithologic division of the Piedmont, which consists of metamorphosed volcanic and sedimentary rocks that are intruded by a number of igneous plutons.

Interpretation of the geologic setting for the site is obtained from information presented on the large scale maps by North Carolina Geological Survey (1985) and Carpenter (1982), and finer scale quadrangle maps (Hanna et al., 2010; Bradley and Hanna, 2010; Hibbard, 2017; Shell and Hibbard, 2017; Wilkins and Hibbard, 2017) that cover the area surrounding the Sunrock site. These older sources describe a variety of deformed Paleozoic felsic to mafic metavolcanic rocks and scattered Mesozoic dikes. The newer maps include felsic to mafic metavolcanic rock types and note later Paleozoic pegmatites intrusions, and younger Mesozoic diabase and dacite dikes. Deformation fabrics described on the newer maps include foliations, lineations, and folds (ductile), and joints and fractures (brittle). Primary porosity of these rocks is likely negligible in comparison to secondary porosity associated with deformation features.

Competent bedrock, consisting of diabase, diorite, and granodiorite, has been encountered at depths ranging from approximately 5-feet to 35-feet below grade throughout the site study areas. Overlying the bedrock is primarily zones of weathered bedrock and unconsolidated overburden, consisting of sands and silt.

As described by Heath (1984), and illustrated in Figure 3, groundwater in the Piedmont physiographic province generally occurs in the overburden under unconfined (i.e., water table) conditions and acts as a reservoir which slowly feeds water into the underlying bedrock via systems of fractures. Groundwater recharge generally occurs in areas above the floodplains of streams and discharge occurs as seepage into springs. Many topologic depressions such as valleys are indicative of zones of more-highly fractured bedrock, which are more readily subject to weathering and/or erosion. Heath notes that the greatest groundwater yields are obtained from the upper 100 meters of bedrock, which is generally where fractures are larger and more numerous.

“Perched” water tables are common in the Piedmont, consisting of isolated and laterally discontinuous lenses or layers of groundwater residing on top of low-permeability layers such as clay or unfractured bedrock. Perched water tables are separate and distinct from the “true” water table that lies at greater depth and are not hydraulically connected to the water table. Perched water tables are generally poor sources of groundwater supply but may serve as sources of water recharge to upland draws or springs where in contact with such features.

The weathered bedrock and overburden zones encountered at the site would be expected to be more permeable and porous than underlying more competent rock. Groundwater is expected to occur within secondary porosity associated with the weathered bedrock zone as well as the bedrock fractures. Groundwater level data collected at the site show that static groundwater levels occur at approximately 26- to 30-feet below grade, generally the same depths as the first occurrence of water noted in the boring logs (also within the overburden or just beneath the top of weathered bedrock), which are clear indicators that groundwater is present under unconfined conditions.

3.0 MARCH 2019 OBSERVATION WELL AND PUMPING WELL INSTALLATIONS

As the first step of the hydrogeological study, Piedmont Geologic supervised the installation of one pumping well and three observation wells within each of the two study areas (Figures 2, 4, and 5). Well-construction specifications are summarized in Table 1 (Appendix B) and well-boring logs are provided in Appendix C. The wells were installed in March 2019 by a North Carolina licensed well driller employed by Carolina-Virginia Well Drilling Inc.

The wells were installed utilizing a truck-mounted Drilltech T25KW rig equipped with a combination of hollow-stem auger and air-rotary tooling. All wells are constructed with nominal 6-inch inside diameter Schedule 40 PVC outer casings with threaded and flush joints extending through overburden and into competent bedrock. Outer-casing depths for the wells ranged in depth from approximately 33- to 69-feet below grade. The outer-casing annuli were tremie-grouted to grade with cement/bentonite slurry. Following a minimum waiting period of approximately 24-hours, the inner borings (approximately 5.5-inch diameter) were advanced through the surface casing and into bedrock, to depths of approximately 300-feet below grade utilizing air-rotary drilling. After reaching the completion depth at each well location, the wells were purged/developed by Carolina-Virginia Well Drilling via air lifting using the drill rig's down-hole air rotary tooling until the discharge water was reasonably clear of rock cuttings and suspended sediments.

Locations of pumping and observation wells within each study area were selected so that the observation wells were located at radial distances of approximately 30-feet, 100-feet, and 300-feet from the pumping well. The well locations were directionally staggered in order to limit potential bias in aquifer characteristics that would be observed if the wells were installed along linear bedrock structures such as fractures or joints. Piedmont Geologic designated the pumping wells based on the highest yielding well, as estimated during drilling, of the first three wells installed in each area. This selection process for the pumping well, along with access-limitations for the drill rig, resulted in slight variations in the actual radial distances between pumping and observation wells versus the targeted distances. A summary of distances between the pumping well and observation wells within each study area is provided below in Table 2.

Table 2: Summary of Area 1 and Area 2 Pumping and Observation Well Layouts

Study Area	Pumping Well	Observation Well	Approximate Radial Distance between Observation Well and Pumping Well (feet)
Area 1	PW-1	OW1-1	292
		OW1-2	100
		OW1-3	31
Area 2	PW-2	OW2-1	31
		OW2-2	254
		OW2-3	86

A pre-existing site observation well (CD-12) was installed by a North Carolina licensed well driller under supervision of Sunrock during late-2018. Based on the relatively large radial distance between CD-12 and pumping wells PW-1 and PW-2 (approximately 2,700-feet and 1,100-feet, respectively), CD-12 was utilized as a background observation well for the hydrogeological study.

4.0 APRIL-MAY 2019 PUMPING TEST

4.1 Pumping Test Methods

Piedmont Geologic completed pumping tests in April-May 2019 utilizing the pumping and observation wells installed in Areas 1 and 2 in March 2019. Methods utilized for each pumping test are described below.

Area 2 Pumping Test Methods

The first pumping test was completed in Area 2 from April 30-May 6, 2019. Well PW-2 was utilized as the pumping well for the test, and wells OW2-1, OW2-2, and OW2-3 were utilized as observation wells. In addition, well CD-12 was utilized as a background observation well.

Pressure transducers with integral data loggers (In-Situ Level TROLL 700) were installed on vented communications cables in all four Area 2 wells plus background observation well CD-12 for automated groundwater-level data collection at 5-second intervals. Groundwater levels were also manually monitored in the Area 2 pumping/observation wells at routine intervals of approximately once per hour using an electronic depth-to-water meter. CD-12 was also manually monitored for background groundwater levels during the pumping test at intervals ranging from approximately 6- to 12-hours.

Prior to the start of the Area 2 pumping test, on April 29, 2019, a submersible electric pump (Grundfos Redi-Flo3) was installed in pumping well PW-2 by Patrick Henry Well Drilling, with the pump inlet set to a depth of approximately 275-feet below grade. A step-drawdown test was planned to be conducted prior to the pumping tests for each of the two study areas to evaluate both efficiency of the pumping well and the potential maximum well yield. However, the wells and aquifer were not capable of yielding significant amounts of water. In addition, the pump was not equipped with a variable speed motor, and included internal sensors that shut down the pump if the pump discharge was restricted by mechanical valves. As a result, conducting a step drawdown test was not practical.

On April 30, 2019, pre-pumping static groundwater levels were measured in the pumping/observation wells, as described above, for an approximately 20-hour period. Following the pre-pumping monitoring period, groundwater pumping was initiated from PW-2 utilizing the submersible electric pump (which was powered by a portable gasoline-powered generator). The groundwater flow rate was measured at approximately 1-hour intervals using a flow totalizer meter that was installed on the pump-discharge piping. Extracted groundwater was discharged to the ground surface along the sloped area west approximately 100-feet west of PW-2 where the water would flow downhill towards unnamed stream 1 to the west, and away from the Area 2 pumping/observation wells. A pumping rate of approximately 26- to

29-gallons per minute (gpm) and a pump setting of 275 feet below grade were maintained throughout the duration of the test.

Piedmont Geologic collected a groundwater sample from the submersible pump discharge line at an elapsed pumping time of approximately 42-hours. The sample was submitted to Pace Analytical in Mt. Juliet, Tennessee (Pace) and analyzed for Target Analyte List (TAL) metals by EPA Methods 200.7 and 245.7.

The submersible pump in PW-2 was turned off after approximately 43-hours of pumping - short of the planned 48-hour period - due to groundwater in observation wells OW2-1 and OW2-3 drawing down to levels near the set depths of the pressure transducers in those wells. Groundwater level measurements in the observation wells were measured over an approximately 64-hour period following the cessation of pumping to monitor groundwater recovery using the procedure described above.

Area 1 Pumping Test Methods

The Area 1 pumping test was completed from May 6-9, 2019, commencing at the end of the 64-hour post-pumping monitoring period for the Area 2 pumping test. Well PW-1 was utilized as the pumping well for the test, and wells OW1-1, OW1-2, and OW1-3 were utilized as observation wells. As with the Area 2 pumping test, well CD-12 was utilized as a background observation well for the Area 1 test.

Prior to the start of the Area 1 pumping test, pre-pumping static groundwater levels were measured in the observation wells, as described above, for an approximately 14-hour period. Following the pre-pumping monitoring period, groundwater pumping was initiated from PW-1 utilizing the submersible electric pump and ancillary equipment described above for Area 1 (with the submersible electric pump set at a depth of approximately 275-feet below grade). Extracted groundwater was managed as described above for Area 2. A pumping rate of approximately 23- to 27-gpm and a pump setting of 275 feet below grade were maintained throughout the duration of the test.

A groundwater sample was collected from the submersible pump discharge line for PW-1 at an elapsed pumping time of approximately 22-hours. The sample was submitted to Pace and analyzed for TAL metals by EPA Methods 200.7 and 245.7.

Piedmont Geologic turned off the submersible pump in PW-1 after approximately 22-hours of pumping - short of the planned 48-hour period - due to groundwater in observation wells OW1-1 and OW1-2 (plus pumping well PW-1) drawing down to levels near the set depths of the pressure transducers in those wells. However, groundwater-level measurements in the pumping and observation wells were measured over an

approximately 31-hour period following the cessation of pumping, as described above, to monitor groundwater recovery.

Pumping Test Deviations

During the Area 1 and Area 2 tests, the generator referenced above was required to be shut off for relatively short periods of time (i.e., generally less than 5-minutes) every approximately 6- to 8-hours of pumping in order to refuel. Subsequently, this resulted in corresponding periods of down-time for the submersible electric pump. Piedmont Geologic recorded the generator/pump shutdown and restart times during the tests so that these time periods could be correlated to potential effects on observed groundwater levels for the pumping and/or observation wells.

In addition, the pressure transducer in background observation well CD-12 had to be removed at the cessation of the Area 2 test for use in the Area 1 pumping/observation wells, in order to replace a pressure transducer that was malfunctioning. However, manual gauging of groundwater levels in CD-12 continued as described above throughout the Area 1 test.

4.2 Pumping Test Results

Water-table contour maps showing pre-pumping and pumping conditions for Area 2 and Area 1 are provided as Figures 6 through 9. Graphs showing groundwater levels versus time for the pumping and observation wells, including manual water-level gauging data plus data logged by the pressure transducers, are provided in Appendix D. AQTESOLV software (version 4.5) by HydroSOLVE, Inc. was used to analyze pumping test data and estimate hydrogeologic-parameter values through curve matching (i.e., fitting mathematical models, or type curves, to drawdown and recovery data). Outputs of the AQTESOLV analyses are provided in Appendix E. A summary of hydrogeologic parameter estimates obtained through curve-matching is provided in Table 3 (Appendix B).

The graph of groundwater levels versus time for background observation well CD-12 (Appendix D) shows relatively stable groundwater levels throughout the entirety of the Area 2 and Area 1 tests, indicating negligible background trends/fluctuations which could potentially effect data analysis. As such, no trend-corrections were applied to any of the Area 2 or Area 1 groundwater level data.

Area 2 Pumping Test Results – Curve Matching & Hydrogeologic Parameters

Summaries of groundwater drawdown in response to pumping for Area 2 wells (as observed at cessation of the pumping cycle) are presented below in Table 4.

Table 4: Summary of Area 2 Drawdown in Pumping/Observation Wells

Well	Distance from Pumping Well (ft)	Static Depth-to-Water (ft below TOC)	Final Depth-to-Water (ft below TOC)	Drawdown (ft)	Specific Capacity (gpm/ft)
PW-2	0	33.80	96.34	62.54	0.44
OW2-1	31	34.15	86.25	52.10	--
OW2-3	86	30.74	81.73	50.99	--
OW2-2	254	30.15	59.75	29.60	--

TOC = Top of casing. PW-2 stickup height is approximately 3.25-feet above grade.
Note: Table sorted by distance from pumping well PW-2.

The graph of groundwater levels versus time for pumping well PW-2 (Appendix D) indicates rapid drawdown during the initial approximately 15-minutes of pumping (corresponding to a drawdown of approximately 16-feet in the well), followed by a more-subdued and sustained drawdown through the duration of the pumping cycle, ending with a final maximum drawdown in the well of approximately 63-feet. The groundwater level in PW-2 fell below the set depth of the pressure transducer (approximately 87-feet below the top of well casing) following approximately 31-hours of elapsed time pumping. Groundwater recovery data for PW-2 generally mirrors that of the pumping data, with a rise of approximately 15-feet during the first approximately 15-minutes of recovery, followed by a more-subdued rate of rise in groundwater levels through the end of post-pumping monitoring.

The graphs of groundwater levels versus time for observation wells OW2-1 and OW2-3 are relatively similar to that of PW-2, with final drawdowns in the well of approximately 52-feet and 51-feet, respectively (Appendix D). OW2-1 and OW2-3 both showed a relatively rapid decrease in groundwater levels during the initial 20-minutes of pumping (drawdowns of approximately 5-feet), followed by a more-subdued rate of drawdown through the duration of pumping.

The graph of groundwater levels versus time for observation well OW2-2 shows steady drawdown throughout the duration of pumping (Appendix D), although much more-subdued than that of PW-2, OW2-1, and OW2-3. Brief intervals of pump-shutdowns for refueling the generator are apparent in the graphs for PW-2, OW2-1, and OW2-3, as indicated by temporary spikes in observed groundwater levels. Recovery percentages (i.e., feet of recovery divided by feet of drawdown) for Area 2 pumping/observation wells following the 64-hour post-pumping monitoring period ranged from approximately 77% (OW2-1) to approximately 87% (OW2-2).

For curve-matching analysis, the Neumann model appears to best fit the Area 2 data (Appendix C-1), as the Theis model and Moench double-porosity model did not provide adequate fits to test data. Two sets of curve-matching results were generated: one using the combined drawdown and recovery phases of the pumping test, and one using only the recovery-phase data (Appendix E-1). It is noted that to aid in curve-

matching analysis, the drawdown data from both study areas was filtered in AQTESOLV to remove the brief spikes in groundwater levels resulting from the temporary generator shutdowns mentioned above. As shown in the graphs of groundwater levels versus time, these brief spikes do not appear to change the overall trends in groundwater levels.

Table 3 (Appendix B) presents estimates of hydrogeologic parameters that were generated for each observation well based on the curve-matching analysis. An aquifer thickness of 270-feet was assumed for Area 2 wells, based on the approximate maximum saturated thickness (i.e., total depth of well minus the observed depth-to-water).

Hydraulic conductivity values estimated for Area 2 observation wells are at the lower end of the range of reported values (Domenico and Schwartz, 1990) for fractured igneous and metamorphic rock (0.0023 feet/day to 85 feet/day), smaller than those reported for weathered igneous rocks (0.16 feet/day to 1.1 feet/day), and consistent with the relatively low yield of the pumping well.

Area 1 Pumping Test Results – Curve Matching & Hydrogeologic Parameters

Summaries of groundwater drawdown in response to pumping for Area 1 wells (as observed at cessation of the pumping cycle) are presented below in Table 5.

Table 5: Summary of Area 1 Drawdown in Pumping/Observation Wells

Well	Distance from Pumping Well (ft)	Static Depth-to-Water (ft below TOC)	Final Depth-to-Water (ft below TOC)	Drawdown (ft)	Specific Capacity (gpm/ft)
PW-1	0	34.47	174.04	137.57	0.18
OW1-3	31	27.09	53.45	26.36	--
OW1-2	100	25.94	87.46	61.52	--
OW1-1	292	29.06	85.51	56.45	--

TOC = Top of casing. PW-1 stickup height is approximately 3.5-feet above grade.
Note: Table sorted by distance from pumping well PW-1.

The graph of groundwater levels versus time for pumping well PW-1 (Appendix D) indicates rapid drawdown during the initial approximately 3-hours of pumping. Following that time, the rate of drawdown in the well decreased, with only approximately 24-feet of drawdown over the remaining 18-hours of pumping, with groundwater levels nearly stabilized after 16-hours of elapsed time pumping. As shown in the graph, the groundwater level in PW-1 fell below the set depth of the pressure transducer (approximately 100-feet below grade) approximately 45-mintutes are pumping began. However, manual gauging of the well continued through the duration of the pumping test. Groundwater recovery data for PW-1 generally mirrors that of the pumping data.

The brief intervals of pump-shutdowns for refueling the generator are apparent in the graph of groundwater levels versus time for PW-1 (Area 1), although they are not readily apparent in any of the graphs for observation wells. The percentages of recovery for Area 1 pumping/observation wells following the 31-hour post-pumping monitoring period ranged from approximately 90% (OW1-3) to approximately 99% (PW-1).

Curve matching was completed for Area 1 observation wells (Appendix E-2) using the Theis and Moench solutions to analyze the combined drawdown and recovery phases of the pumping test, and the Cooper-Jacob solution to analyze the recovery phase only. Estimates of hydrogeologic parameters, including transmissivity and hydraulic conductivity, were generated for each observation well based on the individual curve-matching solutions (Appendix B, Table 3). An aquifer thickness of 273-feet was assumed for Area 1, based on the approximate maximum saturated thickness for Area 1 wells.

As with Area 2 wells, hydraulic conductivity values estimated for Area 1 observation wells are at the lower-range of reported values for fractured igneous and metamorphic rock, smaller than those reported for weathered igneous rocks, and consistent with the relatively low yield of the pumping well.

<u>Area 1 & Area 2 Pumping Test Results – Discussion of Hydraulic Parameters, Area of Influence, & Inflow</u>
The estimated hydrogeologic parameters show that the site aquifer properties are spatially heterogeneous, with some variations in transmissivity and storage coefficient values. The hydraulic conductivities estimated using the recovery-phase data are likely more representative of the true aquifer characteristics, since recovery-phase data are free of potential "noise" that may be present in the drawdown-phase data (such as that created by variations in pumping rates). Rose diagrams (Figure 10), in which the lengths of the arms are scaled to the magnitudes of recovery-phase transmissivities and the arms are oriented along lines extending from the pumping wells to the observation wells show that hydraulic properties are anisotropic, and that the anisotropy varies at each pumping well. Heterogeneity and anisotropy are to be expected in a fractured-rock aquifer.

Further evaluation of data from the drawdown phase of the pumping test shows that wells PW-2, OW2-1, and OW2-3 exhibited behavior that is typical in settings where gravity drainage from an unconfined aquifer is occurring. Drawdown data from OW2-2 and the Area 1 pumping/observation wells did not exhibit gravity drainage behavior, further emphasizing the heterogeneous and anisotropic character of the aquifer. However, it is likely that gravity drainage would have been observed had the Area 1 test been conducted for a longer period of time. Although the pumping phase of the Area 1 test being cut short (i.e., after approximately 22-hours) is less-than ideal with respect to estimating aquifer characteristics based on that portion of the dataset, data was collected for a much longer period during the recovery phase of the test (approximately 31-hours). Thus, the estimated hydraulic parameters obtained using the recovery phase

portion of the test are likely more representative than those obtained using the combined drawdown and recovery phases.

Estimates of the range of hydraulic influence due to mine dewatering computed using the Sichardt and Kusakin (1928 and 1949, respectively; from Bear, 1979) formulae are summarized in Appendix G and displayed in Figures 11 and 12. These models incorporate the planned quarry pit depths, maximum estimated hydraulic conductivities of the recovery-phase data from each study area, and the aquifer thickness to predict distance to zero drawdown with respect to each quarry pit. Two sets of hydraulic influence estimates were calculated for each study area: one for an assumed quarry pit depth of 150-feet, and one for an assumed quarry pit depth of 300-feet.

The "Steady Groundwater Inflows into Open Excavations" worksheet developed by S.S. Papadopoulos & Associates, Inc. was utilized in order to estimate potential groundwater withdrawal rates during the quarry-dewatering process. Model #7 in the worksheet, based on the Dupuit-Thiem equation, was utilized for the groundwater inflow calculations. This model calculates inflow assuming a circular excavation, horizontal, radial steady flow, and unconfined aquifer conditions. Four sets of outputs (Appendix G) were generated for each of the two study areas, utilizing the maximum hydraulic conductivities of the recovery-phase data from each study area, the approximate radius of the proposed quarry pits, plus the estimated radii of influence as determined by the Sichardt and Kusakin formula calculations, and for pit depths of 150-feet and 300-feet.

Estimated radii of influence due to quarry-dewatering and groundwater inflow rates are summarized below in Tables 6 and 7, respectively.

Table 6: Estimated Radii of Influence Due to Quarry Pit Dewatering

Study Area	Quarry Depth	Estimated Radius of Influence (Sichardt Formula)	Estimated Radius of Influence (Kusakin Formula)
Area 1 (Pit A)	150 feet	256 feet	298 feet
	300 feet	567 feet	984 feet
Area 2 (Pit B)	150 feet	247 feet	288 feet
	300 feet	547 feet	949 feet

Note: Radii of influence are referenced in feet from the referenced quarry bench depths.

Table 7: Estimated Groundwater Inflow Rates

Study Area	Pit Depth	Estimated Inflow Rates (Using Sichardt Formula Distances)		Estimated Inflow Rates (Using Kusakin Formula Distances)	
		(gpd)	(gpm)	(gpd)	(gpm)
Area 1 (Pit A)	150 feet	134,702	94	118,518	82
	300 feet	237,160	165	171,810	119
Area 2 (Pit B)	150 feet	114,169	79	100,209	70
	300 feet	302,690	210	210,286	146

The calculations in Tables 6 and 7 above provide a range in estimates, which are largely dependent upon the pit depth used in the calculations. The estimated radii of influence for quarry pit depths of 300 feet are roughly double (Sichardt) to triple (Kusakin) those based on quarry pit depths of 150 feet. Likewise, estimated inflow rates roughly double when the pit depths are increased from 150-feet to 300-feet depth. The estimated extents of hydraulic influence as shown in Figures 11 and 12 were derived using distances obtained from the Kusakin formula outputs, as they provide more conservative (i.e., larger) estimates than those produced by the Sichardt formula. Applying these estimated distances to the proposed perimeters of the quarry pits would considerably overestimate the footprints of hydraulic influence because this scenario would assume the entire footprint of the pits would reach 150-foot or 300-foot depths, as compared to a typical quarry pit that "stair-steps" downward from maximum area at the top of the excavation to minimum area at the maximum depth of the excavation. Instead, the distances calculated based on 150-foot and 300-foot depths for each quarry pit were applied to the planned footprints for each associated pit bench at those depths to obtain a more realistic model of the expected hydraulic influence. Since the model implementation uses the maximum recovery-phase hydraulic conductivity value from each study area rather than an average hydraulic conductivity value, the calculated areas of influence are conservative with respect to overpredicting the area of influence of quarry pit dewatering, and for minimizing risk of excessive drawdown on surrounding water supply wells.

As shown in Figures 11 and 12, future quarry pit dewatering operations will likely have no impact outside of the site property boundary for pit depths of up to 150 feet. Offsite impacts from dewatering for the maximum proposed pit depths of 300 feet, are expected to be restricted to the areas immediately north of Pit A, and to the east and west of Pit B.

<u>Area 1 and Area 2 Pumping Test Results – Laboratory Analysis of Groundwater Samples</u>

Laboratory results of analysis for groundwater samples collected during the pumping tests from the PW-1 and PW-2 discharge lines are summarized in Table 8 (Appendix B). Mercury was detected in the groundwater sample collected from PW-2 at a concentration of 0.461 µg/L, which is above the North Carolina freshwater aquatic life standard of 0.012 µg/L. However, the reported concentration was flagged

by the laboratory, noting that mercury was also detected in the associated laboratory blank, indicating potential cross-contamination or erroneous measurements by the laboratory during analysis. No other analytes were detected at concentrations above applicable surface water standards in the May 2019 groundwater samples. As detailed in Section 6.0, PW-1 and PW-2 were resampled in December 2019 and no analytes were detected in those samples at concentrations above surface water standards.

5.0 WATER-SUPPLY WELL SURVEY

Piedmont Geologic conducted a water-supply well survey in August 2019 to locate private water-supply wells in the vicinity of the site. The water-supply well survey was completed utilizing the online graphical information system (GIS) tools for Caswell County and Person County, plus records on file in each county related to water-supply well permitting and well-construction details. The water-supply well survey targeted properties located within or near approximately 0.5-miles from the estimated extent of hydraulic influence based on quarry pit depths of 150 feet. A summary of the water-supply well survey results is provided in Table 9 (Appendix B). A map showing the locations of water-supply wells, along with the estimated extents of hydraulic influence due to pit dewatering operations, is provided as Figure 13. Tax/property cards for the parcels identified in the water-supply well survey, plus well-construction records that were on file with Caswell County and Person County are provided in Appendix H.

As the first step of the water-supply well survey, a preliminary search of aerial imagery and property records using the Caswell County and Person County GIS tools was conducted to locate parcels potentially containing water-supply wells. Next, a search of Caswell and Person County water-supply well permit records was conducted using the list of addresses suspected of containing water-supply wells. Person County water-supply well permit records were obtained using the county's online database, while permit records for Caswell County were obtained with the assistance of Mr. Donnie Powell of the Caswell County Health Department.

A total of 30 properties containing water-supply wells were located during the water-supply well survey; 26 of which are located in Caswell County and 4 of which are located in Person County. One of the water-supply wells (WSW #1) is located on the site property, west of the proposed quarry pits. Records indicate that one of the Person County properties contains two water-supply wells. All other available records for the remaining properties indicate the presence of only one water-supply well on each.

Reported depths of the water-supply wells (based on well-construction records submitted to the counties by the well-drilling contractors) range from approximately 105- to 562-feet below grade, with reported static water levels ranging from 6- to 35-feet below grade. Reported groundwater production rates (i.e., yields) of the wells range from 0.5- to 43-gpm.

One offsite water-supply well (WSW #2) is located within the area of estimated hydraulic influence for Pit B dewatering operations (based on a pit depth of 300 feet), on the property situated immediately west of Pit B and across Wrenn Road. The property contains an abandoned residential structure and the remainder of the property appears to be utilized solely for agricultural purposes. No well-construction details were available for this water-supply wells. No other water-supply wells appear to be location within the

estimated footprints of hydraulic influence for either quarry pit, based on the maximum proposed pit depths of 300 feet.

6.0 DECEMBER 2019 PUMPING-WELL GROUNDWATER SAMPLING/ANALYSIS

In response to the misunderstanding, as noted in the November 2019 DEMLR letter, that the groundwater samples collected from pumping wells PW-1 and PW-2 during the May 2019 pumping tests were filtered during collection, additional groundwater samples were collected from the wells in December 2019. As the first step in groundwater sampling, each well was gauged for depth-to-water using an electronic water level meter. Next, the wells were sampled utilizing the low-flow sampling technique with a submersible electric pump equipped with dedicated, disposable polyethylene tubing. Prior to each usage, the submersible pump was cleaned using a soap and tap water wash and distilled water rinse. In order to replicate previous sampling results, the submersible pump was set at the same depth as that of the pump used during the May 2019 pumping tests (i.e., approximately 275-feet below grade). The groundwater samples collected from PW-1 and PW-2 were submitted under chain of custody to Pace Analytical in Mt. Juliet, Tennessee (Pace) and analyzed for Target Analyte List (TAL) metals by EPA Methods 200.7 and 245.7. To avoid any confusion regarding interpretation of how the samples were collected, it was expressly noted on the chain of custody that the samples were unfiltered.

Laboratory results of laboratory analysis for groundwater samples collected from PW-1 and PW-2 in May and December 2019 are provided in Appendix F and are summarized in Table 8 (Appendix B). Results of laboratory analysis for the December 2019 groundwater samples were generally consistent with those collected during the May 2019 pumping tests, with the exception that aluminum and iron were detected in the December 2019 samples but not detected in the May 2019 samples. No analytes were detected in the December 2019 samples at concentrations above North Carolina surface water standards.

7.0 EVALUATION OF POTENTIAL INDIRECT IMPACTS TO SURFACE WATERS

Heath (1984) notes that typical forested Piedmont landscapes (i.e., and for the site) are underlain, in sequence by forest litter, unconsolidated weathered bedrock, and bedrock. Furthermore, surface water features typically occur in valleys and other topographic depressions underlain by more permeable overburden and/or more permeable, fractured, and weathered bedrock (Figure 3). Conversely, overburden typically is thinner, and bedrock is typically less fractured and weathered, under ridgetops and higher topographic areas. In these settings, most precipitation infiltrates into the subsurface, with most of the water returning to the atmosphere through evapotranspiration and a lesser amount moving laterally in thin, discontinuous, temporary, perched zones (a.k.a., perched water tables), which may discharge to perennial streams, intermittent streams, or internally drained surface depressions. The remainder infiltrates to and recharges the underlying regionally continuous water table, and eventually discharges to downgradient perennial streams as baseflow.

Daniel and Dahlen (2002) report that baseflow (i.e., from groundwater) makes up an average of 47 percent of total streamflow in seven watersheds of the Piedmont province in North Carolina, meaning that overland flow contributes the majority of water to streamflow in the Piedmont. The nearest USGS gauging station relative to the site are Hyco Creek near Leasburg (USGS 02077200) and South Hyco Creek near Hesters (USGS 02077230). Long-term average daily unit flows on those sites are 0.88 and 0.63 cubic feet per second (cfs), respectively. Baseflow separation performed on daily mean flow of Hyco Creek measured between October 1, 1964 and September 30, 2019 (water years 1965-2019; 19,996 observations) with the Purdue University WHAT application (Lim et.al, 2005), using the default settings for perennial streams in hard rock aquifers and recursive digital filter, finds that baseflow makes up only about 20 percent of total flow, meaning that overland runoff drives the majority of streamflow in this area. The period of record for station 2077230 (3 years) is not long enough to do baseflow separation. We note that the baseflow proportion in Hyco Creek is at the low end of the range of baseflow proportions observed by Daniel and Dahlen (2002). Further, Weaver (2015) reports the 7Q10 flow for Hyco Creek near Leasburg (USGS 02077200) is 0 cfs, and consistent with the small unit flow and baseflow proportion values.

Hydrologic observations made during drilling and in support of the pumping tests demonstrated that the site water table occurs more than 30 feet below ground surface at observed elevations ranging from 560 to 570 feet above mean sea level. Most site drainage features are upland draws, sags, and swales, situated at elevations well-above the site water table and in no way directly connected to, or receiving flow from, the site water table. Rather, these drainage features have intermittent flow that is fed directly by surface runoff, or indirectly by shallow subsurface flow as described above. Quarrying operations may disrupt these minor drainage features directly, where excavation removes the drainage features, and indirectly, where dewatering changes subsurface flow directions in shallow, small, and discontinuous perched water tables,

although this latter mechanism should be active only for drainage features in contact with the quarry pit. Otherwise, these features will be entirely unimpacted by dewatering activities associated with site quarrying operations.

The USGS StreamStats application (USGS, 2016) shows three surface-water bodies that could be impacted by quarrying operations: Sugartree Creek plus two other, unnamed, perennial streams, denoted as "unnamed stream 1" and "unnamed stream 2" (Figure 14). A portion of Sugartree Creek is located within the area of hydraulic influence modeled based on the 300-foot depth for Pit B. A portion of unnamed stream 1 is located within the areas of influence modeled based on 300-foot depths for Pits A and B, and is on the edge of the area of influence modeled based on the 150-foot depth for Pit A. Unnamed stream 2 is not situated in any areas of influence modeled for either pit, but a minor portion of its watershed is situated in portions of the areas of influence modeled for 150-foot and 300-foot depths for Pit A.

Long-term average flows in these streams derived from the long-term average unit flow of Hyco Creek and the watershed areas relative to the Hyco Creek watershed are 9.95×10^6 gpd (1.5 cfs) for Sugartree Creek, 6.14×10^5 gpd (0.95 cfs) for unnamed stream 1, and 4.78×10^5 gpd (0.74 cfs) for unnamed stream 2. As listed, the streamflow for Sugartree Creek makes up 90% of the combined total streamflow for all three features.

Flows are expected to decrease to some degree in the stream reaches located within the area of influence generated from quarry pit dewatering, and, to a lesser degree, potentially, for streams that do not intersect the area of influence but have watershed portions within areas of influence (i.e., unnamed stream 2). Volumes of groundwater removed from each watershed through pit dewatering may be assumed to be proportional to the fraction the area of influence overprinted by the watershed, as follows (see Figure 14).

- Pit A Area of Influence: 72% unnamed stream 1, 28% unnamed stream 2, and 0% Sugartree Creek.
- Pit B Area of Influence: 66% Sugartree Creek, 34% unnamed stream 1, and 0% unnamed stream 2.

Projections of site streamflow reductions are presented as follows in Tables 10 and 11, derived through comparisons of average long-term streamflow estimates, watershed proportions within each pit area of influence, and estimated maximum dewatering rates, as referenced above.

Table 10: Evaluation of Potential Streamflow Reductions; 150-foot Quarry Pit Depth

	Pit A	Pit B
Quarry Pit Dewatering Rate (gpd)	1.35×10^5	1.14×10^5
Sugartree Creek		
Long-Term Average Flow Rate (gpd)	9.95×10^6	9.95×10^6
Portion of Dewatering Influence Area in Watershed (%)	0	66
Streamflow Reduction (gpd)(1)	0	7.52×10^4
Streamflow Reduction as Portion of Long-Term Average Flow (%)	0	1
Unnamed Stream 1		
Long-Term Average Flow Rate (gpd)	6.14×10^5	6.14×10^5
Portion of Dewatering Influence Area in Watershed (%)	72	34
Streamflow Reduction (gpd)(1)	9.72×10^4	3.88×10^4
Streamflow Reduction as Portion of Long-Term Average Flow (%)	16	6
Unnamed Stream 2		
Long-Term Average Flow Rate (gpd)	4.78×10^5	4.78×10^5
Portion of Dewatering Influence Area in Watershed (%)	28	0
Streamflow Reduction (gpd)(1)	3.78×10^4	0
Streamflow Reduction as Portion of Long-Term Average Flow (%)	8	0

(1) Streamflow reduction = (quarry pit dewatering rate) x (percentage of area of dewatering influence in watershed)

Table 11: Evaluation of Potential Streamflow Reductions; 300-foot Quarry Pit Depth

	Pit A	Pit B
Quarry Pit Dewatering Rate (gpd)	2.37×10^5	3.03×10^5
Sugartree Creek		
Long-Term Average Flow Rate (gpd)	9.95×10^6	9.95×10^6
Portion of Dewatering Influence Area in Watershed (%)	0	66
Streamflow Reduction (gpd)(1)	0	2.00×10^5
Streamflow Reduction as Portion of Long-Term Average Flow (%)	0	2
Unnamed Stream 1		
Long-Term Average Flow Rate (gpd)	6.14×10^5	6.14×10^5
Portion of Dewatering Influence Area in Watershed (%)	72	34
Streamflow Reduction (gpd)(1)	1.71×10^5	1.03×10^5
Streamflow Reduction as Portion of Long-Term Average Flow (%)	28	17
Unnamed Stream 2		
Long-Term Average Flow Rate (gpd)	4.78×10^5	4.78×10^5
Portion of Dewatering Influence Area in Watershed (%)	28	0
Streamflow Reduction (gpd)(1)	6.64×10^4	0
Streamflow Reduction as Portion of Long-Term Average Flow (%)	14	0

(1) Streamflow reduction = (quarry pit dewatering rate) x (percentage of area of dewatering influence in watershed)

The above worst-case analysis indicates that flow rates for unnamed streams 1 and 2 may be reduced substantially by dewatering Pit A or Pit B at the 150-foot and 300-foot pit excavation depths, whereas streamflow reductions for Sugartree Creek will be fairly negligible. As it will require decades to reach the maximum excavation depths, dewatering may gradually reduce average flows of unnamed streams 1 and 2, but not immediately, nor in any other accelerated manner, dry them up.

Graphs of the observed streamflow rates over various time periods as measured at the Hyco Creek gauging station (USGS 02077200), along with additional statistical information, is provided in Appendix I. As shown in the graphs, streamflow rates for Hyco Creek have significant seasonal and precipitation-

dependent fluctuations, consistent with the small proportion of baseflow in the hydrograph. Further, during drier periods Hyco Creek has many days per year of zero or near-zero flow (for example, September and October 2019). Given the small areas of watersheds for unnamed streams 1 and 2, and the very low flow conditions observed on Hyco Creek as referenced above, it is highly likely that both unnamed streams 1 and 2 currently do not have measurable flow 25 to about 33 percent of the time[1]. Pit dewatering, at worst, will likely only increase the number of days per year that these streams do not have measurable flow.

In terms of potential impacts to all three site watersheds as a whole, comparison of the sums of the streamflow reduction values listed in Tables 10 and 11 (on page 26) to the sum of the long-term average streamflow values for Sugartree Creek, unnamed stream 1 and unnamed stream 2, results in total long-term average streamflow reductions of 1% and 2% for Pit A at the 150-foot and 300-foot excavation depths, respectively, and 1% and 3% for Pit B at the 150-foot and 300-foot excavation depths, respectively. Furthermore, as the higher potential impacts to unnamed stream 1 and unnamed stream 2, which combine at a point near the northeast corner of the site property, may be mitigated by directing dewatering effluent back unto unnamed stream 1, the expected result is that no substantial net loss of flow in the downgradient combined-stream segment, and no substantial related indirect detrimental downstream impacts, will occur.

[1] No measurable flow duration period estimated using USGS StreamStats flow-duration statistics for Hyco Creek, which were proportionally adjusted based on the ratios of the areas of unnamed stream 1 and unnamed stream 2 watersheds to the Hyco Creek watershed area (<0.1 cfs assumed to be no-measurable flow conditions).

8.0 MONITORING/MITIGATION PLAN FOR PIT DEWATERING

8.1 Monitoring Plan for Pit Dewatering

Sunrock has developed a monitoring plan to track drawdown of the aquifer (i.e., the cone of depression) that is expected to be induced over time as a result of quarry pit dewatering operations. Sunrock will install a total of 18 additional observation wells at various locations throughout the site (Figure 15), including along the perimeter the site boundary, plus the interior of the site near unnamed stream 1. The new deep observation wells will be installed to depths of at least 50 feet below static water levels, or at least 50 feet into unweathered bedrock, whichever is deeper. Select deep observation wells will also be paired with a shallow observation well, to be installed to depths corresponding to the top of bedrock. In addition, the existing onsite water-supply well and the nine wells installed as part of the 2019 hydrogeological study will also be retained and utilized as observation wells in the monitoring plan. This site-wide network of observation wells will allow Sunrock to detect potential issues that may affect offsite water-supply wells. The observation wells be gauged for groundwater levels on a monthly to quarterly basis, beginning at least two months prior to initiation of any site dewatering activities. In conjunction with installation of the additional observation wells, Sunrock also proposes to install four stream gauging stations at the locations shown in Figure 15 to monitor potential streamflow changes that may result from pit dewatering. As with the observation wells, monitoring of the stream gauging stations will be conducted on a monthly to quarterly basis, beginning at least two months prior to any site dewatering activities.

8.2 Mitigation Plan for Pit Dewatering

As discussed in Section 4.0, the only offsite water-supply well identified within the updated estimated footprints of hydraulic influence is located on the property immediately west of proposed quarry pit “B”, across Wrenn Road. This property is currently used for agricultural purposes (i.e., crop fields) and the water-supply well is not in-use and is associated with a vacant/abandoned residential structure.

Should a problem occur with a nearby residential water-supply well, the property owner should notify Sunrock or NCDEQ of the water-supply well issue. The proposed procedures to address complaints/concerns are outlined below:

a. An analysis will be made to determine whether or not the residential water supply well in question is located within the projected zone of influence from quarry pit dewatering, as it exists at the time of the notice.
b. A Sunrock representative, or independent third party (a qualified and/or licensed expert), will conduct an investigation and determine whether mining caused the water-supply well problem. If

a determination is made that the water-supply well in question has failed due to mechanical or structural issues, Acts of Nature (such as, but not limited to tornadoes, droughts, storms, etc.) and not caused by drawdown from the quarry, the NCDEQ will be notified and the procedures outlined in this mitigation plan will not be applicable. The property owner will be notified of the findings of this determination and will be responsible for all repairs and/or replacement costs.

c. If a determination is made that the water-supply well in question has failed due to a decline of groundwater level, has been caused or is a direct result of Sunrock's mining activities or dewatering of the pit, then Sunrock, at its expense, will proceed as quickly as reasonably possible to provide a functioning, permanent water supply to the property owner, either by rehabilitation, repair, or deepening of the existing water supply well; or drilling of a new water-supply well of the same diameter; or by connecting the residence to a public water supply, if available.

    i. Sunrock or a designated third-party expert will evaluate the existing water-supply system to determine the most reasonable method available to restore the permanent water supply. The options available must be capable of meeting the minimum volume used or needed by the property owner before the disruption of water-supply occurred.
    ii. Based on the time necessary to re-establish a permanent supply to the property, it may be necessary to arrange with a licensed and reputable water distributor to provide the affected user with a temporary water supply. This water supply will be for use in normal household activities, such as bathing, washing, and sanitary facilities. This supply will be in the form of a clean-water tanker or container that will be refilled as needed, all at the expense of Sunrock.

This mitigation plan relies on the use of qualified outside vendors to satisfy the needs of a temporary water supply and to develop a permanent water source for those water supply well issues that have been caused by a direct result of Sunrock's mining activities, as verified by a qualified third-party expert. As licensed reputable companies, they are expected to accomplish and carry out their assigned duties in a manner that ensures that all work is completed within a predetermined time period. If for any reason, this work is not completed to an acceptable level of quality and/or within the time frame agreed upon by all parties, the outside vendor will be replaced by another company designated by Sunrock.

9.0 CONCLUSIONS

Significant water-table drawdowns were observed within both site study areas during the May 2019 pumping tests, with (as would be expected) the greatest drawdown confined to the area immediately surrounding the pumping well. Similar effects may be observed as part of any future dewatering during quarrying operations. The drawdown would likely be greater in magnitude and aerial extent than that observed during the pumping tests, due to sustained and prolonged dewatering of the quarry pits that would be typical of quarrying operations. As such, the quarry pit dewatering process could potentially impact offsite private water-supply wells located within the estimated zone of hydraulic influence, through localized drawdown of the aquifer (which could result in reduced groundwater-production rates for the water-supply wells).

However, based on the estimated hydraulic conductivities and radii of hydraulic influence as determined by this hydrogeological study, impacts to offsite water-supply wells are expected to be negligible, with the possible exception of offsite water-supply well location #2 (although it appears that this water-supply well is not currently in service due to the residential structure being abandoned and uninhabited). Based on available records, most of the site-area water-supply wells are constructed to total depths between approximately 150- and 200-feet. In addition, the records indicate that all of the water-supply wells have static standing-water columns of at least approximately 90-feet, indicating that substantial drawdown of the aquifer (i.e., well-outside of estimated buffer areas) would be required to adversely affect groundwater-production rates of the water-supply wells.

Although not identified during analysis of the pumping test data, based on area topography and surface water features, there likely exists multiple boundary conditions throughout the site and surrounding area, such as areas along surface water features and/or topographical divides (i.e., along ridgelines). Such boundary conditions would further limit the actual extent of water-table drawdown through dewatering operations, and the potential impacts to offsite water-supply wells.

Sunrock has also outlined a plan for monitoring groundwater drawdown along the site perimeter, and, although not expected to be needed based on the modeling, plans for mitigating any potential water-supply wells issues that could be experienced by residents of nearby properties as a result of quarrying operations.

In terms of potential indirect impacts to surface-water environments through quarry pit dewatering, evaluation of pit dewatering rates with respect to watershed areas and long-term average streamflow rates indicates that no substantial detrimental effects may be expected. Potential streamflow reductions for the site watersheds as a whole are expected to be no more than around 3 percent.

10.0 REFERENCS

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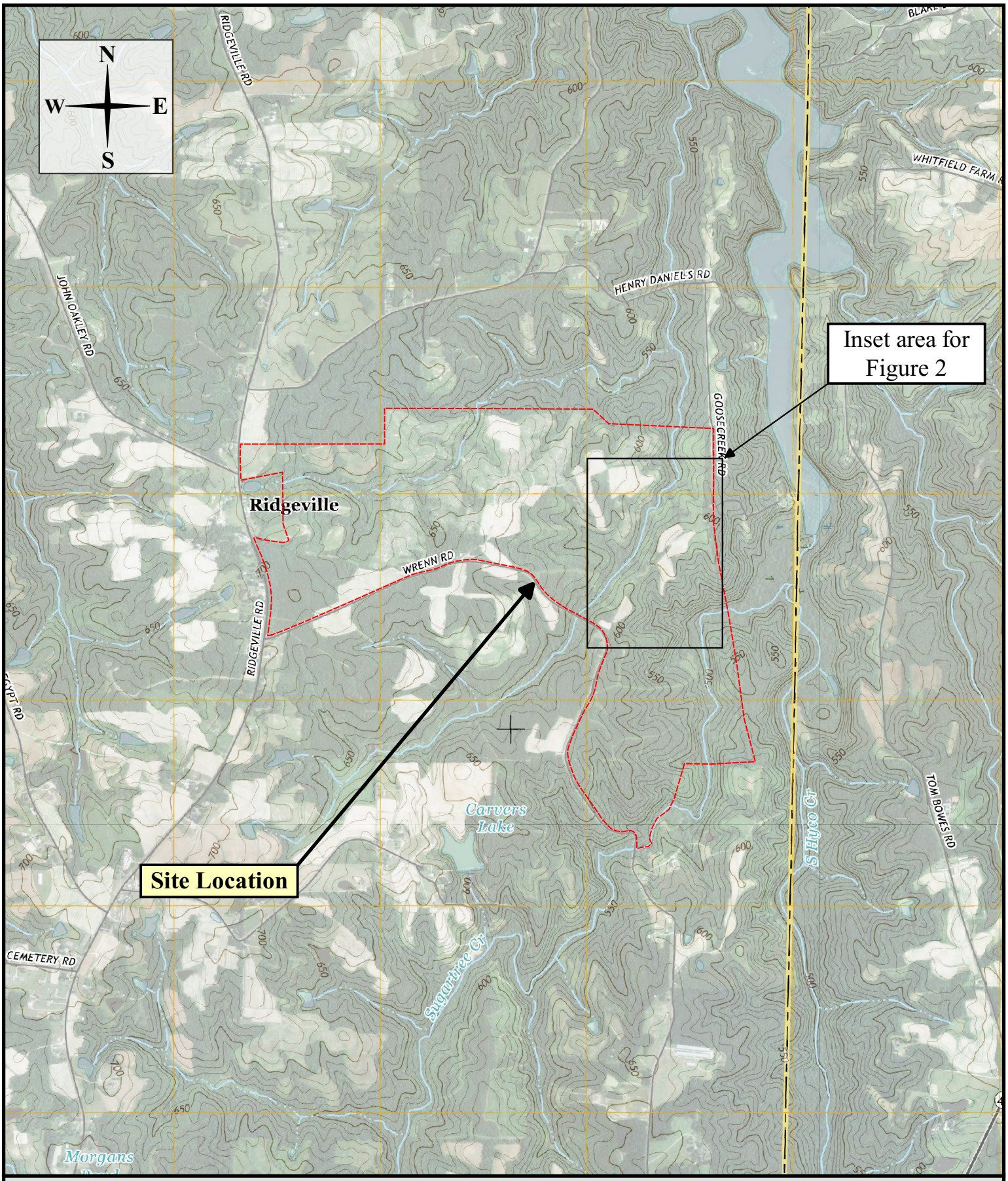
FIGURES



PIEDMONT GEOLOGIC
SMART EARTH SOLUTIONS

0 1000 2000 3000 4000 ft

Data Source: USGS US Topo 7.5-minute map for Ridgeville, NC 2016.

FIGURE 1
SITE LOCATION MAP

Carolina Sunrock
Caswell County Property
Prospect Hill, NC 27314

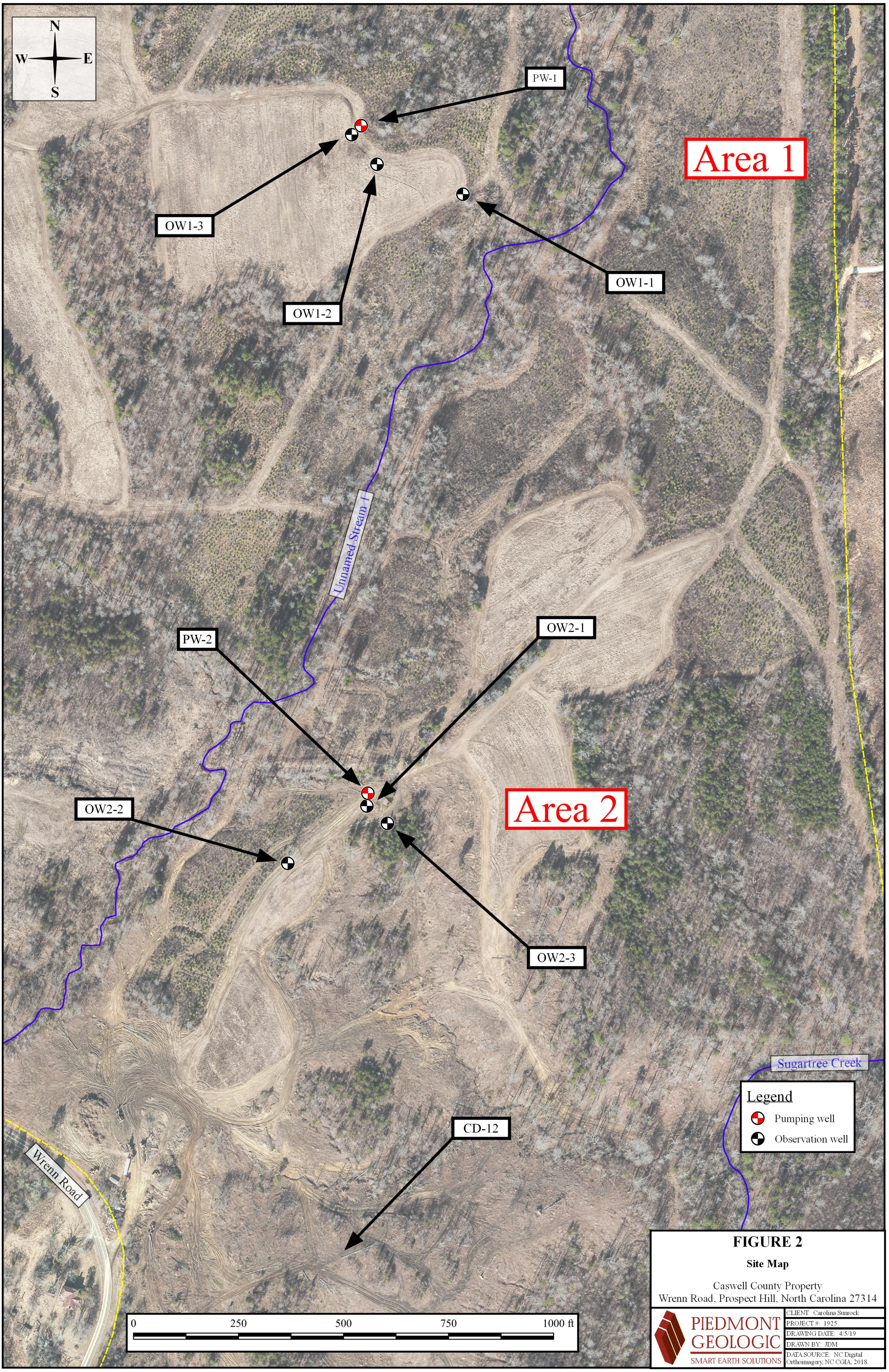


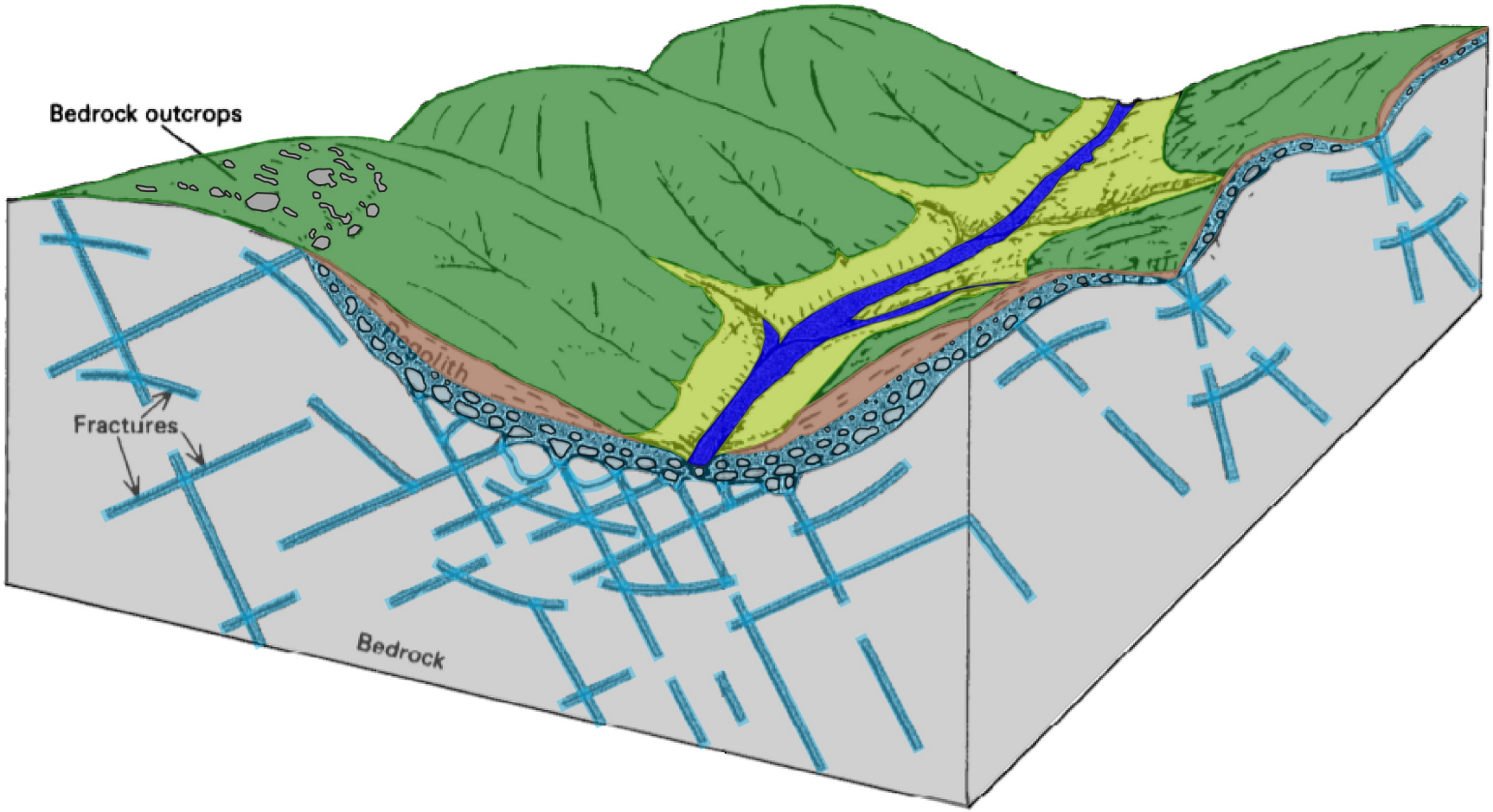
FIGURE 2

Site Map

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

PIEDMONT GEOLOGIC
SMART EARTH SOLUTIONS

CLIENT:	Carolina Sunrock
PROJECT #:	1925
DRAWING DATE:	4/5/19
DRAWN BY:	JDM
DATA SOURCE:	NC Digital Orthoimagery, NC CGIA, 2018.



PIEDMONT GEOLOGIC
SMART EARTH SOLUTIONS

Modified from: Heath, R.C., 1984, *Ground-Water Regions of the United States*, United States Geological Survey Water-Supply Paper 2242, pages 46-48.

FIGURE 3

CONCEPTUAL HYDROGEOLOGICAL MODEL AS DEPICTED BY HEATH (1984)

Carolina Sunrock
Caswell County Property
Prospect Hill, NC 27314

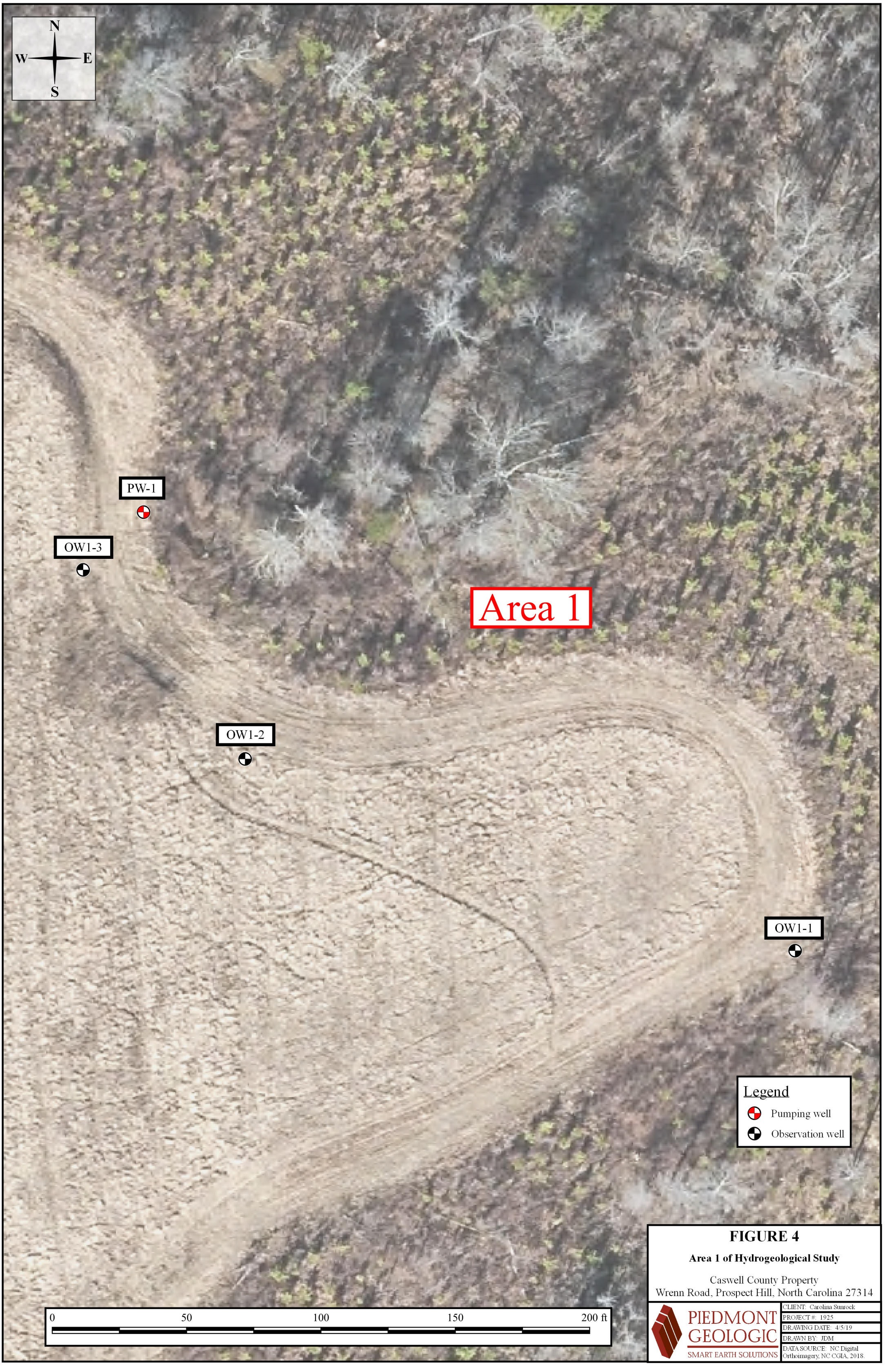


FIGURE 4

Area 1 of Hydrogeological Study

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

PIEDMONT GEOLOGIC
SMART EARTH SOLUTIONS

CLIENT: Carolina Sunrock
PROJECT #: 1925
DRAWING DATE: 4/5/19
DRAWN BY: JDM
DATA SOURCE: NC Digital Orthoimagery, NC CGIA, 2018.

FIGURE 5

Area 2 of Hydrogeological Study

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

PIEDMONT GEOLOGIC
SMART EARTH SOLUTIONS

CLIENT:	Carolina Sunrock
PROJECT #:	1925
DRAWING DATE:	4/5/19
DRAWN BY:	JDM
DATA SOURCE:	NC Digital Orthoimagery, NC CGIA, 2018.

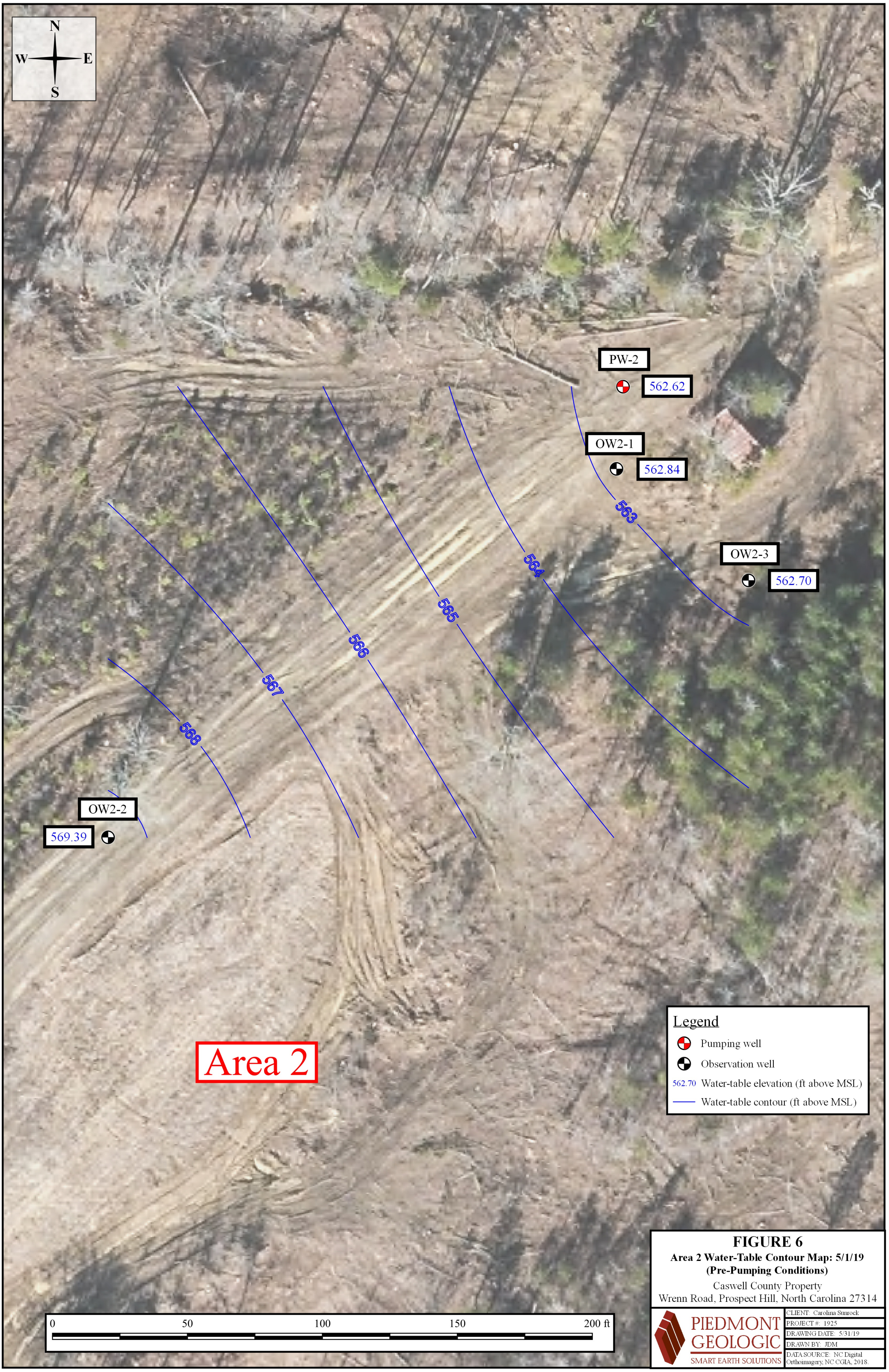


FIGURE 6

Area 2 Water-Table Contour Map: 5/1/19 (Pre-Pumping Conditions)

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

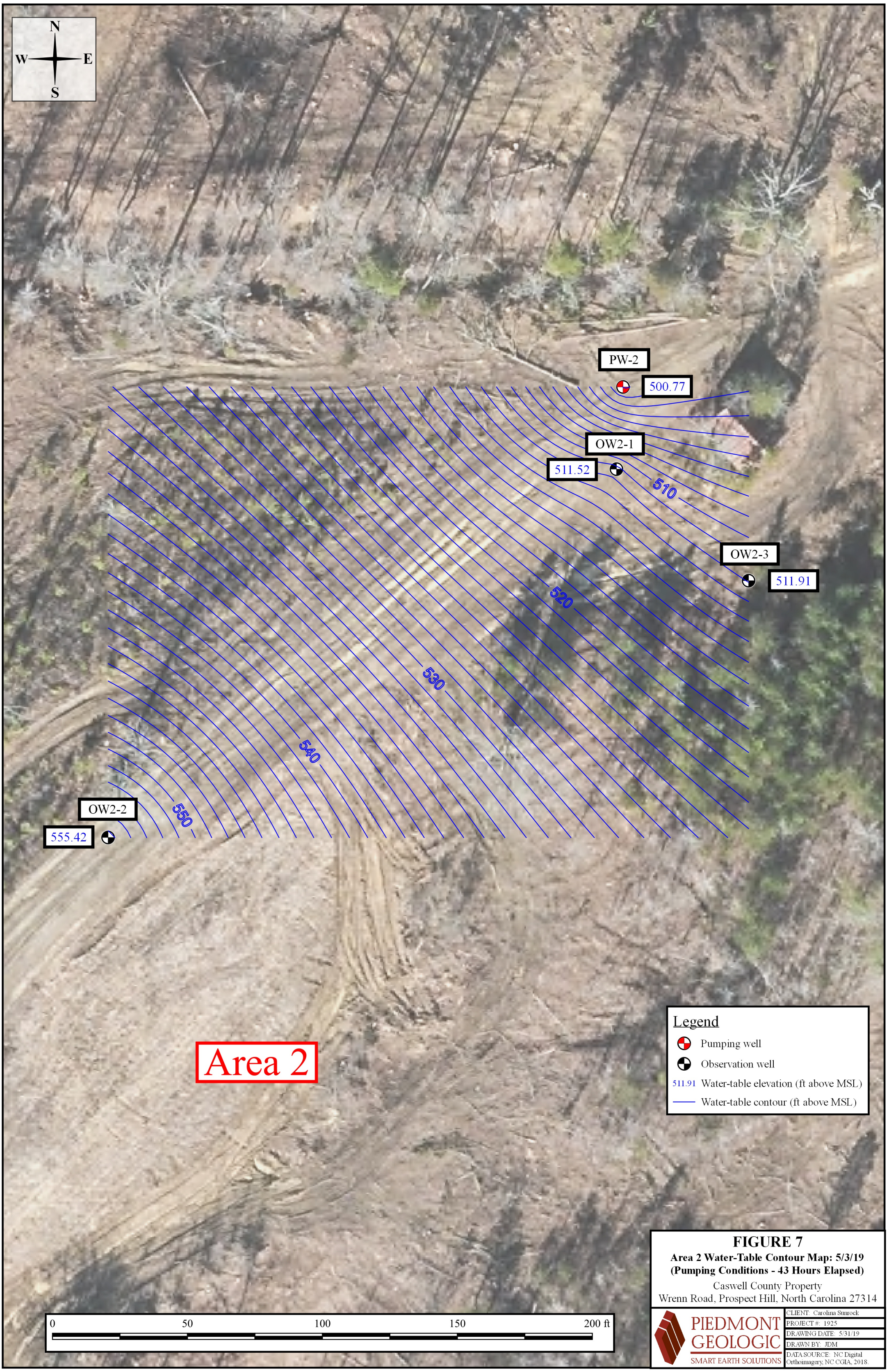


FIGURE 7

Area 2 Water-Table Contour Map: 5/3/19
(Pumping Conditions - 43 Hours Elapsed)

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

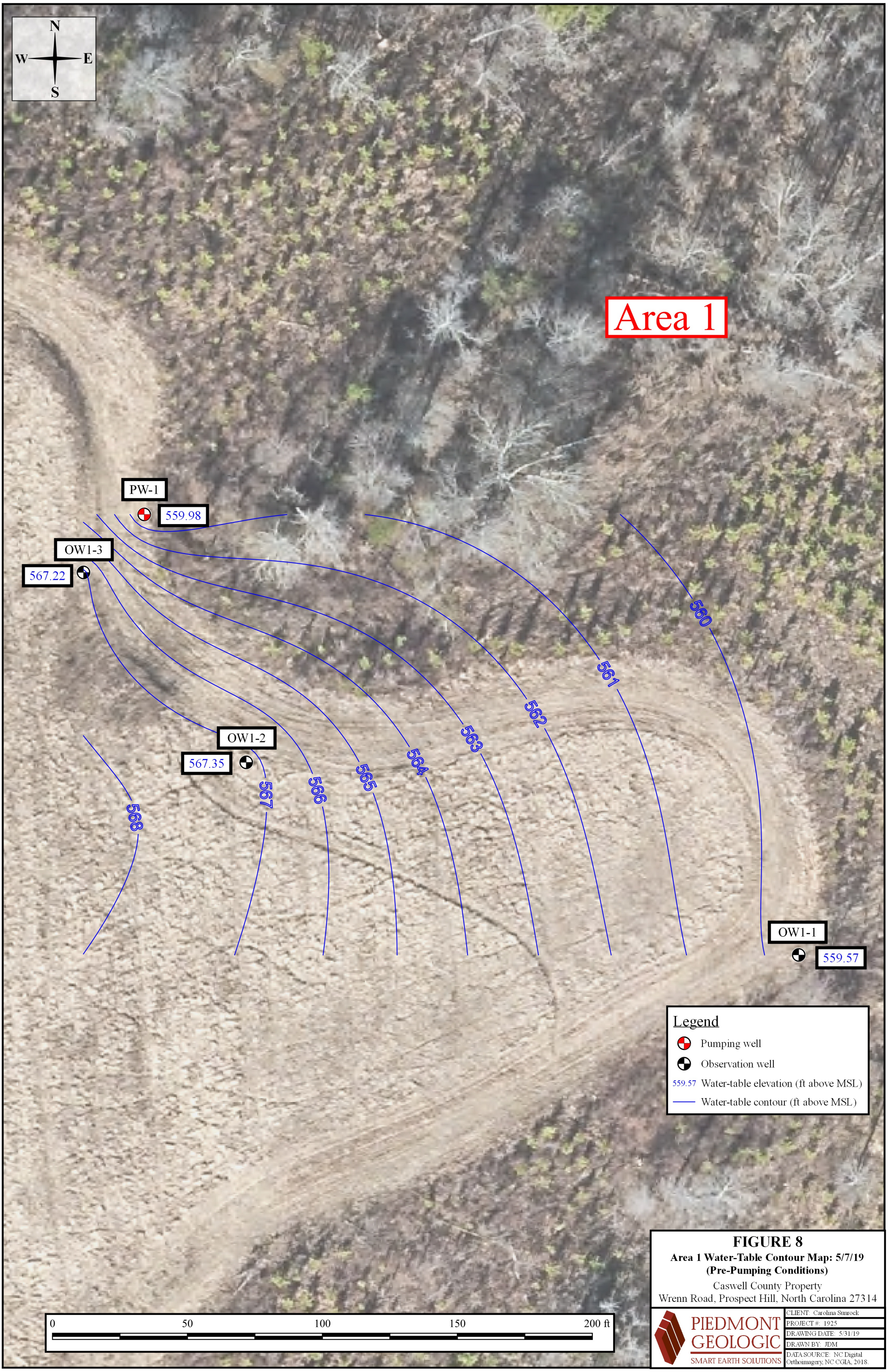


FIGURE 8

Area 1 Water-Table Contour Map: 5/7/19
(Pre-Pumping Conditions)

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

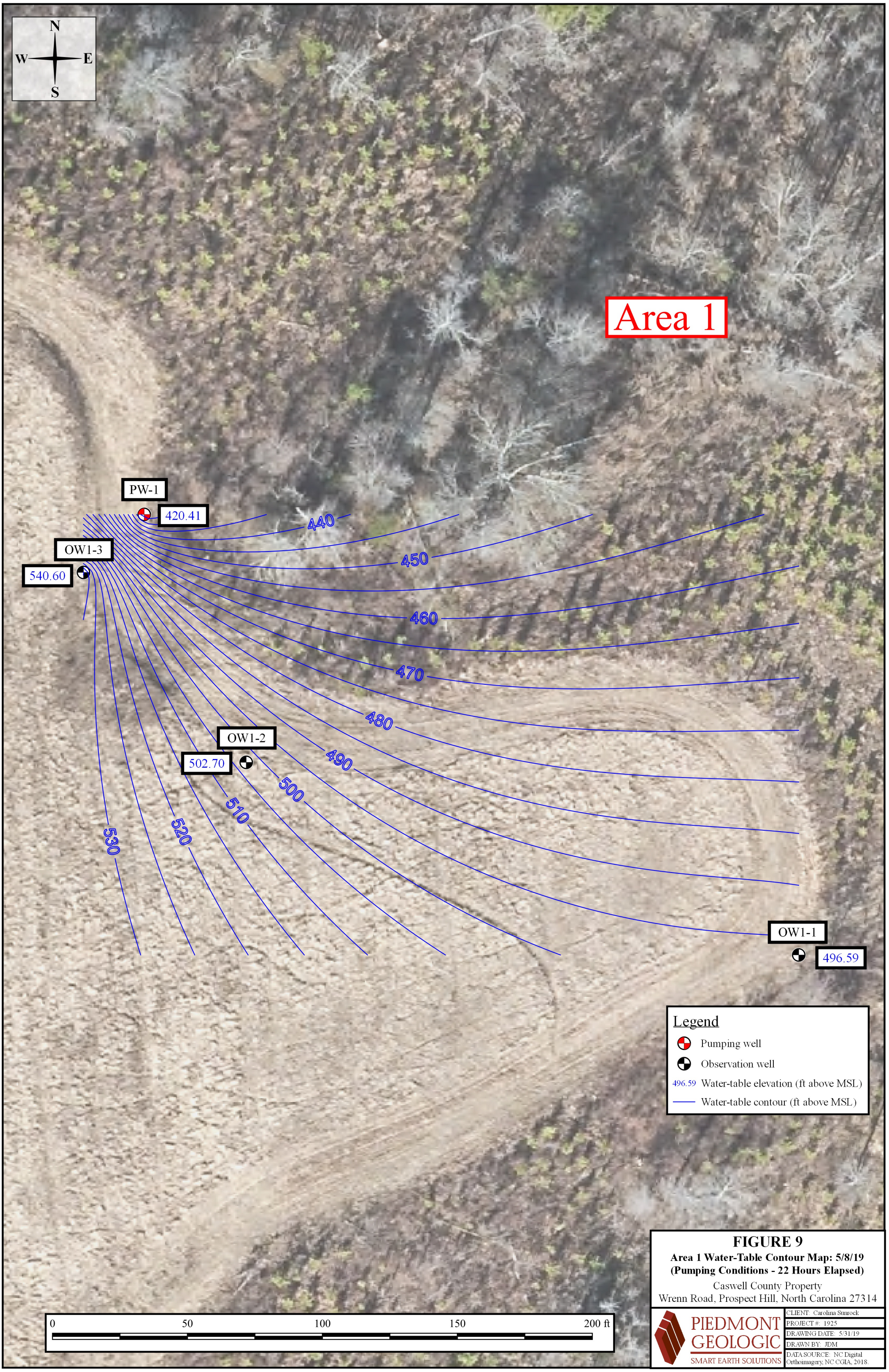


FIGURE 9

Area 1 Water-Table Contour Map: 5/8/19
(Pumping Conditions - 22 Hours Elapsed)

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

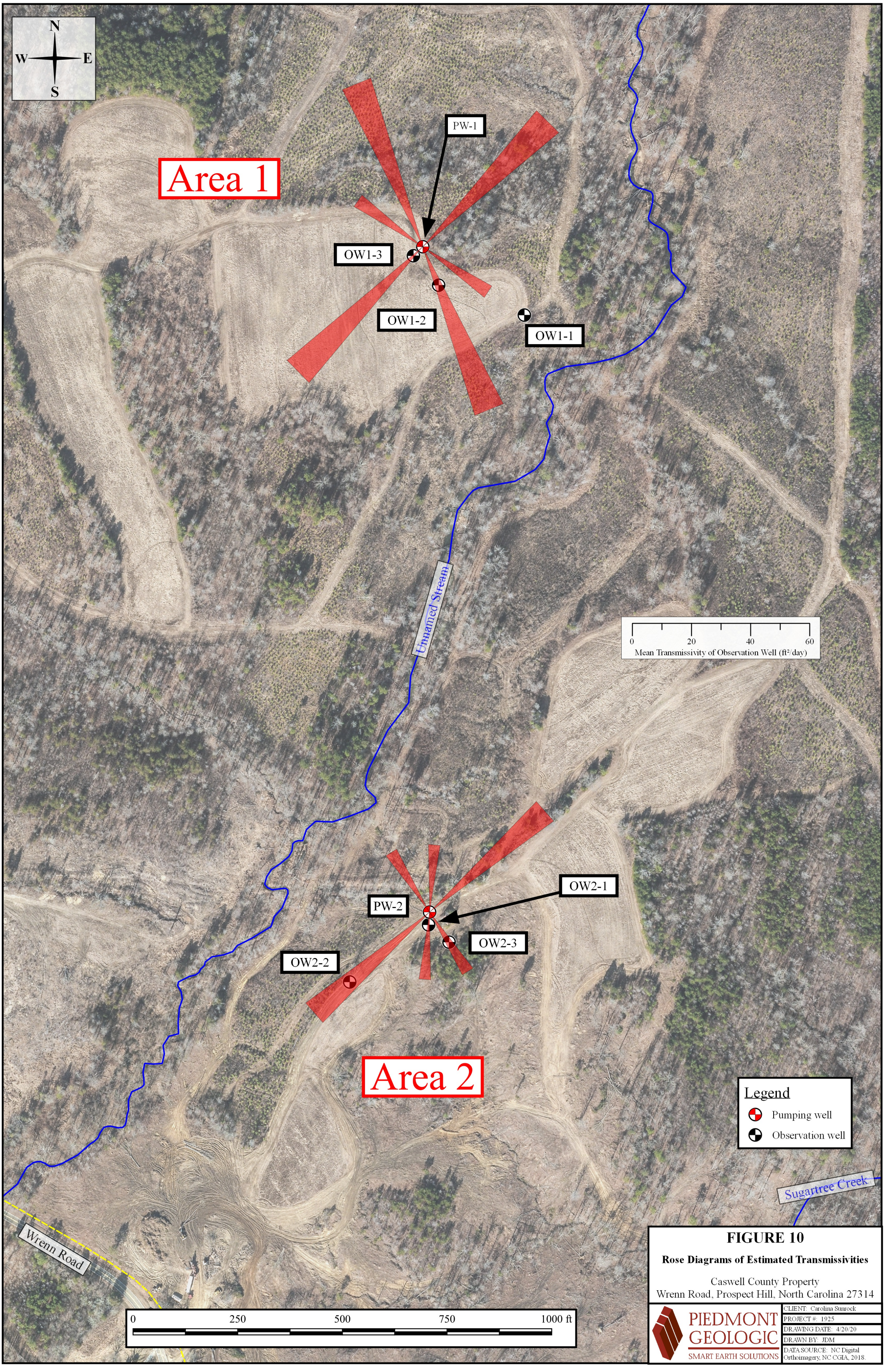


FIGURE 10

Rose Diagrams of Estimated Transmissivities

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

PIEDMONT GEOLOGIC
SMART EARTH SOLUTIONS

CLIENT: Carolina Sunrock
PROJECT #: 1925
DRAWING DATE: 4/20/20
DRAWN BY: JDM
DATA SOURCE: NC Digital Orthoimagery, NC CGIA, 2018.

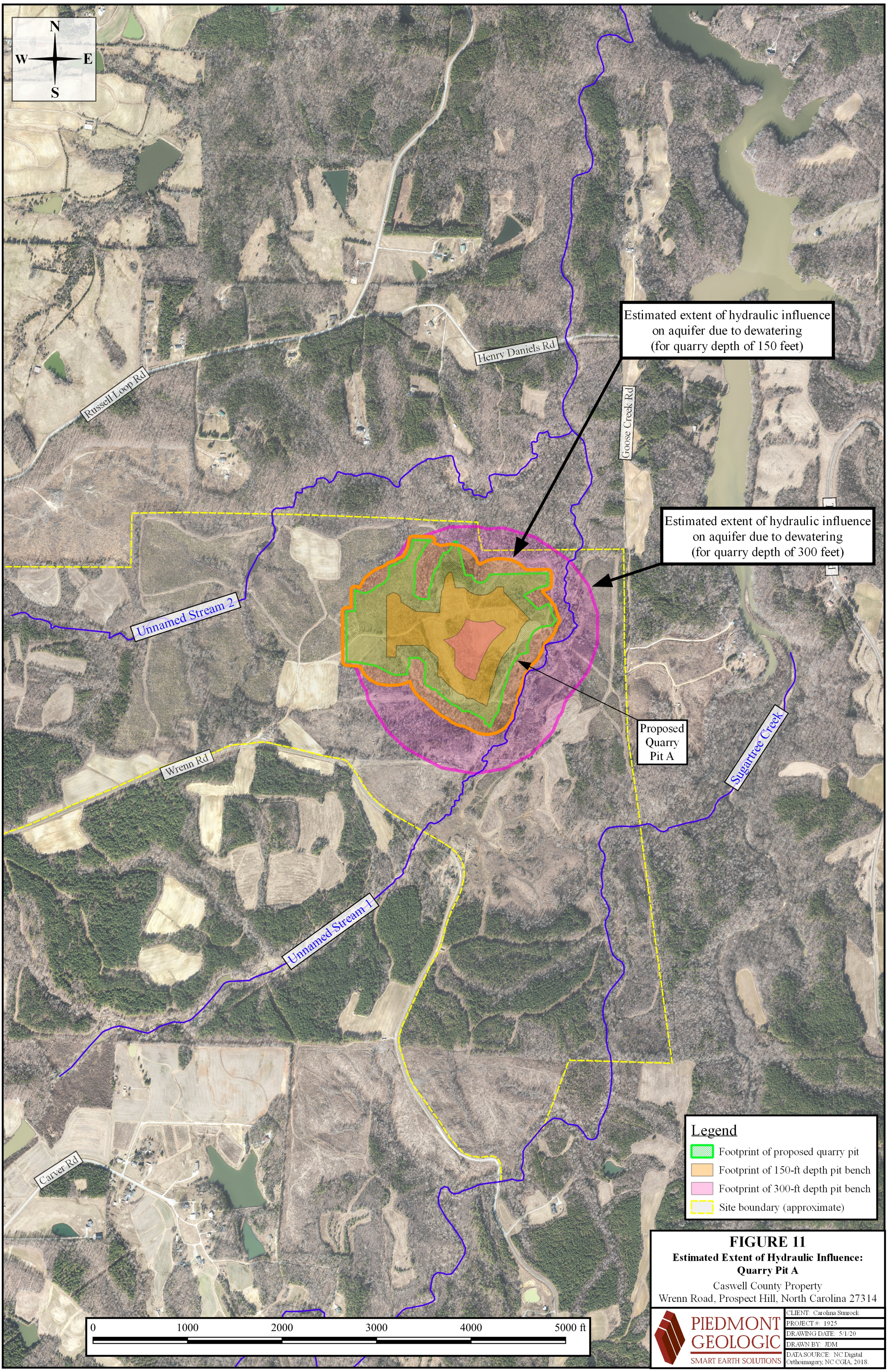


FIGURE 11

Estimated Extent of Hydraulic Influence: Quarry Pit A

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

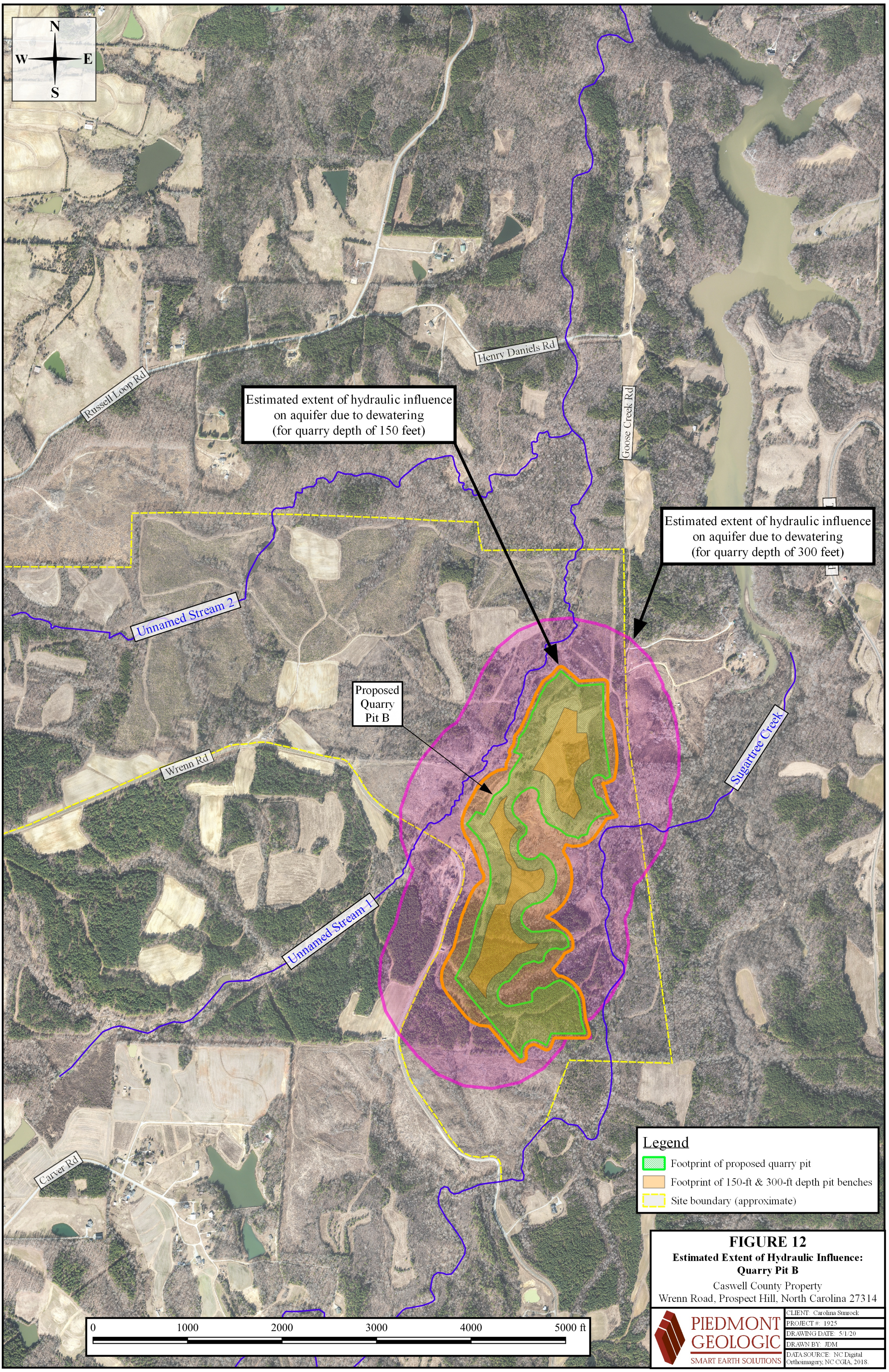


FIGURE 12

Estimated Extent of Hydraulic Influence: Quarry Pit B

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

PIEDMONT GEOLOGIC
SMART EARTH SOLUTIONS

CLIENT: Carolina Sunrock
PROJECT #: 1925
DRAWING DATE: 5/1/20
DRAWN BY: JDM
DATA SOURCE: NC Digital Orthoimagery, NC CGIA, 2018.

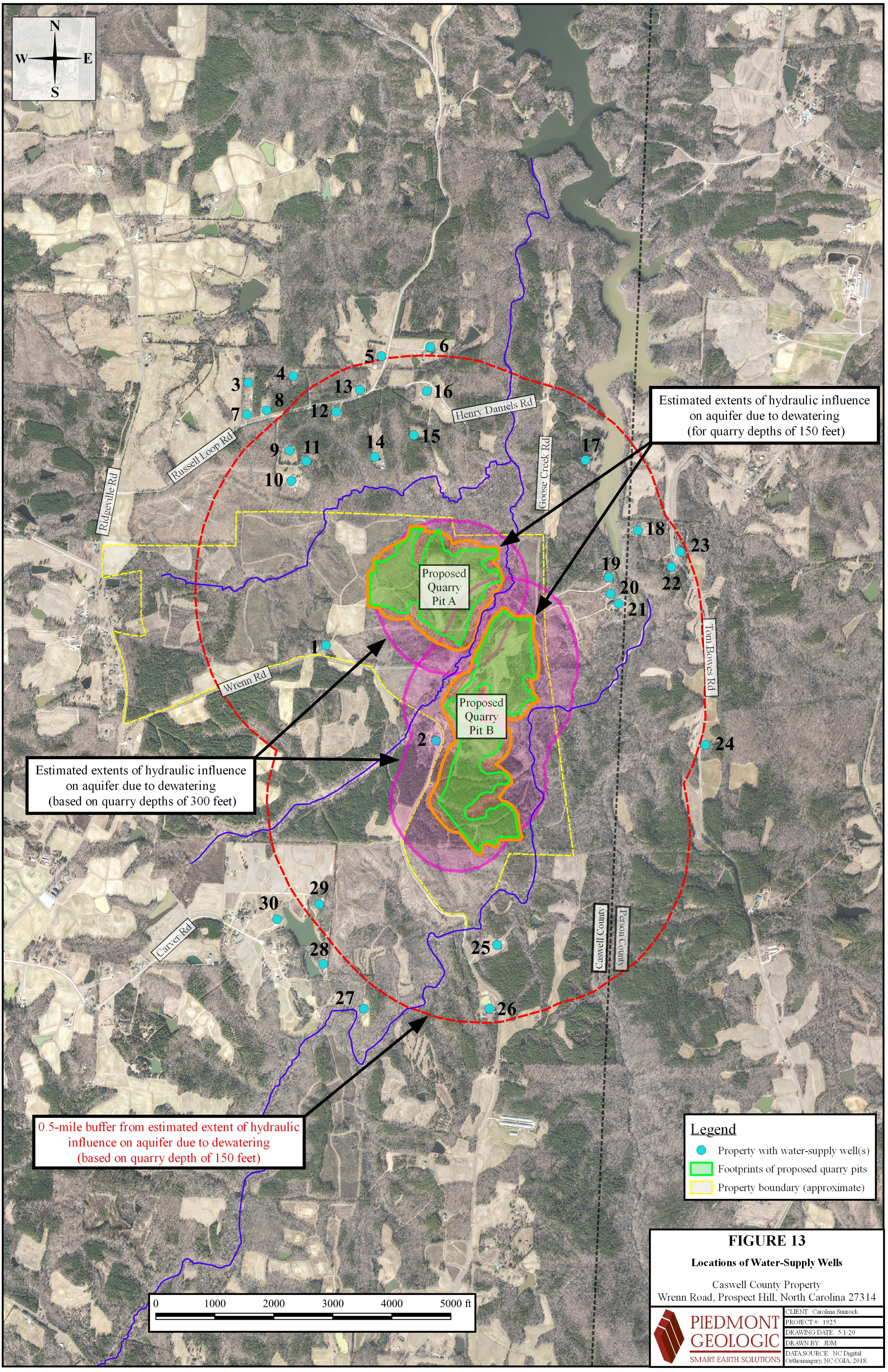


FIGURE 13

Locations of Water-Supply Wells

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

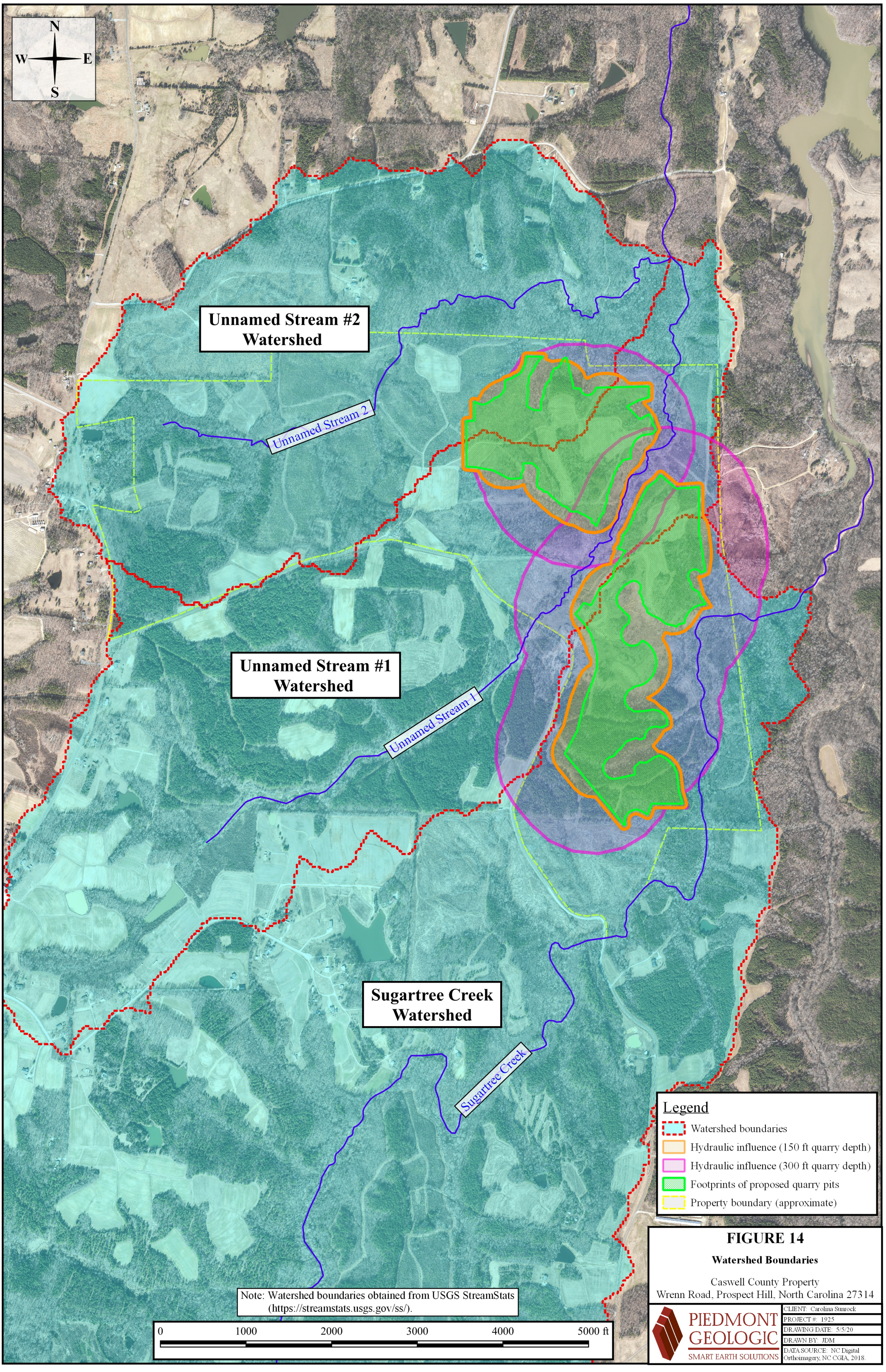


FIGURE 14

Watershed Boundaries

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

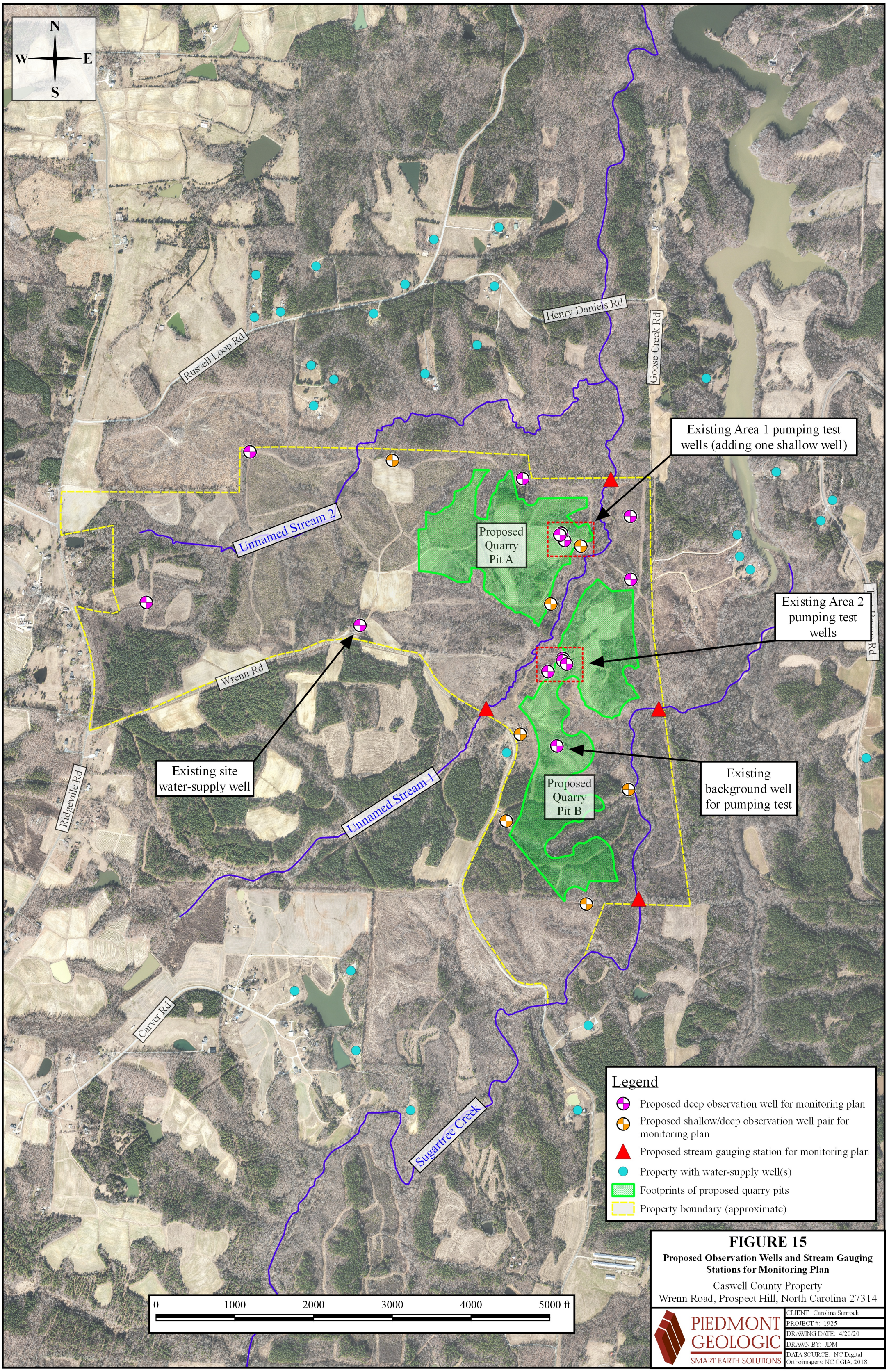


FIGURE 15

Proposed Observation Wells and Stream Gauging Stations for Monitoring Plan

Caswell County Property
Wrenn Road, Prospect Hill, North Carolina 27314

APPENDIX A

REGULATORY COMMENTS ON SUNROCK MINING PERMIT APPLICATION

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
S. Daniel Smith
Director

NORTH CAROLINA
Environmental Quality

November 21, 2019

Certified Mail
Return Receipt Requested
7016 2140 0000 0565 1741

Mr. Scott Martino
Carolina Sunrock LLC
200 Horizon Drive, Suite 100
Raleigh, North Carolina 27615

RE: Proposed Prospect Hill Quarry and Distribution Center
Caswell County
Roanoke River Basin

Dear Mr. Martino:

We have reviewed the application your company submitted for the referenced mine site. In order for this office to complete its review of the referenced project in accordance with GS 74-50 and 51 of the Mining Act of 1971, please provide the additional or revised information in accordance with the following comments:

1. Provide proof, such as copies of the signed return receipts from certified mail, that the following adjoining landowners have been properly notified: Bethel UMC, Phillip & Susan Allen, Scott Wilson-Houghtallen, Sara Cook, Richard & Jerry Cates, Georgia P Lewis, William & Donna Brown, William Morris & Rita Hudgins, Susan Hester and C S Painter Lands. If the notices have been returned as "unclaimed", provide a copy of the envelope with the postal service sticker.

2. Please find enclosed two pieces of correspondence from the Department of Cultural Resources regarding the proposed site. Please provide proof your company has contacted the Department regarding the archeological field investigation, including the location of the historical cemeteries. Any cemeteries found must be located on the mine map with appropriate buffers.

3. Please find enclosed comments from the North Carolina Wildlife Resources Commission regarding the proposed operation. Address **all** of the concerns outlined in the memorandum.

4. Provide proof that your company has obtained a valid wetland delineation approved by the US Army Corps of Engineers and the necessary permits from the Division of Water Resources to impact the large number of streams. Enclosed are comments from that agency.

5. See the comments provided by the Ground Water Management Branch. Because of inaccuracies in the pumping test procedures, re-perform the pumping test and obtain a more accurate zone of influence. Provide an acceptable monitoring plan consisting of a series of monitoring wells as mining progresses to protect the potable water supply wells in the area. See the recommendations in said comments. Include unfiltered testing of the wells for all of the metals on the sample result sheets submitted with the hydrogeological study. Include an adverse impact letter stating what steps your company will take if dewatering activities at the mine should happen to impact any existing water supply well.

6. Please detail (list) the types of NPDES permits for mining and all other proposed industrial activities for the subject site. Also include proof that your company is obtaining all necessary NPDES permits for storm water and pit water discharge, including an acceptable operations and maintenance plan to protect wetlands and water ways.

7. Provide proof that your company has obtained a valid Air Quality permit for the proposed operation.

8. Provide proof that the operation will not have an adverse effect on the Roxboro Lake as it is a publicly owned recreation area.

9. The North Carolina Geological Survey has stated the site is located within the Slate Belt and may have asbestos within the mined material. Explain how your company will protect those individuals near the site from being affected by the asbestos. In addition, provide proof that the release of radon will not be an issue.

10. See the email from the Winston Salem Regional Office regarding the erosion and sediment control plan submitted with your company's application. The erosion and sediment control issues noted in the email from the Winston Salem Regional Office staff must be completely addressed.

Please note, this office may request additional information, not included in this letter, as the mining application review progresses.

Please be advised that our review cannot be completed until all of the items listed above have been fully addressed.

In order to complete the processing of your application, please forward two (2) copies of the requested information to my attention at the following address:

Division of Energy, Mineral Land Resources
Department of Environmental Quality
1612 Mail Service Center
Raleigh, NC 27699-1612

As required by 15A NCAC 5B.0013, you are hereby advised that you have 180 days from the date of your receipt of this letter to submit all of the requested information. If you are unable to meet this deadline and wish to request additional time, you must submit information, in writing, to the Director clearly indicating why the deadline cannot be met and request that an extension of time be granted. If an extension of time is not granted, a decision will be made to grant or deny the mining permit based upon the information currently in the Department's files at the end of the 180-day period.

Though the preceding statement cites the maximum time limit for your response, we encourage you to provide the additional information requested by this letter as soon as possible. Your prompt response will help us to complete the processing of your application sooner.

Please contact me at (919) 707-9220 if you have any questions.

Sincerely,

Judith A. Wehner
Assistant State Mining Specialist

Enclosures

cc: Ms. Tamera Eplin, PE

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of Archives and History
Deputy Secretary Kevin Cherry

October 7, 2019

MEMORANDUM

TO: Brenda Harris
Land Quality Section
Division of Land Resources, NCDENR

FROM: Ramona M. Bartos RSL for Ramona M. Bartos

SUBJECT: Application for Mining Permit, Carolina Sunrock, LLC, Prospect Hill Quarry, Caswell County, ER 19-2783

Thank you for giving us the opportunity to review and comment on the above project pursuant to Chapter 74, Article 7 of the North Carolina General Statutes.

The proposed area of disturbance is adjacent to a tract of land surveyed in 1977 for the City of Roxboro reservoir. That survey identified multiple archaeological sites. Two of those sites (31CS31 and 31CS50) are along the northeastern boundary of the project area. These Archaic period resources were not assessed for the National Register of Historic Places. Additionally, there are several historic properties along the western and southern boundary of the project.

There is a high probability that additional archaeological resources may be present within some portions of the 630-acre proposed area of disturbance. Prior to the initiation of any ground disturbing activities within the project area, we recommend a comprehensive archaeological survey of the project area be conducted by an experienced archaeologist. The purpose of this survey will be to identify and evaluate any archaeological sites that may be damaged or destroyed by the proposed undertaking. Potential effects on unknown resources must be assessed prior to the initiation of construction activities.

Our office now requests consultation with the Office of State Archaeology Review Archaeologist to discuss appropriate field methodologies prior to the archaeological field investigation, including review of the project area to determine high probability areas that will require survey and low probability areas that will not. A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at https://files.nc.gov/dncr-arch/Consultants-List-2019-08-columns.pdf. The archaeologists listed, or any other experienced archaeologist, may be contacted to conduct the recommended survey.

One paper and one digital copy of all resulting archaeological reports, as well as one digital copy of the North Carolina site form for each site recorded, should be forwarded to the Office of State Archaeology through this office for review and comment as soon as they are available and in advance of any construction or ground disturbance activities. Our report guidelines can be found at https://files.nc.gov/dncr-arch/OSA_Guidelines_Dec2017.pdf.

We have determined that the project as proposed will not have an effect on any historic structures.

While we note that this project review is only for a state permit, the potential for federal permits may require further consultation with us and compliance with Section 106 of the National Historic Preservation Act.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

Department of Natural and Cultural Resources
Division of Historical Resources

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of State Archaeology
John Mintz, State Archaeologist

November 13, 2019

Brenda M. Harris
Mining Program Secretary
North Carolina Department of Environmental Quality
512 North Salisbury Street
Raleigh, NC 27699

Re: Prospect Hill Quarry, Caswell County, ER 19-2783

We have been notified that one or more historic cemeteries are located in the subject project area. Cemeteries are protected under North Carolina General Statutes Chapter 14-148 and 14-149, and are afforded consideration under Chapter 65.

We therefore recommend that prior to the initiation of permitted ground disturbing activities, all cemeteries in the project area be delineated and documented by a professional archaeologist. In order to ensure that cemeteries in the parcel are treated in a manner consistent with state law, we also recommend that an avoidance plan be developed for each identified cemetery and an unanticipated discoveries plan be developed in case any burials are discovered in the process of mine operations.

Please note that our office now requests consultation with the Office of State Archaeology Review Archaeologist to discuss appropriate methodologies prior to field investigations. A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at https://files.nc.gov/dncr-arch/Consultants-List-2019-08-columns.pdf. The archaeologists listed, or any other experienced archaeologist, may be contacted to conduct the recommended work.

One paper and one digital copy of all resulting archaeological reports, as well as one digital copy of the North Carolina cemetery form for each cemetery recorded, should be forwarded to the Office of State Archaeology through the State Historic Preservation Office for review and comment as soon as they are available and in advance of any construction or ground disturbance activities.

Thank you for your cooperation and consideration. If you have questions concerning the above comments, please contact me at 919-814-6555 or john.mintz@ncdcr.gov. In all future communication concerning this project, please cite the above-referenced tracking number.

Sincerely,

for John Mintz

Central Office
4619 Mail Service Center
Raleigh NC 27699-4619
919/814-6550; fax 919/715-2671
Location: 109 E. Jones Street
Raleigh NC 27601

OSA Research Center
4619 Mail Service Center
Raleigh NC 27699-4612
919/715-5599; fax 919/715-1380
Location: 215 W. Lane Street
Raleigh NC 27601

Underwater Archaeology Branch
1528 Fr. Fisher Blvd South
Kure Beach NC 28449
910/458-9012, fax 910/458-1093

OAR Conservation Laboratory
1157 VOA Site C Road
West Research Campus
East Carolina University
Greenville NC 27834
252/744-6721

Western Office
Dept. of Cultural Resources
Western Office
176 Riceville Road
Asheville NC 28805
828/274-6789; fax 828/274-6695

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

MEMORANDUM

TO: Brenda M. Harris
Mining Program Secretary
Land Quality Section

FROM: Olivia Munzer, Western Piedmont Coordinator
Habitat Conservation

DATE: 27 September 2019

SUBJECT: New Mining Permit Application for Carolina Sunrock LLC, Prospect Hill Quarry and Distribution Center, Caswell County, North Carolina

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) have reviewed the subject permit application. Our comments are provided in accordance with provisions of the Mining Act of 1971 (as amended, 1982) (G.S. 74-46 through 74-68 15 NCAC 5).

Carolina Sunrock LLC applied for a new mining permit for the proposed Prospect Hill Quarry and Distribution Center located at 1238 Wrenn Road in Prospect Hill, Caswell County, North Carolina. The property is currently comprised of agricultural fields and forest, the majority of which was clear-cut for timber harvest in 2018. Of the 630-acre property, a total of 380 acres will be disturbed for mining activities.

Sugartree Creek and unnamed tributaries to South Hyco Creek and Sugartree Creek flow through the site. Sugartree Creek in the Roanoke River basin is classified as a High-Quality Water and Water Supply II stream by the NC Department of Water Resources (NCDWR). The permit indicates two small wetland areas will be impacted permanently by the site development and construction; however, Sheet 5 indicates streams will be permanently impacted by mining, particularly during Phase IV.

The NCWRC has known records of the state significantly rare Carolina ladle crayfish (*Cambarus davidi*) and an undescribed crayfish species near the site. The lack of records from the site does not imply or confirm the absence of federal or state-listed species. An on-site survey is the only means to determine if the proposed project may impact federal or state rare, threatened, or endangered species. Adjacent to the site, a Dry Oak–Hickory Forest Natural Community lies within the Russell Loop Dry Forest Natural Heritage Natural Area (NHNA). A natural community is a rare or high-quality natural community and a NHNA is a site with special biodiversity significance.

We hesitate to concur with the approval of this mining permit. We have concerns for the direct and

Mailing Address: Habitat Conservation Division • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

indirect impacts to aquatic and terrestrial resources in and adjacent to the proposed project. We offer the following recommendations to minimize impacts to aquatic and terrestrial wildlife resources.

1. In addition to direct impacts, we have concerns on the indirect impact of the operation on the streams and wetlands. The Hydrogeological Study Report (page 18) indicates substantial water-table drawdowns were observed during testing and similar or greater impacts (in extent and magnitude) could be seen during quarry dewatering. Additionally, the aquifer may not recharge at the rate of dewatering, particularly during drought years and/or with sustained and prolonged dewatering. The return water withdrawn during operation will be discharged in the westernmost of the larger unnamed tributaries. We are concerned the portion of the streams and the wetlands within the site may dry up or be abnormally low, which would impact aquatic resources.

2. NCWRC has records of the Carolina ladle crayfish and an undescribed crayfish species in the watershed. Since the impact of dewatering will likely impact stream flow, we request surveys for crayfish at the site. For questions, please contact W. Thomas Russ, the Foothills Aquatic Wildlife Diversity Research Coordinator, at 828-659-3324 or Thomas.russ@ncwildlife.org.

3. The permit application indicates (page 14) that a 100-foot (ft) buffer will be provided along Sugartree Creek and the larger two unnamed tributaries, and intermittent and ephemeral streams and wetlands will have a 50-ft buffer. We are pleased to see the applicant will provide undisturbed buffer widths generally recommended by NCWRC. However, the applicant indicates on page 7 that "Phases I, II, and III within Pit A will be mined leaving a 50-undisturbed buffer along all streams and wetlands within the ultimate pit boundary of Pit A", which is inconsistent with the buffer widths on page 14. Furthermore, Sheet 5 indicates that Phase IV involves "expanding the Pit A through existing streams and wetlands to achieve the ultimate pit boundary of Pit A, installation of a creek crossing to access Pit B, and the stripping and mining of Pit B".

4. We have concerns that the overburden/pond fines disposal areas are adjacent to streams and only separated from the streams by a silt fence and undisturbed stream buffer. If the stream buffer is less than 100 ft, consider using a small berm or other type of structure to safeguard the stream from sediment in case the silt fences fail.

5. Due to the presence of dry oak-hickory forest natural communities in the area, we recommend the applicant plant hickories and oaks in addition to shortleaf pine and maple.

6. The applicant indicates on pages 14, 16, and 18 that they will reseed using native grasses and trees. However, the grasses and lespedeza listed on the seeding schedule (page 20) are all non-native and/or invasive species. Non-native plants should be removed from the seeding schedule and replaced with native alternatives. Consider an alternative mix of red clover, creeping red fescue, and a grain, such as oats, wheat, or rye. Specifically, this project would be ideal for planting native, wildflower seed mixes that will create pollinator habitat within the reclaimed areas. Please see the attached document for recommendations on native seed mixes for disturbed sites.

7. We recommend that water quality, and perhaps surface flow, are monitored downstream of the discharge point.

8. Ensure Erosion Control and Sedimentation Basins and associated structures (i.e., dissipater pads) are located outside the recommended stream buffers, which are a minimum 100-foot for perennial streams and a 50-foot for intermittent streams and wetlands.

27 September 2019
Prospect Hill Mine Permit Application
Caswell County

Thank you for the opportunity to comment. Further information and free technical guidance from the NCWRC is available upon request. For questions or comments, please contact me at (919) 707-0364 or olivia.munzer@ncwildlife.org.

ec: Sue Homewood, NC Division of Water Resources (NCDWR)
David Bailey, U.S. Army Corps of Engineers
W. Thomas Russ, NCWRC

Print this form to PDF *Return PDF of this form to DEMLR CO by email. cc DEMLR RO, DWR SPU.* *Send a copy to the permittee.*

MINING PERMIT APPLICATION REVIEW FORM

for the

DIVISION OF WATER RESOURCES

THIS SECTION TO BE FILLED OUT BY DEMLR:

Project Name Propect Hill Quarry DEMLR Permit 17-02 County Caswell **Applicant's Email: smartino@thesunrockgroup.com**

PERMIT ACTION TYPE:

	YES	NO	Date Commencing
	☐ (	☐ (	

Have land disturbing activities?? started? Date? ☐ (☐ (

Latitud 36.300266 Longitude: -79.167534

Please return comments to (at DEMLR CO): Judy Wehner

Comments due by: 9/27/2019

SECTION BELOW TO BE FILLED OUT BY DWR:

Is the RO concerned that the operation, as proposed, would violate standards of water quality? Yes
Comments: The GW modeling shows a significant lowering of the water table within the footprint of the mine and surrounding areas. The model analyzes the impacts of this lowering on local WSWs however it should also be used to analyze indirect hydraulic impacts on all surrounding wetlands and streams. In addition, 15A NCAC 02B .0214 has very stringent limitations on industrial wastewater and stormwater in WS-II waters. Also, Phase IV of this project indicates buffers will be impacted and .0214 states that no new development is allowed in the buffer. 15A NCAC 02B .0224 has very specific requirements for NPDS wastewater discharges that should be addressed in detail. These questions should be further researched with DEMLR Stormwater Unit and with DWR classifications and/or industrial wastewater unit to determine restrictions/limitations.

Watershed/Stream Name & Classification: Sugar Tree Creek, WS-II; HQW and South Hyco Creek, WS-II; B; HQW

DWR Compliance Status of Mine: NA
Does this mine (or previous owner) have DWR back fees to pay? _____ If yes, amount: _____
Is this mine an active permit in BIMS?_____

	YES	NO
401 Wetland Cert. required?	☑ (	☐ (
401 Wetland Cert. existing?	☐ (Permit #_____	☑ (
Does DWR RO have enough information to determine if a 401 certification is required?	☑ (Application indicates a Nationwide Permit for first Phases but an Individual Permit will be necessary for Phase IV. USACE may not allow applicant	☐ (

	to separate project into phases	

Is an O & M Plan needed?	YES	NO
Are wetlands disturbed at this site?	☑ (minor direct impacts for first few phases. Significant impacts for Phase IV. Also may be significant indirect impacts from hydraulic drawdown of watertable	☐ (_____
Does DWR RO suspect or know of nearby wetlands to the site?	☑ (_____	☐ (_____
Is a wetland delineation required prior to DWR issuing the permit?	☑ (JD- must have delineation map in application verified by USACE ☐ (Consultant _____ ☐ (Onsite? _____ ☐ (Offsite?_____	☐ (_____
Stream Determination Needed?	☑ (see above	☐ (_____
Stream Determination Completed?	☐ (_____	☐ (_____
Does DWR RO need a statement that no wetlands/streams are disturbed for this project from applicant?	☐ (_____	☑ (_____
Buffer Determination Needed?	☐ (_____	☑ (_____
Buffer Determination Completed?	☐ (_____	☑ (_____
Recycle system permit existing?	☐ (Permit #_____	☑ (_____
New Recycle System permit required?* Enough information to determine?	☐ (_____	☑ (_____
Non-discharge permit existing?	☐ (Permit #_____	☐ (_____
Will wastewaters discharge to HQW waters with a 7Q10=0?	☐ (_____	☐ (7Q10 Flow:_____ ☐ (Unknown. Permittee must determine. _____
Does DWR require DEMLR to hold the permit (e.g. so DWR can review it further or because DWR requires more information)?	☐ (Has Violation ☐ (O&M Requirements ☑ (HQW/7Q10 Concerns ☐ (Pay back fees or renew DWR permit ☑ (Other. Please describe the reason to	☐ (_____

	hold the permit: significant concerns about possible indirect impacts to streams and wetlands. RO contact: _____ ☐ (Hold Until: _____	
Mine must wait to dewater until an O&M plan is approved?	☐ (_____	☐ (_____

Reviewed by:

DWR RO Surface Water: SLH Regional Office: WSRO Date: 9/21

RO Aquifer Protection Section: _____ Regional Office: _____ Date: _____

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

September 25, 2019

RECEIVED
SEP 25 2019
LAND QUALITY
MINING PROGRAM

MEMORANDUM

TO: Ms. Judy Wehner
Land Quality Section

FROM: Michael Bauer MB
Ground Water Management Branch
Division of Water Resources

SUBJECT: Comments on the Mining Permit Application Request for:
Carolina Sunrock, LLC.
Carolina Sunrock Prospect Hill Quarry & Distribution Center
Caswell County

Please find attached a copy of the mining permit request for the above referenced project.

The Carolina Sunrock Prospect Hill Quarry & Distribution Center located in Caswell County might have an unduly adverse effect on ground water supplies since mine dewatering is proposed onsite. The hydrogeological study provided with the mine permit application indicates that the mine may pump between 1.75 million gallons of groundwater per day (mgd) and 3.42 mgd depending on pit depth. The hydrogeological study also indicates that the existing nine monitoring wells will be gauged to track/monitor the drawdown of the aquifer on a routine basis. However, a majority of those wells were placed near the center of the property and not outside the excavation boundary.

The Division recommends the following:

- Before dewatering activities begin, monitoring wells should be constructed outside of the excavation limits. These wells should be placed between the excavation and areas where existing water supply wells were located during the water supply well survey (mine application package figure 9). The Division recommends constructing three monitoring wells on the north side of the excavation near water supply wells 10 – 15, two on the northeast side of the excavation near water supply wells 17 – 21, one on the south side of the excavation near water supply well 25, and one on the southwest side of the excavation near water supply well 29.
- Monitoring wells should be gauged for water levels monthly starting at least two months prior to any dewatering activities at the mine.
- Since there are existing water supply wells in the area, the Division of Energy, Mineral, and Land Resources should obtain an adverse impact letter from Carolina Sunrock, LLC. stating what steps the company will take if dewatering activities at the mine should happen to impact any existing water supply wells.

The mine will need to register water withdrawals with the Division of Water Resources on an annual basis since the water withdrawals are over 100,000 gallons per day. The registration form may be obtained from the following link:

https://www.ncwater.org/wwatr

Facilities are required to register their water withdrawals in accordance with the North Carolina General Statute G.S. 143-215.22H. This statute requires any non-agricultural water user who withdraws 100,000 gallons or more in any one day of ground water or surface water to register and update withdrawals. This statute also requires transfers of 100,000 gallons or more in any one day of surface water from one river basin to another river basin to register and update their water transfers. Water withdrawal registrants must complete the annual water use reporting form by April 1 for the previous year.

If you have further questions regarding the water withdrawal registration please contact John Barr with the Division of Water Resources at (919) 707-9021 or email him at john.barr@ncdenr.gov.

Wehner, Judy

From:	Eplin, Tamera
Sent:	Tuesday, October 15, 2019 12:54 PM
To:	Wehner, Judy
Cc:	Lentz, Zachary
Subject:	17-02 Carolina Sunrock / Prospect Hill Quarry
Attachments:	DOC101519-10152019115311.pdf; DOC101519-10152019115300.pdf

Hello Judy,
The DEQ and WSROS comments are attached. Thank you for additional time to review.
DAQ and WQROS comments are attached.
Significant comments on the plans:

1. The proposed mine is in an area of High Quality Waters, as discussed by Sue Homewood.
2. Access for at least one haul road is shown in a wetland and across the Limits of Disturbance. Will this road be used?
3. Contour elevations are necessary.
4. The applicant does not use traditional basin design, wherein water enters the basin on the upgradient side, goes through 3 baffles that divide the basin into fourths (from the basin floor), with a 2:1 to 6:1 length to width ratio. Add the outlets discharging directly into the buffers of creeks leading to the lake, and it is unlikely this mine will avoid impact to the creeks and buffers.
5. In some cases, the baffles are at the bottom of the interior slope of the basins, which is not approvable.
6. If they insist on a U shaped baffle, I'm curious how they intend to maintain them.
7. Silt fence should be placed a minimum of 10 feet below any fill slope to allow for access, maintenance, and sediment storage.
8. The disturbed area equals the drainage area for basin calculations. Does off-site drainage need to be taken into account?
9. Drainage areas should be very clearly shown on the erosion control plan.
10. Any drainage of any basin that close to a creek for any reason, such as to perform basin maintenance, would need to be through a silt bag.
11. They have significant area draining around and below sediment basins to a stone outlet. Stone outlets are not treatment measures, and only meant to prevent silt fence laydown in small areas already determined to have acceptable design for silt fencing (1/4 acre per 100 ft silt fencing, less for steeper slopes). Redesign is needed.
12. They have their LOD right on the buffer lines. This does not allow any vegetative buffer. All sediment loss is a buffer violation.
13. Demolition debris needs to go to a site regulated by the Division of Waste Management.

14. Diversions need to go the end of the sediment basin opposite the skimmer intake. Generally speaking, the basins are not placed to maximize the flow path of the water, which is necessary to allow settling of sediment.
15. Will residents near the lake need to use the mine road for access?
16. Stone outlets are not approvable placements for skimmer outlet stabilization.
17. The C value for disturbed soil should be 0.6, not 0.3.
18. They proposed stone outlets, but didn't provide a detail.
19. They should utilize PAMS, with specifications.
20. Any diversions left in place longer than 30 days should have matting/stabilization upon installation.
21. They should provide measures around the stockpiles.
22. 404/401 certifications?? They should show areas of approved permanent and temporary impact, clearly labeled on the plans. For review of ESC, need a copy of the application and the approval, or a copy of the application and documented receipt.
23. They should clearly stake their LOD, describe within the sequence.
24. Are they using ESC measures to treat stormwater/process water from the proposed asphalt/concrete plant onsite?
25. Sheet 7b – they're proposing open pits going across streams???
26. They list a creek crossing in the sequence of events, but not the ESC plan.
27. They should provide a listing of status of all other applicable permits and list their significance within their construction sequence.
28. Dewatering excavations below the water table should not overwhelm the sediment basins when rainfall is expected.
29. When they resubmit, they need to demonstrate a clear translation between the mine maps and the ESC plan across the phases of the plan.
30. Until all items above are addressed, as well as any additional information you need, the applicant should hold off and resubmit as one comprehensive package. They should be advised that due to the nature of the initial submittal and comments provided, additional review with additional comments is likely.

Please let us know if we may be of additional assistance,

Tamera Eplin, PE, CPESC
Regional Engineer
Land Quality Section, Winston-Salem Regional Office
Division of Energy, Mineral and Land Resources
North Carolina Department of Environmental Quality

(336) 776-9800 office
tamera.eplin@ncdenr.gov

450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105-7407

APPENDIX B

TABLES

TABLE 1
GROUNDWATER OBSERVATION AND PUMPING WELL CONSTRUCTION DETAILS

Carolina Sunrock
Caswell County Property
Prospect Hill, North Carolina

Well No.	Date Installed	Total Depth (1)	Outer Casing Depth (1)	Outer Casing I.D. (in.)	Well I.D. (in.)	Screen Interval (1)	TOC Elev. (2)
AREA 1 OBSERVATION AND PUMPING WELLS							
OW1-1	3/29/2019	300	33	6.125	5.5*	33-300*	588.63
OW1-2	4/3/2019	300	47	6.125	5.5*	47-300*	593.29
OW1-3	4/4/2019	300	52	6.125	5.5*	52-300*	594.31
PW-1	4/2/2019	300	52	6.125	5.5*	52-300*	594.45
AREA 2 OBSERVATION AND PUMPING WELLS							
Well No.	**Date Installed**	**Total Depth (1)**	**Outer Casing Depth (1)**	**Outer Casing I.D. (in.)**	**Well I.D. (in.)**	**Screen Interval (1)**	**TOC Elev. (2)**
OW2-1	3/19/2019	300	49	6.125	5.5*	49-300*	596.99
OW2-2	3/20/2019	300	36	6.125	5.5*	36-300*	599.54
OW2-3	3/26/2019	300	69	6.125	5.5*	69-300*	593.44
PW-2	3/21/2019	300	64	6.125	5.5*	64-300*	596.42
BACKGROUND OBSERVATION WELL							
Well No.	**Date Installed**	**Total Depth (1)**	**Outer Casing Depth (1)**	**Outer Casing I.D. (in.)**	**Well I.D. (in.)**	**Screen Interval (1)**	**TOC Elev. (2)**
CD-12	Dec. 2018	253	20	3	3	20-253*	586.12

(1) Measured in feet below ground surface. (2) Measured in feet above Mean Sea Level.
* Open-hole in bedrock. Well I.D. refers to open hole diameter and screen interval refers to open hole interval.
TOC = Top of casing. I.D. = Inside diameter.

TABLE 3
SUMMARY OF AQTESOLV CURVE-MATCHING RESULTS

Carolina Sunrock
Caswell County Property
Prospect Hill, North Carolina

AREA 1 OBSERVATION WELLS

Well	Solution	Test Phase	T (ft^2/day)	K (ft/day)	S	K_z/K_r	K' (ft/day)	S_s (ft^{-1})	S_s' (ft^{-1})	S_y	S_w	S_f
OW1-1	Theis	Draw. + Rec.	24	0.09	1.43E-05	1	--	--	--	--	--	--
	Moench		48	0.18	--	--	4.23E-02	2.01E-10	2.04E-12	--	500	5
	Cooper-Jacob	Recovery	10	0.04	2.10E-05	1	--	--	--	--	--	--
OW1-2	Theis	Draw. + Rec.	90	0.33	1.70E-04	1	--	--	--	--	--	--
	Moench		76	0.28	--	--	4.23E-02	5.22E-10	2.04E-12	--	500	5
	Cooper-Jacob	Recovery	13	0.05	8.20E-05	1	--	--	--	--	--	--
OW1-3	Theis	Draw. + Rec.	50	0.18	2.12E-03	1	--	--	--	--	--	--
	Moench		90	0.33	--	--	1.89E-05	1.27E-06	4.84E-12	--	78.3	5
	Cooper-Jacob	Recovery	39	0.14	2.55E-03	1	--	--	--	--	--	--
Mean		***Draw. + Rec.***	***63***	***0.23***	***5.76E-04***	***1***	***2.82E-02***	***4.242E-07***	***2.97E-12***	***--***	***359***	***5***
Standard Deviation			*27*	*0.10*	*9.18E-04*	*0*	*2.44E-02*	*7.342E-07*	*1.62E-12*	*--*	*243*	*0*
Mean		***Recovery***	***21***	***0.08***	***8.86E-04***	***1***	***--***	***--***	***--***	***--***	***--***	***--***
Standard Deviation			*31*	*0.11*	*1.18E-03*	*0*	*--*	*--*	*--*	*--*	*--*	*--*

AREA 2 OBSERVATION WELLS

Well	Solution	Test Phase	T (ft^2/day)	K (ft/day)	S	K_z/K_r	K' (ft/day)	S_s (ft^{-1})	S_s' (ft^{-1})	S_y	S_w	S_f
OW2-1	Neuman	Draw. + Rec.	26	0.09	1.86E-04	107.1	--	--	--	7.40E-03	--	--
		Recovery	20	0.07	1.00E-02	1	--	--	--	9.34E-04	--	--
OW2-2	Neuman	Draw. + Rec.	68	0.25	1.59E-04	1.8	--	--	--	2.73E-05	--	--
		Recovery	36	0.13	3.98E-04	1	--	--	--	4.73E-04	--	--
OW2-3	Neuman	Draw. + Rec.	31	0.11	3.46E-05	15.0	--	--	--	1.00E-03	--	--
		Recovery	17	0.06	1.55E-03	1	--	--	--	1.30E-06	--	--
Mean		***Draw. + Rec.***	***42***	***0.15***	***1.26E-04***	***41***	***--***	***--***	***--***	***2.81E-03***	***--***	***--***
Standard Deviation			*23*	*0.08*	*8.07E-05*	*57*	*--*	*--*	*--*	*4.01E-03*	*--*	*--*
Mean		***Recovery***	***25***	***0.09***	***3.98E-03***	***1***	***--***	***--***	***--***	***--***	***--***	***--***
Standard Deviation			*10*	*0.04*	*5.24E-03*	*0*	*--*	*--*	*--*	*--*	*--*	*--*

Note: Aquifer thickness (b) assumed to be 273 feet for Area 1 and 270 feet for Area 2.

T = Transmissivity (ft^2/day)
K = Hydraulic conductivity of the aquifer or fractures (ft/day)
K' = Hydraulic conductivity of matrix (ft/day)
K_z/K_r = Hydraulic conductivity anisotropy ratio, where K_z is the vertical hydraulic conductivity and K_r is the radial/horizontal hydraulic conductivity (dimensionless)
S = Storativity (dimensionless)
S_s = Fracture specific storage (ft^{-1})
S_s' = Matrix specific storage (ft^{-1})
S_y = Specific yield (dimensionless)
S_w = Wellbore skin factor (dimensionless)
S_f = Fracture skin factor (dimensionless)

TABLE 8
SUMMARIZED RESULTS OF LABORATORY ANALYSIS
GROUNDWATER SAMPLES COLLECTED FROM PUMPING WELLS PW-1 AND PW-2

Carolina Sunrock
Caswell County Property
Prospect Hill, North Carolina

Well I.D.: **Sample Date:**	**PW-1** **5/8/19**	**PW-1** **12/23/19**	**PW-2** **5/3/19**	**PW-2** **12/23/19**	**S.W.** **Std. (2)**
EPA Method 200.7 (µg/L) (1)					
Aluminum	<200	847	<200	685	NS
Barium	14.9	11.5	11.5	24.5	1,000 (3)
Calcium	35,100	10,800	45,800	31,500	NS
Iron	<100	1,780	<100	1,210	NS
Magnesium	8,640	7,330	16,100	15,200	NS
Manganese	134	36.5	317	91.1	50 (3)(4)
Potassium	2,580 B	2,980	2,660	4,910	NS
Sodium	16,200	15,500	13,500	16,400	NS
Sulfur	7,000	6,960	4,090	7,480	NS
EPA Method 245.1 (µg/L)					
Mercury	<0.200	<0.200	**0.461 B**	<0.200	0.012 (5)

1) Method compounds detected in one or more samples are listed.
2) NC surface water standard per 15A NCAC 2B or U.S. EPA National Recommended Water Quality Criteria (NRWQC).
3) Human health criteria.
4) Per NC surface water standards table - *"EPA approved removal of NC human health standards* [for manganese] *as part of 2007-2016 Triennial review due to high natural occurrence in NC surface waters. The EPA NRWQC remains here as guidance for instances when toxicity information is needed."*
5) Freshwater aquatic life criteria.
NS = No surface water standard exists.
B = The same analyte was detected in the associated laboratory blank.
Concentrations listed in bold type are above surface NC water standard or U.S. EPA National Criteria.

TABLE 9
SUMMARY OF WATER-SUPPLY WELLS LOCATED WITHIN 0.5-MILES

Carolina Sunrock
Caswell County Property
Prospect Hill, North Carolina

Location I.D. Number (1)	Approximate Distance and Direction (2)	Property Address			Property Use/Type	Current Property Owner(s)	Confirmed WSW Based on County Records? (3)	Reported Depth, Static Water Level, and Yield of WSW (4)		
		Street	City	County				Depth	Static Water Level	Yield
1	20 feet / W	Wrenn Rd. (5)	Prospect Hill	Caswell	Agricultural	ETREE LLC	Yes	N/A	N/A	N/A
2	0 feet / SW	1238 Wrenn Rd.	Prospect Hill	Caswell	Agricultural (6)	ETREE LLC	Yes	N/A	N/A	N/A
3	2,350 feet / NW	523 Russell Loop Rd.	Prospect Hill	Caswell	Residential	Janice R Bullock	Yes	N/A	N/A	N/A
4	2,100 feet / NW	719 Russell Loop Rd.	Prospect Hill	Caswell	Residential/Agricultural	Joe Billy Oakes	Yes	340 feet	24 feet	10 gpm
5	2,200 feet / N	1063 Russell Loop Rd.	Prospect Hill	Caswell	Residential/Agricultural	Big Acorn Farm LLC	Yes	N/A	N/A	N/A
6	2,350 feet / N	1102 Russell Loop Rd.	Prospect Hill	Caswell	Residential	Christopher B Langley & Jerri N Thompson	Yes	160 feet	25 feet	15 gpm
7	1,950 feet / NW	523 Russell Loop Rd.	Prospect Hill	Caswell	Residential	Harvey B Wade Jr.	Yes	N/A	N/A	N/A
8	1,800 feet / NW	595 Russell Loop Rd.	Prospect Hill	Caswell	Residential	Dennis Murray & Lessie Dishman	Yes	N/A	N/A	N/A
9	950 feet / NW	115 Beaver Falls Dr	Prospect Hill	Caswell	Residential	Gene M & Sylvia C Herbert	Yes	157 feet	14 feet	15 gpm
10	650 feet / NW	206 Beaver Falls Dr.	Prospect Hill	Caswell	Residential	Sara Christine Cook	Yes	145 feet	21 feet	7-8 gpm
11	1,000 feet / NW	258 Beaver Falls Dr.	Prospect Hill	Caswell	Residential/Agricultural	Lora Worsham	Yes	105 feet	16 feet	30 gpm
12	1,350 feet / N	802 Russell Loop Rd.	Prospect Hill	Caswell	Residential	Dale R Kemper (trustee)	Yes	N/A	N/A	N/A
13	1,550 feet / N	915 Russell Loop Rd.	Prospect Hill	Caswell	Residential	Dorothy W Dix & Richard E Wilborne	Yes	N/A	N/A	N/A
14	450 feet / N	28 Henry Daniels Rd.	Prospect Hill	Caswell	Residential/Agricultural	Dale R Kemper (trustee)	Yes	165 feet	22 feet	9 gpm
15	8,500 feet / N	200 Henry Daniels Rd.	Prospect Hill	Caswell	Residential/Agricultural	Karen Oestreicher, et al.	Yes	186 feet	35 feet	8 gpm
16	1,600 feet / N	152 Henry Daniels Rd.	Prospect Hill	Caswell	Residential	Oscar & Teresa Gammon III	Yes	N/A	N/A	N/A
17	1,300 feet / NE	Henry Daniels Rd. (5)	Prospect Hill	Caswell	Residential	Tom & Donna Nicholais	Yes	N/A	N/A	N/A
18a	1,550 feet / W	1262 Tom Bowes Rd.	Hurdle Mills	Person	Residential	Amy C McCauley	Yes	142 feet	6 feet	8 gpm
18b								562 feet	29 feet	0.5 gpm
19	750 feet / W	Goose Creek Rd. (5)	Prospect Hill	Caswell	Residential	Georgia T Lewis & Jeffrey G Gravitte	Yes	N/A	N/A	N/A
20	650 feet / W	971 Goose Creek Rd.	Prospect Hill	Caswell	Residential	William N & Donna H Brown	Yes	N/A	N/A	N/A
21	750 feet / W	950 Goose Creek Rd.	Prospect Hill	Caswell	Residential/Agricultural	Parker Pruitt & Rita Hudgins	Yes	N/A	N/A	N/A
22	1,750 feet / W	Tom Bowes Rd. (5)	Hurdle Mills	Person	Residential	Joanne Howerton	Yes	N/A	N/A	N/A
23	2,000 feet / W	Tom Bowes Rd. (5)	Hurdle Mills	Person	Residential	Joanne Howerton	Yes	N/A	N/A	N/A
24	2,100 feet / W	Tom Bowes Rd. (5)	Hurdle Mills	Person	Residential	Ralph B Warren	Yes	N/A	N/A	N/A
25	700 feet / S	2101 Wrenn Rd.	Prospect Hill	Caswell	Residential	Nathaniel C & Jesse D Talley	Yes	180 feet	39 feet	40 gpm
26	1,800 feet / S	2592 Wrenn Rd.	Prospect Hill	Caswell	Residential/Agricultural	Christopher & Julie Woerdeman	Yes	160 feet	30 feet	8 gpm
27	2,500 feet / SW	1275 Carver Rd.	Prospect Hill	Caswell	Residential	John W & Pamela H Carver	Yes	400 feet	30 feet	15 gpm
28	2,500 feet / SW	1209 Carver Rd.	Prospect Hill	Caswell	Residential	Christopher M & Carrie Andrews	Yes	145 feet	Not listed	20 gpm
29	1,850 feet / SW	989 Carver Rd.	Prospect Hill	Caswell	Residential/Agricultural	John T Jr & Patricia M Carver	Yes	N/A	N/A	N/A
30	2,600 feet / SW	981 Carver Rd.	Prospect Hill	Caswell	Residential	Jonathon B Carver	Yes	200 feet	23 feet	43 gpm

(1) Refer to Figure 9 ("Locations of Water-Supply Wells") for I.D. numbers.
(2) Minimum distance from estimated extent of hydraulic influence due to dewatering of proposed quarry pits (based on pit depths of 150 feet).
(3) WSW confirmed based on Caswell County or Person County Health Department and/or tax card records.
(4) Based on well construction records and/or permits filed with County. Well depths and static water levels referenced in feet below grade.
(5) No specific street numbers listed for property in County GIS record or tax card. Refer to Figure 9 for actual location.
(6) Property also contains a vacant/abandoned residential structure.
Note: Property owner, use/type, and address information obtained from Caswell County and Person County GIS websites.
WSW = Water-supply well
N/A = Well construction record not available in County records.
gpm = Gallons per minute

APPENDIX C

BORING LOGS

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.			SHEET: 1 OF 7
BORING/WELL I.D.:	OW1-1	CLIENT:	Carolina Sunrock
DATE(S) DRILLED:	3/28/2019 - 3/29/2019	PROJECT NAME:	Caswell County Hydro Study
LOGGED BY:	J. Murphrey	PROJECT NO.:	1925
DRILL METHOD:	Truck-mounted Drilltech T25KW	PROJECT LOCATION:	Wrenn Road, Prospect Hill, NC
SAMPLING METHOD/INTERVAL:	Logged from cuttings.	DRILLING CONTR.:	Carolina-Virginia Well Co.
BORING DIAMETER:	8" (air hammer bit) from 0'-33' bgs; 5.5" (air hammer bit) from 33'-300' bgs.		
REMARKS:	Area 1 observation well.		

WELL CONSTRUCTION INFORMATION

OUTER CASING SIZE/MATERIAL:	6.125" I.D. Sch. 40 PVC	OUTER CASING INTERVAL:	2.5' ags to 33' bgs
INNER CASING SIZE/MATERIAL:	N/A	INNER CASING INTERVAL:	N/A
SCREEN SIZE/MATERIAL:	N/A; open hole in bedrock	SCREEN INTERVAL:	33' bgs to 300' bgs
SAND PACK SIZE/MATERIAL:	N/A	SAND PACK INTERVAL:	N/A
GROUT TYPE:	Portland Cement	BENTONITE SEAL INTERVAL:	N/A
DEVELOPMENT METHOD/TIME:	Flushed out with rig's air tooling	GROUT INTERVAL:	0' bgs to 33' bgs
REMARKS:	Open hole in bedrock from 33' to 300' bgs. Completed as a stickup well (~2.5' of stickup).		

DESCRIPTIVE LOG

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-0-	0' - 9': Light brown to VF-C grained sand, some silt, dry.
				-5-	
				-10-	9' -22': Brown silt , some VF grained sand, mosit, possibly highly weathered diabase.
				-15-	
				-20-	
					22' - 26': SAA
				-25-	
					26' -35': SAA, color change from light brown to brown, silt, trace-little sand and gravel, moist, slightly weathered.
				-30-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 2 OF 7
BORING/WELL I.D.: OW1-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/28/2019 - 3/29/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-30-	
				-	
				-	
				-	Set 6.125" PVC casing to 33' bgs.
				-	
				-35-	35' - 42': Rock cuttings very light brown to white (diorite),
				-	unweathered.
				-	
				-	
				-	
				-40-	
				-	
				-	42' - 50': SAA
				-	
				-	
				-45-	
				-	
				-	
				-	
				-	
				-50-	50' - 62': SAA, vuttings dark gray to dark brown, wet.
				-	
				-	
				-	
				-	
				-55-	
				-	
				-	
				-	
				-	
				-60-	
				-	
				-	62' - 82': SAA
				-	
				-	
				-65-	
				-	
				-	
				-	
				-	
				-70-	
				-	
				-	
				-	
				-	
				-75-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 3 OF 7
BORING/WELL I.D.: OW1-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/28/2019 - 3/29/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-75-	
				-	
				-	
				-	
				-	
				-80-	
				-	
				-	82' - 102': SAA
				-	
				-	
				-85-	
				-	
				-	
				-	
				-	
				-90-	
				-	
				-	
				-	
				-	
				-95-	
				-	
				-	
				-	
				-	
				-100-	
				-	
				-	102' - 122': SAA
				-	
				-	
				-105-	
				-	
				-	
				-	
				-	
				-110-	
				-	
				-	
				-	
				-	
				-115-	
				-	
				-	
				-	
				-	
				-120-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 4 OF 7
BORING/WELL I.D.: OW1-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/28/2019 - 3/29/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-120-	
				-	
				-	122' - 142': SAA
				-	
				-	
				-125-	
				-	
				-	
				-	
				-	
				-130-	
				-	
				-	
				-	
				-	
				-135-	
				-	
				-	
				-	
				-	
				-140-	
				-	
				-	142' - 162': SAA, cuttings still dark gray.
				-	
				-	
				-145-	
				-	
				-	
				-	
				-	
				-150-	
				-	
				-	
				-	
				-	
				-155-	
				-	
				-	
				-	
				-	
				-160-	
				-	
				-	162' - 182': SAA
				-	
				-	
				-165-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 5 OF 7
BORING/WELL I.D.: OW1-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/28/2019 - 3/29/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-170-	
				-	
				-	
				-	
				-	
				-175-	
				-	
				-	
				-	
				-	
				-180-	
				-	
				-	182' - 202': SAA
				-	
				-	
				-185-	
				-	
				-	
				-	
				-	
				-190-	
				-	
				-	
				-	
				-	
				-195-	
				-	
				-	
				-	
				-	
				-200-	
				-	
				-	202' - 222': SAA
				-	
				-	
				-205-	
				-	
				-	
				-	
				-	
				-210-	
				-	
				-	
				-	
				-	
				-215-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 6 OF 7
BORING/WELL I.D.: OW1-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/28/2019 - 3/29/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-220-	
				-	
				-	222' - 242': SAA
				-	
				-	
				-225-	
				-	
				-	
				-	
				-	
				-230-	
				-	
				-	
				-	
				-	
				-235-	
				-	
				-	
				-	
				-	
				-240-	
				-	
				-	242' - 262': SAA
				-	
				-	
				-245-	
				-	
				-	
				-	
				-	
				-250-	
				-	
				-	
				-	
				-	
				-255-	
				-	
				-	
				-	
				-	
				-260-	
				-	
				-	262' - 282': SAA
				-	
				-	
				-265-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.

BORING/WELL I.D.: OW1-1 | CLIENT/PROJECT: Carolina Sunrock | DATE(S) DRILLED: 3/28/2019 - 3/29/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-270-	
				-275-	
				-280-	
				-	282' - 300': SAA
				-285-	
				-290-	
				-295-	
				-300-	End boring at 300' bgs.
				-305-	
				-310-	
				-315-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.			SHEET: 1 OF 7
BORING/WELL I.D.:	OW1-2	CLIENT:	Carolina Sunrock
DATE(S) DRILLED:	4/2/2019 - 4/3/2019	PROJECT NAME:	Caswell County Hydro Study
LOGGED BY:	J. Murphrey	PROJECT NO.:	1925
DRILL METHOD:	Truck-mounted Drilltech T25KW	PROJECT LOCATION:	Wrenn Road, Prospect Hill, NC
SAMPLING METHOD/INTERVAL:	Logged from cuttings.	DRILLING CONTR.:	Carolina-Virginia Well Co.
BORING DIAMETER:	8" (air hammer bit) from 0'-47' bgs; 5.5" (air hammer bit) from 47'-300' bgs.		
REMARKS:	Area 1 observation well.		

WELL CONSTRUCTION INFORMATION

OUTER CASING SIZE/MATERIAL:	6.125" I.D. Sch. 40 PVC	OUTER CASING INTERVAL:	2.5' ags to 47' bgs
INNER CASING SIZE/MATERIAL:	N/A	INNER CASING INTERVAL:	N/A
SCREEN SIZE/MATERIAL:	N/A; open hole in bedrock	SCREEN INTERVAL:	47' bgs to 300' bgs
SAND PACK SIZE/MATERIAL:	N/A	SAND PACK INTERVAL:	N/A
GROUT TYPE:	Portland Cement	BENTONITE SEAL INTERVAL:	N/A
DEVELOPMENT METHOD/TIME:	Flushed out with rig's air tooling	GROUT INTERVAL:	0' bgs to 47' bgs
REMARKS:	Open hole in bedrock from 47' to 300' bgs. Completed as a stickup well (~2.5' of stickup).		

DESCRIPTIVE LOG

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-0-	0' - 22': Light brown VF-C grained sand, some silt, trace quartz gravel, dry.
				-5-	
				-10-	
				-15-	
				-20-	
				-25-	22' - 52': SAA, moist, wet at 30-35 feet, getting into highly weathered rock at 30'. Softer zone 30-37 feet. More solid rock 37-42 feet. Cuttings dark brown at 40' (diabase).
				-30-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 2 OF 7
BORING/WELL I.D.: OW1-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/2/2019 - 4/3/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-30-	
				-	
				-	
				-	
				-	
				-35-	
				-	
				-	
				-	
				-	
				-40-	
				-	
				-	
				-	
				-	
				-45-	
				-	
				-	Set 6.125" PVC casing to 47' bgs.
				-	
				-	
				-50-	
				-	
				-	52' - 62': SAA (diabase), dry, no significant water-bearing fractures.
				-	
				-	
				-55-	
				-	
				-	
				-	
				-	
				-60-	
				-	
				-	62' - 82': SAA, cuttings now light gray, likely still diabase, moist.
				-	
				-	
				-65-	
				-	
				-	
				-	
				-	
				-70-	
				-	
				-	
				-	
				-	
				-75-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 3 OF 7
BORING/WELL I.D.: OW1-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/2/2019 - 4/3/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-75-	
				-	
				-	
				-	
				-	
				-80-	
				-	
				-	82' - 102': SAA
				-	
				-	
				-85-	
				-	
				-	
				-	
				-	
				-90-	
				-	
				-	
				-	
				-	
				-95-	
				-	
				-	
				-	
				-	
				-100-	
				-	
				-	102' -122': SAA
				-	
				-	
				-105-	
				-	
				-	
				-	
				-	
				-110-	
				-	
				-	
				-	
				-	
				-115-	
				-	
				-	
				-	
				-	
				-120-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 4 OF 7
BORING/WELL I.D.: OW1-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/2/2019 - 4/3/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-120-	
				-	
				-	122' - 142': SAA, possible fracture(s) around 125'-130'.
				-	
				-	
				-125-	
				-	
				-	
				-	
				-	
				-130-	
				-	
				-	
				-	
				-	
				-135-	
				-	
				-	
				-	
				-	
				-140-	
				-	
				-	142' - 162': SAA
				-	
				-	
				-145-	
				-	
				-	
				-	
				-	
				-150-	
				-	
				-	
				-	
				-	
				-155-	
				-	
				-	
				-	
				-	
				-160-	
				-	
				-	162' - 182': SAA
				-	
				-	
				-165-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 5 OF 7
BORING/WELL I.D.: OW1-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/2/2019 - 4/3/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-170-	
				-	
				-	
				-	
				-	
				-175-	
				-	
				-	
				-	
				-	
				-180-	
				-	
				-	182' - 202': SAA
				-	
				-	
				-185-	
				-	
				-	
				-	
				-	
				-190-	
				-	
				-	
				-	
				-	
				-195-	
				-	
				-	
				-	
				-	
				-200-	
				-	
				-	202' - 222': SAA
				-	
				-	
				-205-	
				-	
				-	
				-	
				-	
				-210-	
				-	
				-	
				-	
				-	
				-215-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 6 OF 7
BORING/WELL I.D.: OW1-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/2/2019 - 4/3/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-220-	
				-	
				-	222' - 242': SAA
				-	
				-	
				-225-	
				-	
				-	
				-	
				-	
				-230-	
				-	
				-	
				-	
				-	
				-235-	
				-	
				-	
				-	
				-	
				-240-	
				-	
				-	242' - 262': SAA
				-	
				-	
				-245-	
				-	
				-	
				-	
				-	
				-250-	
				-	
				-	
				-	
				-	
				-255-	
				-	
				-	
				-	
				-	
				-260-	
				-	
				-	262' - 282': SAA
				-	
				-	
				-265-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.

BORING/WELL I.D.: OW1-2 | CLIENT/PROJECT: Carolina Sunrock | DATE(S) DRILLED: 4/2/2019 - 4/3/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-270-	
				-275-	
				-280-	
				-	282' - 300': SAA
				-285-	
				-290-	
				-295-	
				-300-	End boring at 300' bgs.
				-305-	
				-310-	
				-315-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 1 OF 7	
BORING/WELL I.D.:	OW1-3	CLIENT:	Carolina Sunrock
DATE(S) DRILLED:	4/4/2019	PROJECT NAME:	Caswell County Hydro Study
LOGGED BY:	J. Murphrey	PROJECT NO.:	1925
DRILL METHOD:	Truck-mounted Drilltech T25KW	PROJECT LOCATION:	Wrenn Road, Prospect Hill, NC
SAMPLING METHOD/INTERVAL:	Logged from cuttings.	DRILLING CONTR.:	Carolina-Virginia Well Co.
BORING DIAMETER:	8" (air hammer bit) from 0'-52' bgs; 5.5" (air hammer bit) from 52'-300' bgs.		
REMARKS:	Area 1 observation well.		

WELL CONSTRUCTION INFORMATION

OUTER CASING SIZE/MATERIAL:	6.125" I.D. Sch. 40 PVC	OUTER CASING INTERVAL:	2' ags to 52' bgs
INNER CASING SIZE/MATERIAL:	N/A	INNER CASING INTERVAL:	N/A
SCREEN SIZE/MATERIAL:	N/A; open hole in bedrock	SCREEN INTERVAL:	52' bgs to 300' bgs
SAND PACK SIZE/MATERIAL:	N/A	SAND PACK INTERVAL:	N/A
GROUT TYPE:	Portland Cement	BENTONITE SEAL INTERVAL:	N/A
DEVELOPMENT METHOD/TIME:	Flushed out with rig's air tooling	GROUT INTERVAL:	0' bgs to 52' bgs
REMARKS:	Open hole in bedrock from 52' to 300' bgs. Completed as a stickup well (~2' of stickup).		

DESCRIPTIVE LOG

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-0-	0' - 17': Light brown VF-C grained sand, some silt, dry.
				-5-	
				-10-	
				-15-	
					17 ' - 22': Light brown VF-C drained sand, trace quartz gravel.
				-20-	
					22' - 34': SAA, moist to wet (wet 30-33 feet), highly weathered rock with depth.
				-25-	
				-30-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 2 OF 7
BORING/WELL I.D.: OW1-3	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/4/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-30-	
				-	
				-	
				-	
				-	34' - 42': Weathered rock, increasing hardness with depth, fairly
				-35-	solid around 37', wet, brown to dark brown cuttings.
				-	
				-	
				-	
				-	
				-40-	
				-	
				-	42' - 52': Rock (unweathered).
				-	
				-	
				-45-	
				-	
				-	
				-	
				-	
				-50-	
				-	
				-	Set 6.125" PVC casing to 52' bgs.
				-	52' - 62': SAA
				-	
				-55-	
				-	
				-	
				-	
				-	
				-60-	
				-	
				-	62' - 82': SAA, moist-wet (possible fractures).
				-	
				-	
				-65-	
				-	
				-	
				-	
				-	
				-70-	
				-	
				-	
				-	
				-	
				-75-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.

SHEET: 3 OF 7

BORING/WELL I.D.: OW1-3 | CLIENT/PROJECT: Carolina Sunrock | DATE(S) DRILLED: 4/4/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-75-	
				-	
				-	
				-	
				-	
				-80-	
				-	
				-	82' - 102': SAA
				-	
				-	
				-85-	
				-	
				-	
				-	
				-	
				-90-	
				-	
				-	
				-	
				-	
				-95-	
				-	
				-	
				-	
				-	
				-100-	
				-	
				-	102' - 122': SAA
				-	
				-	
				-105-	
				-	
				-	
				-	
				-	
				-110-	
				-	
				-	
				-	
				-	
				-115-	
				-	
				-	
				-	
				-	
				-120-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 4 OF 7
BORING/WELL I.D.: OW1-3	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/4/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-120-	
				-	
				-	122' - 142': SAA
				-	
				-	
				-125-	
				-	
				-	
				-	
				-	
				-130-	
				-	
				-	
				-	
				-	
				-135-	
				-	
				-	
				-	
				-	
				-140-	
				-	
				-	142' - 162': SAA
				-	
				-	
				-145-	
				-	
				-	
				-	
				-	
				-150-	
				-	
				-	
				-	
				-	
				-155-	
				-	
				-	
				-	
				-	
				-160-	
				-	
				-	162' - 182': SAA, no significant water-bearing fractures encountered yet
				-	
				-	
				-165-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 5 OF 7
BORING/WELL I.D.: OW1-3	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/4/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-170-	
				-	
				-	
				-	
				-	
				-175-	
				-	
				-	
				-	
				-	
				-180-	
				-	
				-	182' - 202': SAA
				-	
				-	
				-185-	
				-	
				-	
				-	
				-	
				-190-	
				-	
				-	
				-	
				-	
				-195-	
				-	
				-	
				-	
				-	
				-200-	
				-	
				-	202' - 222': SAA
				-	
				-	
				-205-	
				-	
				-	
				-	
				-	
				-210-	
				-	
				-	
				-	
				-	
				-215-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 6 OF 7
BORING/WELL I.D.: OW1-3	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/4/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-220-	
				-	
				-	222' - 242': SAA
				-	
				-	
				-225-	
				-	
				-	
				-	
				-	
				-230-	
				-	
				-	
				-	
				-	
				-235-	
				-	
				-	
				-	
				-	
				-240-	
				-	
				-	242' - 262': SAA
				-	
				-	
				-245-	
				-	
				-	
				-	
				-	
				-250-	
				-	
				-	
				-	
				-	
				-255-	
				-	
				-	
				-	
				-	
				-260-	
				-	
				-	262' - 282': SAA
				-	
				-	
				-265-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.

SHEET: 7 OF 7

BORING/WELL I.D.: OW1-3 | CLIENT/PROJECT: Carolina Sunrock | DATE(S) DRILLED: 4/4/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-270-	
				-275-	
				-280-	
					282' - 300': SAA
				-285-	
				-290-	
				-295-	
				-300-	End boring at 300' bgs.
				-305-	
				-310-	
				-315-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.			SHEET: 1 OF 7
BORING/WELL I.D.:	OW2-1	CLIENT:	Carolina Sunrock
DATE(S) DRILLED:	3/18/2019 - 3/19/2019	PROJECT NAME:	Caswell County Hydro Study
LOGGED BY:	J. Murphrey	PROJECT NO.:	1925
DRILL METHOD:	Truck-mounted Drilltech T25KW	PROJECT LOCATION:	Wrenn Road, Prospect Hill, NC
SAMPLING METHOD/INTERVAL:	Logged from cuttings.	DRILLING CONTR.:	Carolina-Virginia Well Co.
BORING DIAMETER:	8" (air hammer bit) from 0'-49' bgs; 5.5" (air hammer bit) from 49'-300' bgs.		
REMARKS:	Area 2 observation well.		

WELL CONSTRUCTION INFORMATION

OUTER CASING SIZE/MATERIAL:	6.125" I.D. Sch. 40 PVC	OUTER CASING INTERVAL:	2' ags to 49' bgs
INNER CASING SIZE/MATERIAL:	N/A	INNER CASING INTERVAL:	N/A
SCREEN SIZE/MATERIAL:	N/A; open hole in bedrock	SCREEN INTERVAL:	49' bgs to 300' bgs
SAND PACK SIZE/MATERIAL:	N/A	SAND PACK INTERVAL:	N/A
GROUT TYPE:	Portland Cement	BENTONITE SEAL INTERVAL:	N/A
DEVELOPMENT METHOD/TIME:	Flushed out with rig's air tooling	GROUT INTERVAL:	0' bgs to 49' bgs
REMARKS:	Open hole in bedrock from 49' to 300' bgs. Completed as a stickup well (~2' of stickup).		

DESCRIPTIVE LOG

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-0-	0' - 8': Light brown silt and VF-F grained sand.
				-5-	
				-10-	8' - 22': SAA, with highly weathered rock.
				-15-	
				-20-	
				-25-	22' - 26': SAA, very soft zone, moist.
				-30-	26' - 42': SAA, somewhat harder.

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 2 OF 7
BORING/WELL I.D.: OW2-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/18/2019 - 3/19/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-30-	
				-	
				-	
				-	
				-	
				-35-	35': SAA, wet.
				-	
				-	
				-	
				-	
				-40-	
				-	
				-	42' - 50': SAA, wet, increasing hardness with depth.
				-	
				-	
				-45-	
				-	
				-	
				-	
				-	Set 6.125" PVC casing to 49' bgs.
				-50-	50' - 62': SAA, color change to brown / dark brown. Very hard rock (diabase).
				-	
				-	
				-	
				-	
				-55-	
				-	
				-	
				-	
				-	
				-60-	
				-	
				-	62' - 82': SAA, very hard rock, possible fractures (cuttings moist-wet).
				-	
				-	
				-65-	
				-	
				-	
				-	
				-	
				-70-	
				-	
				-	
				-	
				-	
				-75-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 3 OF 7
BORING/WELL I.D.: OW2-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/18/2019 - 3/19/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-75-	
				-	
				-	
				-	
				-	
				-80-	
				-	
				-	
				-	
				-	
				-85-	
				-	
				-	
				-	
				-	
				-90-	
				-	
				-	
				-	
				-	
				-95-	
				-	
				-	
				-	
				-	
				-100-	
				-	
				-	102' - 114': SAA, diabase, wet.
				-	
				-	
				-105-	
				-	
				-	
				-	
				-	
				-110-	
				-	
				-	
				-	
				-	114' - 122': SAA with apparent water-bearing fracture.
				-115-	
				-	
				-	
				-	
				-	
				-120-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 4 OF 7
BORING/WELL I.D.: OW2-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/18/2019 - 3/19/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-120-	
				-	
				-	122' - 142': SAA
				-	
				-	
				-125-	
				-	
				-	
				-	
				-	
				-130-	
				-	
				-	
				-	
				-	
				-135-	
				-	
				-	
				-	
				-	
				-140-	
				-	
				-	142' - 162': SAA
				-	
				-	
				-145-	
				-	
				-	
				-	
				-	
				-150-	
				-	
				-	
				-	
				-	
				-155-	
				-	
				-	
				-	
				-	
				-160-	
				-	
				-	162' - 182': SAA
				-	
				-	
				-165-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 5 OF 7
BORING/WELL I.D.: OW2-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/18/2019 - 3/19/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-170-	
				-	
				-	
				-	
				-	
				-175-	
				-	
				-	
				-	
				-	
				-180-	
				-	
				-	182' - 202': SAA, with water-bearing fracture around 190' to 195'.
				-	
				-	
				-185-	
				-	
				-	
				-	
				-	
				-190-	
				-	
				-	
				-	
				-	
				-195-	
				-	
				-	
				-	
				-	
				-200-	
				-	
				-	202' - 222': SAA
				-	
				-	
				-205-	
				-	
				-	
				-	
				-	
				-210-	
				-	
				-	
				-	
				-	
				-215-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 6 OF 7
BORING/WELL I.D.: OW2-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/18/2019 - 3/19/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-220-	
				-	
				-	222' - 242': SAA, possioble weathered zone around 230' to 231'.
				-	
				-	
				-225-	
				-	
				-	
				-	
				-	
				-230-	
				-	
				-	
				-	
				-	
				-235-	
				-	
				-	
				-	
				-	
				-240-	
				-	
				-	242' - 262': SAA
				-	
				-	
				-245-	
				-	
				-	
				-	
				-	
				-250-	
				-	
				-	
				-	
				-	
				-255-	
				-	
				-	
				-	
				-	
				-260-	
				-	
				-	262' 282': SAA
				-	
				-	
				-265-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 7 OF 7
BORING/WELL I.D.: OW2-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/18/2019 - 3/19/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-270-	
				-275-	
				-280-	
				-	282' - 300': SAA
				-285-	
				-290-	
				-295-	
				-300-	End boring at 300' bgs.
				-305-	
				-310-	
				-315-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 1 OF 7	
BORING/WELL I.D.:	OW2-2	CLIENT:	Carolina Sunrock
DATE(S) DRILLED:	3/19/2019 - 3/20/2019	PROJECT NAME:	Caswell County Hydro Study
LOGGED BY:	J. Murphrey	PROJECT NO.:	1925
DRILL METHOD:	Truck-mounted Drilltech T25KW	PROJECT LOCATION:	Wrenn Road, Prospect Hill, NC
SAMPLING METHOD/INTERVAL:	Logged from cuttings.	DRILLING CONTR.:	Carolina-Virginia Well Co.
BORING DIAMETER:	8" (air hammer bit) from 0'-36' bgs; 5.5" (air hammer bit) from 36'-300' bgs.		
REMARKS:	Area 2 observation well.		

WELL CONSTRUCTION INFORMATION

OUTER CASING SIZE/MATERIAL:	6.125" I.D. Sch. 40 PVC	OUTER CASING INTERVAL:	2' ags to 36' bgs
INNER CASING SIZE/MATERIAL:	N/A	INNER CASING INTERVAL:	N/A
SCREEN SIZE/MATERIAL:	N/A; open hole in bedrock	SCREEN INTERVAL:	36' bgs to 300' bgs
SAND PACK SIZE/MATERIAL:	N/A	SAND PACK INTERVAL:	N/A
GROUT TYPE:	Portland Cement	BENTONITE SEAL INTERVAL:	N/A
DEVELOPMENT METHOD/TIME:	Flushed out with rig's air tooling	GROUT INTERVAL:	0' bgs to 36' bgs
REMARKS:	Open hole in bedrock from 36' to 300' bgs. Completed as a stickup well (~2' of stickup).		

DESCRIPTIVE LOG

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-0-	0' - 10': Light brown VF-F grained sand, some silt.
				-5-	
				-10-	10' - 22': Light brown VF-C grained sand, some silt, getting into highly weathered rock (still unconsolidated).
				-15-	
				-20-	
					22' - 30': SAA, increasing hardness, some gravel.
				-25-	
				-30-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 2 OF 7
BORING/WELL I.D.: OW2-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/19/2019 - 3/20/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-30-	30' - 40': SAA, getting harder with depth (drill bit chattering), unweathered rock.
				-35-	
					Set 6.125" PVC casing to 36' bgs.
				-40-	40' - 42': SAA, color change from light brown to light grey (diorite), wet.
					42' - 50: SAA
				-45-	
				-50-	50' - 52: SAA
					52' - 62': Color change back to brown / dark brown, rock much harder (diabase).
				-55-	
				-60-	
					62' - 82': SAA
				-65-	
				-70-	
				-75-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 3 OF 7
BORING/WELL I.D.: OW2-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/19/2019 - 3/20/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-75-	
				-	
				-	
				-	
				-	
				-80-	
				-	
				-	82' - 102': SAA, cuttings coming up wet but no significant
				-	water-bearing fracture encountered yet (smaller fractures).
				-	
				-85-	
				-	
				-	
				-	
				-	
				-90-	
				-	
				-	
				-	
				-	
				-95-	
				-	
				-	
				-	
				-	
				-100-	
				-	
				-	102' - 122': SAA
				-	
				-	
				-105-	
				-	
				-	
				-	
				-	
				-110-	
				-	
				-	
				-	
				-	
				-115-	
				-	
				-	
				-	
				-	
				-120-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 4 OF 7
BORING/WELL I.D.: OW2-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/19/2019 - 3/20/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-120-	
				-	
				-	122' - 142': SAA, cuttings moist-wet.
				-	
				-	
				-125-	
				-	
				-	
				-	
				-	
				-130-	
				-	
				-	
				-	
				-	
				-135-	
				-	
				-	
				-	
				-	
				-140-	
				-	
				-	142' - 162': SAA
				-	
				-	
				-145-	
				-	
				-	
				-	
				-	
				-150-	
				-	
				-	
				-	
				-	
				-155-	
				-	
				-	
				-	
				-	
				-160-	
				-	
				-	162' - 182': SAA
				-	
				-	
				-165-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 5 OF 7
BORING/WELL I.D.: OW2-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/19/2019 - 3/20/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-170-	
				-	
				-	
				-	
				-	
				-175-	
				-	
				-	
				-	
				-	
				-180-	
				-	
				-	182' - 202': SAA
				-	
				-	
				-185-	
				-	
				-	
				-	
				-	
				-190-	
				-	
				-	
				-	
				-	
				-195-	
				-	
				-	
				-	
				-	
				-200-	
				-	
				-	202' - 222': SAA, with small water-bearing fracture within this interval.
				-	
				-	
				-205-	
				-	
				-	
				-	
				-	
				-210-	
				-	
				-	
				-	
				-	
				-215-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 6 OF 7
BORING/WELL I.D.: OW2-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/19/2019 - 3/20/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-220-	
				-	
				-	222' - 242': SAA
				-	
				-	
				-225-	
				-	
				-	
				-	
				-	
				-230-	
				-	
				-	
				-	
				-	
				-235-	
				-	
				-	
				-	
				-	
				-240-	
				-	
				-	242' - 262': SAA
				-	
				-	
				-245-	
				-	
				-	
				-	
				-	
				-250-	
				-	
				-	
				-	
				-	
				-255-	
				-	
				-	
				-	
				-	
				-260-	
				-	
				-	262' - 282': SAA
				-	
				-	
				-265-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.

SHEET: 7 OF 7

BORING/WELL I.D.: OW2-2 | CLIENT/PROJECT: Carolina Sunrock | DATE(S) DRILLED: 3/19/2019 - 3/20/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-270-	
				-275-	
				-280-	
					282' - 300': SAA
				-285-	
				-290-	
				-295-	
				-300-	End boring at 300' bgs.
				-305-	
				-310-	
				-315-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.			SHEET: 1 OF 7
BORING/WELL I.D.:	OW2-3	CLIENT:	Carolina Sunrock
DATE(S) DRILLED:	3/22/2019 & 3/26/2019	PROJECT NAME:	Caswell County Hydro Study
LOGGED BY:	J. Murphrey	PROJECT NO.:	1925
DRILL METHOD:	Truck-mounted Drilltech T25KW	PROJECT LOCATION:	Wrenn Road, Prospect Hill, NC
SAMPLING METHOD/INTERVAL:	Logged from cuttings.	DRILLING CONTR.:	Carolina-Virginia Well Co.
BORING DIAMETER:	8" (air hammer bit) from 0'-69' bgs; 5.5" (air hammer bit) from 69'-300' bgs.		
REMARKS:	Area 2 observation well.		

WELL CONSTRUCTION INFORMATION

OUTER CASING SIZE/MATERIAL:	6.125" I.D. Sch. 40 PVC	OUTER CASING INTERVAL:	1.5' ags to 69' bgs
INNER CASING SIZE/MATERIAL:	N/A	INNER CASING INTERVAL:	N/A
SCREEN SIZE/MATERIAL:	N/A; open hole in bedrock	SCREEN INTERVAL:	69' bgs to 300' bgs
SAND PACK SIZE/MATERIAL:	N/A	SAND PACK INTERVAL:	N/A
GROUT TYPE:	Portland Cement	BENTONITE SEAL INTERVAL:	N/A
DEVELOPMENT METHOD/TIME:	Flushed out with rig's air tooling	GROUT INTERVAL:	0' bgs to 69' bgs
REMARKS:	Open hole in bedrock from 69' to 300' bgs. Completed as a stickup well (~1.5' of stickup).		

DESCRIPTIVE LOG

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-0-	0' - 22': Light brown VF-F grained sand and silt. Some M-C grained sand, dry.
				-5-	
				-10-	
				-15-	
				-20-	
					22' - 35': SAA, highly weathered rock, light brown to brown.
				-25-	
				-30-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 2 OF 7
BORING/WELL I.D.: OW2-3	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/22/2019 & 3/26/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-30-	
				-35-	35' - 42': SAA, getting harder with depth, wet at 35 to 40 feet.
				-40-	
					42'- 62': SAA, color change to brown / dark brown rock with increasing hardness with depth, little weathering.
				-45-	
				-50-	
				-55-	
				-60-	
					62' - 82': SAA, hard rock; possiblly some fractures (cuttings moist).
				-65-	
					Set 6.125" PVC casing to 69' bgs.
				-70-	
				-75-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 3 OF 7
BORING/WELL I.D.: OW2-3	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/22/2019 & 3/26/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-75-	
				-	
				-	
				-	
				-	
				-80-	
				-	
				-	82' - 102': SAA
				-	
				-	
				-85-	
				-	
				-	
				-	
				-	
				-90-	
				-	
				-	
				-	
				-	
				-95-	
				-	
				-	
				-	
				-	
				-100-	
				-	
				-	102' - 122': SAA, very solid rock.
				-	
				-	
				-105-	
				-	
				-	
				-	
				-	
				-110-	
				-	
				-	
				-	
				-	
				-115-	
				-	
				-	
				-	
				-	
				-120-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 4 OF 7
BORING/WELL I.D.: OW2-3	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/22/2019 & 3/26/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-120-	
				-	
				-	122' - 142': SAA
				-	
				-	
				-125-	
				-	
				-	
				-	
				-	
				-130-	
				-	
				-	
				-	
				-	
				-135-	
				-	
				-	
				-	
				-	
				-140-	
				-	
				-	142' - 162': SAA
				-	
				-	
				-145-	
				-	
				-	
				-	
				-	
				-150-	
				-	
				-	
				-	
				-	
				-155-	
				-	
				-	
				-	
				-	
				-160-	
				-	
				-	162' - 182': SAA
				-	
				-	
				-165-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 5 OF 7
BORING/WELL I.D.: OW2-3	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/22/2019 & 3/26/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-170-	
				-	
				-	
				-	
				-	
				-175-	
				-	
				-	
				-	
				-	
				-180-	
				-	
				-	182' - 202': SAA
				-	
				-	
				-185-	
				-	
				-	
				-	
				-	
				-190-	
				-	
				-	
				-	
				-	
				-195-	
				-	
				-	
				-	
				-	
				-200-	
				-	
				-	202' - 222': SAA
				-	
				-	
				-205-	
				-	
				-	
				-	
				-	
				-210-	
				-	
				-	
				-	
				-	
				-215-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 6 OF 7
BORING/WELL I.D.: OW2-3	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/22/2019 & 3/26/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-220-	
				-	
				-	222' - 242': SAA
				-	
				-	
				-225-	
				-	
				-	
				-	
				-	
				-230-	
				-	
				-	
				-	
				-	
				-235-	
				-	
				-	
				-	
				-	
				-240-	
				-	
				-	242' - 250': SAA, with water-bearing fracture at 250 feet.
				-	
				-	
				-245-	
				-	
				-	
				-	
				-	
				-250-	250' - 262': SAA
				-	
				-	
				-	
				-	
				-255-	
				-	
				-	
				-	
				-	
				-260-	
				-	
				-	262' - 282': SAA
				-	
				-	
				-265-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.

SHEET: 7 OF 7

BORING/WELL I.D.: OW2-3 | CLIENT/PROJECT: Carolina Sunrock | DATE(S) DRILLED: 3/22/2019 & 3/26/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-270-	
				-275-	
				-280-	
					282' - 300': SAA
				-285-	
				-290-	
				-295-	
				-300-	End boring at 300' bgs.
				-305-	
				-310-	
				-315-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.			SHEET: 1 OF 7
BORING/WELL I.D.:	PW-1	CLIENT:	Carolina Sunrock
DATE(S) DRILLED:	4/1/2019 - 4/2/2019	PROJECT NAME:	Caswell County Hydro Study
LOGGED BY:	J. Murphrey	PROJECT NO.:	1925
DRILL METHOD:	Truck-mounted Drilltech T25KW	PROJECT LOCATION:	Wrenn Road, Prospect Hill, NC
SAMPLING METHOD/INTERVAL:	Logged from cuttings.	DRILLING CONTR.:	Carolina-Virginia Well Co.
BORING DIAMETER:	8" (air hammer bit) from 0'-52' bgs; 5.5" (air hammer bit) from 52'-300' bgs.		
REMARKS:	Area 1 pumping well.		

WELL CONSTRUCTION INFORMATION

OUTER CASING SIZE/MATERIAL:	6.125" I.D. Sch. 40 PVC	OUTER CASING INTERVAL:	3.5' ags to 52' bgs
INNER CASING SIZE/MATERIAL:	N/A	INNER CASING INTERVAL:	N/A
SCREEN SIZE/MATERIAL:	N/A; open hole in bedrock	SCREEN INTERVAL:	52' bgs to 300' bgs
SAND PACK SIZE/MATERIAL:	N/A	SAND PACK INTERVAL:	N/A
GROUT TYPE:	Portland Cement	BENTONITE SEAL INTERVAL:	N/A
DEVELOPMENT METHOD/TIME:	Flushed out with rig's air tooling	GROUT INTERVAL:	0' bgs to 52' bgs
REMARKS:	Open hole in bedrock from 52' to 300' bgs. Completed as a stickup well (~3.5' of stickup).		

DESCRIPTIVE LOG

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-0-	0 ' - 11': Light brown VF-C grained sand, some silt, dry
				-5-	
				-10-	
					11' - 13': White to light gray cuttings, silt, some VF-F grained sand, dry.
					13' - 22': Light brown VF-C grained sand, trace quartz gravel, mosit.
				-15-	
				-20-	
					22' - 34': SAA, moist to wet (wet 30-33 feet), highly weathered rock with depth.
				-25-	
				-30-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 2 OF 7
BORING/WELL I.D.: PW-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/1/2019 - 4/2/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-30-	
				-	
				-	
				-	
				-	34' - 42': Weathered rock, increasing hardness with depth, fairly
				-35-	solid around 37', wet, brown to dark brown cuttings.
				-	
				-	
				-	
				-	
				-40-	
				-	
				-	42' - 62': Rock (unweathered).
				-	
				-	
				-45-	
				-	
				-	
				-	
				-	
				-50-	
				-	
				-	Set 6.125" PVC casing to 52' bgs.
				-	
				-	
				-55-	
				-	
				-	
				-	
				-	
				-60-	
				-	
				-	62' - 82': SAA, rock cuttings appear to be diabase and quartz.
				-	
				-	
				-65-	
				-	
				-	
				-	
				-	
				-70-	
				-	
				-	
				-	
				-	
				-75-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 3 OF 7
BORING/WELL I.D.: PW-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/1/2019 - 4/2/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-75-	
				-	
				-	
				-	
				-	
				-80-	
				-	
				-	82' - 102': SAA; cuttings moist-wet.
				-	
				-	
				-85-	
				-	
				-	
				-	
				-	
				-90-	
				-	
				-	
				-	
				-	
				-95-	
				-	
				-	
				-	
				-	
				-100-	
				-	
				-	102' - 122': SAA
				-	
				-	
				-105-	
				-	
				-	
				-	
				-	
				-110-	
				-	
				-	
				-	
				-	
				-115-	
				-	
				-	
				-	
				-	
				-120-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 4 OF 7
BORING/WELL I.D.: PW-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/1/2019 - 4/2/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-120-	
				-	
				-	122' - 142': SAA
				-	
				-	
				-125-	
				-	
				-	
				-	
				-	
				-130-	
				-	
				-	
				-	
				-	
				-135-	
				-	
				-	
				-	
				-	
				-140-	
				-	
				-	142' - 162': SAA
				-	
				-	
				-145-	
				-	
				-	
				-	
				-	
				-150-	
				-	
				-	
				-	
				-	
				-155-	
				-	
				-	
				-	
				-	
				-160-	
				-	
				-	162' - 182': SAA
				-	
				-	
				-165-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 5 OF 7
BORING/WELL I.D.: PW-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/1/2019 - 4/2/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-170-	
				-	
				-	
				-	
				-	
				-175-	
				-	
				-	
				-	
				-	
				-180-	
				-	
				-	182' - 202': SAA
				-	
				-	
				-185-	
				-	
				-	
				-	
				-	
				-190-	
				-	
				-	
				-	
				-	
				-195-	
				-	
				-	
				-	
				-	
				-200-	
				-	
				-	202' - 222': SAA, rock still appears to be diabase.
				-	
				-	
				-205-	
				-	
				-	
				-	
				-	
				-210-	
				-	
				-	
				-	
				-	
				-215-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 6 OF 7
BORING/WELL I.D.: PW-1	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 4/1/2019 - 4/2/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-220-	
				-	
				-	222' - 242': SAA
				-	
				-	
				-225-	
				-	
				-	
				-	
				-	
				-230-	
				-	
				-	
				-	
				-	
				-235-	
				-	
				-	
				-	
				-	
				-240-	
				-	
				-	242' - 262': SAA
				-	
				-	
				-245-	
				-	
				-	
				-	
				-	
				-250-	
				-	
				-	
				-	
				-	
				-255-	
				-	
				-	
				-	
				-	
				-260-	
				-	
				-	262' - 282': SAA
				-	
				-	
				-265-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.

BORING/WELL I.D.: PW-1 | CLIENT/PROJECT: Carolina Sunrock | DATE(S) DRILLED: 4/1/2019 - 4/2/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-270-	
				-275-	
				-280-	
					282' - 300': SAA
				-285-	
				-290-	
				-295-	
				-300-	End boring at 300' bgs.
				-305-	
				-310-	
				-315-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.			SHEET: 1 OF 7
BORING/WELL I.D.:	PW-2	CLIENT:	Carolina Sunrock
DATE(S) DRILLED:	3/20/2019 - 3/21/2019	PROJECT NAME:	Caswell County Hydro Study
LOGGED BY:	J. Murphrey	PROJECT NO.:	1925
DRILL METHOD:	Truck-mounted Drilltech T25KW	PROJECT LOCATION:	Wrenn Road, Prospect Hill, NC
SAMPLING METHOD/INTERVAL:	Logged from cuttings.	DRILLING CONTR.:	Carolina-Virginia Well Co.
BORING DIAMETER:	8" (air hammer bit) from 0'-64' bgs; 5.5" (air hammer bit) from 64'-300' bgs.		
REMARKS:	Area 2 pumping well.		

WELL CONSTRUCTION INFORMATION

OUTER CASING SIZE/MATERIAL:	6.125" I.D. Sch. 40 PVC	OUTER CASING INTERVAL:	3.5' ags to 64' bgs
INNER CASING SIZE/MATERIAL:	N/A	INNER CASING INTERVAL:	N/A
SCREEN SIZE/MATERIAL:	N/A; open hole in bedrock	SCREEN INTERVAL:	64' bgs to 300' bgs
SAND PACK SIZE/MATERIAL:	N/A	SAND PACK INTERVAL:	N/A
GROUT TYPE:	Portland Cement	BENTONITE SEAL INTERVAL:	N/A
DEVELOPMENT METHOD/TIME:	Flushed out with rig's air tooling	GROUT INTERVAL:	0' bgs to 64' bgs
REMARKS:	Open hole in bedrock from 64' to 300' bgs. Completed as a stickup well (~3.5' of stickup).		

DESCRIPTIVE LOG

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-0-	0'- 22': Light brown silt and VF-F grained sand, dry, some M-C grained sand. Lower 5-10 ft slightly more competent than above (highly weathered rock).
				-5-	
				-10-	
				-15-	
				-20-	
					22' - 32': SAA
				-25-	
				-30-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 2 OF 7
BORING/WELL I.D.: PW-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/20/2019 - 3/21/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-30-	
				-	
				-	32' - 42': Color change from light brown to brown / dark brown,
				-	moist to wet, getting harder.
				-	
				-35-	
				-	
				-	
				-	
				-	
				-40-	
				-	
				-	42' - 62': SAA, color more light brown to light grey, hard rock.
				-	
				-	
				-45-	
				-	
				-	
				-	
				-	
				-50-	50': SAA, very hard rock.
				-	
				-	
				-	
				-	
				-55-	
				-	
				-	
				-	
				-	
				-60-	
				-	
				-	62' - 64': SAA
				-	
				-	Set 6.125" PVC casing to 64' bgs.
				-65-	64' - 102': SAA, brown / dark brown, very solid rock.
				-	
				-	
				-	
				-	
				-70-	
				-	
				-	
				-	
				-	
				-75-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 3 OF 7
BORING/WELL I.D.: PW-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/20/2019 - 3/21/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-75-	
				-	
				-	
				-	
				-	
				-80-	
				-	
				-	
				-	
				-	
				-85-	
				-	
				-	
				-	
				-	
				-90-	
				-	
				-	
				-	
				-	
				-95-	
				-	
				-	
				-	
				-	
				-100-	
				-	
				-	102' - 122': SAA, very hard rock, cuttings are moist-wet.
				-	
				-	
				-105-	
				-	
				-	
				-	
				-	
				-110-	
				-	
				-	
				-	
				-	
				-115-	
				-	
				-	
				-	
				-	
				-120-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 4 OF 7
BORING/WELL I.D.: PW-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/20/2019 - 3/21/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-120-	
				-	
				-	122' - 142': SAA
				-	
				-	
				-125-	
				-	
				-	
				-	
				-	
				-130-	
				-	
				-	
				-	
				-	
				-135-	
				-	
				-	
				-	
				-	
				-140-	
				-	
				-	142'- 162': SAA
				-	
				-	
				-145-	
				-	
				-	
				-	
				-	
				-150-	
				-	
				-	
				-	
				-	
				-155-	
				-	
				-	
				-	
				-	
				-160-	
				-	
				-	162' -182': SAA
				-	
				-	
				-165-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 5 OF 7
BORING/WELL I.D.: PW-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/20/2019 - 3/21/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-170-	
				-	
				-	
				-	
				-	
				-175-	
				-	
				-	
				-	
				-	
				-180-	
				-	
				-	182' - 202': SAA
				-	
				-	
				-185-	
				-	
				-	
				-	
				-	
				-190-	
				-	
				-	
				-	
				-	
				-195-	
				-	
				-	
				-	
				-	
				-200-	
				-	
				-	202' - 222': SAA
				-	
				-	
				-205-	
				-	
				-	
				-	
				-	
				-210-	
				-	
				-	
				-	
				-	
				-215-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 6 OF 7
BORING/WELL I.D.: PW-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/20/2019 - 3/21/2019

DESCRIPTIVE LOG (continued)

CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-220-	
				-	
				-	222' - 242': SAA, water-bearing fracture around 225-230 feet.
				-	
				-	
				-225-	
				-	
				-	
				-	
				-	
				-230-	
				-	
				-	
				-	
				-	
				-235-	
				-	
				-	
				-	
				-	
				-240-	
				-	
				-	242' - 262': SAA
				-	
				-	
				-245-	
				-	
				-	
				-	
				-	
				-250-	
				-	
				-	
				-	
				-	
				-255-	
				-	
				-	
				-	
				-	
				-260-	
				-	
				-	262' - 282': SAA
				-	
				-	
				-265-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

BORING/WELL LOG

PIEDMONT GEOLOGIC, P.C.		SHEET: 7 OF 7
BORING/WELL I.D.: PW-2	CLIENT/PROJECT: Carolina Sunrock	DATE(S) DRILLED: 3/20/2019 - 3/21/2019

DESCRIPTIVE LOG (continued)

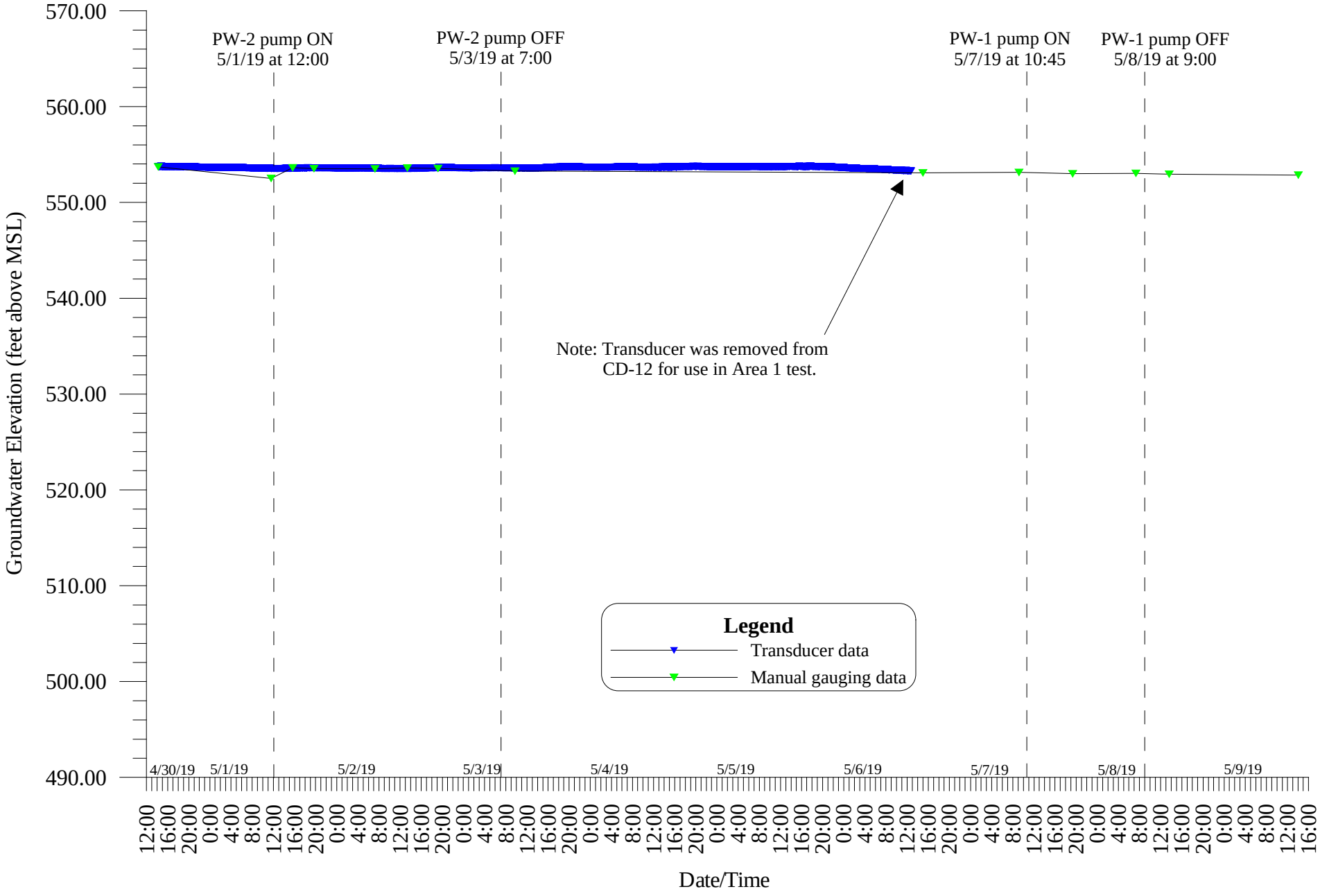
CORE RUN INTERVAL (FT)	SAMPLE INTERVAL (FT)	PID VOCs (ppm)	GRAPHIC COLUMN	DEPTH (FT)	DESCRIPTION OF MATERIAL
				-270-	
				-275-	
				-280-	
				-	282' - 300': SAA
				-285-	
				-290-	
				-295-	
				-300-	End boring at 300' bgs.
				-305-	
				-310-	
				-315-	

HSA	Hollow stem auger		Native soil/rock	VF	Very fine
ags	Above ground surface		Sand pack	F	Fine
bgs	Below ground surface		Bentonite seal	M	Medium
I.D.	Inside diameter		Cement/bentonite grout	C	Coarse
			Well casing		
			Well screen		

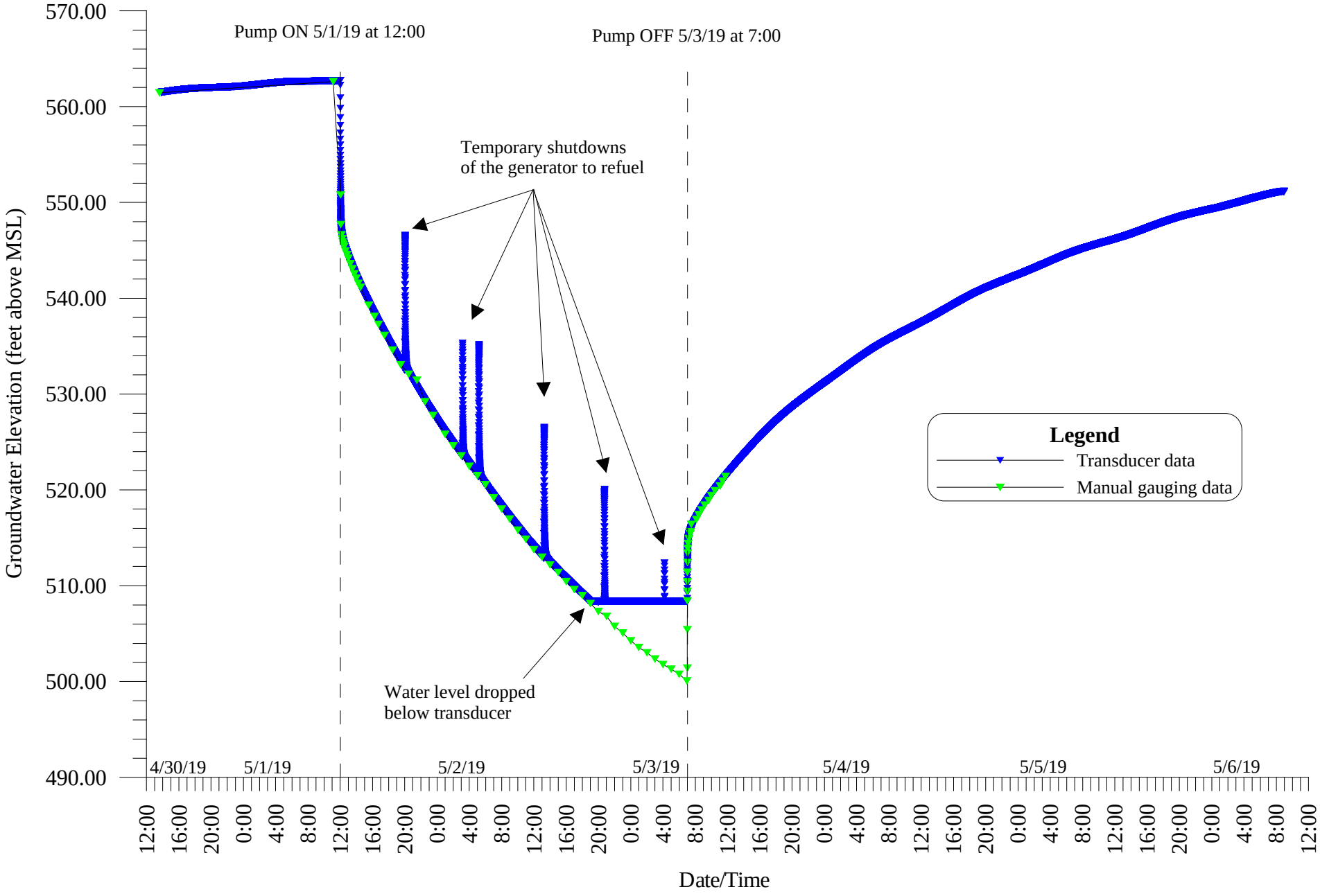
APPENDIX D

GRAPHS (GROUNDWATER LEVELS VS TIME)

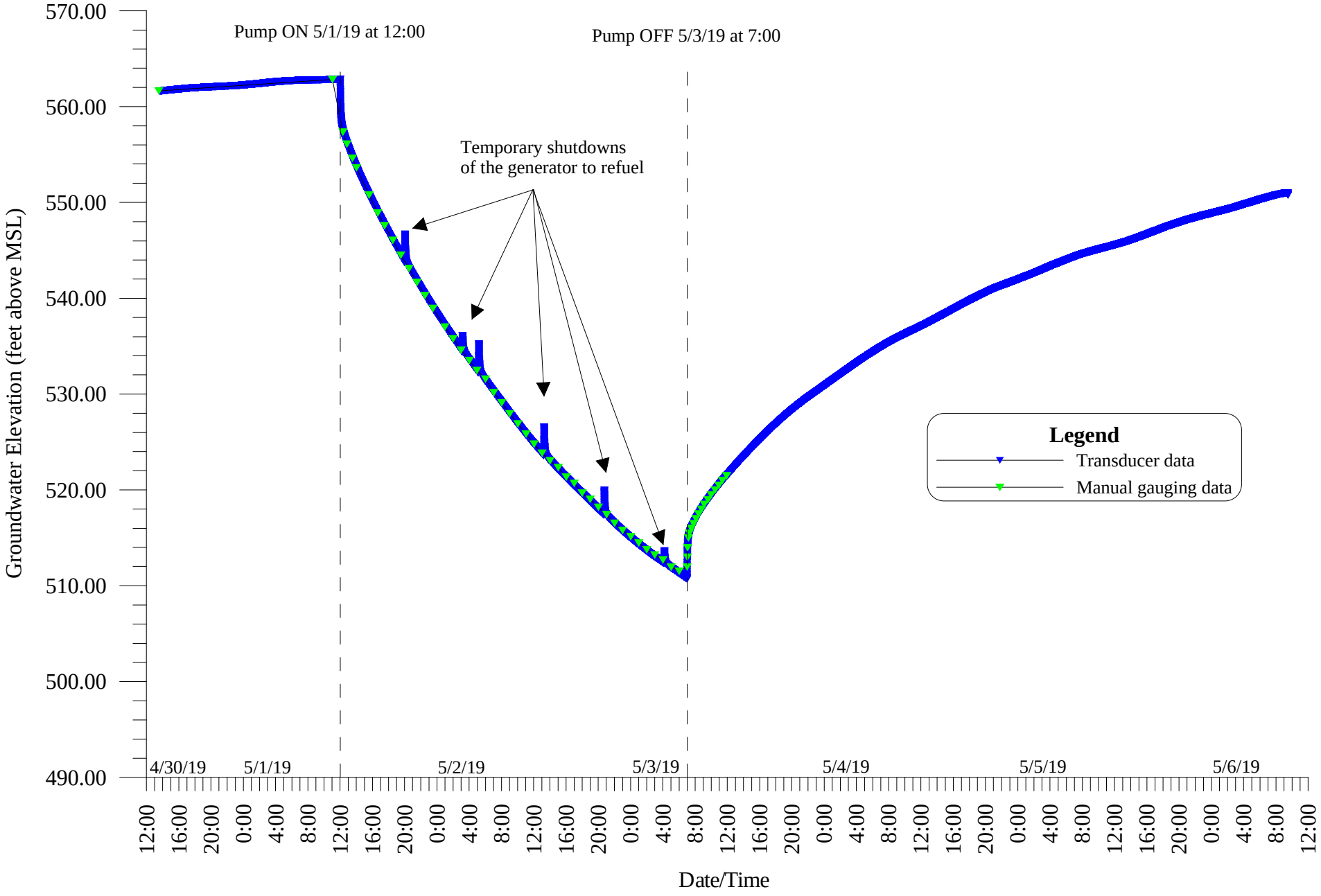
CD-12 (BACKGROUND OBSERVATION WELL)
GROUNDWATER LEVELS VERSUS TIME
CAROLINA SUNROCK - CASWELL COUNTY PROPERTY
APRIL 30 - MAY 9, 2019



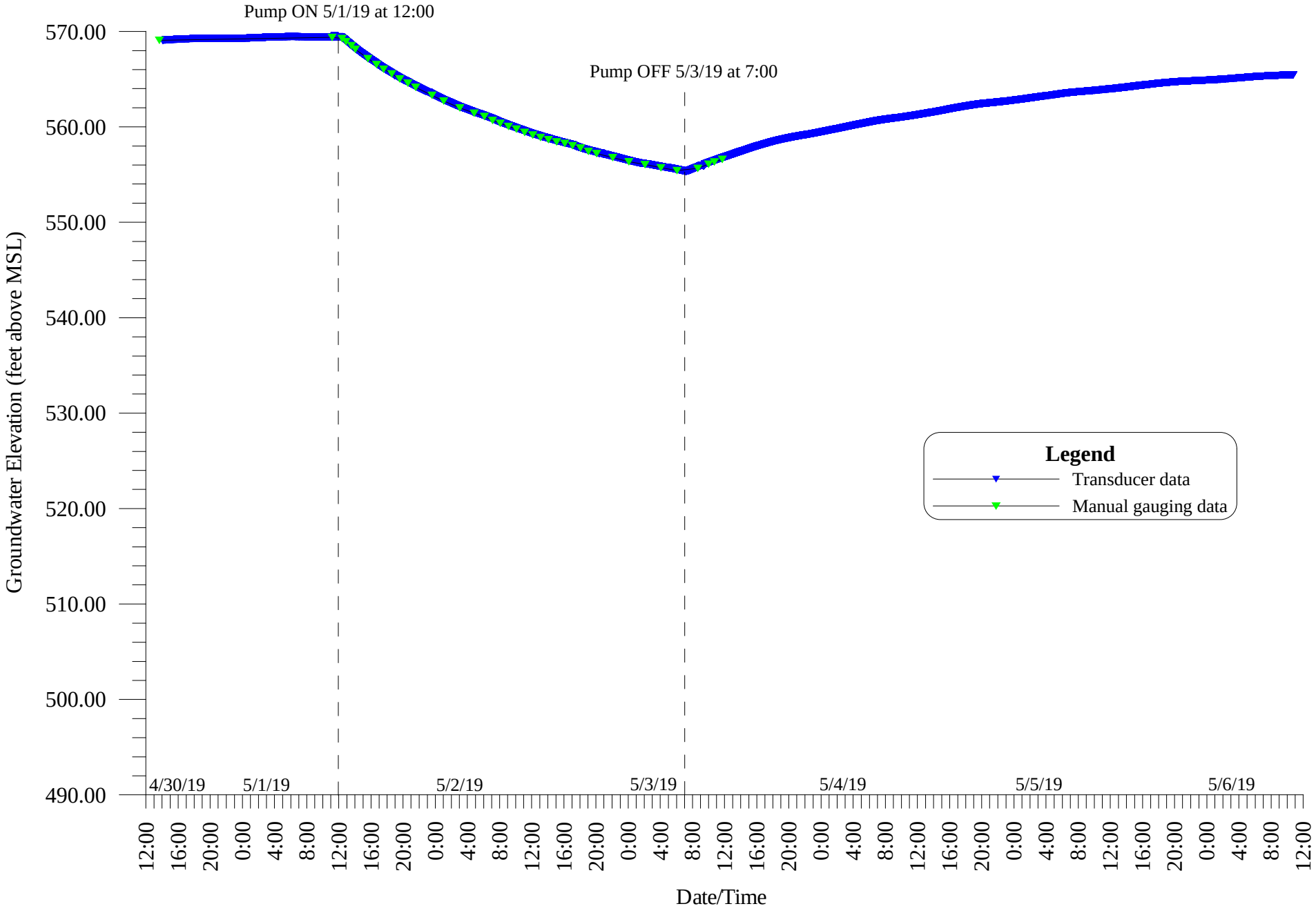
PW-2 (AREA 2 PUMPING WELL)
GROUNDWATER LEVELS VERSUS TIME
CAROLINA SUNROCK - CASWELL COUNTY PROPERTY
APRIL 30 - MAY 6, 2019



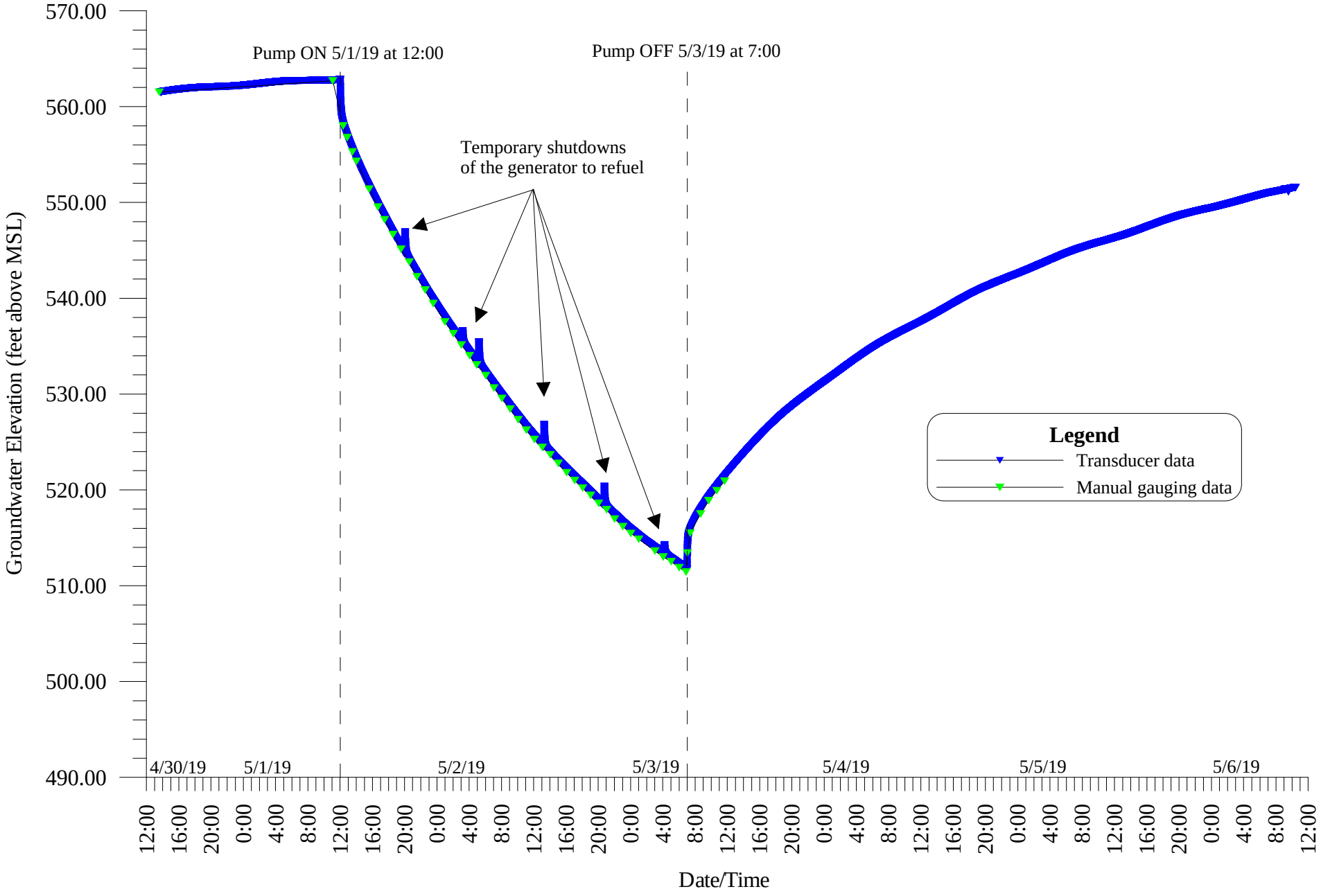
OW2-1 (AREA 2 OBSERVATION WELL)
GROUNDWATER LEVELS VERSUS TIME
CAROLINA SUNROCK - CASWELL COUNTY PROPERTY
APRIL 30 - MAY 6, 2019



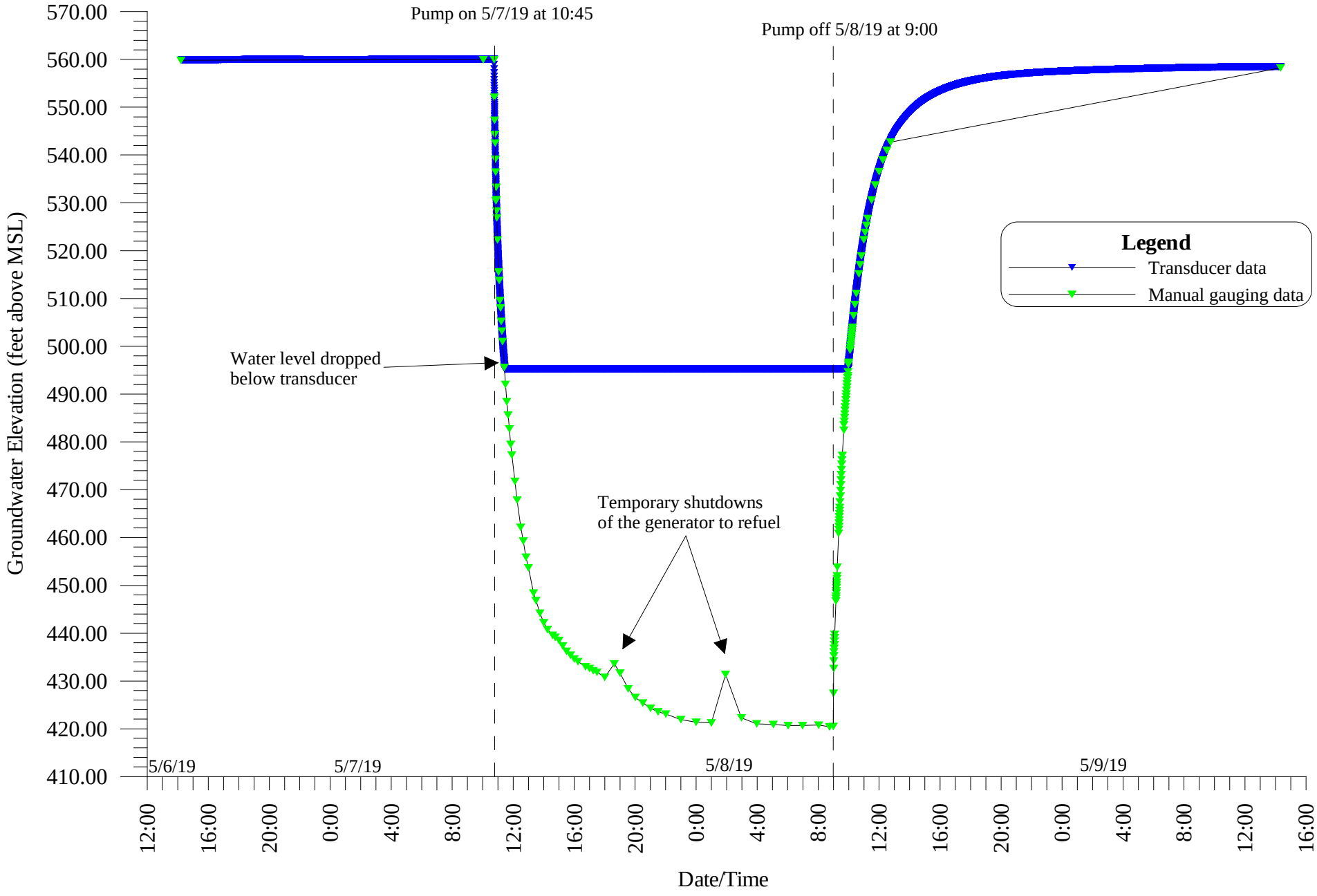
OW2-2 (AREA 2 OBSERVATION WELL)
GROUNDWATER LEVELS VERSUS TIME
CAROLINA SUNROCK - CASWELL COUNTY PROPERTY
APRIL 30 - MAY 6, 2019



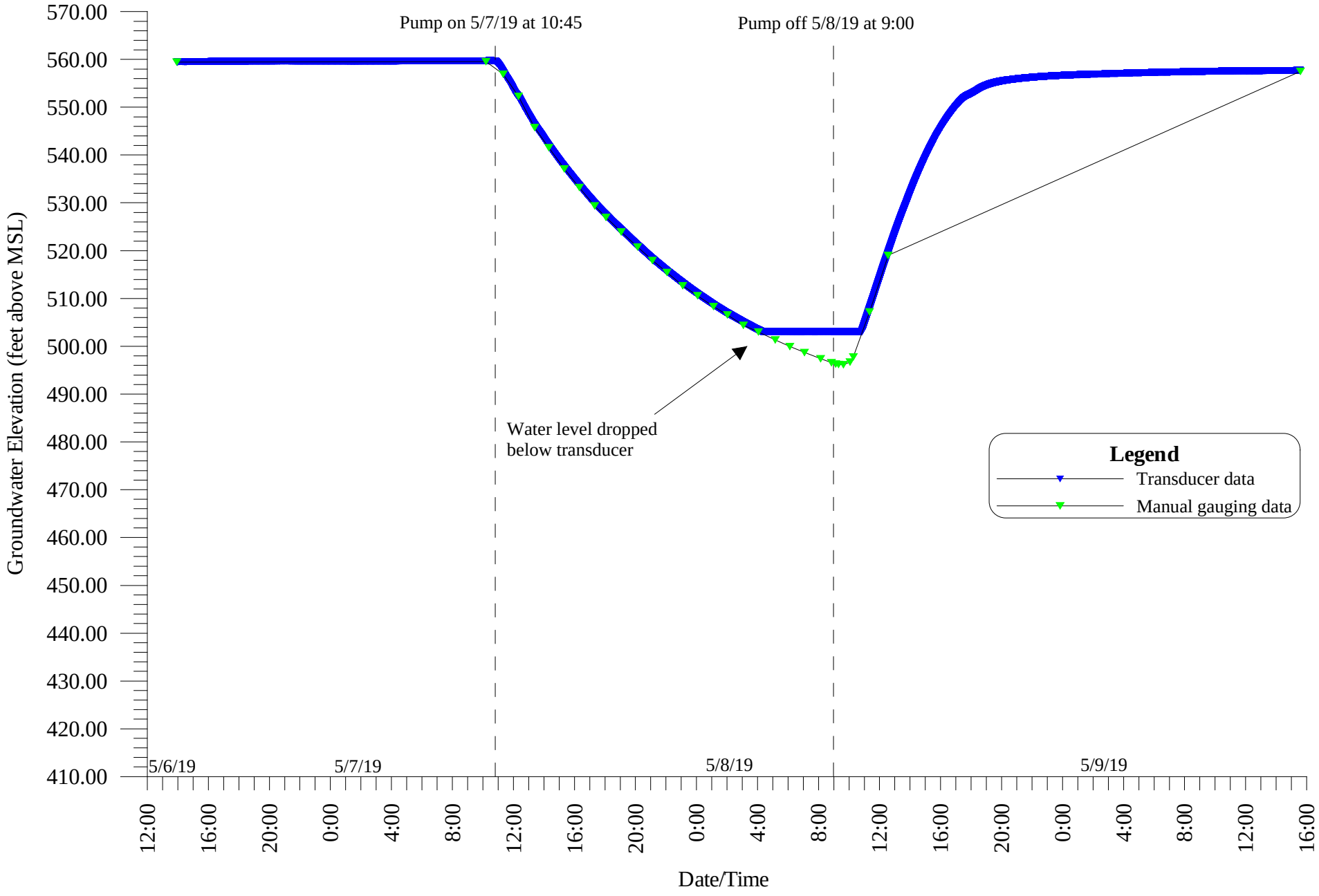
OW2-3 (AREA 2 OBSERVATION WELL)
GROUNDWATER LEVELS VERSUS TIME
CAROLINA SUNROCK - CASWELL COUNTY PROPERTY
APRIL 30 - MAY 6, 2019



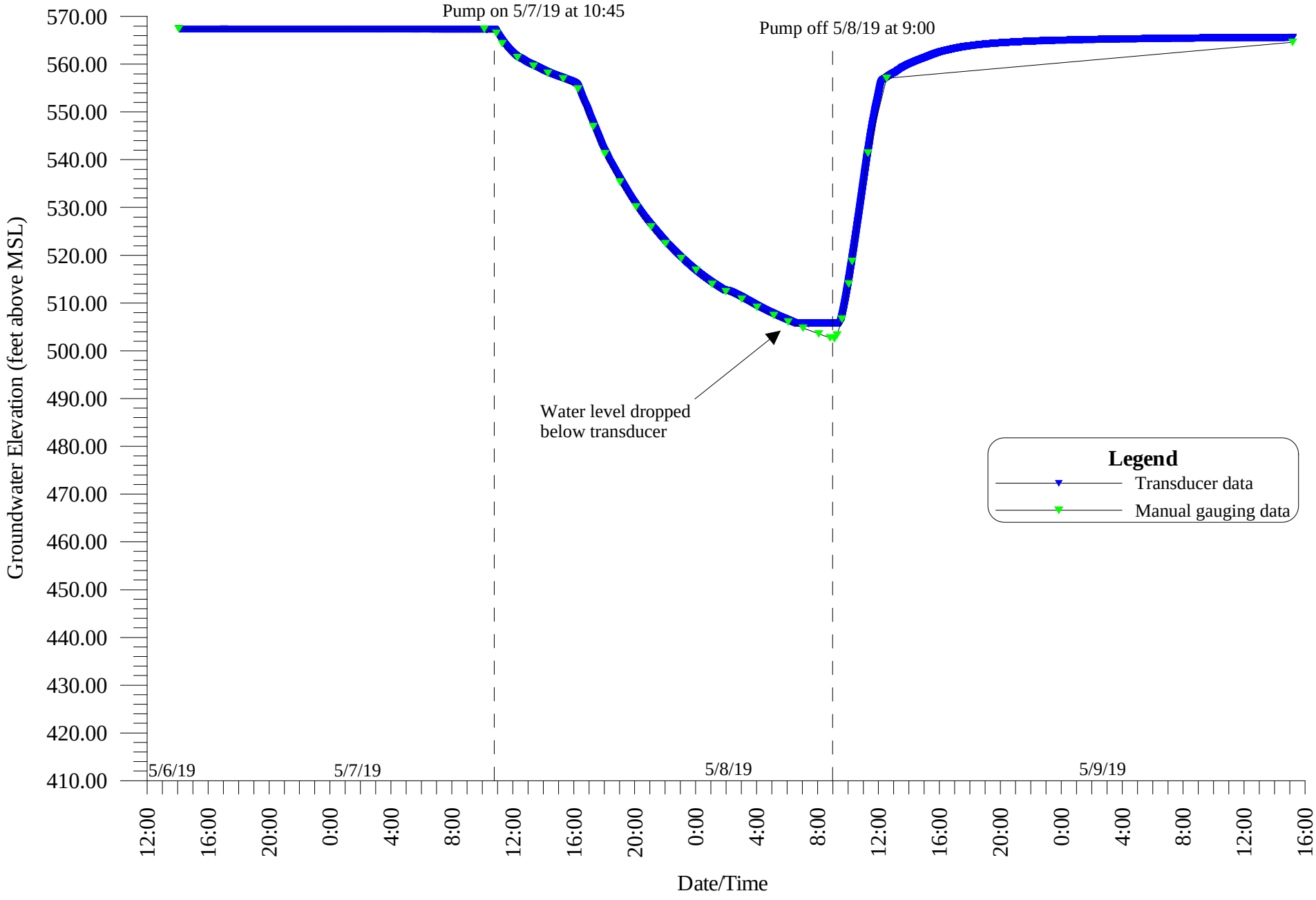
PW-1 (AREA 1 PUMPING WELL)
GROUNDWATER LEVELS VERSUS TIME
CAROLINA SUNROCK - CASWELL COUNTY PROPERTY
MAY 6 - 9, 2019



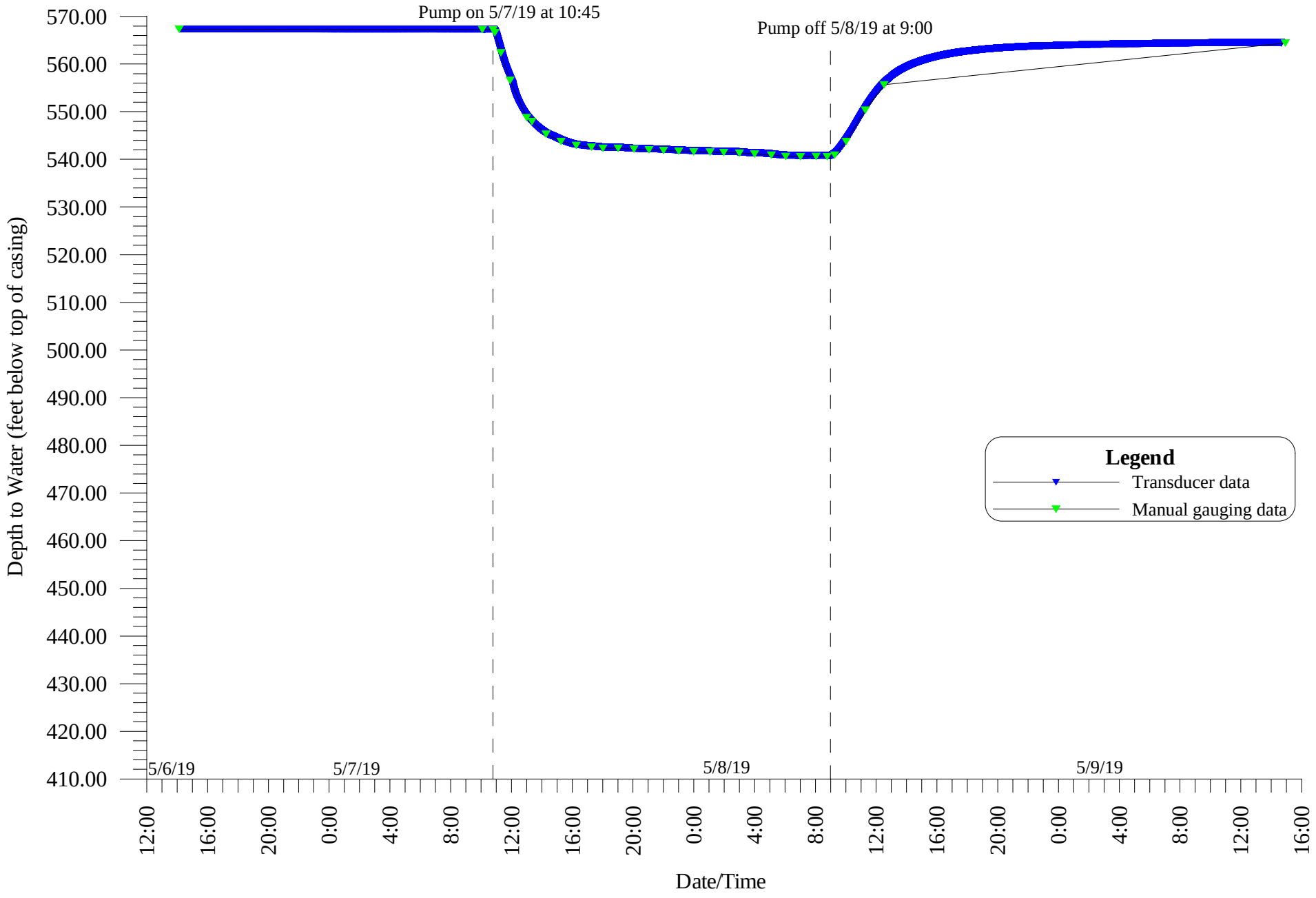
OW1-1 (AREA 1 OBSERVATION WELL)
GROUNDWATER LEVELS VERSUS TIME
CAROLINA SUNROCK - CASWELL COUNTY PROPERTY
MAY 6 - 9, 2019



OW1-2 (AREA 1 OBSERVATION WELL)
GROUNDWATER LEVELS VERSUS TIME
CAROLINA SUNROCK - CASWELL COUNTY PROPERTY
MAY 6 - 9, 2019



OW1-3 (AREA 1 OBSERVATION WELL)
GROUNDWATER LEVELS VERSUS TIME
CAROLINA SUNROCK - CASWELL COUNTY PROPERTY
MAY 6 - 9, 2019



APPENDIX E

AQTESOLV CURVE-MATCHING OUTPUTS

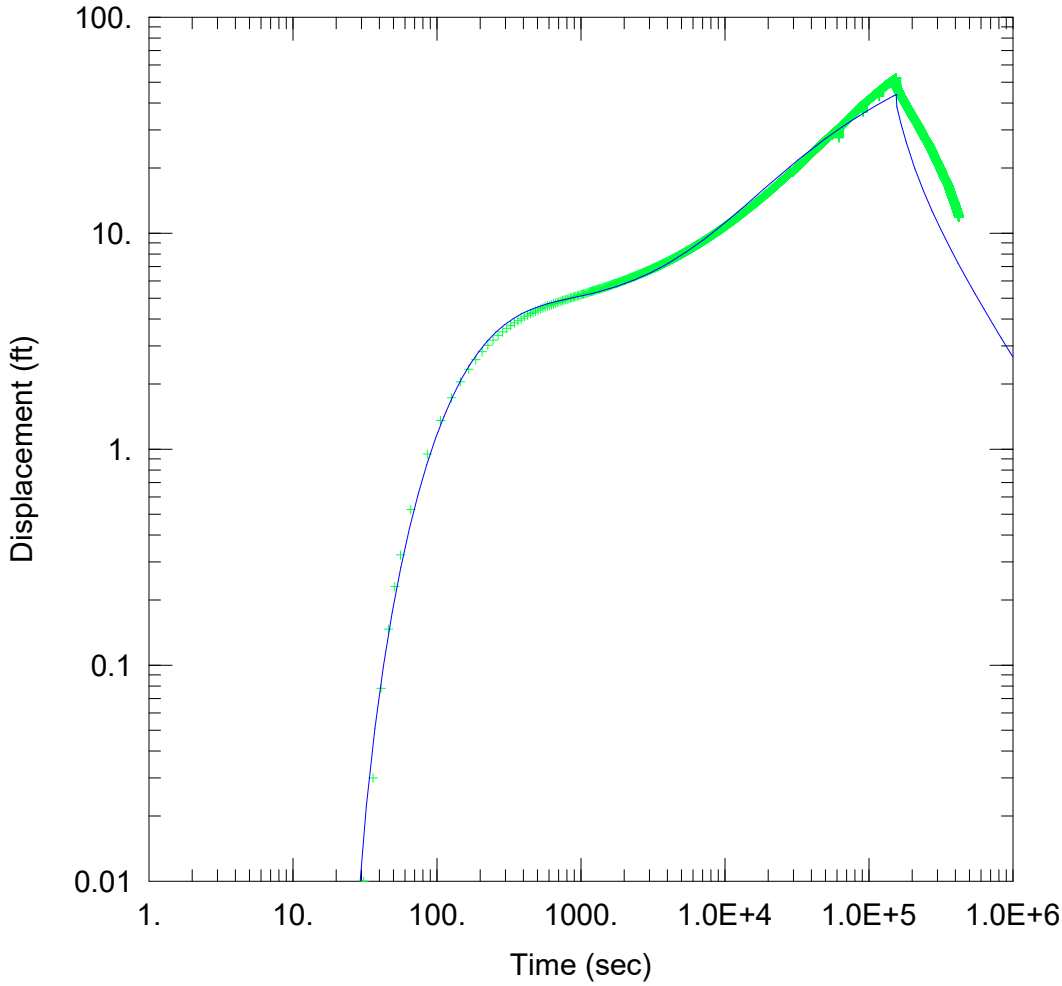
APPENDIX E-1

AREA 2 AQTESOLV OUTPUTS

Index of Area 2 AQTESOLV Outputs

1. Neuman solution (OW2-1, drawdown and recovery phase)
2. Neuman solution (OW2-2, drawdown and recovery phase)
3. Neuman solution (OW2-3, drawdown and recovery phase)
4. Neuman solution (OW2-1, recovery phase only)
5. Neuman solution (OW2-2, recovery phase only)
6. Neuman solution (OW2-3, recovery phase only)

Neuman solution (OW2-1, drawdown and recovery phase)



AREA 2

Data Set: S:\...\Area 2 - AQTESOLV (MODIFIED).aqt
Date: 04/24/20 Time: 13:38:03

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-2
Test Date: 5/1/19 - 5/3/19

AQUIFER DATA

Saturated Thickness: 274. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-2	0	0

Observation Wells

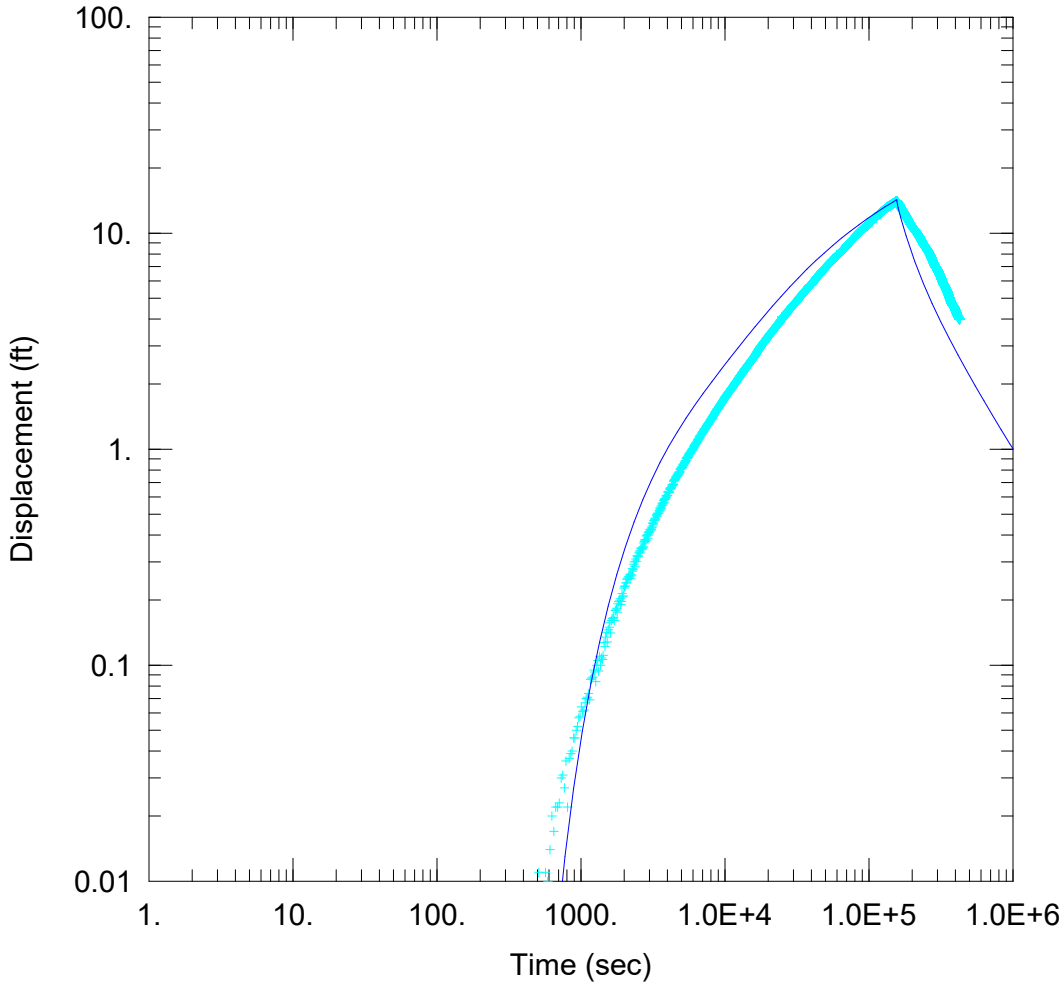
Well Name	X (ft)	Y (ft)
+ OW2-1	30.5	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 25.77 ft^2/day
S = 0.000186
Sy = 0.007401
Kz/Kr = 107.1

Neuman solution (OW2-2, drawdown and recovery phase)



AREA 2

Data Set: S:\...\Area 2 - AQTESOLV (MODIFIED).aqt
Date: 04/24/20 Time: 13:40:38

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-2
Test Date: 5/1/19 - 5/3/19

AQUIFER DATA

Saturated Thickness: 274. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-2	0	0

Observation Wells

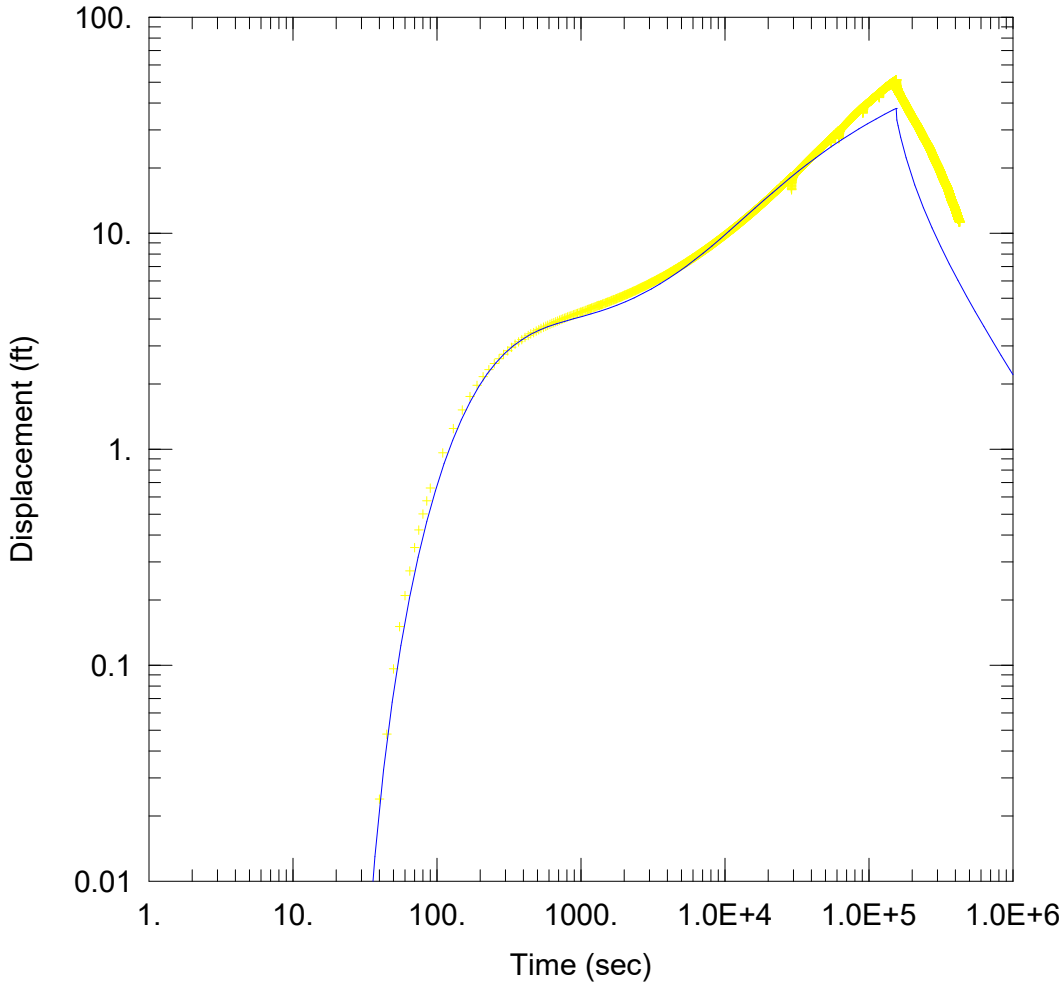
Well Name	X (ft)	Y (ft)
OW2-2	253.5	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 68.27 ft^2/day
S = 0.0001585
Sy = 0.000273
Kz/Kr = 1.778

Neuman solution (OW2-3, drawdown and recovery phase)



AREA 2

Data Set: S:\...\Area 2 - AQTESOLV (MODIFIED).aqt
Date: 04/24/20 Time: 13:41:48

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-2
Test Date: 5/1/19 - 5/3/19

AQUIFER DATA

Saturated Thickness: 274. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-2	0	0

Observation Wells

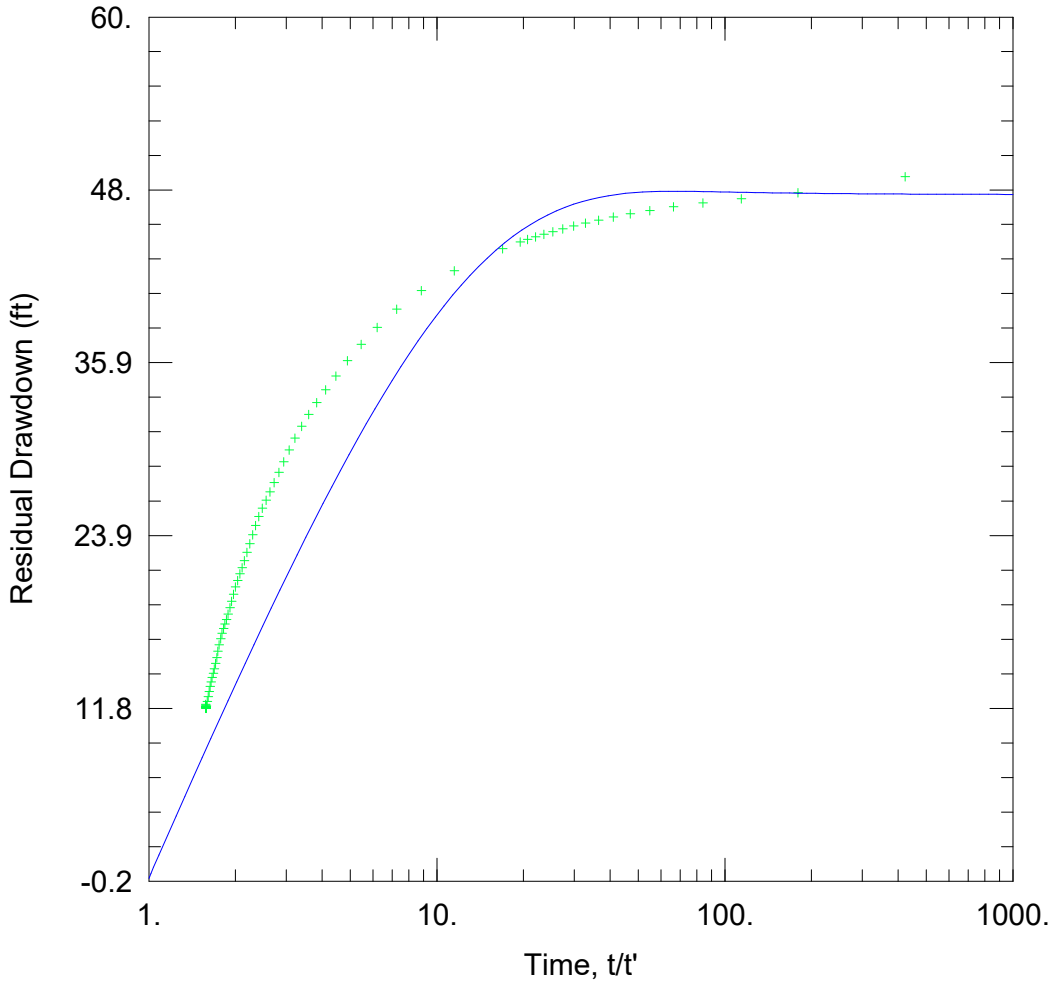
Well Name	X (ft)	Y (ft)
OW2-3	85.5	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 31.11 ft^2/day
S = 3.458E-5
Sy = 0.001
Kz/Kr = 14.96

Neuman solution (OW2-1, recovery phase)



AREA 2

Data Set: S:\...\Area 2 - AQTESOLV - updated 0420.aqt
Date: 04/17/20 Time: 14:57:47

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-2
Test Date: 5/1/19 - 5/3/19

AQUIFER DATA

Saturated Thickness: 274. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-2	0	0

Observation Wells

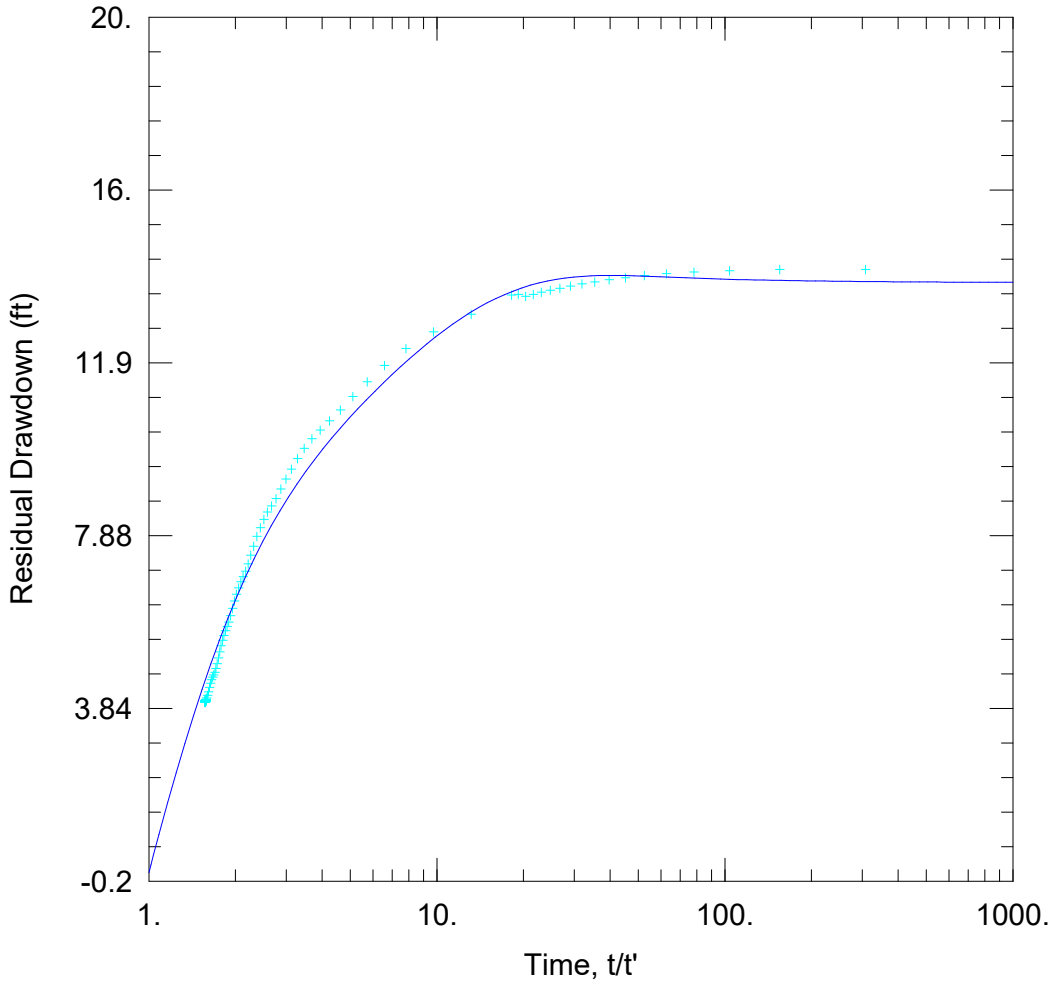
Well Name	X (ft)	Y (ft)
+ OW2-1	30.5	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 20. ft^2/day
S = 0.01
Sy = 0.0009335
Kz/Kr = 1.

Neuman solution (OW2-2, recovery phase)



AREA 2

Data Set: S:\...\Area 2 - AQTESOLV - updated 0420.aqt
Date: 04/17/20 Time: 14:48:21

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-2
Test Date: 5/1/19 - 5/3/19

AQUIFER DATA

Saturated Thickness: 274. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-2	0	0

Observation Wells

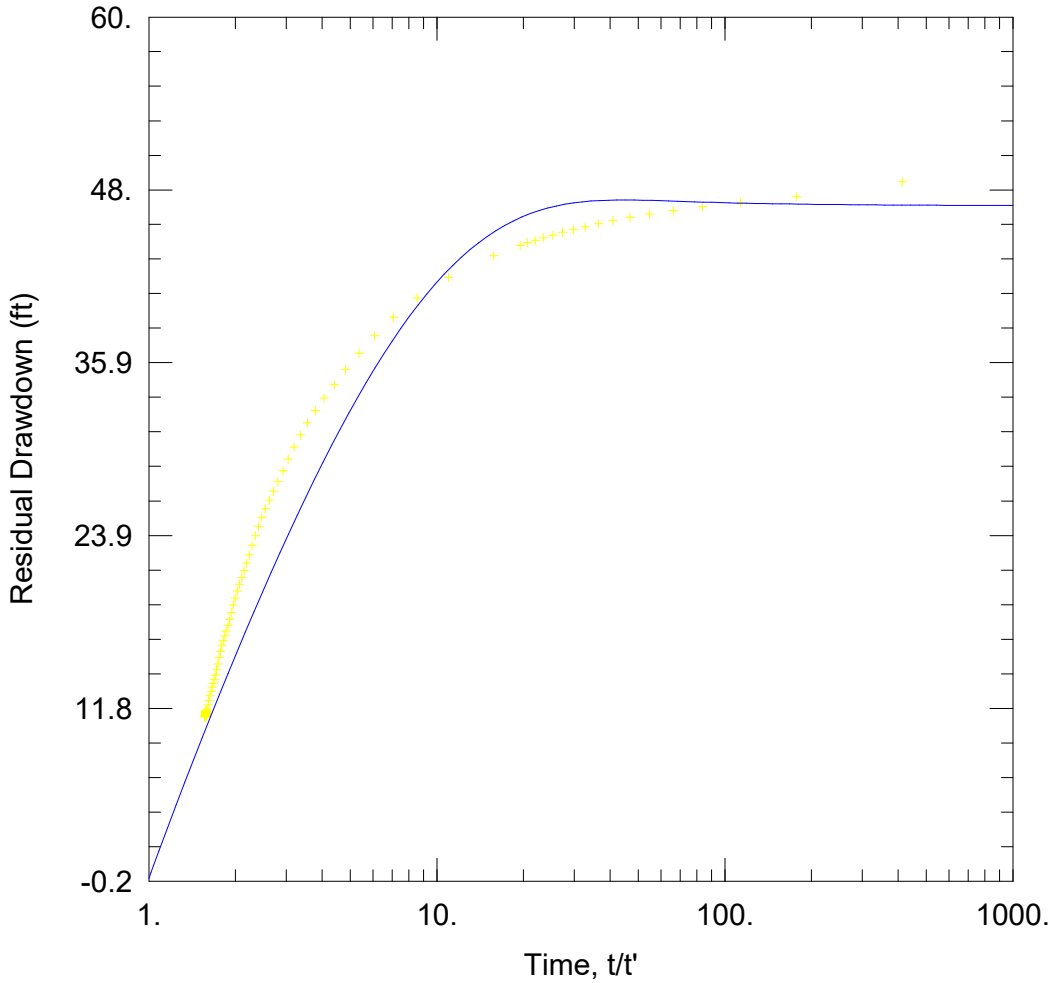
Well Name	X (ft)	Y (ft)
+ OW2-2	253.5	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 36.41 ft^2/day
S = 0.0003981
Sy = 0.0004732
Kz/Kr = 1.

Neuman solution (OW2-3, recovery phase)



AREA 2

Data Set: S:\...\Area 2 - AQTESOLV - updated 0420.aqt
Date: 04/17/20 Time: 15:09:01

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-2
Test Date: 5/1/19 - 5/3/19

AQUIFER DATA

Saturated Thickness: 274. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-2	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OW2-3	85.5	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 17.22 ft^2/day
S = 0.001549
Sy = 1.303E-5
Kz/Kr = 1.

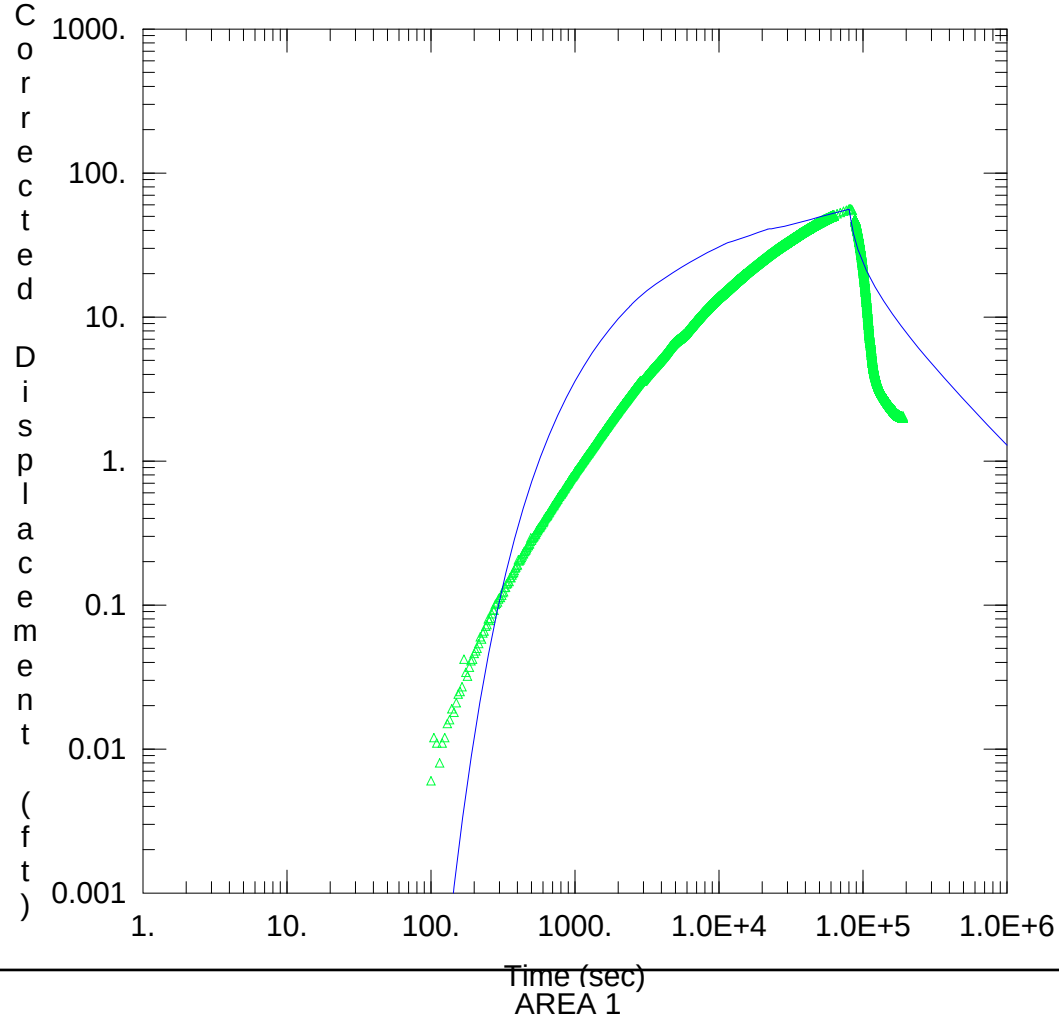
APPENDIX E-2

AREA 1 AQTESOLV OUTPUTS

Index of Area 1 AQTESOLV Outputs

1. Theis solution (OW1-1, drawdown and recovery phase)
2. Theis solution (OW1-2, drawdown and recovery phase)
3. Theis solution (OW1-3, drawdown and recovery phase)
4. Moench solution (OW1-1, drawdown and recovery phase)
5. Moench solution (OW1-2, drawdown and recovery phase)
6. Moench solution (OW1-3, drawdown and recovery phase)
7. Cooper-Jacob solution (OW1-1, recovery phase only)
8. Cooper-Jacob solution (OW1-2, recovery phase only)
9. Cooper-Jacob solution (OW1-3, recovery phase only)

Theis solution (OW1-1, drawdown and recovery phase)



AREA 1

Data Set: S:\...\Area 1 - AQTESOLV.aqt
Date: 07/03/19 Time: 13:18:24

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-1
Test Date: 5/7/19 - 5/9/19

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-1	0	0

Observation Wells

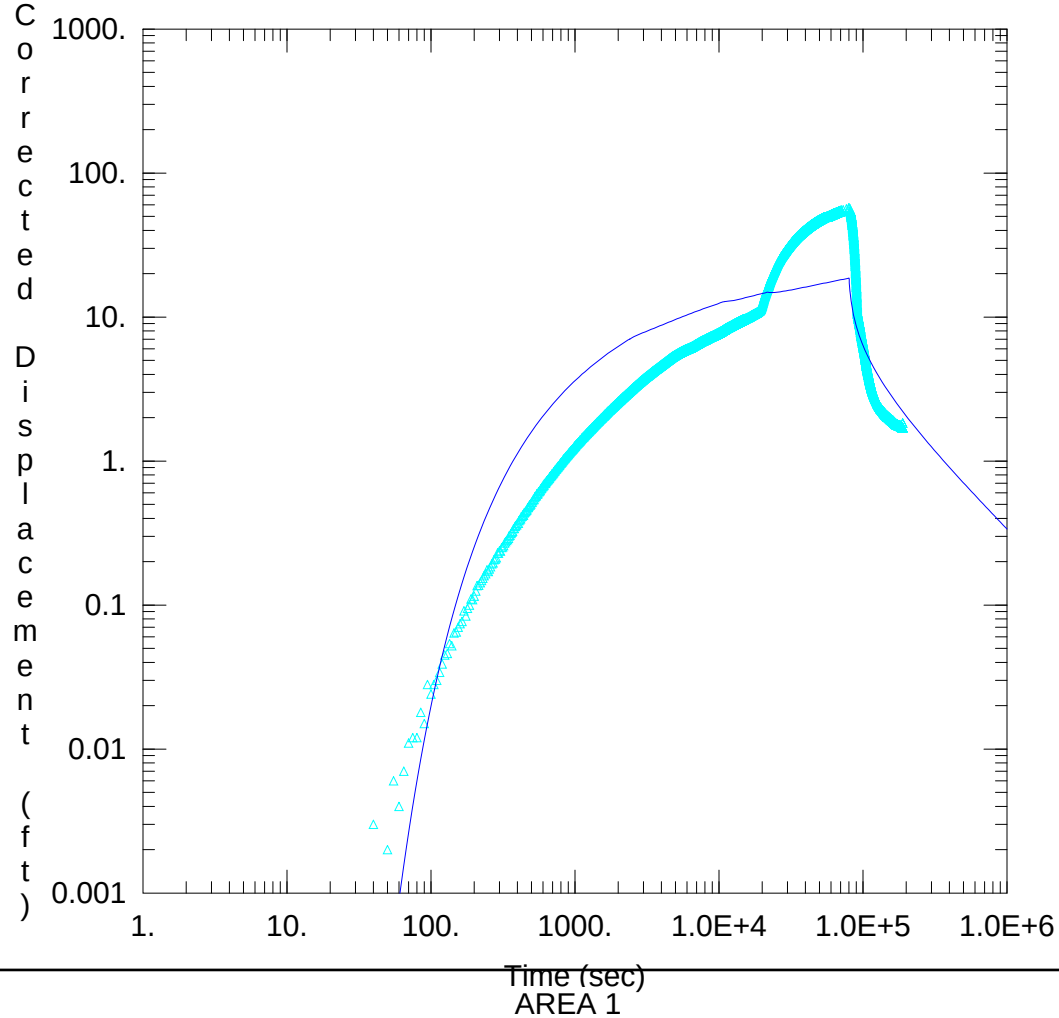
Well Name	X (ft)	Y (ft)
△ OW1-1	292	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 23.71 ft^2/day
S = 1.425E-5
Kz/Kr = 1.
b = 273. ft

Theis solution (OW1-2, drawdown and recovery phase)



AREA 1

Data Set: S:\...\Area 1 - AQTESOLV.aqt
Date: 07/02/19 Time: 16:23:08

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-1
Test Date: 5/7/19 - 5/9/19

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-1	0	0

Observation Wells

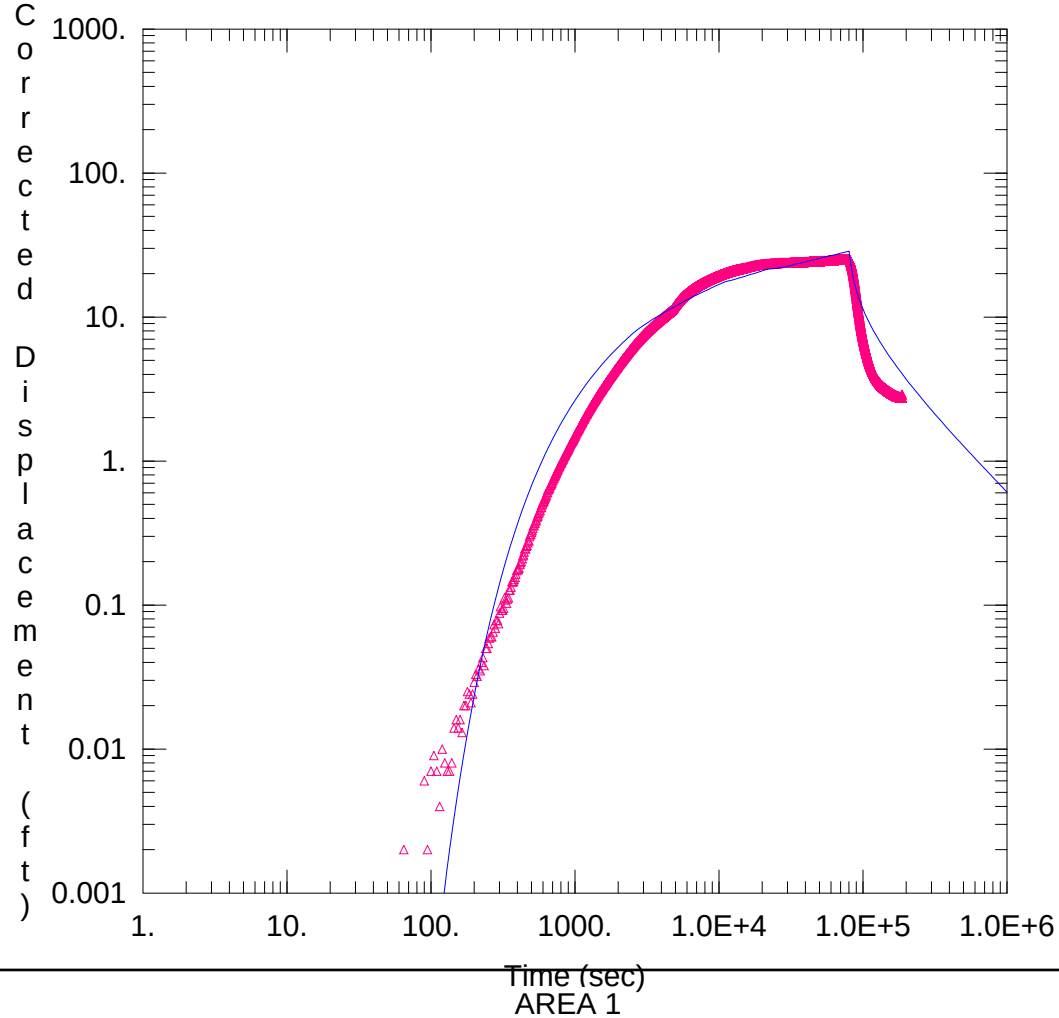
Well Name	X (ft)	Y (ft)
△ OW1-2	99.5	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 90.46 ft^2/day
S = 0.0001696
Kz/Kr = 1.
b = 273. ft

Theis solution (OW1-3, drawdown and recovery phase)



AREA 1

Data Set: S:\...\Area 1 - AQTESOLV.aqt
Date: 07/02/19 Time: 16:21:16

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-1
Test Date: 5/7/19 - 5/9/19

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-1	0	0

Observation Wells

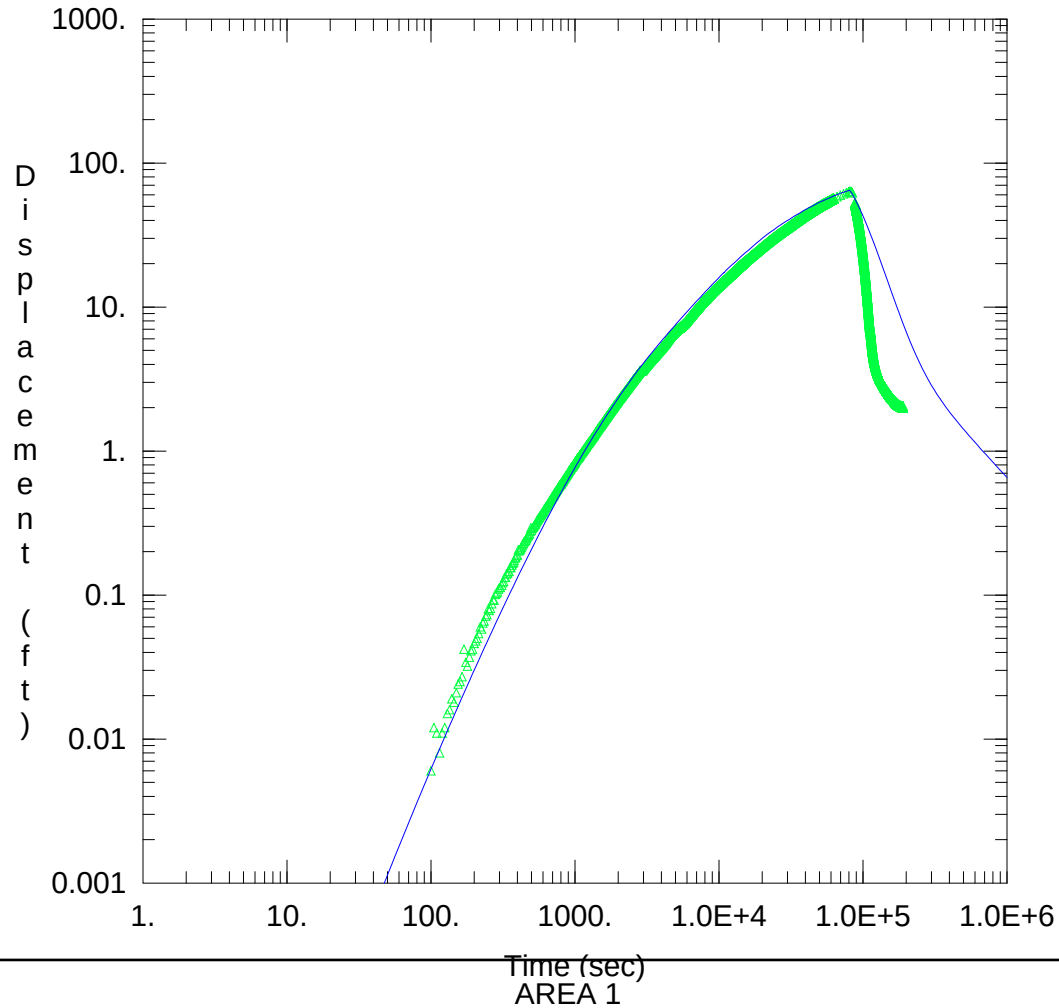
Well Name	X (ft)	Y (ft)
△ OW1-3	31	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 50.08 ft^2/day
S = 0.002119
Kz/Kr = 1.
b = 273. ft

Moench solution (OW1-1, drawdown and recovery phase)



AREA 1

Data Set: S:\...\Area 1 - AQTESOLV.aqt
Date: 07/02/19 Time: 16:57:35

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-1
Test Date: 5/7/19 - 5/9/19

AQUIFER DATA

Saturated Thickness: 273. ft Slab Block Thickness: 15. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-1	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
△ OW1-1	292	0

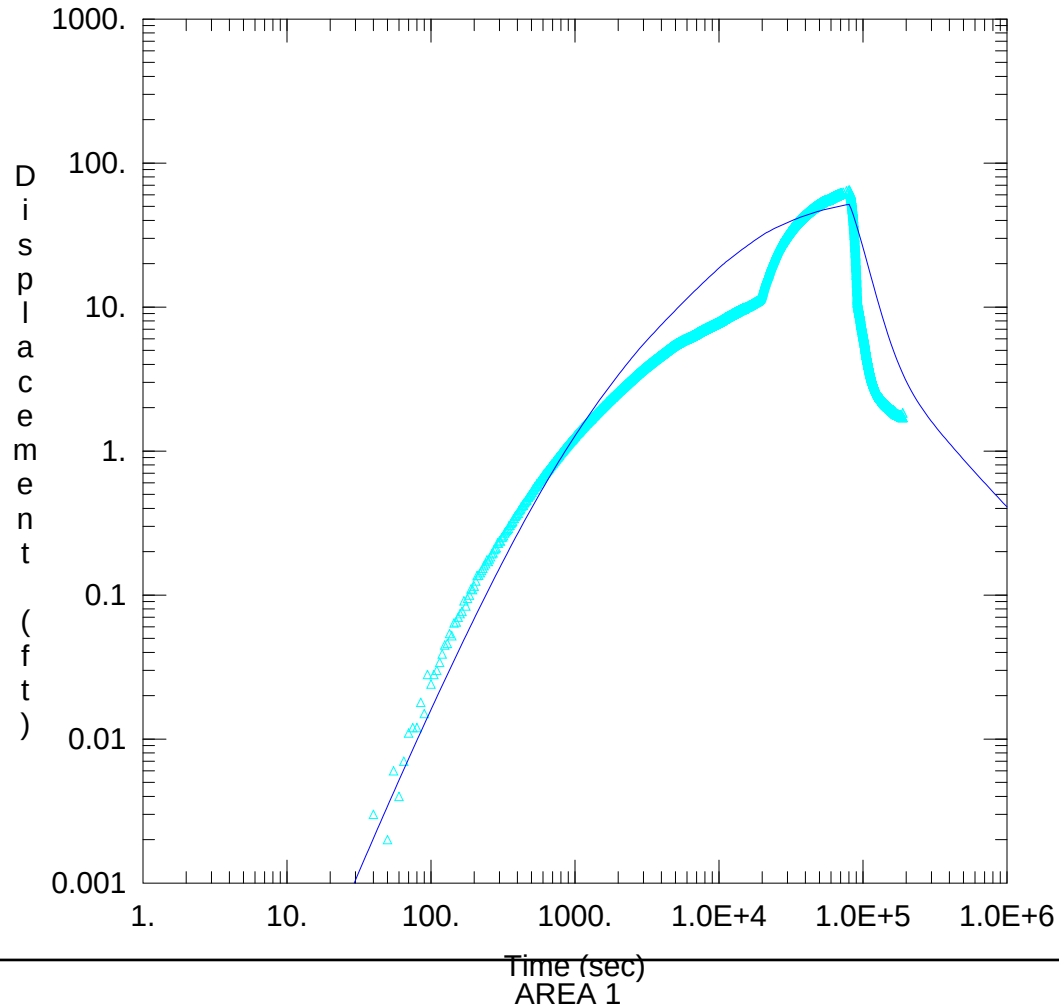
SOLUTION

Aquifer Model: Fractured Solution Method: Moench w/slab blocks

K = 0.1766 ft/day
K' = 0.04229 ft/day
Sw = 500.
r(w) = 0.229 ft

Ss = 2.008E-10 ft^{-1}
Ss' = 2.04E-12 ft^{-1}
Sf = 5.
r(c) = 0.255 ft

Moench solution (OW1-2, drawdown and recovery phase)



AREA 1

Data Set: S:\...\Area 1 - AQTESOLV.aqt
Date: 07/02/19 Time: 16:58:47

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-1
Test Date: 5/7/19 - 5/9/19

AQUIFER DATA

Saturated Thickness: 273. ft Slab Block Thickness: 15. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-1	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
△ OW1-2	99.5	0

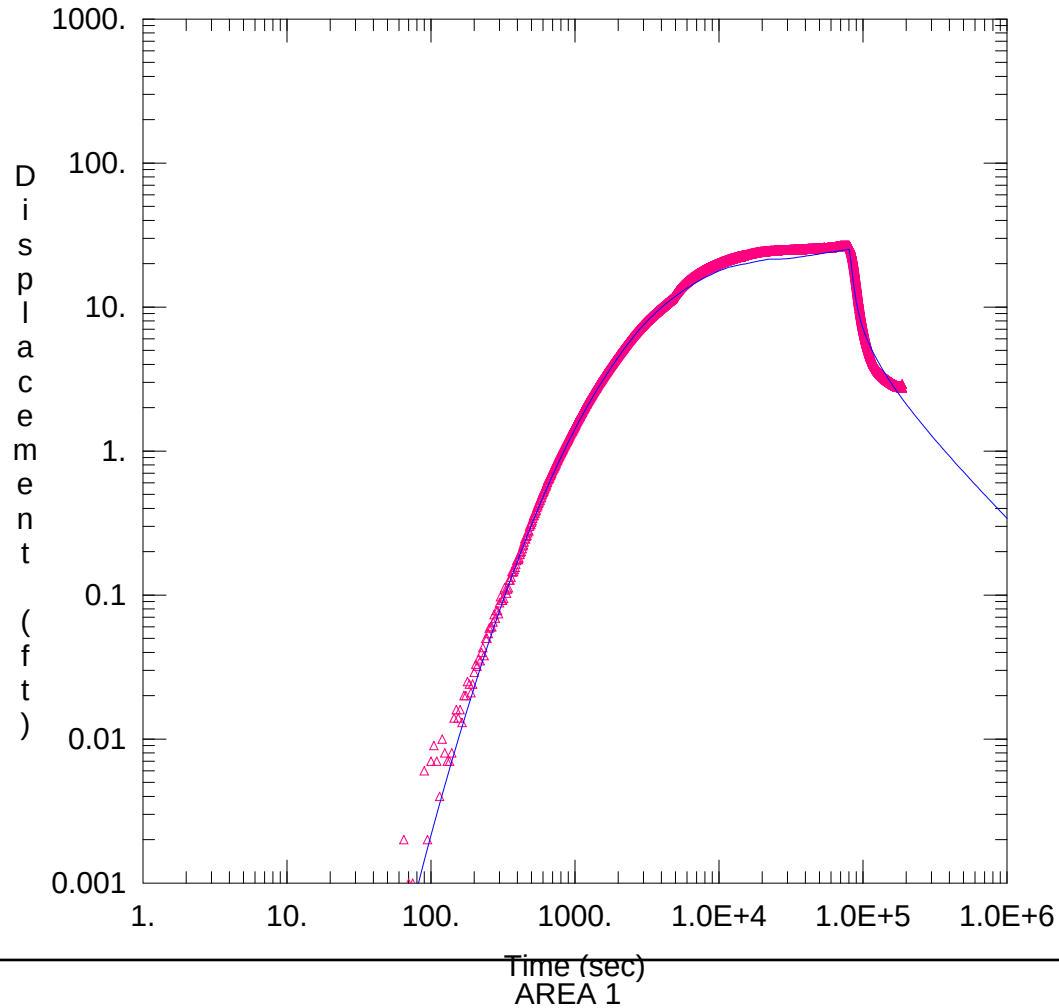
SOLUTION

Aquifer Model: Fractured Solution Method: Moench w/slab blocks

K = 0.2799 ft/day
K' = 0.04229 ft/day
Sw = 500.
r(w) = 0.229 ft

Ss = 5.222E-10 ft^{-1}
Ss' = 2.04E-12 ft^{-1}
Sf = 5.
r(c) = 0.255 ft

Moench solution (OW1-3, drawdown and recovery phase)



AREA 1

Data Set: S:\...\Area 1 - AQTESOLV.aqt
Date: 07/02/19 Time: 16:51:54

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-1
Test Date: 5/7/19 - 5/9/19

AQUIFER DATA

Saturated Thickness: 273. ft Slab Block Thickness: 15. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-1	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
△ OW1-3	31	0

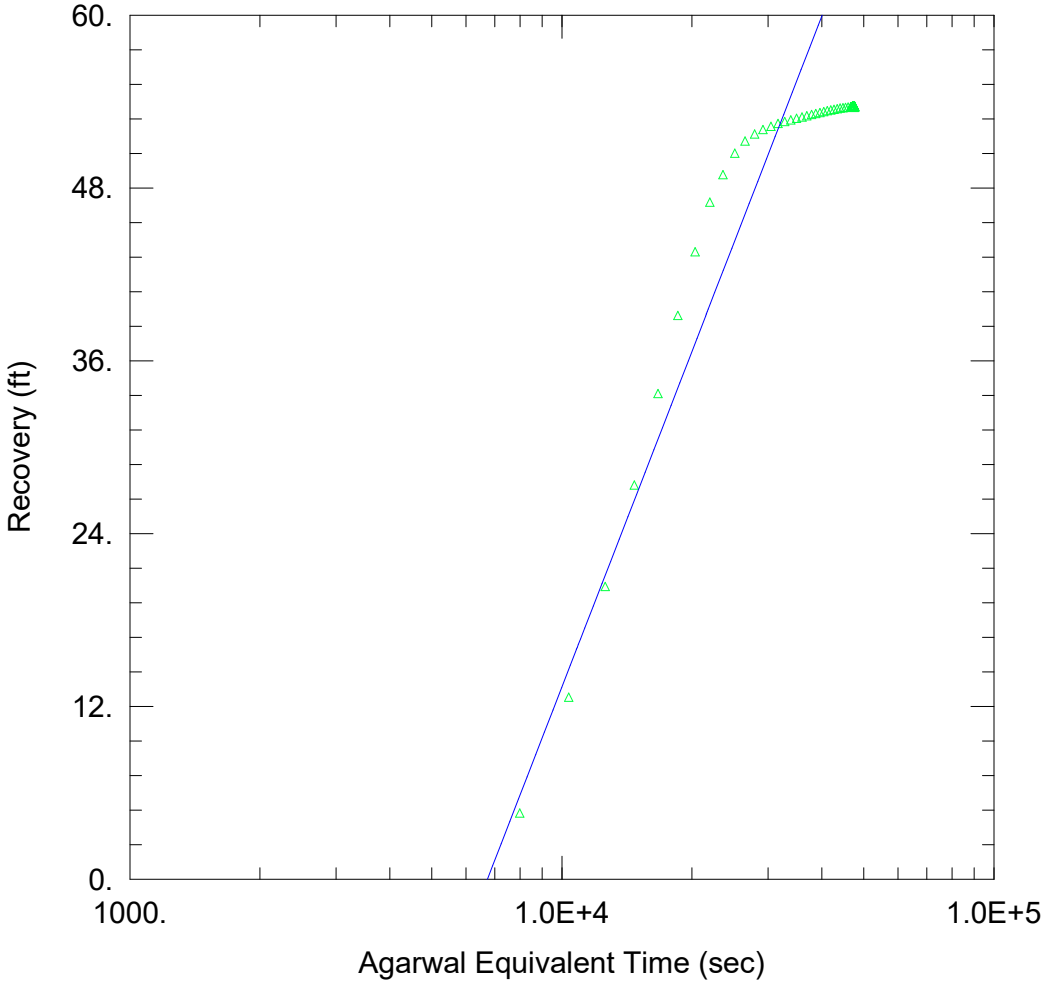
SOLUTION

Aquifer Model: Fractured Solution Method: Moench w/slab blocks

K = 0.3287 ft/day
K' = 1.889E-5 ft/day
Sw = 78.33
r(w) = 0.229 ft

Ss = 1.272E-6 ft^{-1}
Ss' = 4.838E-12 ft^{-1}
Sf = 5.
r(c) = 0.255 ft

Cooper-Jacob solution (OW1-1, recovery phase)



AREA 1

Data Set: S:\...\Area 1 - AQTESOLV revised 122019 - updated 0420.aqt
Date: 04/17/20 Time: 15:18:32

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-1
Test Date: 5/7/19 - 5/9/19

AQUIFER DATA

Saturated Thickness: 273. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-1	0	0

Observation Wells

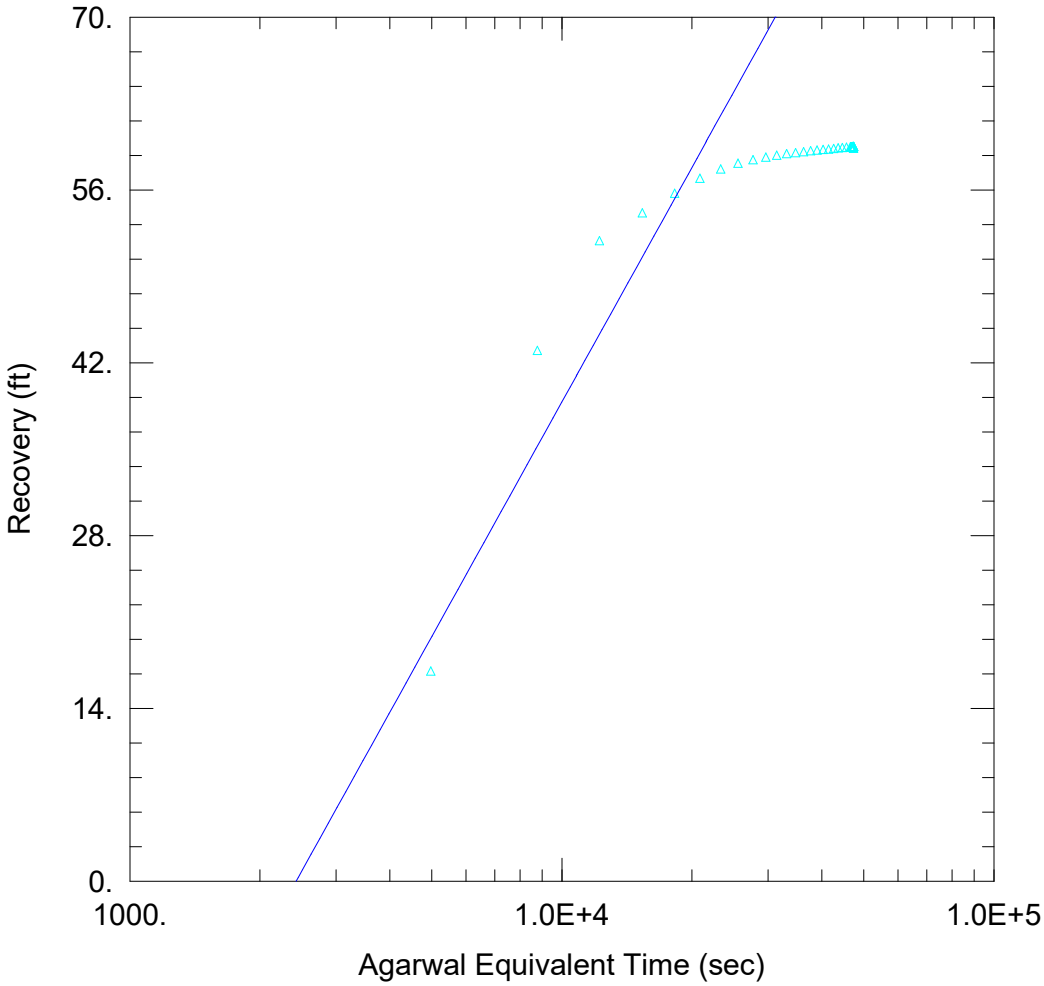
Well Name	X (ft)	Y (ft)
△ OW1-1	292	0

SOLUTION

Aquifer Model: Unconfined Solution Method: Cooper-Jacob

T = 10.48 ft^2/day S = 2.148E-5

Cooper-Jacob solution (OW1-2, recovery phase)



AREA 1

Data Set: S:\...\Area 1 - AQTESOLV revised 122019 - updated 0420.aqt
Date: 04/17/20 Time: 15:25:01

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-1
Test Date: 5/7/19 - 5/9/19

AQUIFER DATA

Saturated Thickness: 273. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-1	0	0

Observation Wells

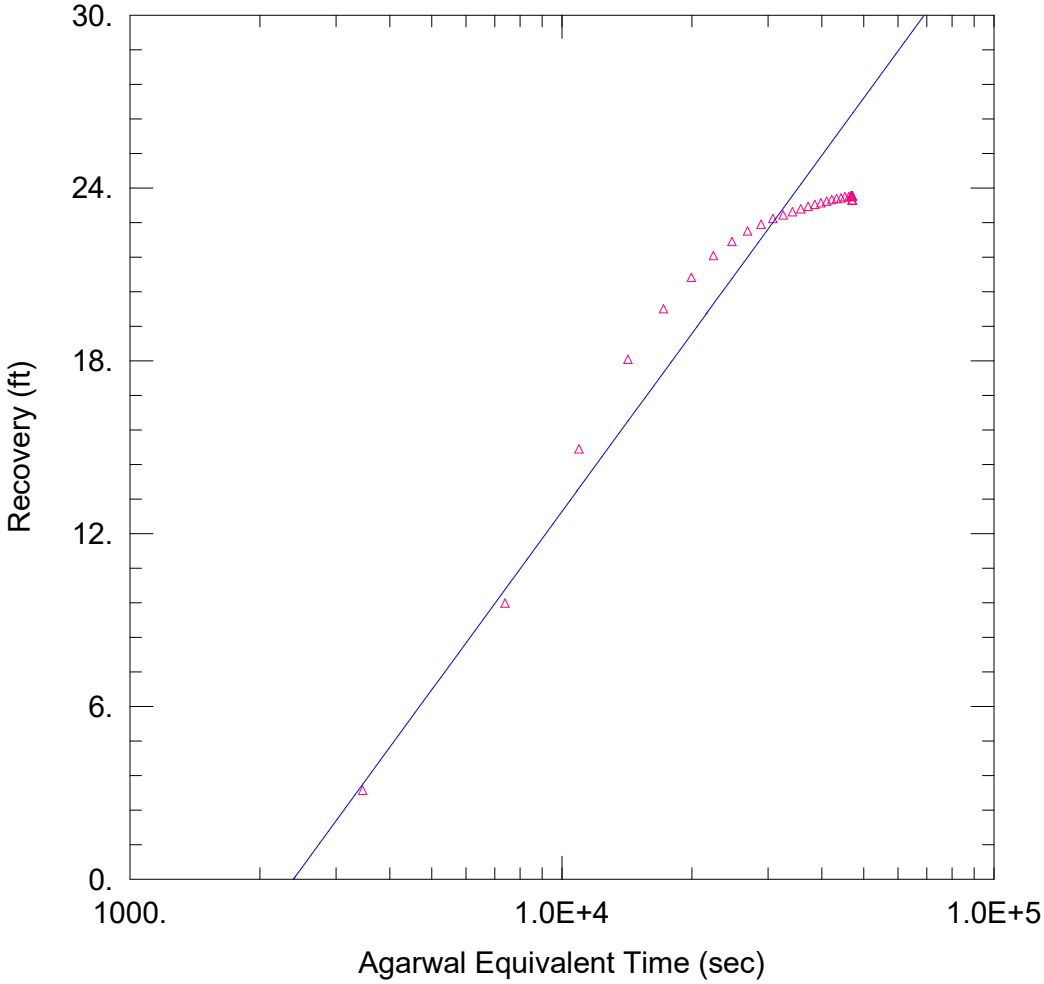
Well Name	X (ft)	Y (ft)
△ OW1-2	99.5	0

SOLUTION

Aquifer Model: Unconfined Solution Method: Cooper-Jacob

T = 12.85 ft^2/day S = 8.187E-5

Cooper-Jacob solution (OW1-3, recovery phase)



AREA 1

Data Set: S:\...\Area 1 - AQTESOLV revised 122019 - updated 0420.aqt
Date: 04/17/20 Time: 15:26:36

PROJECT INFORMATION

Company: Piedmont Geologic
Client: Carolina Sunrock
Project: 1925
Location: Caswell County, NC
Test Well: PW-1
Test Date: 5/7/19 - 5/9/19

AQUIFER DATA

Saturated Thickness: 273. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW-1	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
△ OW1-3	31	0

SOLUTION

Aquifer Model: Unconfined Solution Method: Cooper-Jacob

T = 39.49 ft^2/day S = 0.002554

APPENDIX F

LABORATORY RESULTS

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

May 21, 2019

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Piedmont Geologic

Sample Delivery Group:	L1098025
Samples Received:	05/11/2019
Project Number:	1925
Description:	Sunrock-Caswell Co Hydro
Report To:	Jonathan Murphrey 6003 Chapel Hill Road Suite 145 Raleigh, NC 27607

Entire Report Reviewed By:

Heather J Wagner
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	4
Sr: Sample Results	5
PW-1 EFFLUENT L1098025-01	5
Qc: Quality Control Summary	6
Mercury by Method 245.1	6
Metals (ICP) by Method 200.7	7
Gl: Glossary of Terms	10
Al: Accreditations & Locations	11
Sc: Sample Chain of Custody	12

PW-1 EFFLUENT L1098025-01 WW

Collected by	Collected date/time	Received date/time
Jon Murphrey	05/08/19 08:50	05/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 245.1	WG1280498	1	05/14/19 15:05	05/15/19 09:14	ABL	Mt. Juliet, TN
Metals (ICP) by Method 200.7	WG1280960	1	05/18/19 13:47	05/20/19 23:12	TRB	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Heather J Wagner
Project Manager

Mercury by Method 245.1

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.200	1	05/15/2019 09:14	WG1280498

Metals (ICP) by Method 200.7

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Aluminum	ND		200	1	05/20/2019 23:12	WG1280960
Antimony	ND		10.0	1	05/20/2019 23:12	WG1280960
Arsenic	ND		10.0	1	05/20/2019 23:12	WG1280960
Barium	14.9		5.00	1	05/20/2019 23:12	WG1280960
Beryllium	ND		2.00	1	05/20/2019 23:12	WG1280960
Cadmium	ND		2.00	1	05/20/2019 23:12	WG1280960
Calcium	35100		1000	1	05/20/2019 23:12	WG1280960
Chromium	ND		10.0	1	05/20/2019 23:12	WG1280960
Cobalt	ND		10.0	1	05/20/2019 23:12	WG1280960
Copper	ND		10.0	1	05/20/2019 23:12	WG1280960
Iron	ND		100	1	05/20/2019 23:12	WG1280960
Lead	ND		5.00	1	05/20/2019 23:12	WG1280960
Magnesium	8640		1000	1	05/20/2019 23:12	WG1280960
Manganese	134		10.0	1	05/20/2019 23:12	WG1280960
Nickel	ND		10.0	1	05/20/2019 23:12	WG1280960
Potassium	2580	B	1000	1	05/20/2019 23:12	WG1280960
Selenium	ND		10.0	1	05/20/2019 23:12	WG1280960
Silver	ND		5.00	1	05/20/2019 23:12	WG1280960
Sodium	16200		1000	1	05/20/2019 23:12	WG1280960
Sulfur	7000		1000	1	05/20/2019 23:12	WG1280960
Thallium	ND		10.0	1	05/20/2019 23:12	WG1280960
Vanadium	ND		20.0	1	05/20/2019 23:12	WG1280960
Zinc	ND		50.0	1	05/20/2019 23:12	WG1280960

Method Blank (MB)

(MB) R3411313-1 05/15/19 08:43

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Mercury	U		0.0490	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3411313-2 05/15/19 08:45 • (LCSD) R3411313-3 05/15/19 08:47

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	3.23	2.75	108	91.6	85.0-115			16.3	20

L1097670-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1097670-01 05/15/19 08:50 • (MS) R3411313-4 05/15/19 08:52 • (MSD) R3411313-5 05/15/19 09:00

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	U	2.64	2.57	88.0	85.7	1	70.0-130			2.73	20

L1098562-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1098562-01 05/15/19 09:02 • (MS) R3411313-6 05/15/19 09:05 • (MSD) R3411313-7 05/15/19 09:07

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	U	3.34	3.25	111	108	1	70.0-130			2.81	20

Method Blank (MB)

(MB) R3413070-1 05/20/19 22:24

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Aluminum	43.5	J	27.3	200
Antimony	U		7.70	10.0
Arsenic	U		6.40	10.0
Barium	U		1.00	5.00
Beryllium	U		0.700	2.00
Cadmium	U		0.700	2.00
Calcium	U		100	1000
Chromium	U		1.80	10.0
Cobalt	U		3.00	10.0
Copper	U		7.00	10.0
Iron	U		28.2	100
Lead	3.95	J	2.00	5.00
Magnesium	U		16.8	1000
Manganese	U		2.00	10.0
Nickel	U		5.80	10.0
Potassium	530	J	107	1000
Selenium	U		7.60	10.0
Silver	U		2.70	5.00
Sodium	747	J	93.9	1000
Sulfur	U		220	1000
Thallium	U		6.70	10.0
Vanadium	U		2.60	20.0
Zinc	14.6	J	3.40	50.0

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3413070-2 05/20/19 22:27 • (LCSD) R3413070-3 05/20/19 22:29

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	9910	9780	99.1	97.8	85.0-115			1.30	20
Antimony	1000	1050	1030	105	103	85.0-115			1.53	20
Arsenic	1000	1020	991	102	99.1	85.0-115			2.93	20
Barium	1000	1060	1040	106	104	85.0-115			1.93	20
Beryllium	1000	1040	1020	104	102	85.0-115			2.02	20
Cadmium	1000	1040	1020	104	102	85.0-115			1.99	20
Calcium	10000	10300	10100	103	101	85.0-115			1.40	20
Chromium	1000	997	991	99.7	99.1	85.0-115			0.636	20
Cobalt	1000	1020	1000	102	100	85.0-115			2.17	20
Copper	1000	991	983	99.1	98.3	85.0-115			0.851	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3413070-2 05/20/19 22:27 • (LCSD) R3413070-3 05/20/19 22:29

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Iron	10000	10000	9900	100	99.0	85.0-115			1.38	20
Lead	1000	1010	992	101	99.2	85.0-115			1.96	20
Magnesium	10000	10200	9930	102	99.3	85.0-115			2.31	20
Manganese	1000	990	981	99.0	98.1	85.0-115			0.901	20
Nickel	1000	1010	995	101	99.5	85.0-115			1.92	20
Potassium	10000	9900	9750	99.0	97.5	85.0-115			1.50	20
Selenium	1000	1090	1080	109	108	85.0-115			0.831	20
Silver	200	193	191	96.4	95.3	85.0-115			1.16	20
Sodium	10000	10600	10400	106	104	85.0-115			1.83	20
Sulfur	10000	10900	10700	109	107	85.0-115			2.11	20
Thallium	1000	1010	993	101	99.3	85.0-115			1.58	20
Vanadium	1000	1030	1010	103	101	85.0-115			1.63	20
Zinc	1000	1020	1000	102	100	85.0-115			2.13	20

L1097929-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1097929-07 05/20/19 22:32 • (MS) R3413070-5 05/20/19 22:37 • (MSD) R3413070-6 05/20/19 22:40

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	253	10100	10200	98.2	99.9	1	70.0-130			1.67	20
Antimony	1000	U	1050	1070	105	107	1	70.0-130			2.17	20
Arsenic	1000	U	1010	1030	101	103	1	70.0-130			1.87	20
Barium	1000	20.0	1060	1080	104	106	1	70.0-130			2.35	20
Beryllium	1000	U	1020	1040	102	104	1	70.0-130			2.48	20
Cadmium	1000	U	1030	1060	103	106	1	70.0-130			2.22	20
Calcium	10000	59700	72000	72300	123	126	1	70.0-130			0.388	20
Chromium	1000	U	975	998	97.5	99.8	1	70.0-130			2.30	20
Cobalt	1000	U	990	1010	99.0	101	1	70.0-130			2.15	20
Copper	1000	U	998	1020	99.8	102	1	70.0-130			2.62	20
Iron	10000	273	10000	10300	97.5	100	1	70.0-130			2.86	20
Lead	1000	U	998	1020	99.8	102	1	70.0-130			2.04	20
Magnesium	10000	37100	48200	48400	112	114	1	70.0-130			0.419	20
Manganese	1000	35.1	998	1020	96.3	98.8	1	70.0-130			2.47	20
Nickel	1000	U	981	1000	98.1	100	1	70.0-130			2.12	20
Potassium	10000	1890	11300	11500	93.9	96.4	1	70.0-130			2.17	20
Selenium	1000	U	1090	1110	109	111	1	70.0-130			1.62	20
Silver	200	U	192	198	96.2	98.8	1	70.0-130			2.72	20
Sodium	10000	8340	18200	18500	98.9	102	1	70.0-130			1.54	20
Sulfur	10000	14600	26200	26200	116	116	1	70.0-130			0.108	20

L1097929-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1097929-07 05/20/19 22:32 • (MS) R3413070-5 05/20/19 22:37 • (MSD) R3413070-6 05/20/19 22:40

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Thallium	1000	U	1030	1030	103	103	1	70.0-130			0.0966	20
Vanadium	1000	3.23	1020	1030	101	103	1	70.0-130			1.68	20
Zinc	1000	4.37	981	1000	97.7	99.8	1	70.0-130			2.18	20

L1098040-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1098040-06 05/20/19 22:42 • (MS) R3413070-7 05/20/19 22:45 • (MSD) R3413070-8 05/20/19 22:47

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	ND	9650	9930	96.0	98.8	1	70.0-130			2.89	20
Antimony	1000	ND	1060	1060	106	106	1	70.0-130			0.517	20
Arsenic	1000	ND	1020	1030	102	103	1	70.0-130			0.193	20
Barium	1000	56.8	1100	1110	104	105	1	70.0-130			1.18	20
Beryllium	1000	ND	1020	1030	102	103	1	70.0-130			1.68	20
Cadmium	1000	4.66	1040	1050	104	105	1	70.0-130			1.02	20
Calcium	10000	64700	76700	78200	119	135	1	70.0-130		V	2.05	20
Chromium	1000	ND	963	980	96.3	98.0	1	70.0-130			1.75	20
Cobalt	1000	ND	993	1000	99.3	100	1	70.0-130			0.746	20
Copper	1000	ND	995	1010	99.5	101	1	70.0-130			1.72	20
Iron	10000	ND	9680	9970	96.8	99.7	1	70.0-130			2.90	20
Lead	1000	ND	986	1000	98.2	100	1	70.0-130			1.74	20
Magnesium	10000	11400	21300	21700	99.5	103	1	70.0-130			1.72	20
Manganese	1000	ND	966	984	95.7	97.5	1	70.0-130			1.80	20
Nickel	1000	ND	980	990	98.0	99.0	1	70.0-130			1.06	20
Potassium	10000	1360	10700	10900	93.2	95.3	1	70.0-130			2.00	20
Selenium	1000	ND	1080	1090	108	109	1	70.0-130			0.840	20
Silver	200	ND	192	194	96.2	96.8	1	70.0-130			0.683	20
Sodium	10000	11400	21400	21900	100	105	1	70.0-130			2.23	20
Sulfur	10000	21100	32900	33100	117	120	1	70.0-130			0.825	20
Thallium	1000	ND	1000	1010	100	101	1	70.0-130			0.721	20
Vanadium	1000	ND	1010	1030	101	103	1	70.0-130			1.71	20
Zinc	1000	269	1260	1280	98.9	101	1	70.0-130			1.57	20

1 Cp
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7 Gl
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9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

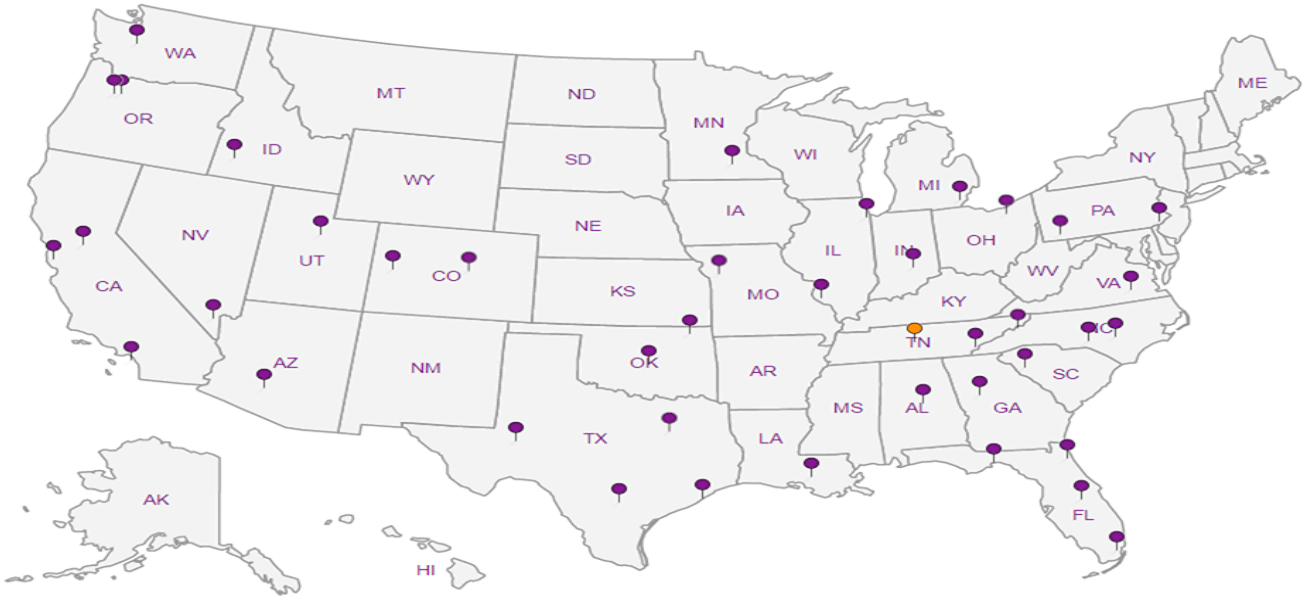
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Piedmont Geologic
6003-145 Chapel Hill Road
Raleigh, NC 27607

Billing Information: **same**

Report to: **Jon Murphrey**

Email To: **jmurphrey@piedmontgeologic.com**

Project Description: **Sunrock - Caswell Co Hydro**

City/State Collected: **Prospect Hill, NC**

Phone: **919-854-9700**
Fax:

Client Project # **1925**

Lab Project #

Collected by (print): **Jon Murphrey**

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Pres Chk: <2

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TAL metals + sulfur by 200.7	Remarks	Sample # (lab only)
PW-1 Effluent	**Grab**	**GW**		**5/8/19**	**850**	**1**	X		-01

RAD SCREEN: <0.5 mR/hr

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # 1098025

Table # F104

Acctnum:

Template:

Prelogin:

TSR:

PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
	5/10/19	930			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
	5/10/19	1550		1.0+0=1.0 pH A2 1	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: / Condition: NCF / OK
			KWillis	5/11/19 845	

ANALYTICAL REPORT

May 15, 2019

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
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9 Sc

Piedmont Geologic

Sample Delivery Group:	L1096383
Samples Received:	05/07/2019
Project Number:	1925
Description:	Sunrock-Caswell County Hydro
Report To:	Pete Dressel 6003 Chapel Hill Rd Ste 145 Raleigh, NC 27607

Entire Report Reviewed By:

Heather J Wagner
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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ONE LAB. NATIONWIDE.

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PW-2 EFFLUENT L1096383-01 WW

Collected by	Collected date/time	Received date/time
Jonathan Murphey	05/03/19 06:15	05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 245.1	WG1278249	1	05/09/19 12:11	05/09/19 20:24	TCT	Mt. Juliet, TN
Metals (ICP) by Method 200.7	WG1280123	1	05/13/19 11:01	05/14/19 08:05	CCE	Mt. Juliet, TN

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Heather J Wagner
Project Manager

Mercury by Method 245.1

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	0.461	B	0.200	1	05/09/2019 20:24	WG1278249

Metals (ICP) by Method 200.7

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Aluminum	ND		200	1	05/14/2019 08:05	WG1280123
Antimony	ND		10.0	1	05/14/2019 08:05	WG1280123
Arsenic	ND		10.0	1	05/14/2019 08:05	WG1280123
Barium	11.5		5.00	1	05/14/2019 08:05	WG1280123
Beryllium	ND		2.00	1	05/14/2019 08:05	WG1280123
Cadmium	ND		2.00	1	05/14/2019 08:05	WG1280123
Calcium	45800		1000	1	05/14/2019 08:05	WG1280123
Chromium	ND		10.0	1	05/14/2019 08:05	WG1280123
Cobalt	ND		10.0	1	05/14/2019 08:05	WG1280123
Copper	ND		10.0	1	05/14/2019 08:05	WG1280123
Iron	ND		100	1	05/14/2019 08:05	WG1280123
Lead	ND		5.00	1	05/14/2019 08:05	WG1280123
Magnesium	16100		1000	1	05/14/2019 08:05	WG1280123
Manganese	317		10.0	1	05/14/2019 08:05	WG1280123
Nickel	ND		10.0	1	05/14/2019 08:05	WG1280123
Potassium	2660		1000	1	05/14/2019 08:05	WG1280123
Selenium	ND		10.0	1	05/14/2019 08:05	WG1280123
Silver	ND		5.00	1	05/14/2019 08:05	WG1280123
Sodium	13500		1000	1	05/14/2019 08:05	WG1280123
Sulfur	4090		1000	1	05/14/2019 08:05	WG1280123
Thallium	ND		10.0	1	05/14/2019 08:05	WG1280123
Vanadium	ND		20.0	1	05/14/2019 08:05	WG1280123
Zinc	ND		50.0	1	05/14/2019 08:05	WG1280123

Method Blank (MB)

(MB) R3409894-1 05/09/19 19:35

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Mercury	0.0733	J	0.0490	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3409894-2 05/09/19 19:37 • (LCSD) R3409894-3 05/09/19 19:40

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	3.09	3.01	103	100	85.0-115			2.56	20

L1092728-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1092728-01 05/09/19 19:42 • (MS) R3409894-4 05/09/19 19:44 • (MSD) R3409894-5 05/09/19 19:54

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	0.690	2.55	2.54	62.1	61.6	1	70.0-130	J6	J6	0.617	20

L1096703-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1096703-01 05/09/19 19:57 • (MS) R3409894-6 05/09/19 19:59 • (MSD) R3409894-7 05/09/19 20:02

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	0.374	2.71	2.65	77.8	75.9	1	70.0-130			2.16	20

Method Blank (MB)

(MB) R3411087-1 05/14/19 07:47

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Aluminum	27.4	J	27.3	200
Antimony	U		7.70	10.0
Arsenic	U		6.40	10.0
Barium	U		1.00	5.00
Beryllium	U		0.700	2.00
Cadmium	U		0.700	2.00
Calcium	U		100	1000
Chromium	U		1.80	10.0
Cobalt	U		3.00	10.0
Copper	U		7.00	10.0
Iron	U		28.2	100
Lead	U		2.00	5.00
Magnesium	43.2	J	16.8	1000
Manganese	U		2.00	10.0
Nickel	U		5.80	10.0
Potassium	110	J	107	1000
Selenium	U		7.60	10.0
Silver	U		2.70	5.00
Sodium	272	J	93.9	1000
Thallium	U		6.70	10.0
Vanadium	3.26	J	2.60	20.0
Zinc	U		3.40	50.0
Sulfur	U		220	1000

L1095478-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1095478-04 05/14/19 07:55 • (MS) R3411087-5 05/14/19 08:00 • (MSD) R3411087-6 05/14/19 08:02

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	393	10500	10100	101	97.1	1	70.0-130			4.16	20
Antimony	1000	ND	1050	1020	105	102	1	70.0-130			2.34	20
Arsenic	1000	ND	1040	1020	104	102	1	70.0-130			1.89	20
Barium	1000	66.4	1140	1110	107	104	1	70.0-130			2.88	20
Beryllium	1000	ND	1050	1010	105	101	1	70.0-130			4.35	20
Cadmium	1000	ND	1060	1030	106	103	1	70.0-130			3.19	20
Calcium	10000	78800	90200	88400	113	95.5	1	70.0-130			1.99	20
Chromium	1000	ND	1010	967	101	96.4	1	70.0-130			4.24	20
Cobalt	1000	ND	1030	1000	103	100	1	70.0-130			2.87	20
Copper	1000	37.3	1090	1050	105	101	1	70.0-130			4.03	20

L1095478-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1095478-04 05/14/19 07:55 • (MS) R3411087-5 05/14/19 08:00 • (MSD) R3411087-6 05/14/19 08:02

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Iron	10000	1070	11200	10800	102	97.5	1	70.0-130			3.83	20
Lead	1000	ND	1040	1010	104	101	1	70.0-130			2.24	20
Magnesium	10000	14700	24900	24200	103	95.3	1	70.0-130			3.00	20
Manganese	1000	27.4	1030	992	101	96.5	1	70.0-130			4.07	20
Nickel	1000	ND	1030	1000	102	99.7	1	70.0-130			2.44	20
Potassium	10000	6960	17200	16900	103	99.4	1	70.0-130			1.86	20
Selenium	1000	ND	1110	1090	111	109	1	70.0-130			2.58	20
Silver	200	ND	207	198	103	98.9	1	70.0-130			4.35	20
Sodium	10000	64300	74200	73100	99.7	88.6	1	70.0-130			1.51	20
Thallium	1000	ND	1050	1020	105	102	1	70.0-130			3.66	20
Vanadium	1000	ND	1030	991	103	98.8	1	70.0-130			4.18	20
Zinc	1000	ND	1050	1030	100	97.9	1	70.0-130			2.50	20

L1096383-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1096383-01 05/14/19 08:05 • (MS) R3411087-7 05/14/19 08:07 • (MSD) R3411087-8 05/14/19 08:10

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	ND	9450	9420	94.5	94.2	1	70.0-130			0.346	20
Antimony	1000	ND	1030	1030	103	103	1	70.0-130			0.166	20
Arsenic	1000	ND	990	977	99.0	97.7	1	70.0-130			1.24	20
Barium	1000	11.5	1050	1040	103	102	1	70.0-130			0.946	20
Beryllium	1000	ND	979	986	97.9	98.6	1	70.0-130			0.675	20
Cadmium	1000	ND	1010	999	101	99.9	1	70.0-130			1.12	20
Calcium	10000	45800	57600	56100	117	102	1	70.0-130			2.68	20
Chromium	1000	ND	958	956	95.8	95.6	1	70.0-130			0.171	20
Cobalt	1000	ND	979	971	97.9	97.1	1	70.0-130			0.889	20
Copper	1000	ND	992	987	99.2	98.7	1	70.0-130			0.531	20
Iron	10000	ND	9580	9610	95.1	95.4	1	70.0-130			0.320	20
Lead	1000	ND	995	983	99.5	98.3	1	70.0-130			1.23	20
Magnesium	10000	16100	26100	25600	99.7	95.1	1	70.0-130			1.81	20
Manganese	1000	317	1290	1270	97.0	95.8	1	70.0-130			0.933	20
Nickel	1000	ND	977	967	97.7	96.7	1	70.0-130			1.02	20
Potassium	10000	2660	12300	12300	96.9	96.0	1	70.0-130			0.691	20
Selenium	1000	ND	1050	1040	105	104	1	70.0-130			1.50	20
Silver	200	ND	194	194	97.1	96.9	1	70.0-130			0.183	20
Sodium	10000	13500	23900	23400	103	98.9	1	70.0-130			1.93	20
Thallium	1000	ND	1010	1000	101	100	1	70.0-130			0.694	20
Vanadium	1000	ND	964	964	96.4	96.4	1	70.0-130			0.0135	20

L1096383-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1096383-01 05/14/19 08:05 • (MS) R3411087-7 05/14/19 08:07 • (MSD) R3411087-8 05/14/19 08:10

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Zinc	1000	ND	967	957	96.7	95.7	1	70.0-130			1.05	20
Sulfur	10000	4090	15200	14900	111	108	1	70.0-130			2.26	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

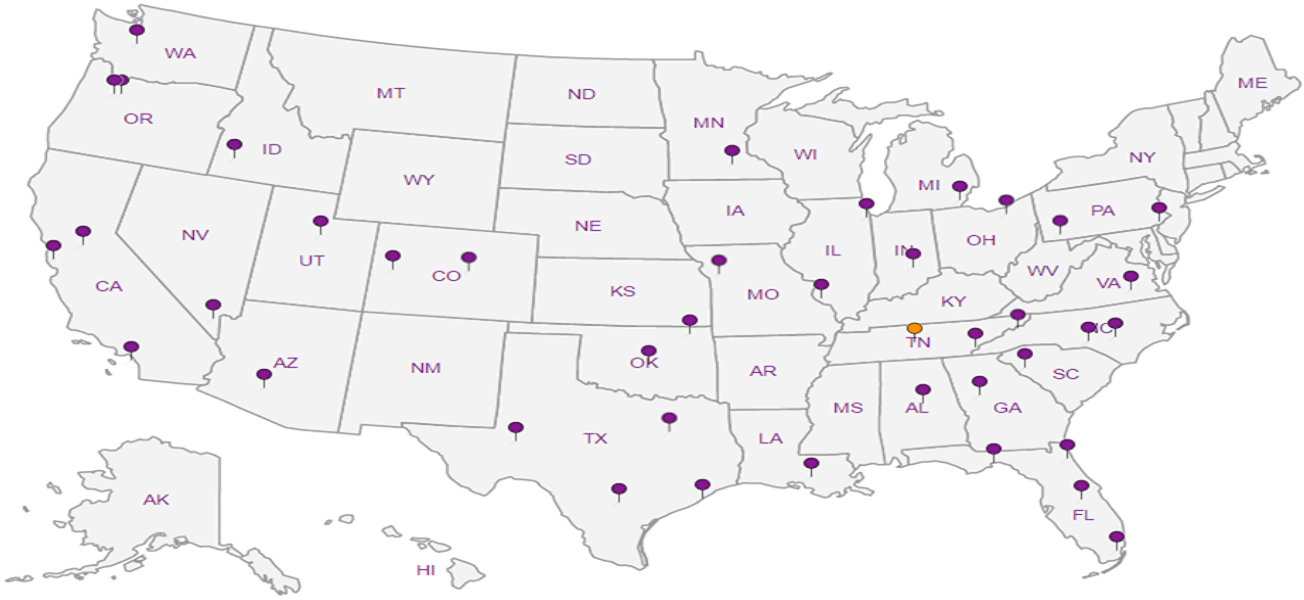
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Company Name/Address:
Piedmont Geologic
6003-145 Chapel Hill Road
Raleigh, NC 27607

Billing Information:

Report to: **Pete Dressel**

Email To: **pjdressel@piedmontgeologic.com**

Project Description: **Sunrock-Caswell County Hydro**

City/State Collected: Prospect Hill, NC

Phone: **(919) 854-9700**
Fax:

Client Project # **1925**

Lab Project #

Collected by (print): Jonathan Murphy

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ____

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No ___Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LAB SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1096383
Table # F118
Acctnum: **PIEGEO**
Template:
Prelogin:
TSR: **Wagner**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Metals - 250ml HDPE HNO3 (plus Sulfur)	Rem./Contaminant	Sample # (lab only)
PW-2 Effluent	GRAB	WT	—	5/3/19	615	1	X		-01

RAD SCREEN: <0.5 mR/hr

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: 4882 8629 2831

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	5/6/19	820	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	5/6/19	1535	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			KWillis

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 2.550-2.6°C Bottles Received: 1

Date: 5/7/19 Time: 845

Hold #

Condition: (lab use only)

COC Seal Intact: ____Y ____N ✓NA

pH Checked: NCF:

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: PIEGEO		SDG#:	L1096383
Cooler Received/Opened On: ~~5/8/19~~ TM 5/7/19		Temperature:	2.6
Received By: Kristin Willis			
Signature: KWillis			

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?		✓	

Pace Analytical®
National Center for Testing & Innovation

Login #:L1096383	Client:PIEGEO	Date:05/07/19	Evaluated by:AM

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time		Login Clarification Needed		**If Broken Container:**
	Temperature not in range		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
x	pH not in range.		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Received Metals container for ID PW-2 Effluent not preserved.

Client informed by:		Call	x	Email		Voice Mail		Date: 5/8/19	Time:
TSR Initials: hw	Client Contact: Jonathan Murphrey								

Login Instructions: preserve the container and log for M200.7TAL, SICP

ANALYTICAL REPORT

January 02, 2020

Piedmont Geologic

Sample Delivery Group:	L1174333
Samples Received:	12/27/2019
Project Number:	1925
Description:	Sunrock - Caswell Co Hydro
Report To:	Pete Dressel 6003 Chapel Hill Rd Ste 145 Raleigh, NC 27607

Entire Report Reviewed By:

Heather J Wagner
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

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PW-1 (UNFILTERED) L1174333-01 WW

Collected by	Collected date/time	Received date/time
Nick Murphrey	12/23/19 13:40	12/27/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 245.1	WG1403906	1	12/30/19 17:10	12/31/19 09:57	ABL	Mt. Juliet, TN
Metals (ICP) by Method 200.7	WG1403163	1	12/29/19 07:35	12/31/19 00:03	RDS	Mt. Juliet, TN
Metals (ICP) by Method 200.7	WG1403163	5	12/29/19 07:35	12/31/19 10:26	EL	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Heather J Wagner
Project Manager

Mercury by Method 245.1

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.200	1	12/31/2019 09:57	WG1403906

Metals (ICP) by Method 200.7

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Aluminum	847		200	1	12/31/2019 00:03	WG1403163
Antimony	ND		10.0	1	12/31/2019 00:03	WG1403163
Arsenic	ND		10.0	1	12/31/2019 00:03	WG1403163
Barium	11.5		5.00	1	12/31/2019 00:03	WG1403163
Beryllium	ND		2.00	1	12/31/2019 00:03	WG1403163
Cadmium	ND		2.00	1	12/31/2019 00:03	WG1403163
Calcium	10800		1000	1	12/31/2019 00:03	WG1403163
Chromium	ND		10.0	1	12/31/2019 00:03	WG1403163
Cobalt	ND		10.0	1	12/31/2019 00:03	WG1403163
Copper	ND		10.0	1	12/31/2019 00:03	WG1403163
Iron	1780		100	1	12/31/2019 00:03	WG1403163
Lead	ND		5.00	1	12/31/2019 00:03	WG1403163
Magnesium	7330		1000	1	12/31/2019 00:03	WG1403163
Manganese	36.5		10.0	1	12/31/2019 00:03	WG1403163
Nickel	ND		10.0	1	12/31/2019 00:03	WG1403163
Potassium	2980		1000	1	12/31/2019 00:03	WG1403163
Selenium	ND		10.0	1	12/31/2019 00:03	WG1403163
Silver	ND		5.00	1	12/31/2019 00:03	WG1403163
Sodium	15500		1000	1	12/31/2019 00:03	WG1403163
Sulfur	6960		5000	5	12/31/2019 10:26	WG1403163
Thallium	ND		10.0	1	12/31/2019 00:03	WG1403163
Vanadium	ND		20.0	1	12/31/2019 00:03	WG1403163
Zinc	ND		50.0	1	12/31/2019 00:03	WG1403163

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3487225-1 12/31/19 09:18

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Mercury	U		0.0490	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3487225-2 12/31/19 09:20 • (LCSD) R3487225-3 12/31/19 09:21

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	3.08	2.97	103	99.1	85.0-115			3.48	20

L1174290-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1174290-01 12/31/19 09:23 • (MS) R3487225-4 12/31/19 09:29 • (MSD) R3487225-5 12/31/19 09:31

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	U	2.53	2.44	84.3	81.3	1	70.0-130			3.62	20

L1174582-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1174582-04 12/31/19 09:33 • (MS) R3487225-6 12/31/19 09:35 • (MSD) R3487225-7 12/31/19 09:37

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	U	2.78	2.65	92.6	88.4	1	70.0-130			4.68	20

Method Blank (MB)

(MB) R3487153-1 12/30/19 22:52

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Aluminum	47.4	J	27.3	200
Antimony	U		7.70	10.0
Arsenic	U		6.40	10.0
Barium	U		1.00	5.00
Beryllium	U		0.700	2.00
Cadmium	U		0.700	2.00
Calcium	U		100	1000
Chromium	U		1.80	10.0
Cobalt	U		3.00	10.0
Copper	U		7.00	10.0
Iron	U		28.2	100
Lead	U		2.00	5.00
Magnesium	U		16.8	1000
Manganese	U		2.00	10.0
Nickel	U		5.80	10.0
Potassium	U		107	1000
Selenium	U		7.60	10.0
Silver	U		2.70	5.00
Sodium	U		93.9	1000
Sulfur	U		220	1000
Thallium	U		6.70	10.0
Vanadium	U		2.60	20.0
Zinc	U		3.40	50.0

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3487153-2 12/30/19 22:55 • (LCSD) R3487153-3 12/30/19 22:58

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	10200	10000	102	100	85.0-115			1.94	20
Antimony	1000	1000	988	100	98.8	85.0-115			1.28	20
Arsenic	1000	997	985	99.7	98.5	85.0-115			1.16	20
Barium	1000	1020	1000	102	100	85.0-115			1.36	20
Beryllium	1000	1010	999	101	99.9	85.0-115			1.40	20
Cadmium	1000	965	953	96.5	95.3	85.0-115			1.21	20
Calcium	10000	9970	9840	99.7	98.4	85.0-115			1.29	20
Chromium	1000	956	943	95.6	94.3	85.0-115			1.34	20
Cobalt	1000	999	982	99.9	98.2	85.0-115			1.72	20
Copper	1000	977	961	97.7	96.1	85.0-115			1.72	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3487153-2 12/30/19 22:55 • (LCSD) R3487153-3 12/30/19 22:58

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Iron	10000	9840	9760	98.4	97.6	85.0-115			0.878	20
Lead	1000	986	969	98.6	96.9	85.0-115			1.75	20
Magnesium	10000	10400	10300	104	103	85.0-115			1.54	20
Manganese	1000	954	937	95.4	93.7	85.0-115			1.81	20
Nickel	1000	985	969	98.5	96.9	85.0-115			1.64	20
Potassium	10000	9830	9670	98.3	96.7	85.0-115			1.70	20
Selenium	1000	1010	1000	101	100	85.0-115			1.20	20
Silver	200	182	180	91.0	89.8	85.0-115			1.29	20
Sodium	10000	9980	9890	99.8	98.9	85.0-115			0.909	20
Sulfur	10000	9960	9800	99.6	98.0	85.0-115			1.62	20
Thallium	1000	1010	993	101	99.3	85.0-115			1.74	20
Vanadium	1000	1010	1010	101	101	85.0-115			0.635	20
Zinc	1000	960	946	96.0	94.6	85.0-115			1.46	20

L1173803-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1173803-02 12/30/19 23:00 • (MS) R3487153-5 12/30/19 23:06 • (MSD) R3487153-6 12/30/19 23:08

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	ND	10000	10100	99.0	99.4	1	70.0-130			0.389	20
Antimony	1000	ND	1020	999	102	99.9	1	70.0-130			2.09	20
Arsenic	1000	12.6	1040	1030	103	102	1	70.0-130			0.979	20
Barium	1000	9.05	1000	994	99.3	98.5	1	70.0-130			0.764	20
Beryllium	1000	2.50	1000	998	100	99.5	1	70.0-130			0.551	20
Cadmium	1000	64.1	1070	1060	100	99.3	1	70.0-130			0.802	20
Calcium	10000	5360	15100	15000	97.6	96.2	1	70.0-130			0.907	20
Chromium	1000	21.1	957	952	93.6	93.1	1	70.0-130			0.532	20
Cobalt	1000	ND	1060	1050	105	104	1	70.0-130			0.814	20
Copper	1000	19.6	1000	996	98.1	97.6	1	70.0-130			0.498	20
Iron	10000	1260	11000	11000	97.9	97.7	1	70.0-130			0.183	20
Lead	1000	ND	1020	1010	102	100	1	70.0-130			1.50	20
Magnesium	10000	ND	10700	10600	99.4	98.4	1	70.0-130			0.995	20
Manganese	1000	14.9	947	940	93.2	92.5	1	70.0-130			0.791	20
Nickel	1000	53.8	1090	1080	104	103	1	70.0-130			0.931	20
Potassium	10000	1400	11400	11500	100	101	1	70.0-130			0.719	20
Selenium	1000	ND	1070	1070	107	107	1	70.0-130			0.523	20
Silver	200	ND	188	187	94.1	93.6	1	70.0-130			0.446	20
Sodium	10000	1280000	1330000	1310000	428	266	1	70.0-130	E V	E V	1.23	20
Sulfur	10000	226000	242000	239000	160	130	1	70.0-130	E V	E	1.25	20

L1173803-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1173803-02 12/30/19 23:00 • (MS) R3487153-5 12/30/19 23:06 • (MSD) R3487153-6 12/30/19 23:08

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Thallium	1000	ND	1020	1010	102	101	1	70.0-130			0.610	20
Vanadium	1000	ND	1010	999	101	99.5	1	70.0-130			1.04	20
Zinc	1000	57.1	1010	1010	95.6	94.9	1	70.0-130			0.678	20

L1173855-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1173855-01 12/30/19 23:11 • (MS) R3487153-7 12/30/19 23:14 • (MSD) R3487153-8 12/30/19 23:16

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	ND	10400	10800	103	107	1	70.0-130			3.52	20
Antimony	1000	ND	1010	1040	101	104	1	70.0-130			3.05	20
Arsenic	1000	ND	1010	1050	101	105	1	70.0-130			3.41	20
Barium	1000	9.31	1030	1060	102	105	1	70.0-130			2.77	20
Beryllium	1000	ND	1020	1050	102	105	1	70.0-130			2.97	20
Cadmium	1000	ND	976	1000	97.6	100	1	70.0-130			2.82	20
Calcium	10000	24500	35400	36100	109	117	1	70.0-130			2.10	20
Chromium	1000	ND	965	998	96.5	99.8	1	70.0-130			3.29	20
Cobalt	1000	ND	1000	1030	100	103	1	70.0-130			2.96	20
Copper	1000	ND	985	1010	98.5	101	1	70.0-130			2.34	20
Iron	10000	ND	10000	10400	99.2	103	1	70.0-130			3.54	20
Lead	1000	ND	996	1030	99.6	103	1	70.0-130			3.54	20
Magnesium	10000	2710	13100	13400	104	107	1	70.0-130			2.24	20
Manganese	1000	ND	967	994	96.1	98.8	1	70.0-130			2.78	20
Nickel	1000	ND	991	1020	99.1	102	1	70.0-130			2.83	20
Potassium	10000	2240	12100	12400	98.8	102	1	70.0-130			2.43	20
Selenium	1000	ND	1020	1050	102	105	1	70.0-130			3.45	20
Silver	200	ND	185	190	92.5	95.1	1	70.0-130			2.70	20
Sodium	10000	5970	15900	16300	99.6	103	1	70.0-130			2.25	20
Sulfur	10000	4150	14500	15000	104	108	1	70.0-130			2.98	20
Thallium	1000	ND	1010	1050	101	105	1	70.0-130			3.18	20
Vanadium	1000	ND	1020	1050	102	105	1	70.0-130			2.84	20
Zinc	1000	ND	978	1010	96.7	99.5	1	70.0-130			2.80	20

1 Cp
2 Tc
3 Ss
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Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

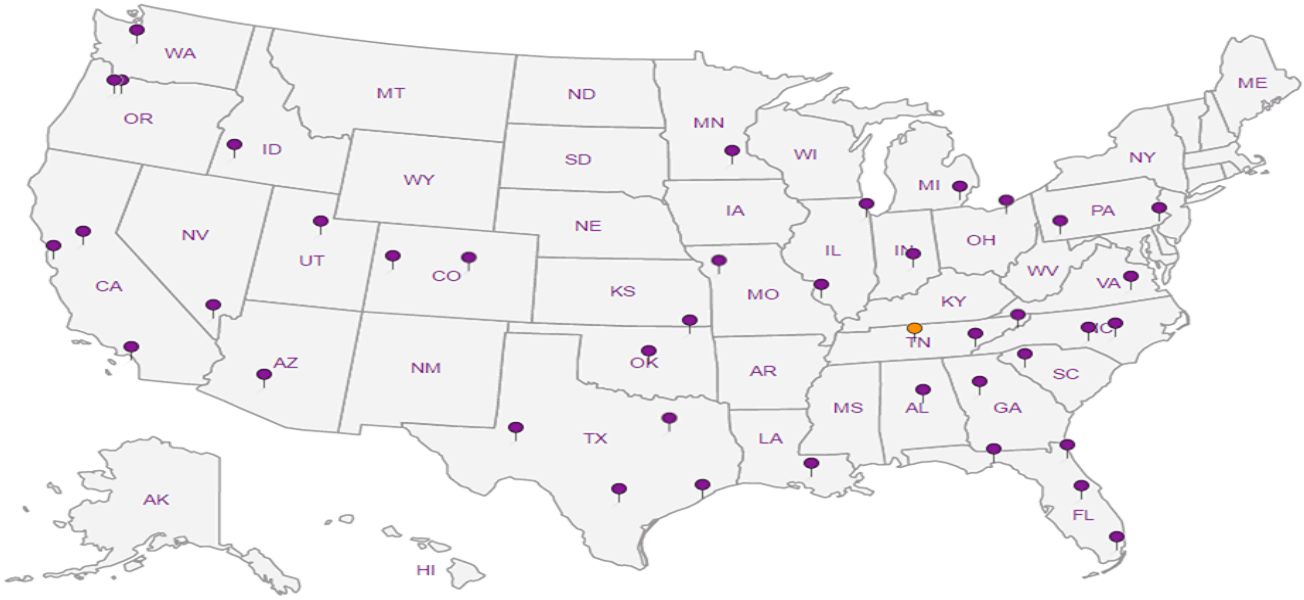
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Piedmont Geologic
6003-145 Chapel Hill Road
Raleigh, NC 27607

Billing Information: * Picked up
Same

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1174333
D189

Report to: Jon Murphrey
Email To: jmurphrey@piedmontgeologic.com
Project Description: Sunrock-Caswell Co Hydro
City/State Collected: Prospect Hill, NC
Phone: 919-854-9700
Fax:
Client Project # 1925
Lab Project #
Collected by (print): Nick Murphrey
Site/Facility ID #
P.O. #
Collected by (signature):
Immediately Packed on Ice N ___ Y ✓
Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Quote #
Date Results Needed

Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TAL metals + sulfur by 200.7/245.1	Remarks	Sample # (lab only)
PW-1 (unfiltered)	Grab	GW		12/23/19	1340	2	X		-01

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Sample is unfiltered

pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____

Tracking # 1145 2239 9343

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

RAD SCREEN: <0.5 mR/hr

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeOH TBR
	12/23/19	1553	12-26-19 1221	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: A3 °C 1.7+.1=1.8 Bottles Received: 2
	12-26-19	1229		
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:
	12-26-19	1700		12/27/19 830

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

ANALYTICAL REPORT

January 02, 2020

1 Cp
2 Tc
3 Ss
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6 Qc
7 Gl
8 Al
9 Sc

Piedmont Geologic

Sample Delivery Group:	L1174330
Samples Received:	12/27/2019
Project Number:	1925
Description:	Sunrock-Caswell Co Hydro
Report To:	Jonathan Murphrey 6003 Chapel Hill Road Suite 145 Raleigh, NC 27607

Entire Report Reviewed By:

Heather J Wagner
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

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PW-2 (UNFILTERED) L1174330-01 WW

Collected by	Collected date/time	Received date/time
Nick Murphrey	12/23/19 12:15	12/27/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 245.1	WG1403906	1	12/30/19 17:10	12/31/19 09:55	ABL	Mt. Juliet, TN
Metals (ICP) by Method 200.7	WG1403163	1	12/29/19 07:35	12/31/19 00:00	EL	Mt. Juliet, TN
Metals (ICP) by Method 200.7	WG1403163	5	12/29/19 07:35	12/31/19 10:23	EL	Mt. Juliet, TN

1 Cp
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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Heather J Wagner
Project Manager

Mercury by Method 245.1

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.200	1	12/31/2019 09:55	WG1403906

Metals (ICP) by Method 200.7

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Aluminum	685		200	1	12/31/2019 00:00	WG1403163
Antimony	ND		10.0	1	12/31/2019 00:00	WG1403163
Arsenic	ND		10.0	1	12/31/2019 00:00	WG1403163
Barium	24.5		5.00	1	12/31/2019 00:00	WG1403163
Beryllium	ND		2.00	1	12/31/2019 00:00	WG1403163
Cadmium	ND		2.00	1	12/31/2019 00:00	WG1403163
Calcium	31500		1000	1	12/31/2019 00:00	WG1403163
Chromium	ND		10.0	1	12/31/2019 00:00	WG1403163
Cobalt	ND		10.0	1	12/31/2019 00:00	WG1403163
Copper	ND		10.0	1	12/31/2019 00:00	WG1403163
Iron	1210		100	1	12/31/2019 00:00	WG1403163
Lead	ND		5.00	1	12/31/2019 00:00	WG1403163
Magnesium	15200		1000	1	12/31/2019 00:00	WG1403163
Manganese	91.1		10.0	1	12/31/2019 00:00	WG1403163
Nickel	ND		10.0	1	12/31/2019 00:00	WG1403163
Potassium	4910		1000	1	12/31/2019 00:00	WG1403163
Selenium	ND		10.0	1	12/31/2019 00:00	WG1403163
Silver	ND		5.00	1	12/31/2019 00:00	WG1403163
Sodium	16400		1000	1	12/31/2019 00:00	WG1403163
Sulfur	7480		5000	5	12/31/2019 10:23	WG1403163
Thallium	ND		10.0	1	12/31/2019 00:00	WG1403163
Vanadium	ND		20.0	1	12/31/2019 00:00	WG1403163
Zinc	ND		50.0	1	12/31/2019 00:00	WG1403163

1 Cp
2 Tc
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9 Sc

Method Blank (MB)

(MB) R3487225-1 12/31/19 09:18

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Mercury	U		0.0490	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3487225-2 12/31/19 09:20 • (LCSD) R3487225-3 12/31/19 09:21

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	3.08	2.97	103	99.1	85.0-115			3.48	20

L1174290-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1174290-01 12/31/19 09:23 • (MS) R3487225-4 12/31/19 09:29 • (MSD) R3487225-5 12/31/19 09:31

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	U	2.53	2.44	84.3	81.3	1	70.0-130			3.62	20

L1174582-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1174582-04 12/31/19 09:33 • (MS) R3487225-6 12/31/19 09:35 • (MSD) R3487225-7 12/31/19 09:37

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	U	2.78	2.65	92.6	88.4	1	70.0-130			4.68	20

Method Blank (MB)

(MB) R3487153-1 12/30/19 22:52

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Aluminum	47.4	J	27.3	200
Antimony	U		7.70	10.0
Arsenic	U		6.40	10.0
Barium	U		1.00	5.00
Beryllium	U		0.700	2.00
Cadmium	U		0.700	2.00
Calcium	U		100	1000
Chromium	U		1.80	10.0
Cobalt	U		3.00	10.0
Copper	U		7.00	10.0
Iron	U		28.2	100
Lead	U		2.00	5.00
Magnesium	U		16.8	1000
Manganese	U		2.00	10.0
Nickel	U		5.80	10.0
Potassium	U		107	1000
Selenium	U		7.60	10.0
Silver	U		2.70	5.00
Sodium	U		93.9	1000
Sulfur	U		220	1000
Thallium	U		6.70	10.0
Vanadium	U		2.60	20.0
Zinc	U		3.40	50.0

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3487153-2 12/30/19 22:55 • (LCSD) R3487153-3 12/30/19 22:58

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	10200	10000	102	100	85.0-115			1.94	20
Antimony	1000	1000	988	100	98.8	85.0-115			1.28	20
Arsenic	1000	997	985	99.7	98.5	85.0-115			1.16	20
Barium	1000	1020	1000	102	100	85.0-115			1.36	20
Beryllium	1000	1010	999	101	99.9	85.0-115			1.40	20
Cadmium	1000	965	953	96.5	95.3	85.0-115			1.21	20
Calcium	10000	9970	9840	99.7	98.4	85.0-115			1.29	20
Chromium	1000	956	943	95.6	94.3	85.0-115			1.34	20
Cobalt	1000	999	982	99.9	98.2	85.0-115			1.72	20
Copper	1000	977	961	97.7	96.1	85.0-115			1.72	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3487153-2 12/30/19 22:55 • (LCSD) R3487153-3 12/30/19 22:58

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Iron	10000	9840	9760	98.4	97.6	85.0-115			0.878	20
Lead	1000	986	969	98.6	96.9	85.0-115			1.75	20
Magnesium	10000	10400	10300	104	103	85.0-115			1.54	20
Manganese	1000	954	937	95.4	93.7	85.0-115			1.81	20
Nickel	1000	985	969	98.5	96.9	85.0-115			1.64	20
Potassium	10000	9830	9670	98.3	96.7	85.0-115			1.70	20
Selenium	1000	1010	1000	101	100	85.0-115			1.20	20
Silver	200	182	180	91.0	89.8	85.0-115			1.29	20
Sodium	10000	9980	9890	99.8	98.9	85.0-115			0.909	20
Sulfur	10000	9960	9800	99.6	98.0	85.0-115			1.62	20
Thallium	1000	1010	993	101	99.3	85.0-115			1.74	20
Vanadium	1000	1010	1010	101	101	85.0-115			0.635	20
Zinc	1000	960	946	96.0	94.6	85.0-115			1.46	20

L1173803-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1173803-02 12/30/19 23:00 • (MS) R3487153-5 12/30/19 23:06 • (MSD) R3487153-6 12/30/19 23:08

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	ND	10000	10100	99.0	99.4	1	70.0-130			0.389	20
Antimony	1000	ND	1020	999	102	99.9	1	70.0-130			2.09	20
Arsenic	1000	12.6	1040	1030	103	102	1	70.0-130			0.979	20
Barium	1000	9.05	1000	994	99.3	98.5	1	70.0-130			0.764	20
Beryllium	1000	2.50	1000	998	100	99.5	1	70.0-130			0.551	20
Cadmium	1000	64.1	1070	1060	100	99.3	1	70.0-130			0.802	20
Calcium	10000	5360	15100	15000	97.6	96.2	1	70.0-130			0.907	20
Chromium	1000	21.1	957	952	93.6	93.1	1	70.0-130			0.532	20
Cobalt	1000	ND	1060	1050	105	104	1	70.0-130			0.814	20
Copper	1000	19.6	1000	996	98.1	97.6	1	70.0-130			0.498	20
Iron	10000	1260	11000	11000	97.9	97.7	1	70.0-130			0.183	20
Lead	1000	ND	1020	1010	102	100	1	70.0-130			1.50	20
Magnesium	10000	ND	10700	10600	99.4	98.4	1	70.0-130			0.995	20
Manganese	1000	14.9	947	940	93.2	92.5	1	70.0-130			0.791	20
Nickel	1000	53.8	1090	1080	104	103	1	70.0-130			0.931	20
Potassium	10000	1400	11400	11500	100	101	1	70.0-130			0.719	20
Selenium	1000	ND	1070	1070	107	107	1	70.0-130			0.523	20
Silver	200	ND	188	187	94.1	93.6	1	70.0-130			0.446	20
Sodium	10000	1280000	1330000	1310000	428	266	1	70.0-130	E V	E V	1.23	20
Sulfur	10000	226000	242000	239000	160	130	1	70.0-130	E V	E	1.25	20

L1173803-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1173803-02 12/30/19 23:00 • (MS) R3487153-5 12/30/19 23:06 • (MSD) R3487153-6 12/30/19 23:08

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Thallium	1000	ND	1020	1010	102	101	1	70.0-130			0.610	20
Vanadium	1000	ND	1010	999	101	99.5	1	70.0-130			1.04	20
Zinc	1000	57.1	1010	1010	95.6	94.9	1	70.0-130			0.678	20

L1173855-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1173855-01 12/30/19 23:11 • (MS) R3487153-7 12/30/19 23:14 • (MSD) R3487153-8 12/30/19 23:16

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	10000	ND	10400	10800	103	107	1	70.0-130			3.52	20
Antimony	1000	ND	1010	1040	101	104	1	70.0-130			3.05	20
Arsenic	1000	ND	1010	1050	101	105	1	70.0-130			3.41	20
Barium	1000	9.31	1030	1060	102	105	1	70.0-130			2.77	20
Beryllium	1000	ND	1020	1050	102	105	1	70.0-130			2.97	20
Cadmium	1000	ND	976	1000	97.6	100	1	70.0-130			2.82	20
Calcium	10000	24500	35400	36100	109	117	1	70.0-130			2.10	20
Chromium	1000	ND	965	998	96.5	99.8	1	70.0-130			3.29	20
Cobalt	1000	ND	1000	1030	100	103	1	70.0-130			2.96	20
Copper	1000	ND	985	1010	98.5	101	1	70.0-130			2.34	20
Iron	10000	ND	10000	10400	99.2	103	1	70.0-130			3.54	20
Lead	1000	ND	996	1030	99.6	103	1	70.0-130			3.54	20
Magnesium	10000	2710	13100	13400	104	107	1	70.0-130			2.24	20
Manganese	1000	ND	967	994	96.1	98.8	1	70.0-130			2.78	20
Nickel	1000	ND	991	1020	99.1	102	1	70.0-130			2.83	20
Potassium	10000	2240	12100	12400	98.8	102	1	70.0-130			2.43	20
Selenium	1000	ND	1020	1050	102	105	1	70.0-130			3.45	20
Silver	200	ND	185	190	92.5	95.1	1	70.0-130			2.70	20
Sodium	10000	5970	15900	16300	99.6	103	1	70.0-130			2.25	20
Sulfur	10000	4150	14500	15000	104	108	1	70.0-130			2.98	20
Thallium	1000	ND	1010	1050	101	105	1	70.0-130			3.18	20
Vanadium	1000	ND	1020	1050	102	105	1	70.0-130			2.84	20
Zinc	1000	ND	978	1010	96.7	99.5	1	70.0-130			2.80	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

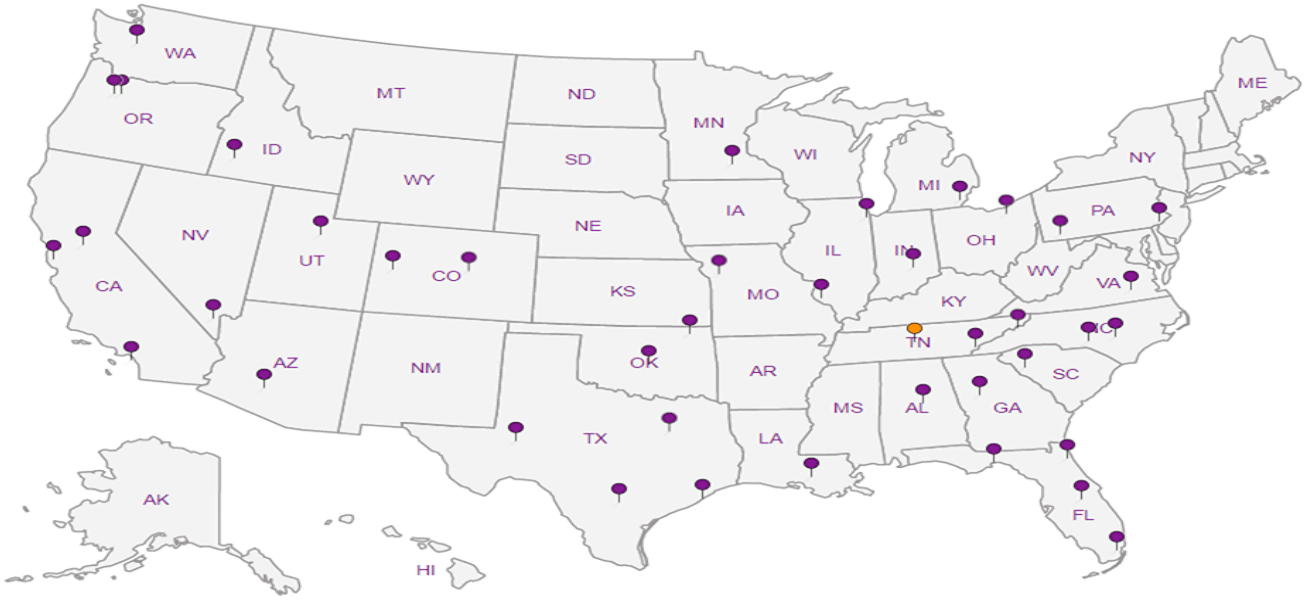
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Piedmont Geologic
6003-145 Chapel Hill Road
Raleigh, NC 27607

Billing Information: Same

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LAB SCIENCES

YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1174330

D190

Report to: Jon Murphrey

Email To: jmurphrey@piedmontgeologic.com

Project Description: Sunrock-Caswell Co Hydro

City/State Collected: Prospect Hill, NC

Phone: Fax: 919-854-9700

Client Project # 1925

Lab Project #

Collected by (print): Nick Murphrey

Site/Facility ID #

P.O. #

Collected by (signature): Nick Murphrey

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TAL metals + SULAW by 200.7/245.1	Remarks	Sample # (lab only)
PW-2 (unfiltered)	Grab	GW		12/23/19	1215	2	X		-01

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Sample is unfiltered

pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____

Tracking # 1145 2239 9343

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

RAD SCREEN: <0.5 mR/hr

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes No HCL / MeOH TBR
Nick Murphrey	12/23/19	1553	Daniel X Spence / Pace 12-26-19 1221	
Daniel X Spence / Pace	12-26-19	1229		Temp: 1.7+.1=1.8 °C Bottles Received: 2
	12-26	1700	Received for lab by: (Signature) Haley M	Date: 12/27/19 Time: 830

If preservation required by Login: Date/Time

Hold:

Condition: NCF OK

APPENDIX G

HYDRAULIC INFLUENCE AND INFLOW CALCULATIONS

Radius of influence calculations using the Sichardt (1928) formula.

R_0 = 3000*(H - h)*sqrt(K)

where, H = initial head of the aquifer, prior to dewatering (meters)
h = final head of the dewatered aquifer (meters)
K = hydraulic conductivity (meters/sec)
R_o = radius of influence (meters)

K (Area 1 - maximum of recovery phase) = 0.14 ft/day = 4.94E-07 meters/sec
K (Area 2 - maximum of recovery phase) = 0.13 ft/day = 4.59E-07 meters/sec
H - h ≈ 37 meters for Areas 1 and 2 based on quarry depth of 150 feet
H - h ≈ 82 meters for Areas 1 and 2 based on quarry depth of 300 feet

Area 1/Pit A (quarry depth of 150 feet)

R_0 = 3000*(37)*sqrt(4.94E-07)

≈ **78** **meters**
≈ **256** **feet**

Area 1/Pit A (quarry depth of 300 feet)

R_0 = 3000*(82)*sqrt(4.94E-07)

≈ **173** **meters**
≈ **567** **feet**

Area 2/Pit B (quarry depth of 150 feet)

R_0 = 3000*(37)*sqrt(4.59E-07)

≈ **75** **meters**
≈ **247** **feet**

Area 2/Pit B (quarry depth of 300 feet)

R_0 = 3000*(82)*sqrt(4.59E-07)

≈ **167** **meters**
≈ **547** **feet**

Radius of influence calculations using the Kusakin (1949) formula.

$R = 575*s_w*sqrt(H*K)$

where, H = saturated aquifer thickness (meters)
s_w = drawdown (meters)
K = hydraulic conductivity (meters/sec)
R = radius of influence (meters)

K (Area 1 - maximum of recovery phase) = 0.14 ft/day = 4.94E-07 meters/sec
K (Area 2 - maximum of recovery phase) = 0.13 ft/day = 4.59E-07 meters/sec
H - h ≈ 37 meters for Areas 1 and 2 based on quarry depth of 150 feet
H - h ≈ 82 meters for Areas 1 and 2 based on quarry depth of 300 feet

Area 1/Pit A (quarry depth of 150 feet)

R = 575*(37)*sqrt(37*4.94E-07)

≈ **91** **meters**
≈ **298** **feet**

Area 1/Pit A (quarry depth of 300 feet)

R = 575*(82)*sqrt(82*4.94E-07)

≈ **300** **meters**
≈ **984** **feet**

Area 2/Pit B (quarry depth of 150 feet)

R = 575*(37)*sqrt(37*4.59E-07)

≈ **88** **meters**
≈ **288** **feet**

Area 2/Pit B (quarry depth of 300 feet)

R = 575*(82)*sqrt(82*4.59E-07)

≈ **289** **meters**
≈ **949** **feet**

Steady groundwater inflows into open excavations

Christopher J. Neville and Xiaomin Wang
S.S. Papadopulos & Associates, Inc.
Last update: 2014/04/27

Questions? cneville@sspa.com

Part 1: Linear flow into trenches

Model 1	Linear confined flow into a trench (flow both sides)
Model 2	Linear unconfined flow into a trench (flow both sides)
Model 3	Linear confined/unconfined flow into a trench (flow both sides)
Model 4	Linear unconfined flow into a trench, with recharge (flow both sides)
Model 5	Linear groundwater flow into a slot with a leaky confining layer (Flow both sides)

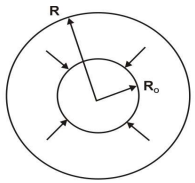
Part 2. Radial flow into circular excavations

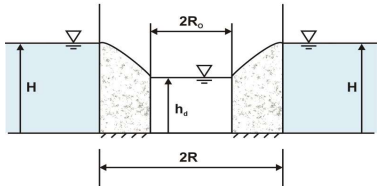
Model 6	Radial confined flow into a circular excavation	
Model 7	Radial unconfined flow into a circular excavation	**<-----Model used in calculations**
Model 8	Radial confined/unconfined flow into a circular excavation	
Model 9	Radial unconfined flow into a circular excavation, with recharge	
Model 10	Radial flow into a circular excavation in an aquifer overlain by a leaky aquitard	

Part 3. Flow into the bottom of a circular excavation

Models 11-12	Flow into the base of a circular excavation

Model 7 (Utylizing Sichardt formula estimates)
Radial unconfined flow into a circular excavation





*****ASSUMED PIT DEPTH = 150 FEET*****

Units are labels only; the user must specify consistent units

Caswell County Hydro Study - Area 1 (Pit A)

Parameter	Units	Value	User-specified units	
Hydraulic conductivity, K	L/T	4.94E-07	m/s	K (Area 1 - maximum of recovery phase) = 0.14 ft/day = 4.94E-07 meters/sec
Elevation of base of aquifer, z_{bot}	L	0.0	m	
Thickness of aquifer where confined, D	L	N/A	m	
Distance from centre of excavation to constant-head boundary, R	L	258.0	m	<---78 m (calculated from Sichardt formula; based on quarry depth of 150 ft) + 180 m (assumed radius of 150-ft depth pit bench)
Distance from centre to boundary of excavation, R_0	L	180.0	m	<---assumed radius of 150-ft depth pit bench
Head at the constant-head boundary, H	L	37.0	m	<---saturated thickness to be dewatered
Head in the excavation, h_d	L	0.0	m	

Result

Calculated inflow, Q	L^3/T	5.902E-03	m^3/s

Q =	**0.00590**	**m^3/s**
=	**94**	**gal/min**
=	**134,702**	**gal/day**

Caswell County Hydro Study - Area 2 (Pit B)

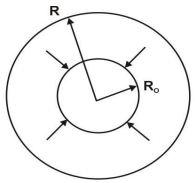
Parameter	Units	Value	User-specified units	
Hydraulic conductivity, K	L/T	4.59E-07	m/s	K (Area 2 - maximum of recovery phase) = 0.13 ft/day = 4.59E-07 meters/sec
Elevation of base of aquifer, z_{bot}	L	0.0	m	
Thickness of aquifer where confined, D	L	N/A	m	
Distance from centre of excavation to constant-head boundary, R	L	230.0	m	<---75 m (calculated from Sichardt formula; based on quarry depth of 150 ft) + 155 m (assumed radius of 150-ft depth pit bench)
Distance from centre to boundary of excavation, R_0	L	155.0	m	<---assumed radius of 150-ft depth pit bench
Head at the constant-head boundary, H	L	37.0	m	<---saturated thickness to be dewatered
Head in the excavation, h_d	L	0.0	m	

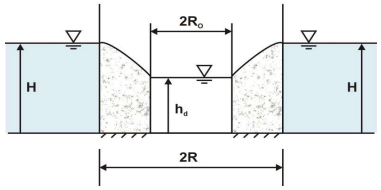
Result

Calculated inflow, Q	L^3/T	5.002E-03	m^3/s

Q =	**0.00500**	**m^3/s**
=	**79**	**gal/min**
=	**114,169**	**gal/day**

Model 7 (Utylizing Sichardt formula estimates)
Radial unconfined flow into a circular excavation





*****ASSUMED PIT DEPTH = 300 FEET*****

Units are labels only; the user must specify consistent units

Caswell County Hydro Study - Area 1 (Pit A)

Parameter	Units	Value	User-specified units	
Hydraulic conductivity, K	L/T	4.94E-07	m/s	K (Area 1 - maximum of recovery phase) = 0.14 ft/day = 4.94E-07 meters/sec
Elevation of base of aquifer, z_{bot}	L	0.0	m	
Thickness of aquifer where confined, D	L	N/A	m	
Distance from centre of excavation to constant-head boundary, R	L	273.0	m	<---173 m (calculated from Sichardt formula; based on quarry depth of 300 ft) + 100 m (assumed radius of 300-ft depth pit bench)
Distance from centre to boundary of excavation, R_0	L	100.0	m	<---assumed radius of 300-ft depth pit bench
Head at the constant-head boundary, H	L	82.0	m	<---saturated thickness to be dewatered
Head in the excavation, h_d	L	0.0	m	

Result

Calculated inflow, Q	L^3/T	1.039E-02	m^3/s

Q =	**0.01039**	**m^3/s**
=	**165**	**gal/min**
=	**237,160**	**gal/day**

Caswell County Hydro Study - Area 2 (Pit B)

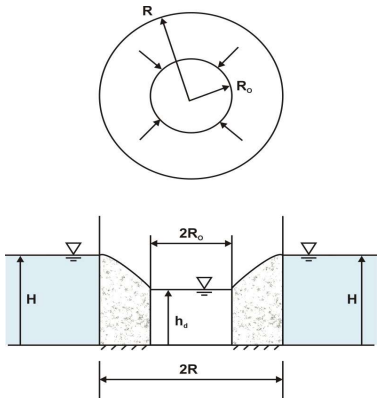
Parameter	Units	Value	User-specified units	
Hydraulic conductivity, K	L/T	4.59E-07	m/s	K (Area 2 - maximum of recovery phase) = 0.13 ft/day = 4.59E-07 meters/sec
Elevation of base of aquifer, z_{bot}	L	0.0	m	
Thickness of aquifer where confined, D	L	N/A	m	
Distance from centre of excavation to constant-head boundary, R	L	322.0	m	<---167 m (calculated from Sichardt formula; based on quarry depth of 300 ft) + 155 m (assumed radius of 300-ft depth pit bench)
Distance from centre to boundary of excavation, R_0	L	155.0	m	<---assumed radius of 300-ft depth pit bench
Head at the constant-head boundary, H	L	82.0	m	<---saturated thickness to be dewatered
Head in the excavation, h_d	L	0.0	m	

Result

Calculated inflow, Q	L^3/T	1.326E-02	m^3/s

Q =	**0.01326**	**m^3/s**
=	**210**	**gal/min**
=	**302,690**	**gal/day**

Model 7 (Utylizing Kusakin formula estimates)
Radial unconfined flow into a circular excavation



*****ASSUMED PIT DEPTH = 150 FEET*****

Units are labels only; the user must specify consistent units

Caswell County Hydro Study - Area 1 (Pit A)

Parameter	Units	Value	User-specified units	
Hydraulic conductivity, K	L/T	4.94E-07	m/s	K (Area 1 - maximum of recovery phase) = 0.14 ft/day = 4.94E-07 meters/sec
Elevation of base of aquifer, z_{bot}	L	0.0	m	
Thickness of aquifer where confined, D	L	N/A	m	
Distance from centre of excavation to constant-head boundary, R	L	271.0	m	<---91 m (calculated from Kusakin formula; based on quarry depth of 150 ft) + 180 m (assumed radius of 150-ft depth pit bench)
Distance from centre to boundary of excavation, R_0	L	180.0	m	<---assumed radius of 150-ft depth pit bench
Head at the constant-head boundary, H	L	37.0	m	<---saturated thickness to be dewatered
Head in the excavation, h_d	L	0.0	m	

Result

Calculated inflow, Q	L^3/T	5.193E-03	m^3/s

Q =	**0.00519**	**m^3/s**
=	**82**	**gal/min**
=	**118,518**	**gal/day**

Caswell County Hydro Study - Area 2 (Pit B)

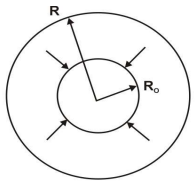
Parameter	Units	Value	User-specified units	
Hydraulic conductivity, K	L/T	4.59E-07	m/s	K (Area 2 - maximum of recovery phase) = 0.13 ft/day = 4.59E-07 meters/sec
Elevation of base of aquifer, z_{bot}	L	0.0	m	
Thickness of aquifer where confined, D	L	N/A	m	
Distance from centre of excavation to constant-head boundary, R	L	243.0	m	<---88 m (calculated from Kusakin formula; based on quarry depth of 150 ft) + 155 m (assumed radius of 150-ft depth pit bench)
Distance from centre to boundary of excavation, R_0	L	155.0	m	<---assumed radius of 150-ft depth pit bench
Head at the constant-head boundary, H	L	37.0	m	<---saturated thickness to be dewatered
Head in the excavation, h_d	L	0.0	m	

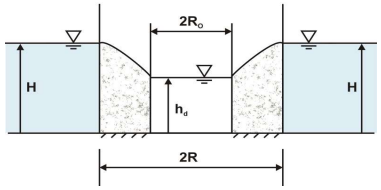
Result

Calculated inflow, Q	L^3/T	4.390E-03	m^3/s

Q =	**0.00439**	**m^3/s**
=	**70**	**gal/min**
=	**100,209**	**gal/day**

Model 7 (Utylizing Kusakin formula estimates)
Radial unconfined flow into a circular excavation





*****ASSUMED PIT DEPTH = 300 FEET*****

Units are labels only; the user must specify consistent units

Caswell County Hydro Study - Area 1 (Pit A)

Parameter	Units	Value	User-specified units	
Hydraulic conductivity, K	L/T	4.94E-07	m/s	K (Area 1 - maximum of recovery phase) = 0.14 ft/day = 4.94E-07 meters/sec
Elevation of base of aquifer, z_{bot}	L	0.0	m	
Thickness of aquifer where confined, D	L	N/A	m	
Distance from centre of excavation to constant-head boundary, R	L	400.0	m	<---300 m (calculated from Kusakin formula; based on quarry depth of 300 ft) + 100 m (assumed radius of 300-ft depth pit bench)
Distance from centre to boundary of excavation, R_0	L	100.0	m	<---assumed radius of 300-ft depth pit bench
Head at the constant-head boundary, H	L	82.0	m	<---saturated thickness to be dewatered
Head in the excavation, h_d	L	0.0	m	

Result

Calculated inflow, Q	L^3/T	7.527E-03	m^3/s

Q =	**0.00753**	**m^3/s**
=	**119**	**gal/min**
=	**171,810**	**gal/day**

Caswell County Hydro Study - Area 2 (Pit B)

Parameter	Units	Value	User-specified units	
Hydraulic conductivity, K	L/T	4.59E-07	m/s	K (Area 2 - maximum of recovery phase) = 0.13 ft/day = 4.59E-07 meters/sec
Elevation of base of aquifer, z_{bot}	L	0.0	m	
Thickness of aquifer where confined, D	L	N/A	m	
Distance from centre of excavation to constant-head boundary, R	L	444.0	m	<---289 m (calculated from Kusakin formula; based on quarry depth of 300 ft) + 155 m (assumed radius of 300-ft depth pit bench)
Distance from centre to boundary of excavation, R_0	L	155.0	m	<---assumed radius of 300-ft depth pit bench
Head at the constant-head boundary, H	L	82.0	m	<---saturated thickness to be dewatered
Head in the excavation, h_d	L	0.0	m	

Result

Calculated inflow, Q	L^3/T	9.213E-03	m^3/s

Q =	**0.00921**	**m^3/s**
=	**146**	**gal/min**
=	**210,286**	**gal/day**

APPENDIX H

WATER-SUPPLY WELL SURVEY RECORDS

Location #1 – Wrenn Road

ETREE LLC 2019 1,002,594 MKT CARD 001
PID R 0133.00.00.0005.0000 1,002,594 PY Val 164,127 USE 1,002,594 LAND 016
P O BOX 850 838,467 DEF BLDG 000
LISTER 11/19/2015 MW BURLINGTON NC 27216 488.710 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG PLAT ADDRESS 0000000 WRENN RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 604 816 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: WRENN ROAD & RIDGEVILLE RD ALSO GOOSE CREEK RD

SALES

IN	Q	RC	M	V	Sale Date	Sale Price
WD	U	0A		V	1/08/2018	

BUILDING PERMITS

Number	Type	Description	Issued	Schd Complt	Revisit	Act Complt	Amount

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020LAC	N	HS W/UTIL					1.000	AC	15,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	15,000.000	15,000
3		280NAC		OPEN ON PAVED ROAD					30.000	AC	2,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,000.000	60,000
4		660AUV	U	USE VALUE OPEN					30.000	AC	590.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	590.000	17,700
5		280AAC		OPEN ON PAVED ROAD					50.000	AC	1,800.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,800.000	90,000
6		660AUV	U	USE VALUE OPEN					50.000	AC	590.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	590.000	29,500
7		400LAC		WOOD ON PAVED RD					10.000	AC	1,600.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,600.000	16,000
8		640AUV	U	USE VALUE WOOD					10.000	AC	250.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	250.000	2,500
9		400KAC		WOOD ON PAVED RD					151.710	AC	1,400.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,400.000	212,394
10		640AUV	U	USE VALUE WOOD					151.710	AC	250.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	250.000	37,927
11		400AAC		WOOD ON PAVED RD					180.000	AC	1,200.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,200.000	216,000
12		640AUV	U	USE VALUE WOOD					180.000	AC	250.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	250.000	45,000
13		400EAC		WOOD ON PAVED RD					20.000	AC	800.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	800.000	16,000
14		640AUV	U	USE VALUE WOOD					20.000	AC	250.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	250.000	5,000
15		460LAC		ROAD FRONT WOODLAND					46.000	AC	8,200.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	8,200.000	377,200
16		640AUV	U	USE VALUE WOOD					46.000	AC	250.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	250.000	11,500

Location #2 – 1238 Wrenn Road

ETREE LLC 2019 680,120 MKT CARD 001
PID R 0133.00.00.0045.0000 680,120 PY Val 127,832 USE 658,950 LAND 016
P O BOX 850 552,288 DEF 21,055 BLDG 001
LISTER 11/19/2015 MW BURLINGTON NC 27216 280.450 ACRES 115 XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG PLAT ADDRESS 0001238 WRENN RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 604 816 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: WRENN RD

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

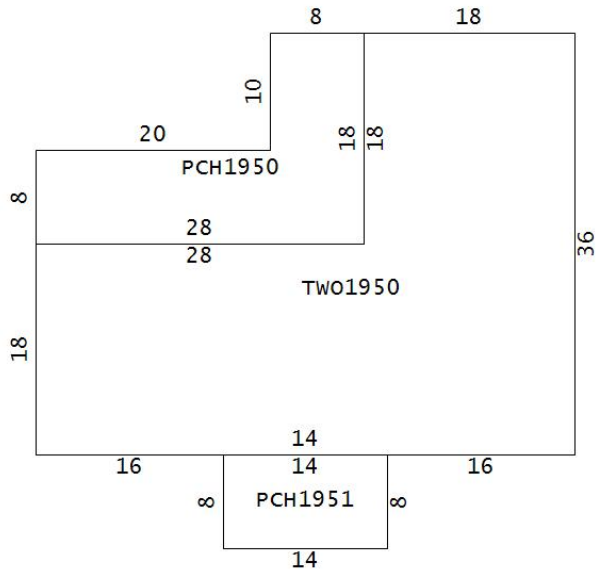
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001BF SNG FAMILY	ARCH	N/A	QUAL	C3 GRADE C	STYS		SIZE	0B GRADE B
FNDN	06 STONE	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	02 DBL SIDING	EXW2	N/A	EXW2%	
HEAT	04 NONE	A/C	N/A	RSTR	02 HIP	RCV1	02 METAL	RCV2	N/A	RCV2%	
INT1	05 PLASTER	INT2	N/A	INT2%		FLR1	06 PINE	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	04	BATH		BDRM		ROOM		SPCD	VP VERY POOR
UD-1	N/A	FRPL	1B FIREPLACE	CHMN	1B FP CHIMNEY	HBTH	N/A	BATH	B1 1 BATH	FUEL	N/A
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1950	EYB 1950

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
TWO STO	1152	2235	2304	1152			10.00	
PORCH	304	85					10.00	
PORCH	112	31					10.00	
LUMP						210551	10.00	21,055
TOTAL	1568		2304		91.38		10.00	
TOTAL		2351		1152		210551		21,055

TRAVERSE

TWO1950= N18 PCH1950= N8 E20 N10 E8 S18 W28$ E28 N18 E18 S36 W16 PCH1951= S8 W14 N8 E14$ W14 W16$.



ETREE LLC 2019 680,120 MKT CARD 002
PID R 0133.00.00.0045.0000 680,120 PY Val 127,832 USE 658,950 LAND 016
P O BOX 850 552,288 DEF 21,055 BLDG 001
LISTER 11/19/2015 MW BURLINGTON NC 27216 280.450 ACRES 115 XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG PLAT ADDRESS 0001238 WRENN RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 604 816 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: WRENN RD

SALES

IN	Q	RC	M	V	Sale Date	Sale Price
WD	U	0A		V	1/08/2018	

BUILDING PERMITS

Number	Type	Description	Issued	Schd Complt	Revisit	Act Complt	Amount

EXTRA FEATURES

Seq	Bldg Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
004	STRGFR	50-STORAGFR	24	16		384.000	SF	1	0E	6.000	0000	.05	1.00	1.00	1.00	100.00	115

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020JAC	N	HS W/UTIL					1.000	AC	13,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	13,000.000	13,000
3		280NAC		OPEN ON PAVED ROAD					25.000	AC	2,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,000.000	50,000
4		660AUV	U	USE VALUE OPEN					25.000	AC	590.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	590.000	14,750
5		280AAC		OPEN ON PAVED ROAD					40.000	AC	1,800.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,800.000	72,000
6		660AUV	U	USE VALUE OPEN					40.000	AC	590.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	590.000	23,600
7		340DAC		PSTRE ON PAVED ROAD					5.000	AC	1,500.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,500.000	7,500
8		660AUV	U	USE VALUE OPEN					5.000	AC	590.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	590.000	2,950
9		400AAC		WOOD ON PAVED RD					79.000	AC	1,200.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,200.000	94,800
10		640AUV	U	USE VALUE WOOD					79.000	AC	250.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	250.000	19,750
11		400DAC		WOOD ON PAVED RD					69.450	AC	1,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,000.000	69,450
12		640AUV	U	USE VALUE WOOD					69.450	AC	250.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	250.000	17,362
13		400EAC		WOOD ON PAVED RD					20.000	AC	800.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	800.000	16,000
14		640AUV	U	USE VALUE WOOD					20.000	AC	250.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	250.000	5,000
15		460LAC		ROAD FRONT WOODLAND					41.000	AC	8,200.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	8,200.000	336,200
16		640AUV	U	USE VALUE WOOD					41.000	AC	250.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	250.000	10,250

Location #3 – 523 Russell Loop Road

BULLOCK,JANICE RIMMER 2019 78,603 MKT CARD 001
PID R 0132.00.00.0058.0000 78,603 PY Val USE 14,810 LAND 002
523 RUSSELL LOOP RD DEF 63,793 BLDG 001
LISTER 11/14/2015 MW PROSPECT HILL NC 27314 1.300 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 14 341 PLAT ADDRESS 0000513 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 389 905 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF RUSSELL LOOP RD DEEDS 176-505;183-310 DECL TO AFFIX DB 602-537

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

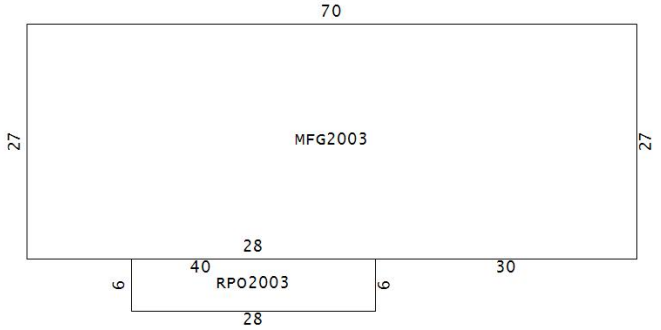
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	05 MFG HOUSE	BVAL	0005C6 MFG HSE/DW	ARCH	01 D/W	QUAL	C3 GRADE C	STYS		SIZE	N/A
FNDN	01 BRICK	FRME	02 STEELFRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	08 CARPT/VYNL	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	06	BATH		BDRM	3	ROOM	5	SPCD	N/A
UD-1	N/A	FRPL	1C FIREPLACE	CHMN	N/A	HBTH	N/A	BATH	C3 3 BATHS	FUEL	N/A
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%	AYB 2001	EYB 2003	

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
D/W M/H	1890	1890	1890	1890			74.00	
RAIPATI	168	35					74.00	
LUMP						86208	74.00	63,793
TOTAL	2058		1890		45.61		74.00	
TOTAL		1925		1890		86208		63,793

TRAVERSE

MFG2003=N27E70S27W30 RPO2003= S6W28N6E28$W40$.



BULLOCK,JANICE RIMMER 2019 78,603 MKT CARD 002
PID R 0132.00.00.0058.0000 78,603 PY Val USE 14,810 LAND 002
523 RUSSELL LOOP RD DEF 63,793 BLDG 001
LISTER 11/14/2015 MW PROSPECT HILL NC 27314 1.300 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 14 341 PLAT ADDRESS 0000513 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 389 905 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF RUSSELL LOOP RD DEEDS 176-505;183-310 DECL TO AFFIX DB 602-537

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number	Type	Description
WD	U	12		V	7/20/2001				

BUILDING PERMITS

Issued	Schd Complt	Revisit	Act Complt	Amount

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020KAC		HS W/UTIL					1.000	AC	14,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	14,000.000	14,000
2		080KAC		2-4 ACRE					.300	AC	2,700.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,700.000	810

Location #4 – 719 Russell Loop Road

OAKES,JOE BILLY 2019 111,350 MKT CARD 001
PID R 0147.00.00.0018.0000 111,350 PY Val USE 73,904 LAND 005
719 RUSSELL LP RD DEF 37,046 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 15.690 ACRES 400 XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 11 79 PLAT ADDRESS 0000719 RUSSELL LP RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 290 72 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP ROAD

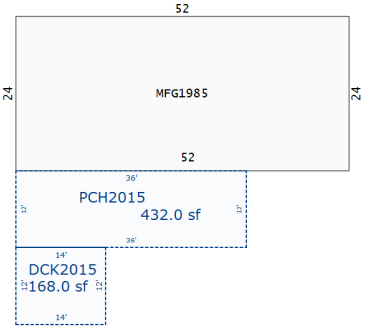
BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	05 MFG HOUSE	BVAL	0005C6 MFG HSE/DW	ARCH	01 D/W	QUAL	C3 GRADE C	STYS		SIZE	N/A
FNDN	04 PIER	FRME	02 STEELFRAME	WNDO	N/A	EXW1	18 T-111/PLYW	EXW2	N/A	EXW2%	
HEAT	08 CENT H&AC	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	05 CARPET	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	06	BATH		BDRM	3	ROOM	6	SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH	C2 2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%	AYB 1985	EYB 1985	

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
D/W M/H	1248	1248	1248	1248			55.00	
PORCH	432	186					55.00	
DECK	168	44					55.00	
LUMP						67357	55.00	37,046
TOTAL	1848		1248		53.97		55.00	
TOTAL		1478		1248		67357		37,046

TRAVERSE
MFG1985=1248$ PCH2015=432$ DCK2015=168$.



Sketch by Apex Sketch

OAKES,JOE BILLY 2019 111,350 MKT CARD 002
PID R 0147.00.00.0018.0000 111,350 PY Val USE 73,904 LAND 005
719 RUSSELL LP RD DEF 37,046 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 15.690 ACRES 400 XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 11 79 PLAT ADDRESS 0000719 RUSSELL LP RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 290 72 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP ROAD

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		000051	METAL STORAGE				1.000	UT	1	0E	400.000	0000	1.00	1.00	1.00	1.00	100.00	400

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020JAC		HS W/UTIL					1.000	AC	13,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	13,000.000	13,000
2		280NAC		OPEN ON PAVED ROAD					1.000	AC	2,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,000.000	2,000
3		400LAC		WOOD ON PAVED RD					8.690	AC	1,600.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,600.000	13,904
4		460MAC		ROAD FRONT WOODLAND					2.000	AC	9,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	9,000.000	18,000
5		260MAC		ROAD FRONTAGE OPEN					3.000	AC	9,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	9,000.000	27,000

#2 (0147 018)

RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3461-A

1. WELL CONTRACTOR: Ryan Clayton
Well Contractor (Individual) Name

Barnette Well Drilling Inc.
Well Contractor Company Name

611 Barnette Tingen Rd
Street Address

Roxboro NC 27574
City or Town State Zip Code

(336) 599-0015
Area code Phone number

2. WELL INFORMATION:
WELL CONSTRUCTION PERMIT# W.P. # P09031001
OTHER ASSOCIATED PERMIT#(if applicable)
SITE WELL ID #(if applicable)

3. WELL USE (Check Applicable Box): Residential Water Supply ☑
DATE DRILLED 9-8-10
TIME COMPLETED 100 AM ☐ PM ☑

4. WELL LOCATION:
CITY: Prospect Hill COUNTY Caswell
719 Russell Loop Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING: (check appropriate box)
☐Slope ☐Valley ☑Flat ☐Ridge ☐Other

LATITUDE 36 ° ' " DMS OR 3x.xxxxxxxxx DD
LONGITUDE 75 ° ' " DMS OR 7x.xxxxxxxxx DD
Latitude/longitude source: ☐GPS ☐Topographic map
(location of well must be shown on a USGS topo map andattached to this form if not using GPS)

5. WELL OWNER: Joe Oakes
Owner Name

719 Russell Loop Rd.
Street Address

Prospect Hill N.C. 27314
City or Town State Zip Code

(919) 304-0454
Area code Phone number

6. WELL DETAILS:
a. **TOTAL DEPTH:** 340 FL
b. **DOES WELL REPLACE EXISTING WELL?** YES ☑ NO ☐
c. **WATER LEVEL** Below Top of Casing: 25 FT.
(Use "+" if Above Top of Casing)
d. **TOP OF CASING IS** 2 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.
e. **YIELD (gpm):** 10 **METHOD OF TEST** Blown 20m
f. **DISINFECTION: Type** HTH **Amount** 1/2 Cup

g. **WATER ZONES** (depth):

Top 270	Bottom 272	Top	Bottom
Top	Bottom	Top	Bottom
Top	Bottom	Top	Bottom

7. CASING:

Depth		Diameter	Thickness/ Weight	Material
Top 0	Bottom 102 Ft.	6"/4	SDR-21	PVC
Top	Bottom Ft.			
Top	Bottom Ft.			

8. GROUT:

Depth		Material	Method
Top 0	Bottom 20 Ft.	Sand/Cement	Poured
Top	Bottom Ft.		
Top	Bottom Ft.		

9. SCREEN:

Depth		Diameter	Slot Size	Material
Top	Bottom Ft.	in.	in.	
Top	Bottom Ft.	in.	in.	
Top	Bottom Ft.	in.	in.	

10. SAND/GRAVEL PACK:

Depth		Size	Material
Top	Bottom Ft.		
Top	Bottom Ft.		
Top	Bottom Ft.		

11. DRILLING LOG

Top	Bottom	Formation Description
0	2	Topsoil
2	28	Dirt/Sand
28	98	Sandstone
98	340	Granite

12. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Ryan Clayton 9-8-10
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

John Ryan Clayton
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit within 30 days of completion to: Division of Water Quality - Information Processing, 1617 Mail Service Center, Raleigh, NC 27699-161, Phone : (919) 807-6300

Form GW-1a
Rev. 2/09

Location #5 – 1063 Russell Loop Road

BIG ACORN FARM LLC 2019 100,106 MKT CARD 001
PID R 0147.00.00.0010.0000 173,900 PY Val USE 87,520 LAND 006
2104 TURNER RD DEF BLDG 000
LISTER 11/23/2015 GP MEBANE NC 27302 30.800 ACRES 12,586 XFOB 003
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 5 BLK PL BK/PG 17 141 PLAT ADDRESS 0001063 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 579 89 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP RD PLAT 4-194&195 DB 220-641 X 2/18/19 SUBD BY PLT 17/141.

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number	Type	Description
QC	U	0C		V	6/23/2014				
NW	U	10		V	7/12/2001				

BUILDING PERMITS

Issued	Schd Complt	Revisit	Act Complt	Amount

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		SHELTR	41-SHELTER	76	64		4864.000	SF	1	0E	3.000	0000	.80	1.00	1.00	1.00	100.00	11,674
002		WDDECK	62-WOODDECK	8	10		80.000	SF	1	0D	5.000	0000	1.00	1.00	1.00	1.00	100.00	400
003		STRGFR	50-STORAGFR	8	8		64.000	SF	1	0D	8.000	0000	1.00	1.00	1.00	1.00	100.00	512

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020LAC		HS W/UTIL					1.000	AC	15,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	15,000.000	15,000
3		280OAC		OPEN ON PAVED ROAD					2.000	AC	2,200.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,200.000	4,400
4		280NAC		OPEN ON PAVED ROAD					4.000	AC	2,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,000.000	8,000
5		400LAC		WOOD ON PAVED RD					5.000	AC	1,600.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,600.000	8,000
6		400KAC		WOOD ON PAVED RD					15.800	AC	1,400.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,400.000	22,120
7		260NAC		ROAD FRONTAGE OPEN					3.000	AC	10,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	10,000.000	30,000

Location #6 – 1101 Russell Loop Road

LANGLEY,CHRISTOPHER B & JERRI 2019 184,131 MKT CARD 001
PID R 0147.00.00.0002.0000 THOMPSON JERRI N 184,131 PY Val USE 52,500 LAND 004
1102 RUSSELL LOOP RD DEF 100,848 BLDG 001
LISTER 11/22/2015 GP PROSPECT HILL NC 27314 13.660 ACRES 30,783 XFOB 009
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT A&B BLK PL BK/PG 11 925 PLAT ADDRESS 0001102 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 306 545 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP RD

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

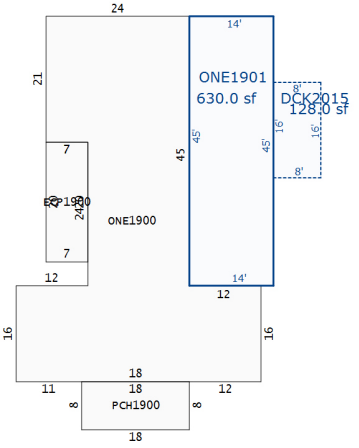
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001CA SNG FAMILY	ARCH	N/A	QUAL	C4 GRADE C-5	STYS		SIZE	0C GRADE C
FNDN	01 BRICK	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	01 FACE BRICK	EXW2	N/A	EXW2%	
HEAT	11 CNTRLHT&AC	A/C	N/A	RSTR	01 GABLE	RCV1	02 METAL	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	05 CARPET	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	03	BATH		BDRM	3	ROOM	5	SPCD	N/A
UD-1	N/A	FRPL	1C FIREPLACE	CHMN	1C FP CHIMNEY	HBTH	N/A	BATH	C1 1 BATH	FUEL	03 GAS
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1904	EYB 1980

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
ONE STO	1568	1568	1568	1568			60.00	
ENCL PO	140	53					60.00	
PORCH	144	40					60.00	
ONE STO	630	630	630	630			60.00	
DECK	128	26					60.00	
LUMP						168080	60.00	100,848
TOTAL	2610		2198		76.46		60.00	
TOTAL		2317		2198		168080		100,848

TRAVERSE

ONE1900=1568$ ECP1900=140$ PCH1900=144$ ONE1901=630$
DCK2015=128$.



Sketch by Apex Sketch

LANGLEY,CHRISTOPHER B & JERRI 2019 184,131 MKT CARD 002
PID R 0147.00.00.0002.0000 THOMPSON JERRI N 184,131 PY Val USE 52,500 LAND 004
1102 RUSSELL LOOP RD DEF 100,848 BLDG 001
LISTER 11/22/2015 GP PROSPECT HILL NC 27314 13.660 ACRES 30,783 XFOB 009
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT A&B BLK PL BK/PG 11 925 PLAT ADDRESS 0001102 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 306 545 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP RD

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		PACKHS	35 PACK HSE	36	24		864.000	SF	1	0D	10.000	0000	.20	1.00	1.00	1.00	100.00	1,728
002		CARPRT	6-CARPORT	32	22		704.000	SF	1	0D	2.990	0000	.80	1.00	1.00	1.00	100.00	1,684
003		STRGFR	50-STORAGFR	12	22		264.000	SF	1	0D	8.000	0000	1.00	1.00	1.00	1.00	100.00	2,112
004		SHELTR	41-SHELTER	12	20		1.000	SF	1	0E	3.000	2003	1.00	1.00	1.00	1.00	100.00	3
005		000062	WOOD DECK	1	1		1.000	UT	1	0E	1,500.000	2003	1.00	1.00	1.00	1.00	100.00	1,500
006		SHELTR	41-SHELTER	12	20		240.000	SF	1	0D	3.500	0000	1.00	1.00	1.00	1.00	100.00	840
007		STRGFR	50-STORAGFR	12	12		144.000	SF	1	0D	8.000	0000	.80	1.00	1.00	1.00	100.00	922
008		SHPF/M	43-SHOP FRAME/M	56	28		1568.000	SF	1	0C	25.000	0000	.50	1.00	1.00	1.00	100.00	19,600
009		LEANTO	LEANTO	56	18		1008.000	SF	1	0C	2.500	0000	.95	1.00	1.00	1.00	100.00	2,394

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020LAC		HS W/UTIL					1.660	AC	15,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	15,000.000	24,900
2		280BAC		OPEN ON PAVED ROAD					7.000	AC	1,600.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,600.000	11,200
3		400LAC		WOOD ON PAVED RD					4.000	AC	1,600.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,600.000	6,400
4		260NAC		ROAD FRONTAGE OPEN					1.000	AC	10,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	10,000.000	10,000

#4 (0147 010)

CASWELL COUNTY ENVIRONMENTAL HEALTH
P.O. Box 1238 - 144 Main Street
Yanceyville, NC 27379
336-694-9731

WELL COMPLETION REPORT

Name: Langley (LAST) Chris (FIRST) (MI)

Address: Box 1102 Russell Loop Rd Prospect Hill

Location:

Distance From Nearest Property Line 10 Ft. Water Bearing Zones Depth 140 Ft. _____ Ft.

Distance From nearest Source of Pollution 100 Ft. Casing Depth From 0 to 84 Ft.

Total Depth of Well 160 Ft. GPM 15 Casing Diameter 6 1/4 In.

Static Water Level 25 Ft.

Casing Type: PVC (SDR-21) ✓ Galvanized Steel _____ Thickness _____ In.

If PVC Is Consent Form Attached ? Yes ☑ No ☐

Drive Shoe: Yes ☑ No ☐ Height of Casing Above Ground In.

Problems in Setting Casing: Yes ☐ No ☑ Explain:

Grout Type: Bentonite ☐ Neat ☐ Sand/Cement ☑ Concrete ☐ Annular Space: Width _____ In.

Water in Annuar Space: Yes ☐ No ☑ Method of Grout: Pump ☐ Pressure ☐ Poured ☑

If Yes, was water removed? (Explain)

No. Bags of Portland Cement _____ Depth From 0 to 20 Ft.

Weight of 1 Bag _____ Lbs. ID Plate ✓

DRILLING LOG

Depth From	To	Formation Description
0	7	overburden
7	30	saprolite
30	70	Shale
70	160	gray rock

I hereby certify that the above information is correct and that this well was constructed in accordance with the Caswell County Well Ordinance

Douglas E Jones
Name of Contractor

Douglas E Jones
Signature of Contractor

2498
Certification #

6-6-05
Date

Inspection Completed By Connie Powell Date 6/6/05

Location #7 – 523 Russell Loop Road

WADE,HARVEY B 2019 95,969 MKT CARD 001
PID R 0132.00.00.0032.0000 95,969 PY Val USE 18,455 LAND 002
523 RUSSELL LOOP RD DEF 76,070 BLDG 001
LISTER 11/14/2015 MW PROSPECT HILL NC 27314 2.650 ACRES 1,444 XFOB 003
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 1 BLK PL BK/PG 183 311 PLAT ADDRESS 0000523 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 183 310 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP RD PLAT 176 PG 505

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

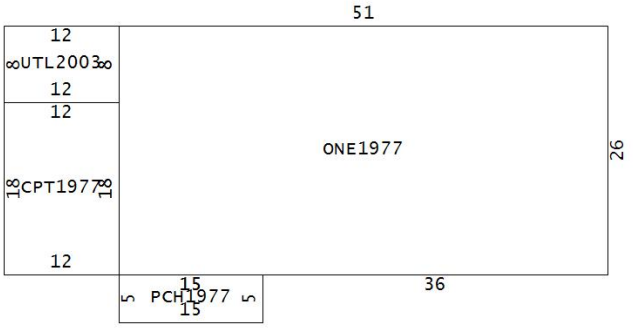
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001CA SNG FAMILY	ARCH	N/A	QUAL	C4 GRADE C-5	STYS		SIZE	0C GRADE C
FNDN	01 BRICK	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	01 FACE BRICK	EXW2	N/A	EXW2%	
HEAT	01 CENT HEAT	A/C	N/A	RSTR	01 GABLE	RCV1	02 METAL	RCV2	N/A	RCV2%	
INT1	03 MIXED	INT2	N/A	INT2%		FLR1	10 VINYL	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	03	BATH		BDRM	3	ROOM	5	SPCD	N/A
UD-1	N/A	FRPL	1C FIREPLACE	CHMN	1C FP CHIMNEY	HBTH	N/A	BATH	C1 1 BATH	FUEL	02 OIL
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1977	EYB 1986

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
ONE STO	1326	1326	1326	1326			69.00	
CARPORT	216	54					69.00	
UTILITY	96	24					69.00	
PORCH	75	21					69.00	
LUMP						110247	69.00	76,070
TOTAL	1713		1326		83.14		69.00	
TOTAL		1425		1326		110247		76,070

TRAVERSE

ONE1977= N18 CPT1977= W12 S18 E12 N18$ UTL2003= N8 W12S8E 12$N8 E51 S26 W36 PCH1977= W15 S5E15 N5$ W15$.



WADE,HARVEY B 2019 95,969 MKT CARD 002
PID R 0132.00.00.0032.0000 95,969 PY Val USE 18,455 LAND 002
523 RUSSELL LOOP RD DEF 76,070 BLDG 001
LISTER 11/14/2015 MW PROSPECT HILL NC 27314 2.650 ACRES 1,444 XFOB 003
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 1 BLK PL BK/PG 183 311 PLAT ADDRESS 0000523 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 183 310 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP RD PLAT 176 PG 505

EXTRA FEATURES

Seq	Bldg Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
002	000041	SHELTER	20	12		240.000	SF	1	0E	3.000	0000	.20	1.00	1.00	1.00	100.00	144
003	000006	CARPORT/INEXPEN	21	18		1.000	UT	1		600.000	0000	1.00	1.00	1.00	1.00	100.00	600
004	CHNFN4	75-CHNFENC4	400	1		400.000	SF	1	0D	3.500	0000	.50	1.00	1.00	1.00	100.00	700

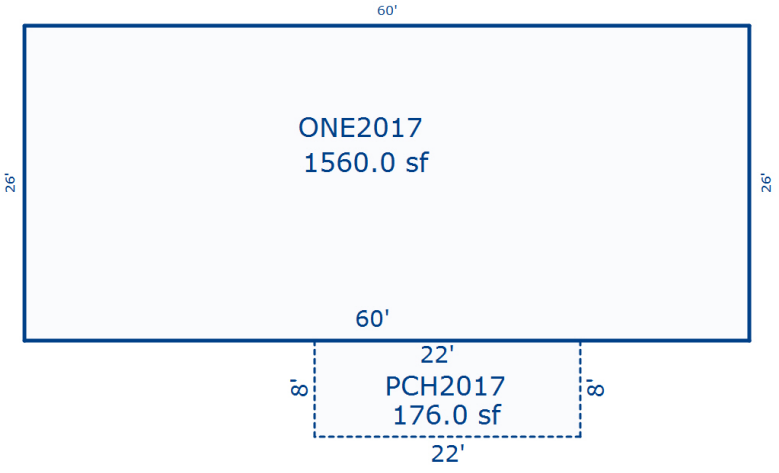
LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020KAC		HS W/UTIL					1.000	AC	14,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	14,000.000	14,000
2		080KAC		2-4 ACRE					1.650	AC	2,700.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,700.000	4,455

Location #8 – 595 Russell Loop Road

```
                                  MURRAY,DENNIS & DISHMAN,LESSIE            2019     156,604 MKT                  CARD 001
PID R 0132.00.00.0031.0000        L/E &CHRISTINE MURRAY(1/3)       80,978 PY Val            USE           27,284 LAND 002
                                   PO BOX 10                                               DEF          123,912 BLDG 001
LISTER 11/14/2015  MW             PROSPECT HILL NC 27314                            5.920 ACRES          5,408 XFOB 004
TWP HIGHTOWER           CITY                      FIRE                     RESCUE                      OTHER
LOT    3&4 BLK                            PL BK/PG            PLAT        ADDRESS 0000595 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000     USE 000100 RESIDENTIAL            DEED 607   745    AICUZ           PRINTED  6/07/2019 BY  THOMAS
LEGAL:  595 RUSSELL LOOP RD DB220-597
                                  BUILDING CHARACTERISTICS  for BldgSeq# 001    (Item# 001  )
Code   Description  Code       Description  Code   Description   Code   Description   Code   Description   Code   Description
MODL 01 SNG FAMILY  BVAL 0001CG SNG FAMILY  ARCH 23 OFFMODULAR   QUAL C3 GRADE C      STYS                 SIZE 0C GRADE C
FNDN 02 CONC BLOCK  FRME   01   WOOD FRAME  WNDO    N/A          EXW1 03 VINYL        EXW2    N/A          EXW2%
HEAT 02 HEAT PUMP   A/C    01   CENTRALA/C  RSTR 01 GABLE        RCV1 01 ASPSHINGLE   RCV2    N/A          RCV2%
INT1 01 SHEETROCK   INT2        N/A         INT2%                FLR1 14 CPT/VNYL     FLR2    N/A          FLR2%
KTCH    N/A         DPRT   02               BATH                 BDRM     3           ROOM                 SPCD     N/A
UD-1    N/A         FRPL        N/A         CHMN    N/A          HBTH    N/A          BATH C2 2 BATHS      FUEL 04 ELECTRIC
FXTR    N/A         UD-8        N/A         RMYR    N/A          RMYR    N/A          UD-9%           AYB 2017       EYB 2017


                        AREA CALCULATION                                                    TRAVERSE
 Subarea  Actual     Adj   Heated  Prime    Rate    Value %Good       RCNLD  ONE2017=1560$ PCH2017=176$.
 ONE STO    1560    1560     1560   1560                100.00
 PORCH       176      49                                 100.00
 LUMP                                           123912100.00     123,912
 TOTAL      1736             1560          79.43        100.00
 TOTAL              1609            1560           123912           123,912
```



Sketch by Apex Sketch

```
                                  MURRAY,DENNIS & DISHMAN,LESSIE             2019     156,604 MKT                    CARD 002
PID R 0132.00.00.0031.0000        L/E &CHRISTINE MURRAY(1/3)        80,978 PY Val             USE            27,284 LAND 002
                                   PO BOX 10                                                   DEF           123,912 BLDG 001
LISTER 11/14/2015  MW             PROSPECT HILL NC 27314                                5.920 ACRES          5,408 XFOB 004
TWP HIGHTOWER           CITY                        FIRE                      RESCUE                        OTHER
LOT    3&4 BLK                            PL BK/PG             PLAT         ADDRESS 0000595 RUSSELL LOP RD PROSPECT HILL 27314
NBHD 00000000     USE 000100 RESIDENTIAL            DEED 607   745    AICUZ           PRINTED  6/07/2019 BY  THOMAS
LEGAL:  595 RUSSELL LOP RD DB220-597
              SALES                                                 BUILDING PERMITS
IN Q RC M V Sale Date   Sale Price      Number    Type  Description   Issued   Schd Complt  Revisit    Act Complt   Amount
WD U 0G   I   6/25/2018                16315     PORC  PORCH        7/09/2018                          7/19/2018
WL U 12   I   9/30/2002                16187     MODU  MODULAR     10/26/2017                          3/02/2018
                                             EXTRA FEATURES
Seq Bldg Code   Description    Length Width Height   #Units    UT  Qty Qual   UTPrice  Year Adj1 Adj2 Adj3 Adj4 %Good     Value
002      MHSPAC 33-M/H SPAC                                1.000 UT    1  0D   3,100.000 0000 1.00 1.00 1.00 1.00 100.00        3,100
004      000041 SHELTER                                    1.000 SF    1  0D     100.000 0000 1.00 1.00 1.00 1.00 100.00          100
005      SHELTR 41-SHELTER         20    14            280.000 SF    1  0D       3.500 2017  .95 1.00 1.00 1.00 100.00          931
006      STRGFR 50-STORAGFR        14    12            168.000 SF    1  0D       8.000 2017  .95 1.00 1.00 1.00 100.00        1,277
                                                 LAND
Seq     Zone     Code   Use   Description
   Front    Depth    Back  FT       #Units UT       UTPrice Adj1 Adj2 Adj3 Adj4 Fadj Dadj      Nbhd Adj       Eff Rate       Value
  1             020KAC        HS W/UTIL
                                     1.000 AC    14,000.000 1.00 1.00 1.00 1.00 1.00 1.00         1.000     14,000.000      14,000
  2             080KAC        2-4 ACRE
                                     4.920 AC     2,700.000 1.00 1.00 1.00 1.00 1.00 1.00         1.000      2,700.000      13,284
```

Location #9 – 115 Beaver Falls Drive

HEBERT,GENE M & SYLVIA C 2019 109,563 MKT CARD 001
PID R 0147.00.00.0021.0000 109,563 PY Val USE 55,704 LAND 003
PO BOX 171 DEF 53,859 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 0171 12.940 ACRES XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 5 BLK PL BK/PG 11 184 PLAT ADDRESS 0000115 BEAVER FALLS DR PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 256 534 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: BEAVER FALLS DR OFF RUSSELL LP

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	05 MFG HOUSE	BVAL	0005C6 MFG HSE/DW	ARCH	N/A	QUAL	C2 GRADE C+5	STYS		SIZE	N/A
FNDN	01 BRICK	FRME	02 STEELFRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	08 CENT H&AC	A/C	N/A	RSTR	01 GABLE	RCV1	02 METAL	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	08 CARPT/VYNL	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	06	BATH		BDRM	4	ROOM	7	SPCD	N/A
UD-1	N/A	FRPL	1C FIREPLACE	CHMN	N/A	HBTH	N/A	BATH	C3 3 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1991	EYB 1995

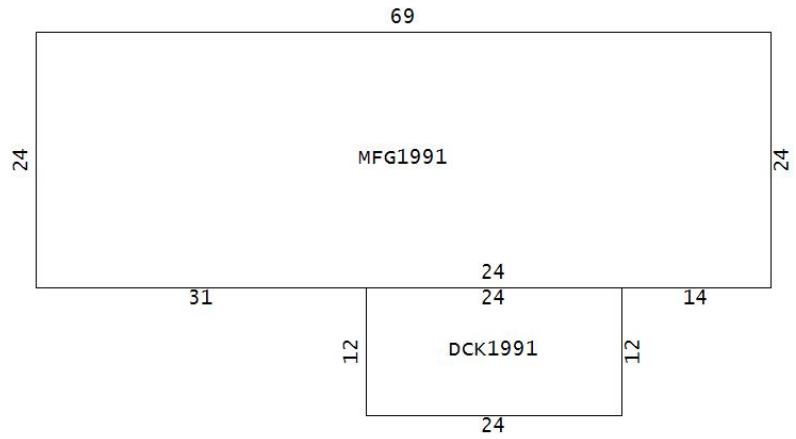
AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
D/W M/H	1656	1656	1656	1656			65.00	
DECK	288	75					65.00	
LUMP						82860	65.00	53,859
TOTAL	1944		1656		50.03		65.00	
TOTAL		1731		1656		82860		53,859

TRAVERSE

MFG1991= N24 E69 S24 W14 24 W31$.

DCK1991= S12 W24 N12 E24$ W



HEBERT,GENE M & SYLVIA C 2019 109,563 MKT CARD 002
PID R 0147.00.00.0021.0000 109,563 PY Val USE 55,704 LAND 003
PO BOX 171 DEF 53,859 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 0171 12.940 ACRES XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 5 BLK PL BK/PG 11 184 PLAT ADDRESS 0000115 BEAVER FALLS DR PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 256 534 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: BEAVER FALLS DR OFF RUSSELL LP

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		000099	MISC BUILDING				1.000	UT	1		.000	0000	1.00	1.00	1.00	1.00	100.00	

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020JAC		HS W/UTIL					1.000	AC	13,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	13,000.000	13,000
2		400LAC		WOOD ON PAVED RD					7.940	AC	1,600.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,600.000	12,704
3		460KAC		ROAD FRONT WOODLAND					4.000	AC	7,500.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	7,500.000	30,000

#4

115 Beaver Falls

Caswell County Health Department
Well Permit

Date: 5-13-91 This Permit Void After 1 Years

Owner: TOM & SUE BRUNO SR# Russell Loop

Location/Directions: Russ. Loop + 2 mi. to 1st DRIVE ON RT

Subdivision Name: BEAVER FALLS Lot # 5

Drilling Contractor: Evans Well Co.

WELL CONSTRUCTION

Distance from Nearest Property Line 15 plus Distance from Source of Pollution 100 plus

Total Depth: 157 Ft. Yield: 15 GPM Static Water Level 14 Ft.

Water Bearing Zones: Depth 65 Ft. 97 Ft. 152 Ft. ____ Ft.

Casing: Depth: From 0 to 37 Ft. Diameter: 6 1/4 Inches

TYPE: Steel ____ Galvanized Steel ✓

If Steel, does owner approve: Yes ____ No ____

Weight: 13 Thickness: 188 Height Above Ground: 1 Inches

Drive Shoe: Yes ✓ No ____

Were Problems Encountered in Setting the Casing? Yes ____ No ✓

If "yes" give reason: ____

Grout: Type: Neat ✓ Sand/Cement ____ Concrete ____

Annular Space Width 3 Inches

Water in Annular Space: Yes ____ No ✓

Method: Pumped ____ Pressure ____ Poured ✓

Depth: From 0 to 20 Ft.

Materials Used: No. Bags Portland Cement 4 Weight of 1 bag 94 lbs.

If mixture (sand, gravel, cuttings) - Ratio: 2 to 1

ID Plates: Yes ✓ No ____

~~4x4~~ slab Yes ✓ No ____

4 1/2 x 4 1/2

DRILLING LOG

Depth From	Depth To	Formation Description
0	3	Clay
3	8	Sandy Soil
8	27	Sand
27	35	Sand Rock
35	157	Granite

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT AND THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH REGULATIONS SET FORTH BY THE CASWELL COUNTY HEALTH DEPARTMENT.

Evans Well Co 6-18-91
Signature of Contractor Date

Jim Allison RD 5-13-91
Sanitarian's Signature Date Issued

Jim Allison 6-18-91
Sanitarian's Signature Date Completed

Sketch well location on reverse side.

Tax Map# Parcel# PIN Permit# A-051391-2

Location #10 – 206 Beaver Falls Drive

COOK,SARA CHRISTINE 2019 93,585 MKT CARD 001
PID R 0147.00.00.0001.0000 93,585 PY Val USE 45,040 LAND 002
312 MASON ROAD DEF 44,945 BLDG 001
LISTER 11/22/2015 GP DURHAM NC 27712 17.020 ACRES 3,600 XFOB 002
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 4 BLK A PL BK/PG 11 184 PLAT ADDRESS 0000206 BEAVER FALLS DR PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 545 1264 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: BEAVER FALLS DRIVE OFF RUSSELL LOOP RD PLAT 11 PG 135

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

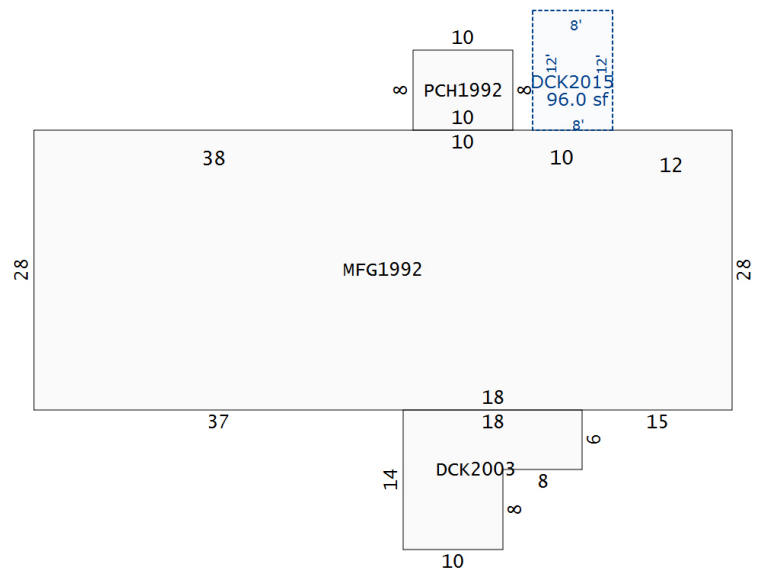
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	05 MFG HOUSE	BVAL	0005D6 MFG HSE/DW	ARCH	01 D/W	QUAL	D2 GRADE D+5	STYS		SIZE	N/A
FNDN	04 PIER	FRME	02 STEELFRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	08 CENT H&AC	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	02 WOODPANEL	INT2	N/A	INT2%		FLR1	05 CARPET	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	06	BATH		BDRM	3	ROOM	5	SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH	D2 2 BATHS	FUEL	01 NONE
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1992	EYB 1992

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
D/W M/H	1960	1960	1960	1960			62.00	
PORCH	80	34					62.00	
DECK	188	49					62.00	
DECK	96	25					62.00	
LUMP						72493	62.00	44,945
TOTAL	2324		1960		36.98		62.00	
TOTAL		2068		1960		72493		44,945

TRAVERSE

MFG1992=1960$ PCH1992=80$ DCK2003=188$ DCK2015=96$.



Sketch by Apex Sketch

COOK,SARA CHRISTINE 2019 93,585 MKT CARD 002
PID R 0147.00.00.0001.0000 93,585 PY Val USE 45,040 LAND 002
312 MASON ROAD DEF 44,945 BLDG 001
LISTER 11/22/2015 GP DURHAM NC 27712 17.020 ACRES 3,600 XFOB 002
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 4 BLK A PL BK/PG 11 184 PLAT ADDRESS 0000206 BEAVER FALLS DR PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 545 1264 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: BEAVER FALLS DRIVE OFF RUSSELL LOOP RD PLAT 11 PG 135

SALES

IN	Q	RC	M	V	Sale Date	Sale Price
WD	U	0E	I		2/16/2010	

BUILDING PERMITS

Number	Type	Description	Issued	Schd	Complt	Revisit	Act	Complt	Amount

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		000027	DETACHED FR GAR				1.000	SF	1	0D	3,000.000	0000	.40	1.00	1.00	1.00	100.00	1,200
002		FRMBRN	1-FRAME BARN	30	40		1200.000	SF	1	0E	5.000	0000	.40	1.00	1.00	1.00	100.00	2,400

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020JAC		HS W/UTIL					1.000	AC	13,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	13,000.000	13,000
2		280NAC		OPEN ON PAVED ROAD					16.020	AC	2,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,000.000	32,040

CASWELL COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION

206 Beaver Fall NO. N050793-2

#5

(This permit expires five years from date of issue)

WELL PERMIT

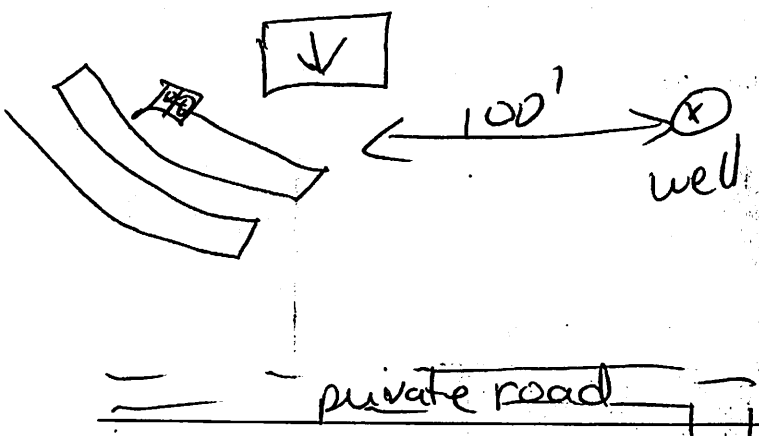
____ New Well
____ Replacement Well

NAME Cody Cook ADDRESS 912 Camden Ave Durham

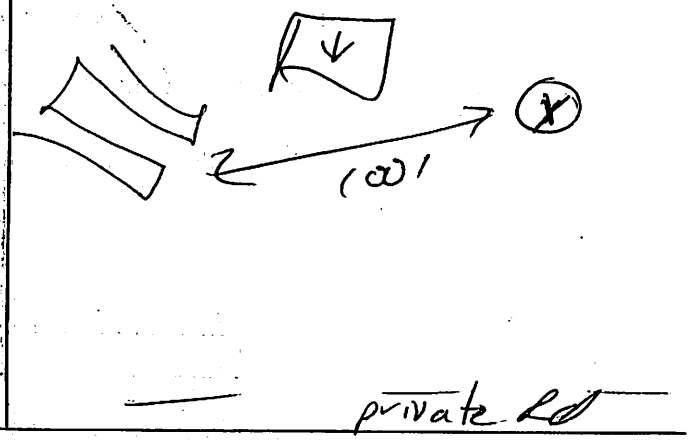
Directions to Site 86 S (L) John Oakley Rd (L) Ridgeville (R) Russel Coup - 1st gravel on (R)

Well to Serve: ✓ Residence ____ Mobile Home Park ____ Other

Sketch of Well Site



Sketch of Installation



WELL CONSTRUCTION

Distance from nearest property line 15 plus
Distance from source of pollution 100 plus
Total depth of well 145 ft. GPM 7-8

Water bearing Zones: Depth 90 Ft. 115 Ft.
Casing: Depth: From 0 to 83 Ft.
Diameter 6 1/4
Static Water Level 21 Ft.

Casing Type: Steel ____ Galvanized Steel ✓ Thickness 188
If steel, does owner approve: ____ Yes ____ No
Drive Shoe ✓ Yes ____ No Height of casing above ground 12 inches
Problems in setting casing ____ Yes ✓ No. Explain ____

Grout Type: ____ Neat ✓ Sand/Cement ____ Concrete. Annular space width 3 In.
Water in Annular space ____ Yes ✓ No Method of Grout ____ Pump ____ Pressure ✓ Poured
No. Bags of Portland Cement 4 Depth: From 0 to 20 Ft.
Weight of 1 bag 94 lbs. Proper Slab Constructed ✓ ID Plate ✓

DRILLING LOG

Depth From	Depth To	Formation Description
0	78	Sandy Soil
78	81	Sand
81	145	Hard Rock

I hereby certify that the above information is correct and that this well was constructed in accordance with the Caswell County Well Ordinance.

Warren Wells 8-25-93
Signarure of Contractor Date

Permit Issued By Jerri Nelson EHS I Date 5-7-93
Inspection Completed By Jerri Nelson EHS I Date 8-25-93

Location #11 – 258 Beaver Falls Drive

WORSHAM,LORA 2019 163,529 MKT CARD 001
PID R 0147.00.00.0026.0000 163,529 PY Val USE 35,250 LAND 003
258 BEAVER FALLS DR DEF 126,661 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 15.750 ACRES 1,618 XFOB 003
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 4 BLK PL BK/PG 11 184 PLAT ADDRESS 0000258 BEAVER FALLS DR PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 451 556 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: BEAVER FALLS DRIVE

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

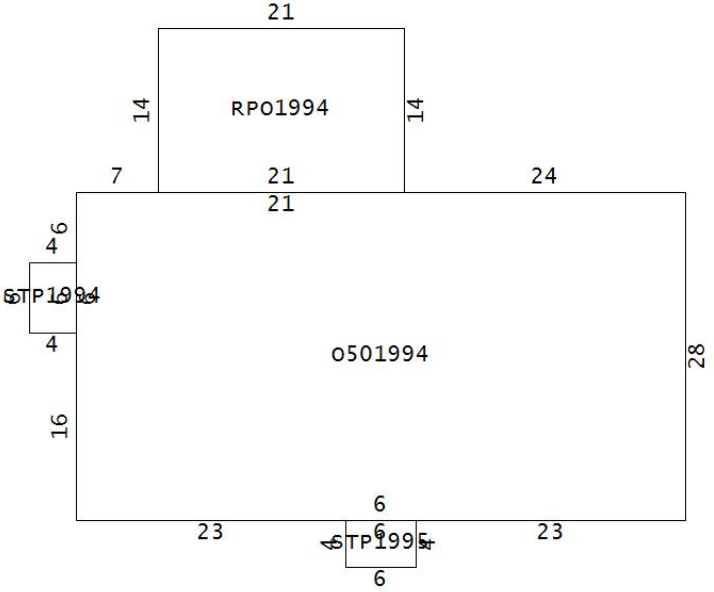
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001CG SNG FAMILY	ARCH	N/A	QUAL	C3 GRADE C	STYS		SIZE	0C GRADE C
FNDN	01 BRICK	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	20 MIXED	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	02	BATH		BDRM	4	ROOM	10	SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH	C3 3 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1994	EYB 1994

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
1.50 ST	1456	2038	2184	1456			83.00	
STOOP	24	5					83.00	
RAIPATI	294	35					83.00	
STOOP	24	5					83.00	
LUMP						152604	83.00	126,661
TOTAL	1798		2184		69.87		83.00	
TOTAL		2083		1456		152604		126,661

TRAVERSE

O501994= N16 STP1994= W4 N6 E4S6$ N6 N6 E7 RPO1994= N14 E 21 S14 W21$ E21 E24 S28 W23 STP1995= S4 W6 N4 E6$ W6 W23$.



WORSHAM,LORA 2019 163,529 MKT CARD 002
PID R 0147.00.00.0026.0000 163,529 PY Val USE 35,250 LAND 003
258 BEAVER FALLS DR DEF 126,661 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 15.750 ACRES 1,618 XFOB 003
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 4 BLK PL BK/PG 11 184 PLAT ADDRESS 0000258 BEAVER FALLS DR PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 451 556 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: BEAVER FALLS DRIVE

SALES

IN	Q	RC	M	V	Sale Date	Sale Price
WD	U	0E	I		3/16/2004	

BUILDING PERMITS

Number	Type	Description	Issued	Schd Complt	Revisit	Act Complt	Amount

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		SHELTR	41-SHELTER	20	12		240.000	SF	1	0D	3.500	0000	.20	1.00	1.00	1.00	100.00	168
002		STRGFR	50-STORAGFR	16	12		192.000	SF	1	0D	8.000	0000	.55	1.00	1.00	1.00	100.00	845
003		CARPRT	6-CARPORT	21	18		378.000	SF	1	0E	4.000	2003	.40	1.00	1.00	1.00	100.00	605

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020JAC		HS W/UTIL					1.000	AC	13,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	13,000.000	13,000
2		400LAC		WOOD ON PAVED RD					8.000	AC	1,600.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,600.000	12,800
3		400KAC		WOOD ON PAVED RD					6.750	AC	1,400.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,400.000	9,450

#6

Caswell County Health Department
Well Permit

258 Beaver Falls

Date: 3-20-92 This Permit Void After 5 Years

Owner: Ronald M. Banach SR#

Location/Directions: Russell Leap Rd off 2 Hwy. 70 SM thru woods

Subdivision Name: _____ Lot # _____

Drilling Contractor: Evans Well Co

WELL CONSTRUCTION

Distance from Nearest Property Line 15 plus Distance from Source of Pollution 100 plus

Total Depth: 105 Ft. Yield: 30 GPM Static Water Level 16 Ft.

Water Bearing Zones: Depth 80 Ft. 95 Ft. ____ Ft. ____ Ft.

Casing: Depth: From 0 to 67 Ft. Diameter: 6 Inches

TYPE: Steel _____ Galvanized Steel ✓

If Steel, does owner approve: Yes _____ No _____

Weight: 13 Thickness: .188 Height Above Ground: 12 Inches

Drive Shoe: Yes ✓ No _____

Were Problems Encountered in Setting the Casing? Yes _____ No ✓

If "yes" give reason: _____

Grout: Type: Neat _____ Sand/Cement ✓ Concrete _____

Annular Space Width 3 Inches

Water in Annular Space: Yes _____ No ✓

Method: Pumped _____ Pressure _____ Poured ✓

Depth: From 0 to 20 Ft.

Materials Used: No. Bags Portland Cement 4 Weight of 1 bag 94 lbs.

If mixture (sand, gravel, cuttings) - Ratio: 2 to 1

ID Plates: Yes ✓ No _____

4½x4½ slab Yes ✓ No _____

DRILLING LOG

Depth From	Depth To	Formation Description
0	3	Red Soil
3	15	Sandy Soil
15	60	Sand
60	65	Shale Rock
65	105	Hard Rock

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT AND THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH REGULATIONS SET FORTH BY THE CASWELL COUNTY HEALTH DEPARTMENT.

Evans Well Co. 2-22-93
Signature of Contractor Date

Jim Allen, R.S. 3-20-92
Sanitarian's Signature Date Issued

Jerri Nelson 2-22-93
Sanitarian's Signature Date Completed

Sketch well location on reverse side.

Map# _____ Parcel# _____ PIN _____ Permit# A-03 2092-1

Location #12 – 802 Russell Loop Road

KEMPER,DALE R TRUSTEE 2019 299,255 MKT CARD 001
PID R 0147.00.00.0031.0000 71,988 PY Val USE 78,488 LAND 003
28 HENRY DANIELS RD DEF 217,796 BLDG 001
LISTER PROSPECT HILL NC 27314 19.180 ACRES 2,971 XFOB 003
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 1 BLK PL BK/PG 11 184 PLAT ADDRESS 0000802 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 596 972 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP & HENRY DANIELS X X X

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

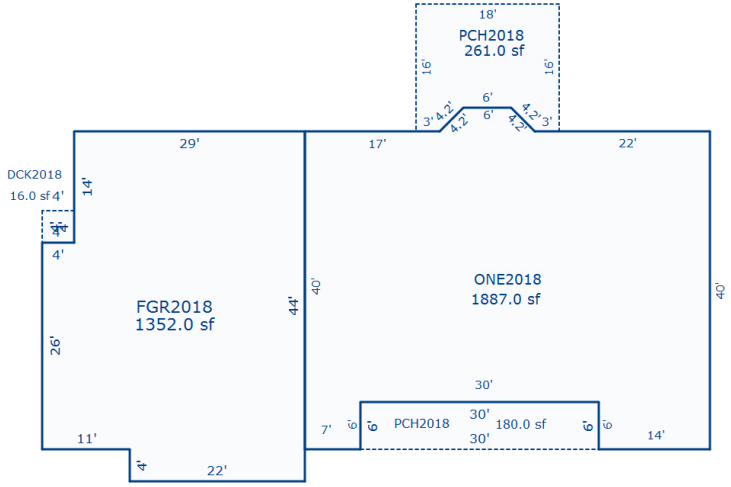
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001CG SNG FAMILY	ARCH	10 CONVENTL	QUAL	C1 GRADE C+10	STYS		SIZE	0C GRADE C
FNDN	06 STONE	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	01 CENTRALA/C	RSTR	02 HIP	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	17 LAMINATED	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	02	BATH		BDRM	3	ROOM		SPCD	N/A
UD-1	N/A	FRPL	1C FIREPLACE	CHMN	N/A	HBTH	N/A	BATH	C2 2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 2018	EYB 2018

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
ONE STO	1887	1887	1887	1887			100.00	
PORCH	441	123					100.00	
FIN GAR	1352	635					100.00	
DECK	16	3					100.00	
LUMP						217796	100.00	217,796
TOTAL	3696		1887		115.41		100.00	
TOTAL		2648		1887		217796		217,796

TRAVERSE

ONE2018=1887$ PCH2018=441$ FGR2018=1352$ DCK2018=16$.



Sketch by Apex Sketch

KEMPER,DALE R TRUSTEE 2019 299,255 MKT CARD 002
PID R 0147.00.00.0031.0000 71,988 PY Val USE 78,488 LAND 003
28 HENRY DANIELS RD DEF 217,796 BLDG 001
LISTER PROSPECT HILL NC 27314 19.180 ACRES 2,971 XFOB 003
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 1 BLK PL BK/PG 11 184 PLAT ADDRESS 0000802 RUSSELL LOOP RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 596 972 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP & HENRY DANIELS X X X
16202 SFD SING FAML 12/07/2017 4/06/2018

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		STRGML	51-STORAGML	20	8		160.000	SF	1	0C	10.000	2018	.97	1.00	1.00	1.00	100.00	1,552
002		CNCPAV	82-CONCPAVE	32	25		800.000	SF	1	0C	1.500	2018	.95	1.00	1.00	1.00	100.00	1,140
003		CHNFN4	75-CHNFENC4	72	1		72.000	SF	1	0C	4.000	2018	.97	1.00	1.00	1.00	100.00	279

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020KAC		HS W/UTIL					1.000	AC	14,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	14,000.000	14,000
2		460KAC		ROAD FRONT WOODLAND					6.000	AC	7,500.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	7,500.000	45,000
3		400LAC		WOOD ON PAVED RD					12.180	AC	1,600.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,600.000	19,488

Location #13 – 915 Russell Loop Road

DIX,DOROTHY W & 2019 75,191 MKT CARD 001
PID R 0147.00.00.0013.0000 RICHARD E WILBORNE (JTRS) 75,191 PY Val USE 19,400 LAND 002
2386 RED MARSHALL RD DEF 55,503 BLDG 001
LISTER 11/23/2015 GP PELHAM NC 27311 3.000 ACRES 288 XFOB 002
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 12 126 PLAT ADDRESS 0000915 RUSSELL LP RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 610 1377 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: RUSSELL LOOP RD DEED 241-756 X 6/18/13 REMOVED ROBERT L KIRBY

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

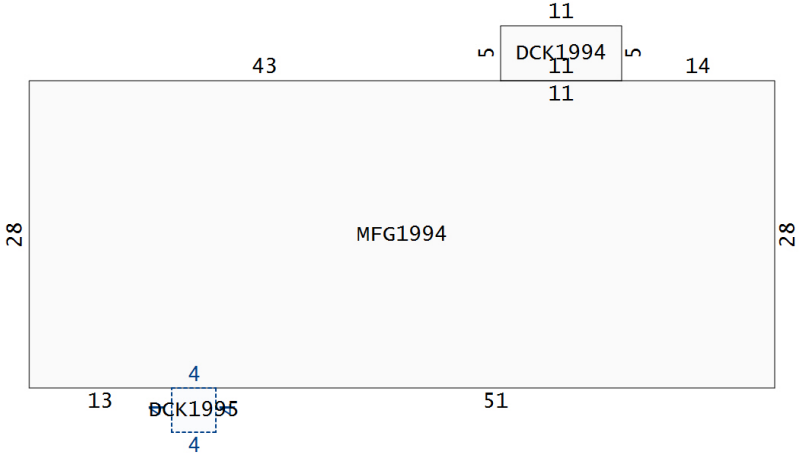
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	05 MFG HOUSE	BVAL	0005C6 MFG HSE/DW	ARCH	N/A	QUAL	C2 GRADE C+5	STYS		SIZE	N/A
FNDN	01 BRICK	FRME	02 STEELFRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	03 ELEC BB	A/C	01 CENTRALA/C	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	05 CARPET	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	06	BATH		BDRM	3	ROOM	6	SPCD	N/A
UD-1	N/A	FRPL	1C FIREPLACE	CHMN	N/A	HBTH	N/A	BATH	C2 2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1994	EYB 1994

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
D/W M/H	1904	1904	1904	1904			64.00	
DECK	55	14					64.00	
DECK	16	4					64.00	
LUMP						86724	64.00	55,503
TOTAL	1975		1904		45.54		64.00	
TOTAL		1922		1904		86724		55,503

TRAVERSE

MFG1994=1904$ DCK1994=55$ DCK1995=16$.



Sketch by Apex Sketch

```
                                  DIX,DOROTHY W &                            2019      75,191 MKT                   CARD 002
PID R 0147.00.00.0013.0000        RICHARD E WILBORNE (JTRS)         75,191 PY Val             USE            19,400 LAND 002
                                  2386 RED MARSHALL RD                                        DEF            55,503 BLDG 001
LISTER 11/23/2015  GP             PELHAM NC 27311                                      3.000 ACRES             288 XFOB 002
TWP HIGHTOWER            CITY                        FIRE                      RESCUE                        OTHER
LOT        BLK                              PL BK/PG 12   126    PLAT         ADDRESS 0000915 RUSSELL LP RD PROSPECT HILL 27314
NBHD 00000000     USE 000100 RESIDENTIAL            DEED 610   1377   AICUZ           PRINTED  6/07/2019 BY  THOMAS
LEGAL:  RUSSELL LOOP RD DEED 241-756 X 6/18/13 REMOVED ROBERT L KIRBY
             SALES                                                BUILDING PERMITS
IN Q RC M V Sale Date   Sale Price      Number    Type  Description   Issued   Schd Complt  Revisit    Act Complt   Amount
WD Q      I  12/04/2018        80,000
                                          EXTRA FEATURES
Seq Bldg Code   Description    Length Width Height   #Units    UT  Qty Qual   UTPrice  Year Adj1 Adj2 Adj3 Adj4 %Good     Value
001      STRGFR 50-STORAGFR        12    10            120.000 SF    1  0E        .000 0000  .60 1.00 1.00 1.00 100.00
003      STRGML 51-STORAGML        12    12            144.000 SF    1  0E       5.000 0000  .40 1.00 1.00 1.00 100.00          288
                                                LAND
Seq     Zone     Code   Use   Description
   Front    Depth    Back  FT       #Units UT       UTPrice Adj1 Adj2 Adj3 Adj4 Fadj Dadj      Nbhd Adj       Eff Rate       Value
  1            020KAC        HS W/UTIL
                                     1.000 AC    14,000.000 1.00 1.00 1.00 1.00 1.00 1.00         1.000     14,000.000      14,000
  2            080KAC        2-4 ACRE
                                     2.000 AC     2,700.000 1.00 1.00 1.00 1.00 1.00 1.00         1.000      2,700.000       5,400
```

Location #14 – 28 Henry Daniels Road

KEMPER,DALE R TRUSTEE 2019 483,396 MKT CARD 001
PID R 0147.00.00.0025.0000 483,396 PY Val USE 62,675 LAND 004
28 HENRY DANIELS RD DEF 378,973 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 33.050 ACRES 41,748 XFOB 004
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 2 BLK PL BK/PG 11 184 PLAT ADDRESS 0000028 HENRY DANIELS RD PROSPECT HILL 2731
NBHD 00000000 USE 000200 AGRICULTURE DEED 596 972 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: HENRY DANIELS RD & RUSSELL LP DB 263-41 X X

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

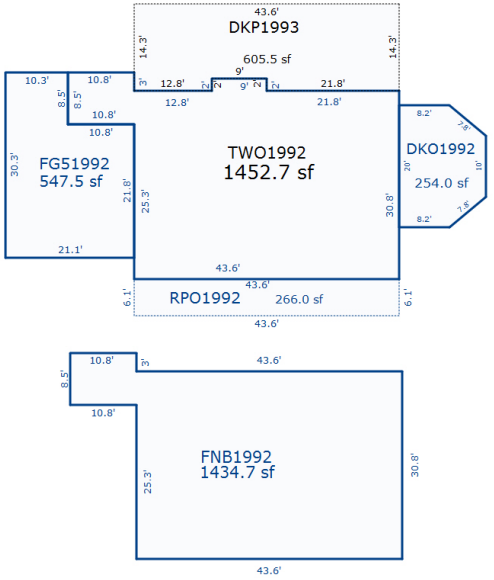
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001AA SNG FAMILY	ARCH	N/A	QUAL	A5 GRADE A-10	STYS		SIZE	0A GRADE A
FNDN	01 BRICK	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	01 FACE BRICK	EXW2	N/A	EXW2%	
HEAT	11 CNTRLHT&AC	A/C	N/A	RSTR	02 HIP	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	12 HARDWOOD	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	03	BATH		BDRM	4	ROOM	11	SPCD	N/A
UD-1	N/A	FRPL	3A FIREPLACE	CHMN	2A FP CHIMNEY	HBTH	A1 1 HALFBATH	BATH	A2 2 BATHS	FUEL	03 GAS
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1992	EYB 1992

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
TWO STO	1453	2819	2906	1453			75.25	
.5STY/F	548	630	630	548			75.25	
DECK/PA	605	127					75.25	
RAIPATI	266	32					75.25	
DECK/ON	254	305	254				75.25	
FINSH B	1435	804					75.25	
LUMP						503619	75.25	378,973
TOTAL	4561		3790		132.88		75.25	
TOTAL		4717		2001		503619		378,973

TRAVERSE

TWO1992=1453$ FG51992=548$ DKP1993=605$ RPO1992=266$
DKO1992=254$ FNB1992=1435$.



Sketch by Apex Sketch

KEMPER,DALE R TRUSTEE 2019 483,396 MKT CARD 002
PID R 0147.00.00.0025.0000 483,396 PY Val USE 62,675 LAND 004
28 HENRY DANIELS RD DEF 378,973 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 33.050 ACRES 41,748 XFOB 004
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 2 BLK PL BK/PG 11 184 PLAT ADDRESS 0000028 HENRY DANIELS RD PROSPECT HILL 2731
NBHD 00000000 USE 000200 AGRICULTURE DEED 596 972 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: HENRY DANIELS RD & RUSSELL LP DB 263-41 X X

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number	Type	Description
WD	U	0P		I	12/13/2016	390,000	16041	ASBL	ASSOR BLDG
WD	Q			I	11/02/2006	650,000	13988	RENO	RENOVATION

BUILDING PERMITS

Issued	Schd Complt	Revisit	Act Complt	Amount
2/01/2017				
11/08/2010				

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		CNCSLB	74-CONCSLAB	30	24		720.000	SF	1	0C	2.000	0000	.70	1.00	1.00	1.00	100.00	1,008
002		ADRIVE	7-ASPDRIVE	1600	8		12800.000	SF	1	0B	2.250	2002	.80	1.00	1.00	1.00	100.00	23,040
003		000006	CARPORT/INEXPEN	21	18		1.000	UT	1		600.000	2017	1.00	1.00	1.00	1.00	100.00	600
004		MTLGAR	METAL GARAGE	40	30		1200.000	SF	1	0C	15.000	2017	.95	1.00	1.00	1.00	100.00	17,100

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020LAC		HS W/UTIL					1.000	AC	15,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	15,000.000	15,000
2		300NAC		OPEN ON DIRT ROAD					2.000	AC	1,750.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,750.000	3,500
3		420LAC		WOOD ON DIRT ROAD					21.050	AC	1,500.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,500.000	31,575
4		420KAC		WOOD ON DIRT ROAD					9.000	AC	1,400.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,400.000	12,600

#9

28 Henry Daniels

Caswell County Health Department
Well Permit

Date: 5-14-91 This Permit Void After 3 Years

Owner: Jim R. Dodley SR# Henry Daniel

Location/Directions: Russell Loop (L) H. Daniel Rd 1st drive to (RT)

Subdivision Name: Westendorf - Beaver Falls Lot # 58 AC

Drilling Contractor:

WELL CONSTRUCTION

Distance from Nearest Property Line 207 Distance from Source of Pollution 100 +

Total Depth: 165 Ft. Yield: 9 GPM Static Water Level 22 Ft.

Water Bearing Zones: Depth 28-38 Ft. 70-145 Ft. ____ Ft. ____ Ft.

Casing: Depth: From 0 to 33 Ft. Diameter: 6 Inches

TYPE: Steel ____ Galvanized Steel 188 wall

If Steel, does owner approve: Yes ✓ No ____

Weight: 13 lb Thickness: 188 Height Above Ground: 18" Inches

Drive Shoe: Yes ✓ No ____

Were Problems Encountered in Setting the Casing? Yes ____ No ✓

If "yes" give reason: ____

Grout: Type: Neat ____ Sand/Cement ✓ Concrete ____

Annular Space Width 11 Inches

Water in Annular Space: Yes ✓ No ____

Method: Pumped ____ Pressure ____ Poured ✓

Depth: From 0 to 33 Ft.

Materials Used: No. Bags Portland Cement 6 Weight of 1 bag 94 lbs.

If mixture (sand, gravel, cuttings) - Ratio: 2 to 1

ID Plates: Yes ✓ No ____

~~4x4~~ slab Yes ✓ No ____

5x5 ~~4½ x 4½~~

DRILLING LOG

Depth From	Depth To	Formation Description
0	20	Soil
20	26	Overburden
26	28	Broken Rock
28	165	Blue Granite

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT AND THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH REGULATIONS SET FORTH BY THE CASWELL COUNTY HEALTH DEPARTMENT.

Craig Hinson

Signature of Contractor Date

Jim Allison, RS 5-14-91

Sanitarian's Signature Date Issued

J. Allison 5-17-91

Sanitarian's Signature Date Completed

Sketch well location on reverse side.

Tax Map# Parcel# PIN Permit# A-05491-3

Location #15 – 200 Henry Daniels Road

OESTREICHER,KAREN ETAL 2019 200,832 MKT CARD 001
PID R 0147.00.00.0019.0000 200,832 PY Val USE 47,565 LAND 003
228 CACTUS DR DEF 140,864 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 18.010 ACRES 12,403 XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT B BLK PL BK/PG 15 871 PLAT ADDRESS 0000200 HENRY DANIELS RD PROSPECT HILL 2731
NBHD 00000000 USE 000200 AGRICULTURE DEED 503 835 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: HENRY DANIELS RD REF DEEDS 318-857;352-95 PLAT 11/135 8/6/07 AC INCREASE P/P 15/871`

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

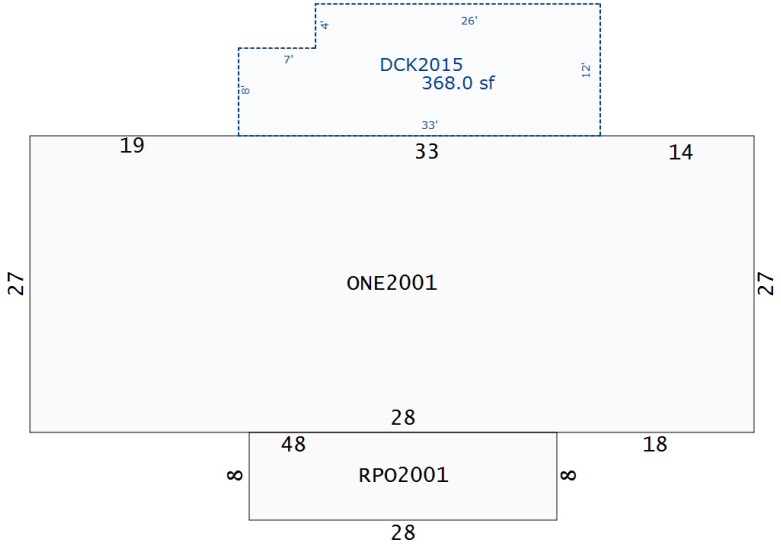
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001CG SNG FAMILY	ARCH	18 MODULAR	QUAL	C1 GRADE C+10	STYS		SIZE	0C GRADE C
FNDN	01 BRICK	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	04 HARDW/CRPT	FLR2	10 VINYL	FLR2%	20
KTCH	N/A	DPRT	02	BATH		BDRM	3	ROOM	7	SPCD	N/A
UD-1	N/A	FRPL	1C FIREPLACE	CHMN	1C FP CHIMNEY	HBTH	N/A	BATH	C2 2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 2001	EYB 2001

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
ONE STO	1782	1782	1782	1782			89.00	
RAIPATI	224	27					89.00	
DECK	368	74					89.00	
LUMP						158275	89.00	140,864
TOTAL	2374		1782		88.81		89.00	
TOTAL		1883		1782		158275		140,864

TRAVERSE

ONE2001=1782$ RPO2001=224$ DCK2015=368$.



Sketch by Apex Sketch

OESTREICHER,KAREN ETAL 2019 200,832 MKT CARD 002
PID R 0147.00.00.0019.0000 200,832 PY Val USE 47,565 LAND 003
228 CACTUS DR DEF 140,864 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 18.010 ACRES 12,403 XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT B BLK PL BK/PG 15 871 PLAT ADDRESS 0000200 HENRY DANIELS RD PROSPECT HILL 2731
NBHD 00000000 USE 000200 AGRICULTURE DEED 503 835 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: HENRY DANIELS RD REF DEEDS 318-857;352-95 PLAT 11/135 8/6/07 AC INCREASE P/P 15/871`

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number	Type	Description
WD	Q		I		9/29/2006	156,000			
WD	U	12	I		6/19/2002				

BUILDING PERMITS

Issued	Schd	Complt	Revisit	Act	Complt	Amount

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		DFRGAR	27-DETFRGAR	24	32		768.000	SF	1	0D	17.000	0000	.95	1.00	1.00	1.00	100.00	12,403

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020KAC		HS W/UTIL					1.000	AC	14,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	14,000.000	14,000
2		100LAC		5-9 ACRE					7.000	AC	2,650.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,650.000	18,550
3		420LAC		WOOD ON DIRT ROAD					10.010	AC	1,500.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,500.000	15,015

#10

Caswell County Environmental Health

P.O. Drawer H • Yanceyville, NC 27379
(336) 694-9731

Well Completion Report

Name: Kenny Kirby

Address:

Location: Henry Daniel

Distance From Nearest Property Line 15 plus Ft.

Water Bearing Zones Depth 102 Ft. 121 Ft. 168

Distance From Nearest Source of Pollution 100 plus Ft.

Casing Depth From 0 to 64 Ft.

Total Depth of Well 186 Ft. GPM 8

Diameter 6 1/4 In.

Static Water Level 35 Ft.

Casing Type: Steel _____ Galvanized Steel ✓ Thickness 188 In.

If Steel, Does Owner Approve _____ Yes _____ No

Drive Shoe ✓ Yes _____ No Height of Casing Above Ground 12 In.

Problems in Setting Casing _____ Yes _____ No Explain _____

Grout Type: _____ Neat ✓ Sand/Cement _____ Concrete Annular Space Width ✓ In.

Water in Annular Space _____ Yes ✓ No Method of Grout ____ Pump ____ Pressure ✓ Poured

No. Bags of Portland Cement _____ Depth From 0 to 2 Ft.

Weight of 1 Bag 94 Lbs. Proper Slab Constructed ✓ ID Plate ✓

DRILLING LOG

Depth From	Depth To	Formation Description
0	21	Sandy Soil
21	62	Soft Sand Rock
62	138	Hard Brown Rock
138	186	Gray Granite

I hereby certify that the above information is correct and that this well was constructed in accordance with the Caswell County Well Ordinance

Ruthie Fowler
Signature of Contractor

2031
Certification #

10-26-01
Date

Inspection Completed By [signature] Date: 10-26-01

Location #16 – 152 Henry Daniels Road

GAMMON,OSCAR & TERESA III 2019 71,840 MKT CARD 001
PID R 0147.00.00.0029.0000 71,840 PY Val USE 16,700 LAND 002
152 HENRY DANIELS RD DEF 51,097 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 2.000 ACRES 4,043 XFOB 003
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 14 205 PLAT ADDRESS 0000152 HENRY DANIELS RD PROSPECT HILL 2731
NBHD 00000000 USE 000100 RESIDENTIAL DEED 378 890 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: HENRY DANIELS RD

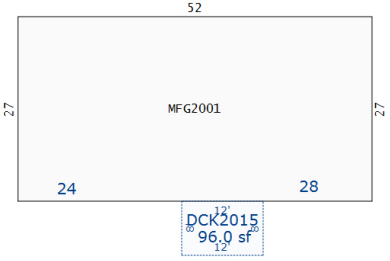
BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	05 MFG HOUSE	BVAL	0005C6 MFG HSE/DW	ARCH	01 D/W	QUAL	C1 GRADE C+10	STYS		SIZE	N/A
FNDN	01 BRICK	FRME	02 STEELFRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	08 CARPT/VYNL	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	06	BATH		BDRM	3	ROOM	5	SPCD	N/A
UD-1	N/A	FRPL	1C FIREPLACE	CHMN	N/A	HBTH	N/A	BATH	C2 2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 2001	EYB 2001

AREA CALCULATION TRAVERSE

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
D/W M/H	1404	1404	1404	1404			71.00	
DECK	96	25					71.00	
LUMP						71968	71.00	51,097
TOTAL	1500		1404		51.25		71.00	
TOTAL		1429		1404		71968		51,097

MFG2001=1404$ DCK2015=96$.



Sketch by Apex Sketch

GAMMON,OSCAR & TERESA III 2019 71,840 MKT CARD 002
PID R 0147.00.00.0029.0000 71,840 PY Val USE 16,700 LAND 002
152 HENRY DANIELS RD DEF 51,097 BLDG 001
LISTER 11/23/2015 GP PROSPECT HILL NC 27314 2.000 ACRES 4,043 XFOB 003
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 14 205 PLAT ADDRESS 0000152 HENRY DANIELS RD PROSPECT HILL 2731
NBHD 00000000 USE 000100 RESIDENTIAL DEED 378 890 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: HENRY DANIELS RD

SALES

IN	Q	RC	M	V	Sale Date	Sale Price
WD	U			V	12/05/2000	16,000

BUILDING PERMITS

Number	Type	Description	Issued	Schd Complt	Revisit	Act Complt	Amount

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		CARPRT	6-CARPORT	21	18		378.000	SF	1	0E	4.000	2003	.40	1.00	1.00	1.00	100.00	605
002		STRGFR	50-STORAGFR	20	12		240.000	SF	1	0C	12.000	0000	.95	1.00	1.00	1.00	100.00	2,736
003		STRGML	51-STORAGML	12	10		120.000	SF	1	0D	6.500	0000	.90	1.00	1.00	1.00	100.00	702

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020KAC		HS W/UTIL					1.000	AC	14,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	14,000.000	14,000
2		080KAC		2-4 ACRE					1.000	AC	2,700.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,700.000	2,700

Location #17 – Henry Daniels Road

NICHOLAIS,TOM & DONNA 2019 135,974 MKT CARD 001
PID R 0147.00.00.0015.0000 135,974 PY Val USE 68,780 LAND 002
3813 CLOEE CIRCLE DEF 38,575 BLDG 001
LISTER 11/23/2015 GP HILLSBOROUGH NC 27278 1.160 ACRES 28,619 XFOB 004
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 11 414 PLAT ADDRESS 0000000 HENRY DANIELS RD PROSPECT HILL 2731
NBHD 00000000 USE 000100 RESIDENTIAL DEED 508 265 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF HENRY DANIELS RD PLAT 10/289;11/955 DEEDS 216-235;261-481;310-776

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

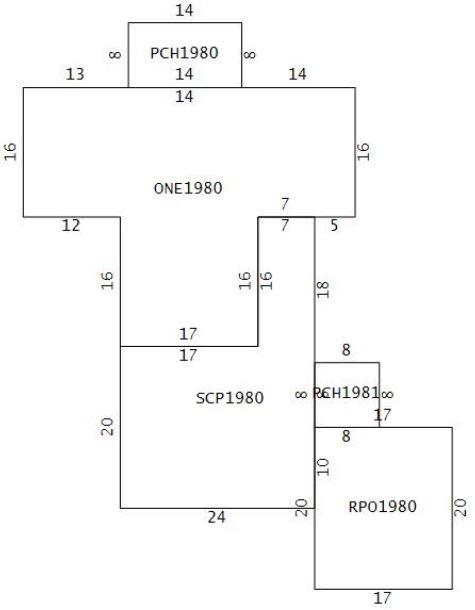
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001EA SNG FAMILY	ARCH	N/A	QUAL	E1 GRADE E+10	STYS		SIZE	0E GRADE E
FNDN	02 CONC BLOCK	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	05 LOG	EXW2	N/A	EXW2%	
HEAT	11 CNTRLHT&AC	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	10 LOG	INT2	N/A	INT2%		FLR1	05 CARPET	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	03	BATH		BDRM	2	ROOM	4	SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH	E1 1 BATH	FUEL	03 GAS
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1980	EYB 1985

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
ONE STO	928	928	928	928			67.00	
PORCH	112	31					67.00	
SCREEN	592	178					67.00	
PORCH	64	18					67.00	
RAIPATI	340	41					67.00	
LUMP						57576	67.00	38,575
TOTAL	2036		928		62.04		67.00	
TOTAL		1196		928		57576		38,575

TRAVERSE

ONE1980= N16 W12 N16 E13 PCH1980= N8 E14 S8 W14$ E14 E14S16 W5 SCP1980= S18 PCH1981= E8 S8 W8 N8$ S8 RPO1980= E17 S20 W17 N20$ S10 W24 N20 E17 N16 E7$ W7 S16 W17$.



NICHOLAIS,TOM & DONNA 2019 135,974 MKT CARD 002
PID R 0147.00.00.0015.0000 135,974 PY Val USE 68,780 LAND 002
3813 CLOEE CIRCLE DEF 38,575 BLDG 001
LISTER 11/23/2015 GP HILLSBOROUGH NC 27278 1.160 ACRES 28,619 XFOB 004
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 11 414 PLAT ADDRESS 0000000 HENRY DANIELS RD PROSPECT HILL 2731
NBHD 00000000 USE 000100 RESIDENTIAL DEED 508 265 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF HENRY DANIELS RD PLAT 10/289;11/955 DEEDS 216-235;261-481;310-776

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number
WD	Q		I		12/20/2006	190,000	

BUILDING PERMITS

Type	Description	Issued	Schd Complt	Revisit	Act Complt	Amount

EXTRA FEATURES

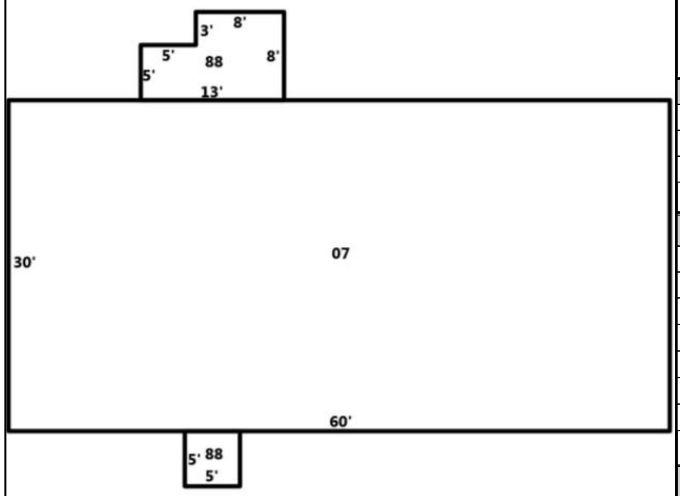
Seq	Bldg Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001	WDPR/D	37-WOOD PEIR/DO	24	24		576.000	SF	1	0C	15.000	0000	.85	1.00	1.00	1.00	100.00	7,344
002	CNCSLB	74-CONCSLAB	60	12		720.000	SF	1	0D	1.500	0000	.91	1.00	1.00	1.00	100.00	983
003	CARPRT	6-CARPORT	24	20		480.000	SF	1	0D	6.000	0000	.95	1.00	1.00	1.00	100.00	2,736
004	DFRGAR	27-DETFRGAR	30	28		840.000	SF	1	0C	22.000	0000	.95	1.00	1.00	1.00	100.00	17,556

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		120KAC		WTRFRONT W/ UTIL					1.000	AC	67,500.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	67,500.000	67,500
2		080XAC		2-4 ACRE					.160	AC	8,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	8,000.000	1,280

Location #18 – 1262 Tom Bowes Road

07/31/2019 04:23 OWNERSHIP 51979301	PROPERTY DESCRIPTION	TAX DESCRIPTION	MAP NUMBER	CARD#
MCCAULEY AMY C 1262 TOM BOWES RD HURDLE MILLS, NC 27541 DEED: 801 345 3/30/2012 $161,250	2 & 94/100 ACRES/MODULAR PLATBOOK/PAGE/DATE: 138 76 NB: 00000 00000 TOM BOWES RD 1262	BUSHY FORK BOAT DOCK #: 7000	A10 33 RECORD NUMBER: 6977 ROUTE: BF 109 013 LISTER: DTB 3/26/2012 REVIEWER: DTB 4/12/2012	1 / 1



TOPO	STREET	UTILITIES	NOTES	AC
ROLLING	PAVED	WELL SEPTIC ELECTRIC	WATERVIEW	2.9400

#	LAND CLASS	SIZE	BASERATE	*	ACF	*	ADJ	=	ADJ RATE	*	UNITS	=	LNDVALUE
1	51UWTRVIEW1	1.000	26000		1.00		1.00		26000		1.000		26000
2	41WRESID 1	0.940	2835		0.84		1.00		2381		0.940		2238
3	11WBLDGSIT1	1.000	14000		0.84		1.00		11760		1.000		11760

ACREAGE FACTOR: 6 **FRONTAGE FACTOR:** 0 **LAND VALUE** **39998**

#	OTHER FEATURES	SIZE	BASERATE	COND	ADJ RATE	UNITS	VALUE
1	04 D STG.SHED	10 * 20	9.61	0.90	8.65	200	1730
2	19 PIERS	1 * 1	500.00	0.00	500.00	1	500

OTHER FEATURES VALUE: **2230**

FOUNDATION	XTR_FINISH	ROOF TYPE	ROOF MTRL	SIZE/QTY
BRICK	AL/VYN	GABLE	ASPHSHNG	1.0000 STHT 3 BDRM

WALL FINSIH	FLOORS	HEAT&AIR	HEAT FUEL	BLDING #
DRY WALL	TILE CARPET	HT PUMP	ELECTRIC	1

IMPROVEMENT TYPE:	Dwelling	GRADE:	C-10	AYB:	2005	EYB:	2005	CONDITION:	A	DEPR TABLE:	00	SQ FT TABLE:	

DIMENSIONS: 07=N30E60S30W60Area:1800;88=S5E5N5W5Area:25;88=N5E5N3E8S8W13Area:89;TotalArea:1914

STRUCTURE	SKETCH-SF	*	STHT	=	AREA	RATE	*	GRDE	+	HEAT	+	EXWL	*	WLHT	=	ADJRATE	*	AREA	=	RPCN	*	DEPF	*	CNDF	=	STR-VALUE
07 07 MODULAR HOME	1800		1.00		1800	70.15		C 0.90		2.50				1.00		65.64		1800		118152		0.92		0.9000		97830
1 FIREPLACE	0				0											4000.00		0		4000		0.92		0.9000		3312
2 BATHS	0				0											4000.00		0		8000		0.92		0.9000		6624
88 88 DECK	25		1.00		25	12.82		0.90						1.00		11.54		25		289		0.92		0.9000		239
88 88 DECK	89		1.00		89	12.68		0.90						1.00		11.41		89		1015		0.92		0.9000		840
	1800	HSF			1914	TSF										RPCN- 73.03/HSF				131456		VALU- 60.47/HSF				108845

STRUCTURE VALUE **108845**

CARD 1 VALUE **151073**

VALUATION	THIS CARD	+	OTHER CARD	=	VALUE	PREV-VAL	P-N%
LAND	39998				39998	21700	0.54
OTHER FEAT	2230				2230	2230	0.93
STRUCTURE	108845				108845	112777	1.04
TOTAL	151073				151073	136549	1.11

OTHER CARDS VALUE

TOTAL VALUE **151073**

NBHD ADJUSTMENT: 1.000 * 151073 = 151073

TAX YEAR: 2020 **(767030) Group:0** **APPRAISED VALUE** 151073

Person County, NC **REVAL YEAR: 2013** **DEFERRED VALUE** 0 **TAXABLE VALUE** 151073

PERSON COUNTY ENVIRONMENTAL HEALTH

WELL LOG

Date: 4-9-98
Owner: Henry Cockerham
Location/Directions: Bowes Rd SR# _____

Subdivision Name: _____
Drilling Contractor: Evans Well Drilling Co Inc Lot # _____

WELL CONSTRUCTION

Distance from Nearest Property Line 15 plus Distance from Source of Pollution 100 plus
Total Depth: 142 Ft. Yield: 8 GPM Static Water Level 6 Ft.
Water Bearing Zones: Depth 90 Ft. _____ Ft. _____ Ft. _____ Ft.
Casing: Depth: From 0 to 32 Ft. Diameter: 6 1/4 Inches
TYPE: Steel _____ Galvanized Steel ✓
If Steel, does owner approve: Yes _____ No _____
Weight: 13 Thickness: 188 Height Above Ground: 12 Inches
Drive Shoe: Yes ✓ No _____
Were Problems Encountered in Setting the Casing? Yes _____ No ✓
If "yes" give reason: _____
Grout: Type: Neat _____ Sand/Cement ✓ Concrete _____
Annular Space Width 3 Inches
Water in Annular Space: Yes _____ No ✓
Method: Pumped _____ Pressure _____ Poured ✓
Depth: From 0 to 20 Ft.
Materials Used: No. Bags Portland Cement _____ Weight of 1 bag 94 lbs.
If mixture (sand, gravel, cuttings) - Ratio: 2 to 1
ID Plates: Yes ✓ No _____
4 x 4 slab Yes ✓ No _____

DRILLING LOG

Depth From	Depth To	Formation Description
0	3	Red Clay
3	30	Sandy Soil
30	142	Brown Green Gray Rock

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT AND THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH REGULATIONS SET FORTH BY THE PERSON COUNTY HEALTH DEPARTMENT.

Evans Well Co 4-14-98
Signature of Contractor Date

PERSON COUNTY ENVIRONMENTAL HEALTH

WELL LOG

Date: 4-9-98
Owner: Henry Cockerham
Location/Directions: Bowes Rd. off Hester Store Rd SR# _____

Subdivision Name: _____
Drilling Contractor: Evans Well Drilling Co. Inc Lot # _____

WELL CONSTRUCTION

Distance from Nearest Property Line 15 plus Distance from Source of Pollution 100 plus
Total Depth: 562 Ft. Yield: ½ GPM GPM Static Water Level 29 Ft.
Water Bearing Zones: Depth 450 Ft. _____ Ft. _____ Ft. _____ Ft.
Casing: Depth: From 0 to 43 Ft. Diameter: 6¼ Inches
TYPE: Steel _____ Galvanized Steel ✓
If Steel, does owner approve: Yes _____ No _____
Weight: 13 Thickness: 188 Height Above Ground: 12 Inches
Drive Shoe: Yes ✓ No _____
Were Problems Encountered in Setting the Casing? Yes _____ No ✓
If "yes" give reason: _____
Grout: Type: Neat _____ Sand/Cement ✓ Concrete _____
Annular Space Width 3 Inches
Water in Annular Space: Yes _____ No ✓
Method: Pumped _____ Pressure _____ Poured ✓
Depth: From 0 to 20 Ft.
Materials Used: No. Bags Portland Cement _____ Weight of 1 bag 94 lbs.
If mixture (sand, gravel, cuttings) - Ratio: 2 to 1
ID Plates: Yes ✓ No _____
4 x 4 slab Yes ✓ No _____

DRILLING LOG

Depth From	Depth To	Formation Description
0	3	Yellow Clay
3	10	Sandy Soil
10	40	Sand Rock
40	562	Brown, Green, White Granite

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT AND THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH REGULATIONS SET FORTH BY THE PERSON COUNTY HEALTH DEPARTMENT.

Evans Well Co. 4-14-98
Signature of Contractor Date

Location #19 – Goose Creek Road

LEWIS,GEORGIA T 2019 121,792 MKT CARD 001
PID R 0147.00.00.0023.0000 GRAVITTE JEFFREY GATES 121,792 PY Val USE 117,600 LAND 002
708 OAKDALE DRIVE DEF BLDG 000
LISTER 11/23/2015 GP HILLSBOROUGH NC 27278 10.000 ACRES 4,192 XFOB 002
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 11 329 PLAT ADDRESS 0000000 GOOSE CREEK RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 259 104 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF HENRY DANIELS RD

14927 POLE BARN 1/07/2016 2/06/2017

EXTRA FEATURES

Seq	Bldg Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001	WDDECK	62-WOODDECK	20	16		320.000	SF	1	0E	5.000	0000	.70	1.00	1.00	1.00	100.00	1,120
002	POLBRN	POLE BARN	24	16		384.000	SF	1	0B	8.000	2016	1.00	1.00	1.00	1.00	100.00	3,072

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		140JAC		WTRFRONT N/UTIL					2.000	AC	48,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	48,000.000	96,000
2		440PAC		WOOD ON PVT/DIRT RD					8.000	AC	2,700.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,700.000	21,600

Location #20 – 971 Goose Creek Road

BROWN,WILLIAM N & DONNA H 2019 104,579 MKT CARD 001
PID R 0147.00.00.0008.0000 104,579 PY Val USE 101,179 LAND 003
971 GOOSE CREEK RD DEF BLDG 000
LISTER 11/23/2015 GP PROSPECT HILL NC 27214 10.370 ACRES 3,400 XFOB 004
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT A BLK PL BK/PG 11 443 PLAT ADDRESS 0000971 GOOSE CREEK RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 374 614 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF HENRY DANIELS RD PLAT 11 PG 252

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number
WD	U		I		8/23/2000	35,000	

BUILDING PERMITS

Type	Description	Issued	Schd Complt	Revisit	Act Complt	Amount

EXTRA FEATURES

Seq	Bldg Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001	000013	CABIN				1.000	UT	1	0D	3,000.000	0000	1.00	1.00	1.00	1.00	100.00	3,000
002	000051	METAL STORAGE				1.000	UT	1	0D	100.000	0000	1.00	1.00	1.00	1.00	100.00	100
003	000041	SHELTER				1.000	UT	1	0D	100.000	0000	1.00	1.00	1.00	1.00	100.00	100
004	000062	WOOD DECK				1.000	UT	1	0E	200.000	0000	1.00	1.00	1.00	1.00	100.00	200

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		120GFF		WTRFRONT W/ UTIL					1.000	AC	280.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	280.000	280
2		440PAC		WOOD ON PVT/DIRT RD					7.370	AC	2,700.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,700.000	19,899
3		140IAC		WTRFRONT N/UTIL					2.000	AC	40,500.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	40,500.000	81,000

Location #21 – 950 Goose Creek Road

PRUITT,PARKER & RITA HUDGINS 2019 147,761 MKT CARD 001
PID R 0147.00.00.0024.0000 (1/2 INT EACH) 147,761 PY Val USE 118,381 LAND 003
603 SEYMOR STREET DEF BLDG 000
LISTER 11/23/2015 GP GRAHAM NC 27253 13.030 ACRES 29,380 XFOB 006
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT B BLK PL BK/PG 11 443 PLAT ADDRESS 0000950 GOOSE CREEK RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 608 1 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: GOOSE CRK RD OFF HENRY DANIELS DB 262-440;543-1538

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number
WD	U	0C		I	7/16/2018	2,000	
WD	U	0E		I	7/14/2016		
WD	U	0E		I	11/16/2009	35,000	

BUILDING PERMITS

Type	Description	Issued	Schd Complt	Revisit	Act Complt	Amount

EXTRA FEATURES

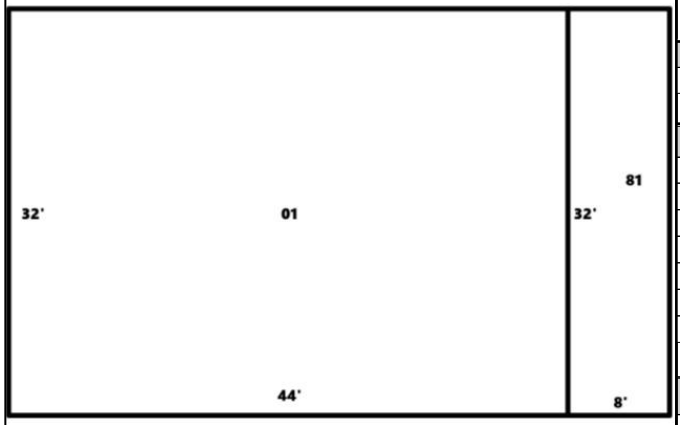
Seq	Bldg Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001	000050	FRAME STORAGE				1.000	UT	1	0D	500.000	0000	1.00	1.00	1.00	1.00	100.00	500
002	000013	CABIN				1.000	UT	1	0D	2,500.000	0000	1.00	1.00	1.00	1.00	100.00	2,500
003	000041	SHELTER				1.000	UT	1	0D	500.000	0000	1.00	1.00	1.00	1.00	100.00	500
004	SHPF/M	43-SHOP FRAME/M	36	32		1152.000	SF	1	0C	25.000	0000	.85	1.00	1.00	1.00	100.00	24,480
005	000050	FRAME STORAGE				1.000	UT	1	0D	600.000	0000	1.00	1.00	1.00	1.00	100.00	600
006	000050	FRAME STORAGE				1.000	UT	1		800.000	0000	1.00	1.00	1.00	1.00	100.00	800

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		120IAC		WTRFRONT W/ UTIL					1.000	AC	46,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	46,000.000	46,000
2		440PAC		WOOD ON PVT/DIRT RD					9.030	AC	2,700.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,700.000	24,381
3		140EAC		WTRFRONT N/UTIL					3.000	AC	16,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	16,000.000	48,000

Location #22 – Tom Bowes Road

07/31/2019 04:32 OWNERSHIP 9580302	PROPERTY DESCRIPTION	TAX DESCRIPTION	MAP NUMBER	CARD#
HOWERTON JOANNE 191 LEWIS WINSTEAD LOOP RD ROXBORO, NC 27574 DEED: 112 605 11/30/1967 $0	HOUSE & LOT PLATBOOK/PAGE/DATE: NB: 00000 00000 TOM BOWES RD	BUSHY FORK	A10 22A RECORD NUMBER: 6972 ROUTE: BF 109 012 LISTER: DTB 3/26/2012 REVIEWER: DTB 4/12/2012	1 / 1



TOPO	STREET	UTILITIES	NOTES	LT
ROLLING	PAVED	WELL SEPTIC ELECTRIC		1.0000

#	LAND CLASS	SIZE	BASERATE	*	ACF	*	ADJ	=	ADJ RATE	*	UNITS	=	LNDVALUE
1	11WBLDGSIT1	1.000	14000		1.00		1.00		14000		1.000		14000

ACREAGE FACTOR: 6 **FRONTAGE FACTOR:** 0 **LAND VALUE** **14000**

#	OTHER FEATURES	SIZE	BASERATE	COND	ADJ RATE	UNITS	VALUE
1	04 STG.SHED	1 * 1	100.00	0.00	100.00	1	100

OTHER FEATURES VALUE: **100**

FOUNDATION	XTR_FINISH	ROOF TYPE	ROOF MTRL	SIZE/QTY
CONCBLCK	AL/VYN	GABLE	METAL	1.0000 STHT 0 BDRM

WALL FINSIH	FLOORS	HEAT&AIR	HEAT FUEL	BLDING #
UNFINISH	CONCRETE SOFTWOOD TILE	CENTRAL CENT-A/C	GAS ELECTRIC	1

IMPROVEMENT TYPE:	Dwelling	GRADE:	C	AYB:	1967	EYB:	1975	CONDITION:	F	DEPR TABLE:	03	SQ FT TABLE:	
DIMENSIONS:	01=N32E44S32W44Area:1408;81=E8N32W8S32Area:256;TotalArea:1664												

STRUCTURE	SKETCH-SF	*	STHT	=	AREA	RATE	*	GRDE	+	HEAT	+	EXWL	*	WLHT	=	ADJRATE	*	AREA	=	RPCN	*	DEPF	*	CNDF	=	STR-VALUE
01 01 SNG FAML	1408		1.00		1408	73.65		C		2.50				1.00		76.15		1408		107219		0.52				55754
1 BATHS	0				0											4000.00		0		4000		0.52				2080
100%UNF-BSMT	0				1408	19.89										19.89		1408		28005		0.52				14563
81 81 ENCPORCH	256		1.00		256	23.98								1.00		23.98		256		6139		0.52				3192
	1408	HSF			3072	TSF										RPCN- 103.24/HSF				145363		VALU- 53.69/HSF				75589

STRUCTURE VALUE **75589**

CARD 1 VALUE **89689**

VALUATION	THIS CARD	+	OTHER CARD	=	VALUE	PREV-VAL	P-N%
LAND	14000				14000	10000	0.71
OTHER FEAT	100				100	100	1.00
STRUCTURE	75589				75589	70231	0.93
TOTAL	89689				89689	80331	1.12

OTHER CARDS VALUE

TOTAL VALUE **89689**

NBHD ADJUSTMENT: 1.000 * 89689 = 89689

Person County, NC

TAX YEAR: 2020 **(745641) Group:0**
REVAL YEAR: 2013 **DEFERRED VALUE** 0

APPRAISED VALUE 89689
TAXABLE VALUE 89689

Location #23 – Tom Bowes Road

08/07/2019 04:01 OWNERSHIP 9580306	PROPERTY DESCRIPTION	TAX DESCRIPTION	MAP NUMBER	CARD#
HOWERTON JOANNE 191 LEWIS WINSTEAD LOOP RD ROXBORO, NC 27574 DEED: 170 69 11/30/1981 $0	DEF/T 74 & 39/100 ACRES PLATBOOK/PAGE/DATE: NB: 00000 00000 TOM BOWES RD HURDLE MILLS	BUSHY FORK PUV DATE: 01/01/2002 BOAT DOCK #: 7000	A10 22 RECORD NUMBER: 6973 ROUTE: BF 109 010 LISTER: DTB 3/26/2012 REVIEWER: DTB 4/12/2012	1 / 1

TOPO	STREET	UTILITIES	NOTES	AC
ROLLING	PAVED	WELL SEPTIC ELECTRIC	ORG USE CHARLIE & JOANNE 84	74.3900

#	LAND CLASS	SIZE	BASERATE	*	ACF	*	ADJ	=	ADJ RATE	*	UNITS	=	LNDVALUE
1	51TWTRVIEW1	1.000	24000		1.00		0.80		19200		1.000		19200
2	21WCLEARED1	23.260	3150		1.10		1.00		3465		23.260		80596
3	31WWOODED 1	50.130	1575		1.10		1.00		1733		50.130		86875

ACREAGE FACTOR: 2 **FRONTAGE FACTOR:** 0 **LAND VALUE** **186671**

#	OTHER FEATURES	SIZE	BASERATE	COND	ADJ RATE	UNITS	VALUE
1	17 BULKBARN	1 * 3	300.00	0.00	300.00	3	300
2	24 TENANTHS	16 * 20	1500.00	0.00	1500.00	320	1500
3	24 TENANTHS	1 * 1		0.00	0.00	1	0
4	21 BARN	18 * 40		0.00	0.00	720	0
5	33 OFB/DECK	8 * 8		0.00	0.00	64	0
6	33 OFB/DECK	8 * 8		0.00	0.00	64	0
7	29 OFB/OFP	8 * 47	200.00	0.00	200.00	376	200
8	25 D MH HKUP	1 * 2	2050.00	0.80	1640.00	2	3280
9	29 OFB/OFP	12 * 54	500.00	0.00	500.00	648	500
10	36 OFB/FRAD	12 * 19	500.00	0.00	500.00	228	500
11	33 OFB/DECK	12 * 14		0.00	0.00	168	0

OTHER FEATURES VALUE: **6280**

FOUNDATION	XTR_FINISH	ROOF TYPE	ROOF MTRL	SIZE/QTY
				STHT BDRM

WALL FINSIH	FLOORS	HEAT&AIR	HEAT FUEL	BLDING #

IMPROVEMENT TYPE:		GRADE:		AYB:		EYB:		CONDITION:		DEPR TABLE:		SQ FT TABLE:	

DIMENSIONS:

STRUCTURE	SKETCH-SF	*	STHT	=	AREA	RATE	*	GRDE	+	HEAT	+	EXWL	*	WLHT	=	ADJRATE	*	AREA	=	RPCN	*	DEPF	*	CNDF	=	STR-VALUE
0																										

HSF TSF RPCN- /HSF VALU- /HSF

STRUCTURE VALUE **0**

CARD VALUE **192951**

VALUATION	THIS CARD	+	OTHER CARD	=	VALUE	PREV-VAL	P-N%
LAND	186671				186671	173051	0.93
OTHER FEAT	6280				6280	6280	1.99
STRUCTURE	0				0	0	0.00
TOTAL	192951				192951	185531	1.04

OTHER CARDS VALUE

TOTAL VALUE **192951**

NBHD ADJUSTMENT: 1.000 * 192951 = 192951

TAX YEAR: 2020 **(756864) Group:0** **APPRAISED VALUE** 192951

Person County, NC **REVAL YEAR: 2013** **DEFERRED VALUE** 144981 **TAXABLE VALUE** 47970

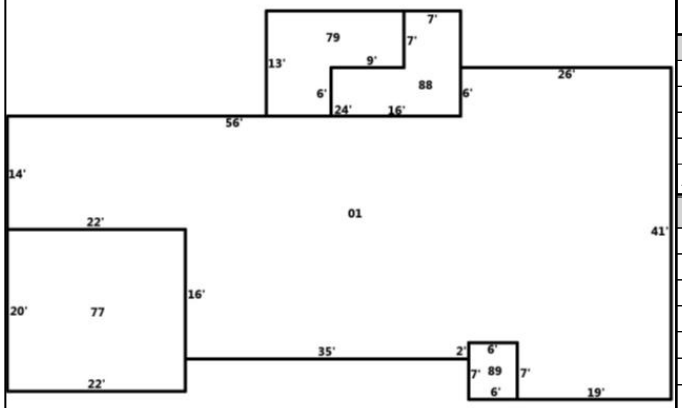
08/07/2019 04:01 OWNERSHIP 9580306	PROPERTY DESCRIPTION	TAX DESCRIPTION	MAP NUMBER	CARD #
HOWERTON JOANNE 191 LEWIS WINSTEAD LOOP RD ROXBORO, NC 27574 DEED: 170 69 11/30/1981 $0	DEF/T 74 & 39/100 ACRES PLATBOOK/PAGE/DATE: NB: 00000 00000 TOM BOWES RD HURDLE MILLS	BUSHY FORK	A10 22 RECORD NUMBER: 6973 ROUTE: BF 109 010 LISTER: DTB 3/26/2012 REVIEWER: DTB 4/12/2012	1 / 1

#	LAND CLASS	SIZE	BASERATE	*	ACF	*	ADJ	=	ADJRATE	*	UNITS	=	LNDVALUE	USE-CLASS	ACREAGE	*	RATE	=	USE-VALUE
1	51TWTRVIEW1	1.000AC	24000		1.00		0.80		19200		1.000		19200	INELIGIBLE					19200
2	21WCLEARED1	23.260AC	3150		1.10		1.00		3465		23.260		80596	TL03	23.260		385.00		8955
3	31WWOODED 1	50.130AC	1575		1.10		1.00		1733		50.130		86875	WD02	50.130		270.00		13535
TOTALS													186671						41690

LAND VALUE:	186671
LAND USE VALUE:	41690
DEFERRED VALUE:	144981

Location #24 – Tom Bowes Road

08/07/2019 04:04 OWNERSHIP 390301	PROPERTY DESCRIPTION	TAX DESCRIPTION	MAP NUMBER	CARD#
WARREN RALPH B 7324 GORDONTON RD HURDLE MILLS, NC 27541-9218 DEED:	DEF/T216&46AC/PARC A/HSE PLATBOOK/PAGE/DATE: 16 665 NB: 00000 00000 GORDONTON RD 7324	BUSHY FORK PUV DATE: 01/01/2015	A10 36 RECORD NUMBER: 7390 ROUTE: BF 109 023 LISTER: PLC 12/4/2014 REVIEWER: PLC 2/6/2015	1 / 1



TOPO	STREET	UTILITIES	NOTES	AC
ROLLING	PAVED	WELL SEPTIC ELECTRIC	PUV/EXPANSION UNIT F15 FRM4672/LND/OFB1 6938 F15	216.4600

#	LAND CLASS	SIZE	BASERATE	*	ACF	*	ADJ	=	ADJ RATE	*	UNITS	=	LNDVALUE
1	12ABLDGSIT2	1.000	16000		1.00		1.00		16000		1.000		16000
2	22ACLEARED2	29.200	3600		0.88		1.00		3168		29.200		92506
3	32AWOODED 2	183.260	1800		0.88		1.00		1584		183.260		290284
4	92APOND 2	3.000	3600		0.88		1.00		3168		3.000		9504

ACREAGE FACTOR: 0 **FRONTAGE FACTOR:** 0 **LAND VALUE** **408294**

#	OTHER FEATURES	SIZE	BASERATE	COND	ADJ RATE	UNITS	VALUE
1	18 TOB.BARN	1 * 4	0.00	0.00	0.00	4	0
2	24 TENANTHS	1 * 1	300.00	0.00	300.00	1	300
3	04 STG.SHED	1 * 1	350.00	0.00	350.00	1	350
4	24 TENANTHS	1 * 1	1500.00	0.00	1500.00	1	1500

OTHER FEATURES VALUE: **2150**

FOUNDATION	XTR_FINISH	ROOF TYPE	ROOF MTRL	SIZE/QTY
BRICK	BRICK	GABLE	ASPHSHNG	1.0000 STHT 0 BDRM

WALL FINSIH	FLOORS	HEAT&AIR	HEAT FUEL	BLDING #
DRY WALL PANEL UNFINISH	CONCRETE TILE CARPET	HT PUMP	ELECTRIC WOOD	1

IMPROVEMENT TYPE:	Dwelling	GRADE:	C+10	AYB:	1977	EYB:	1977	CONDITION:	A	DEPR TABLE:	00	SQ FT TABLE:	

DIMENSIONS: 01=N16W22N14E56N6E26S41W19N7W6S2W35Area:2347;89=E6S7W6N7Area:42;77=W22S20E22N20Area:440;79=N13W24S13E24Area:312;88=Area:312;88=N6E9N7E7S13W16Area:145;TotalArea:3598

STRUCTURE	SKETCH-SF	*	STHT	=	AREA	RATE	*	GRDE	+	HEAT	+	EXWL	*	WLHT	=	ADJRATE	*	AREA	=	RPCN	*	DEPF	*	CNDF	=	STR-VALUE
01 01 SNG FAML	2347		1.00		2347	66.84		C 1.10		2.50		2.75		1.00		78.77		2347		184873		0.64				118319
2 FIREPLACE	0				0											4000.00		0		8000		0.64				5120
3 BATHS	0				0											4000.00		0		12000		0.64				7680
75%UNF-BSMT	0				1760	18.05		1.10								19.86		1760		34954		0.64				22371
88 88 DECK	312		1.00		312	11.57		1.10						1.00		12.73		312		3972		0.64				2542
88 88 DECK	145		1.00		145	12.48		1.10						1.00		13.73		145		1991		0.64				1274
89 89 OM-PORCH	42		1.00		42	29.11		1.10						1.00		32.02		42		1345		0.64				861
79 79 PATIO	312		1.00		312	3.25		1.10						1.00		3.58		312		1117		0.64				715
77 77 ATGARAGE	440		1.00		440	17.74		1.10						1.00		19.51		440		8584		0.64				5494
	2347	HSF			5358	TSF										RPCN- 109.43/HSF				256836		VALU- 70.04/HSF				164376

STRUCTURE VALUE **164376**

CARD 1 VALUE **574820**

VALUATION	THIS CARD	+	OTHER CARD	=	VALUE	PREV-VAL	P-N%
LAND	408294				408294	271794	0.67
OTHER FEAT	2150				2150	2150	0.30
STRUCTURE	164376				164376	146470	0.89
TOTAL	574820				574820	418914	1.37

OTHER CARDS VALUE

TOTAL VALUE **574820**

NBHD ADJUSTMENT: 1.000 * 574820 = 574820

TAX YEAR: 2020 **(745547) Group:0** **APPRAISED VALUE** 574820

Person County, NC **REVAL YEAR: 2013** **DEFERRED VALUE** 330417 **TAXABLE VALUE** 244403

08/07/2019 04:04 OWNERSHIP 390301	PROPERTY DESCRIPTION	TAX DESCRIPTION	MAP NUMBER	CARD #
WARREN RALPH B 7324 GORDONTON RD HURDLE MILLS, NC 27541-9218 DEED:	DEF/T216&46AC/PARC A/HSE PLATBOOK/PAGE/DATE: 16 665 NB: 00000 00000 GORDONTON RD 7324	BUSHY FORK	A10 36 RECORD NUMBER: 7390 ROUTE: BF 109 023 LISTER: PLC 12/4/2014 REVIEWER: PLC 2/6/2015	1 / 1

#	LAND CLASS	SIZE	BASERATE	*	ACF	*	ADJ	=	ADJRATE	*	UNITS	=	LNDVALUE	USE-CLASS	ACREAGE	*	RATE	=	USE-VALUE
1	12ABLDGSIT2	1.000AC	16000		1.00		1.00		16000		1.000		16000	INELIGIBLE					16000
2	22ACLEARED2	29.200AC	3600		0.88		1.00		3168		29.200		92506	TL03	29.200		385.00		11242
3	32AWOODED 2	183.260AC	1800		0.88		1.00		1584		183.260		290284	WD02	183.260		270.00		49480
4	92APOND 2	3.000AC	3600		0.88		1.00		3168		3.000		9504	TL03	3.000		385.00		1155
TOTALS													408294						77877

LAND VALUE:	408294
LAND USE VALUE:	77877
DEFERRED VALUE:	330417

Location #25 – 2101 Wrenn Road

TALLEY,NATHANIEL C & JESSE D 2019 271,094 MKT CARD 001
PID R 0148.00.00.0031.0000 271,094 PY Val USE 20,208 LAND 002
2101 WRENN RD DEF 250,886 BLDG 001
LISTER 11/21/2015 GP PROSPECT HILL NC 27314 4.720 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 1 BLK PL BK/PG 16 167 PLAT ADDRESS 0002101 WRENN RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 532 1333 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: WRENN ROAD X X

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

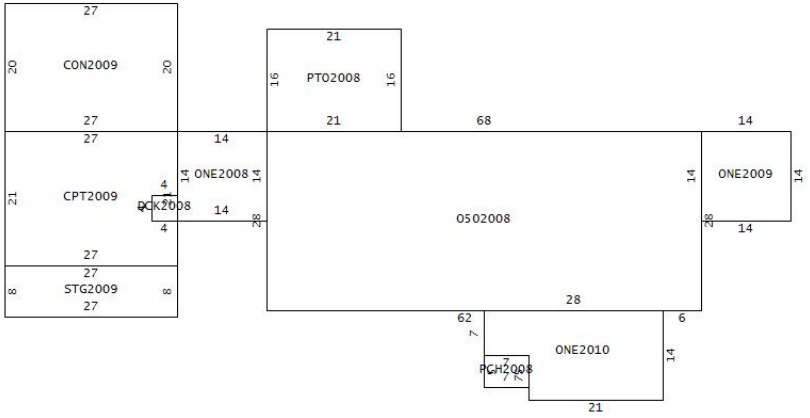
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001CG SNG FAMILY	ARCH	18 MODULAR	QUAL	C2 GRADE C+5	STYS		SIZE	0C GRADE C
FNDN	06 STONE	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	20 MIXED	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	02	BATH		BDRM	3	ROOM	5	SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH	C2 2 BATHS	FUEL	03 GAS
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 2008	EYB 2008

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
1.50 ST	1904	2666	2856	1904			95.00	
PATIO	336	17					95.00	
ONE STO	196	196	196	196			95.00	
CONC SL	540	27					95.00	
CARPORT	567	142					95.00	
STG ROO	216	54					95.00	
DECK	16	3					95.00	
ONE STO	196	196	196	196			95.00	
ONE STO	343	343	343	343			95.00	
PORCH	35	10					95.00	
MORE								
TOTAL	4349		3591		73.54		95.00	
TOTAL		3654		2639		264091		250,886

TRAVERSE

O502008=N28 PTO2008=E21N16W21 S16$ ONE2008=W14 CON2009=N20 W27S20E27$ CPT2009=W27 S21 STG2009=S8E27N8W27$ E27 N21$ S14 DCK2008=W4N4E4 S4$ E14N14$E68 ONE2009= E14 S14 W14 N14$ S28 W6 ONE2010=S14W21N7 PCH2008=W7S5E7N5$ W7 N7 E28$ W62$.



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                                  TALLEY,NATHANIEL C & JESSE D              2019     271,094 MKT                   CARD 002
PID R 0148.00.00.0031.0000                                          271,094 PY Val             USE            20,208 LAND 002
                                  2101 WRENN RD                                                DEF           250,886 BLDG 001
LISTER 11/21/2015  GP             PROSPECT HILL NC 27314                                4.720 ACRES                 XFOB 000
TWP HIGHTOWER           CITY                        FIRE                     RESCUE                        OTHER
LOT      1 BLK                            PL BK/PG 16   167    PLAT         ADDRESS 0002101 WRENN RD PROSPECT HILL 27314
NBHD 00000000     USE 000100 RESIDENTIAL            DEED 532   1333   AICUZ           PRINTED  6/07/2019 BY  THOMAS
LEGAL:  WRENN ROAD X X
                                  BUILDING CHARACTERISTICS  for BldgSeq# 001    (Item# 001  )
Code   Description  Code       Description  Code   Description   Code   Description   Code   Description   Code   Description
MODL 01 SNG FAMILY  BVAL 0001CG SNG FAMILY  ARCH 18 MODULAR      QUAL C2 GRADE C+5    STYS                  SIZE 0C GRADE C
FNDN 06 STONE       FRME   01   WOOD FRAME  WNDO    N/A         EXW1 03 VINYL        EXW2    N/A           EXW2%
HEAT 02 HEAT PUMP   A/C         N/A         RSTR 01 GABLE       RCV1 01 ASPSHINGLE   RCV2    N/A           RCV2%
INT1 01 SHEETROCK   INT2        N/A         INT2%               FLR1 20 MIXED        FLR2    N/A           FLR2%
KTCH    N/A         DPRT   02               BATH                BDRM     3           ROOM     5            SPCD     N/A
UD-1    N/A         FRPL        N/A         CHMN    N/A         HBTH    N/A          BATH C2 2 BATHS       FUEL 03 GAS
FXTR    N/A         UD-8        N/A         RMYR    N/A         RMYR    N/A          UD-9%            AYB 2008       EYB 2008
                        AREA CALCULATION                                                   TRAVERSE
Subarea  Actual     Adj   Heated  Prime    Rate    Value %Good       RCNLD ***SEE PAGE ONE FOR SKETCH***
LUMP                                                264091 95.00     250,886
TOTAL      4349               3591          73.54        95.00
TOTAL              3654            2639           264091           250,886
```

TALLEY,NATHANIEL C & JESSE D 2019 271,094 MKT CARD 003
PID R 0148.00.00.0031.0000 271,094 PY Val USE 20,208 LAND 002
2101 WRENN RD DEF 250,886 BLDG 001
LISTER 11/21/2015 GP PROSPECT HILL NC 27314 4.720 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 1 BLK PL BK/PG 16 167 PLAT ADDRESS 0002101 WRENN RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 532 1333 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: WRENN ROAD X X

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number	Type	Description
WD	U	0E		V	7/29/2008		13578	MODU	MODULAR

BUILDING PERMITS

Issued	Schd Complt	Revisit	Act Complt	Amount
10/13/2008			3/08/2010	238,622

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020LAC		HS W/UTIL					1.000	AC	15,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	15,000.000	15,000
2		400KAC		WOOD ON PAVED RD					3.720	AC	1,400.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,400.000	5,208

#18

RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2030

1. WELL CONTRACTOR:
Michael K. Evans
Well Contractor (Individual) Name
Evans Well Drilling Co Inc
Well Contractor Company Name
STREET ADDRESS 4488 Shady Grove Rd
Providence NC 27315
City or Town State Zip Code
( ) _____
Area code- Phone number

2. WELL INFORMATION:
SITE WELL ID #(if applicable) ✓
WELL CONSTRUCTION PERMIT# ✓
OTHER ASSOCIATED PERMITS(if applicable) _____

3. WELL USE (Check Applicable Box): ✓ Residential Water Supply
DATE DRILLED 11-17-08
TIME COMPLETED 5 Hrs AM PM ✓

4. WELL LOCATION:
CITY Prospect Hill COUNTY Caswell
Wrenn Rd
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
Slope Valley Flat Ridge Other
(check appropriate box)
LATITUDE
LONG TUDE
May be in degrees, minutes, seconds or in a decimal format
Latitude/longitude source: GPS Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

5. WELL OWNER
OWNER'S NAME Nathan Talley
STREET ADDRESS Wrenn Rd
Prospect Hill NC
City or Town State Zip Code
( ) _____
Area code - Phone number

6. WELL DETAILS:
a. TOTAL DEPTH: 180
b. DOES WELL REPLACE EXISTING WELL? YES NO ✓
c. WATER LEVEL Below Top of Casing: 40 FT
(Use "+" if Above Top of Casing)
d. TOP OF CASING IS 1 FT. Above Land Surface*
*Top of casing terminated stick below land surface may require a variance in accordance with 15A NCAC 2C .0118.
e. YIELD (gpm) 40 METHOD OF TEST Air

f. DISINFECTION: Type _____ Amount _____

g. WATER ZONES (depth)
From 70 To 75 From 135 To 140
From 176 To 180 From _____ To _____
From _____ To _____ From _____ To _____

7. CASING:

From	To	Depth	Diameter	Thickness/Weight	Material
0	30	Ft	6 in	SDR 21	PVC
		Ft.			
		Ft.			

8. GROUT:

From	To	Depth	Material	Method
0		Ft	Sand-Cement	poured
		Ft.		
		Ft.		

9. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
		Ft.	in.	in.	
		Ft.	in.	in.	
		Ft.	in.	in.	

10. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
		Ft.		
		Ft.		
		Ft.		

11. DRILLING LOG

From	To	Formation Description
0	3	Red Clay
3	18	Soft Sand Rock
18	28	Gray Granite
28	180	Gray, green Granite

12. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Michael K. Evans 11-17-08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Michael K Evans
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 560.

Form GW-1b
Rev 3/07

Location #26 – 2592 Wrenn Road

WOERDEMAN,CHRISTOPHER & JULIE 2019 272,185 MKT CARD 001
PID R 0148.00.00.0006.0000 272,185 PY Val USE 56,770 LAND 004
2592 WRENN RD DEF 211,559 BLDG 001
LISTER 11/21/2015 GP PROSPECT HILL NC 27314 16.550 ACRES 3,856 XFOB 002
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 10 517 PLAT ADDRESS 0002592 WRENN RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 592 1037 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: WRENN RD X X X

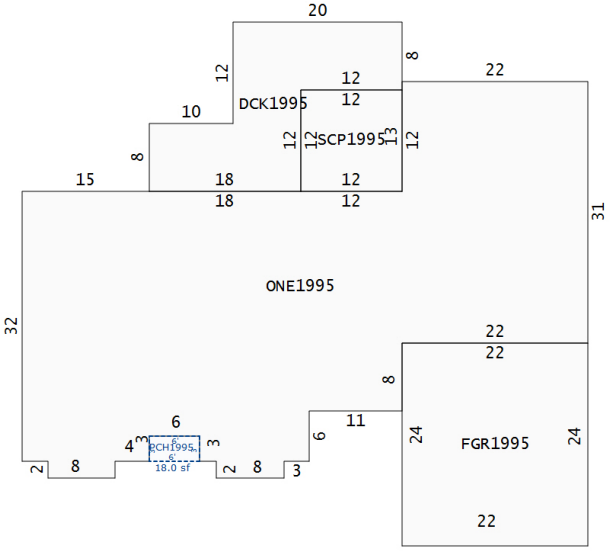
BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001BG SNG FAMILY	ARCH	N/A	QUAL	B2 GRADE B+5	STYS		SIZE	0B GRADE B
FNDN	01 BRICK	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	20 MIXED	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	02	BATH		BDRM		ROOM		SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH	B2 2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 1995	EYB 2002

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
ONE STO	2070	2070	2070	2070			90.00	
DECK	336	67					90.00	
SCREEN	144	43					90.00	
FIN GAR	528	248					90.00	
PORCH	18	5					90.00	
LUMP						235066	90.00	211,559
TOTAL	3096		2070		113.55		90.00	
TOTAL		2433		2070		235066		211,559

TRAVERSE
ONE1995=2070$ DCK1995=336$ SCP1995=144$ FGR1995=528$
PCH1995=18$.



Sketch by Apex Sketch

WOERDEMAN,CHRISTOPHER & JULIE 2019 272,185 MKT CARD 002
PID R 0148.00.00.0006.0000 272,185 PY Val USE 56,770 LAND 004
2592 WRENN RD DEF 211,559 BLDG 001
LISTER 11/21/2015 GP PROSPECT HILL NC 27314 16.550 ACRES 3,856 XFOB 002
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 10 517 PLAT ADDRESS 0002592 WRENN RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 592 1037 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: WRENN RD X X X

SALES

IN	Q	RC	M	V	Sale Date	Sale Price
WD	Q		I		5/31/2016	265,000

BUILDING PERMITS

Number	Type	Description	Issued	Schd	Complt	Revisit	Act	Complt	Amount

EXTRA FEATURES

Seq	Bldg Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001	000041	SHELTER				1.000	UT	1	0E	400.000	0000	1.00	1.00	1.00	1.00	100.00	400
002	STABLE	10-STABLES	24	24		576.000	SF	1	0E	7.500	2003	.80	1.00	1.00	1.00	100.00	3,456

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020KAC		HS W/UTIL					1.000	AC	14,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	14,000.000	14,000
2		280AAC		OPEN ON PAVED ROAD					3.000	AC	1,800.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,800.000	5,400
3		400KAC		WOOD ON PAVED RD					9.550	AC	1,400.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,400.000	13,370
4		260LAC		ROAD FRONTAGE OPEN					3.000	AC	8,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	8,000.000	24,000

#19

CASWELL COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION

NO. D-091694-04

(This permit expires five years from date of issue.)

WELL PERMIT

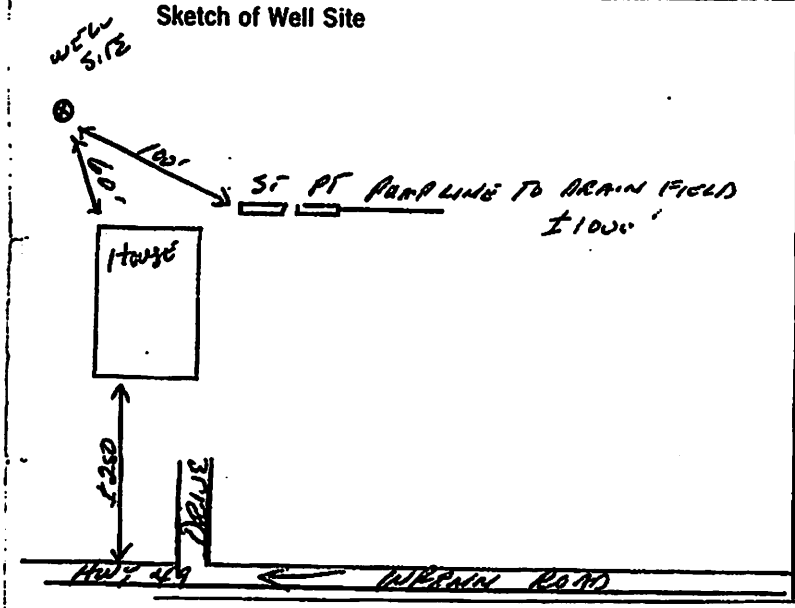
X New Well
____ Replacement Well

NAME James P. Cattlett ADDRESS 947 Ridgeville Rd. Prospect Hill, NC

Directions to Site 86S TO RIDGEVILLE RD - L - TO PAINTER RD - R - TO WREXHAM RD L - SITE IS ABOUT 1½ MILES ON LEFT

Well to Serve: X Residence ____ Mobile Home Park ____ Other

Sketch of Well Site



Sketch of Installation

WELL CONSTRUCTION

Distance from nearest property line 15 plus
Distance from source of pollution 100 plus
Total depth of well 160 ft. GPM 8

Water bearing Zones: Depth 91 Ft. ____ Ft.
Casing: Depth: From 0 to 36½ Ft.
Diameter 6 x 4
Static Water Level 30 Ft.

Casing Type: Steel ____ Galvanized Steel ✓ Thickness 188
If steel, does owner approve: ____ Yes ____ No
Drive Shoe ✓ Yes ____ No Height of casing above ground 12 inches
Problems in setting casing ____ Yes ✓ No. Explain ____
Grout Type: ____ Neat ✓ Sand/Cement ____ Concrete. Annular space width 3 In.
Water in Annular space ____ Yes ✓ No. Method of Grout ____ Pump ____ Pressure ✓ Poured
No. Bags of Portland Cement 4 Depth: From 0 to 30 Ft.
Weight of 1 bag 94 lbs. Proper Slab Constructed ✓ ID Plate ✓

DRILLING LOG

Depth From	Depth To	Formation Description
0	5	Red Soil
5	30	Brown Rock
30	160	Gray Granite

I hereby certify that the above information is correct and that this well was constructed in accordance with the Caswell County Well Ordinance.

Signature of Contractor: Tilson Well Co. Date: 12-6-95

Permit Issued By Thomas Davis JR5 Date 9-16-94

Inspection Completed By Thomas Davis JR5 Date 12-8-95

Location #27 – 1275 Carver Road

CARVER,JOHN W & PAMELA H 2019 171,734 MKT CARD 001
PID R 0148.00.00.0007.0000 171,734 PY Val USE 19,900 LAND 002
1275 CARVER RD DEF 151,834 BLDG 001
LISTER 11/21/2015 GP PROSPECT HILL NC 27314 5.000 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 15 56 PLAT ADDRESS 0001151 CARVER RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 411 103 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: CARVER RD (OFF)

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

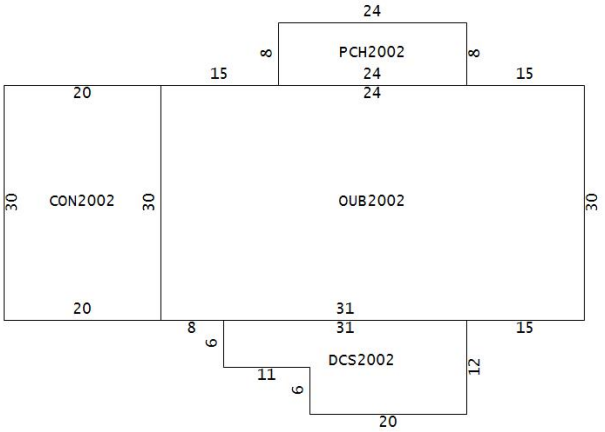
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	01 SNG FAMILY	BVAL	0001CG SNG FAMILY	ARCH	18 MODULAR	QUAL	C1 GRADE C+10	STYS	1.0	SIZE	0C GRADE C
FNDN	01 BRICK	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	20 MIXED	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	02	BATH		BDRM	3	ROOM		SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH	C2 2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%	AYB 2002	EYB 2002	

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
ONE/UNF	1620	1895	1620				90.00	
CONC SL	600	30					90.00	
PORCH	192	54					90.00	
DK/CONS	306	77					90.00	
LUMP						168705	90.00	151,834
TOTAL	2718		1620		104.13		90.00	
TOTAL		2056				168705		151,834

TRAVERSE

OUB2002=N30CON2002=W20S30E20 N30$E15PCH2002=N8E24S8W24$E24 E15S30W15DCS2002=S12W20N6W11N6E31$W31W8$.



CARVER,JOHN W & PAMELA H 2019 171,734 MKT CARD 002
PID R 0148.00.00.0007.0000 171,734 PY Val USE 19,900 LAND 002
1275 CARVER RD DEF 151,834 BLDG 001
LISTER 11/21/2015 GP PROSPECT HILL NC 27314 5.000 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 15 56 PLAT ADDRESS 0001151 CARVER RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 411 103 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: CARVER RD (OFF)

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020HAC	HS W/UTIL						1.000	AC	11,500.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	11,500.000	11,500
2		080IAC	2-4 ACRE						4.000	AC	2,100.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,100.000	8,400

#6. ATI
0148 007
Donnie Powell

Caswell County Environmental Health
P.O. Drawer H • Yanceyville, NC 27379
(336) 694-6731

Well Completion Report

Name: John W Carver

Address: Carver Rd Prospect Hill nc 27314

Location: 86 S to Ridgeville Rd To Egypt Rd To End Take pivet Rd ¼ mile to prop

Distance From Nearest Property Line 20 Ft.

Water Bearing Zones Depth 360 Ft. 380 Ft.

Distance From Nearest Source of Polution 100 PL Ft.

Casing Depth From 12 to 42 Ft.

Total Depth of Well 400 Ft. GPM 15

Diameter 6 5/8 in.

Static Water Level 30 Ft.

Casing Type: Steel ____ Galvanized Steel ____ Thickness 188 in.

If Steel, Does Owner Approve ____ Yes ____ No

Drive Shoe ____ Yes ____ No Height of Casing Above Ground 12 in.

Problems in Setting Casing ____ Yes ____ No Explain ____

Grout Type: ____ Neat ____ Sand/Cement Rock Concrete Annular Space Width 3 in.

Water in Annular Space ____ Yes ____ No Method of Grout ____ Pump ____ Pressure ____ Poured

No. Bags of Portland Cement 4 Depth From 0 to 22 Ft.

Weight of 1 Bag 94 Lbs. Proper Slab Constructed yes ID Plate yes

DRILLING LOG

Depth From	Depth To	Formation Description
1	20	Sand Rock
20	42	Hard Rock

I hereby certify that the above information is correct and that this well was constructed in accordance with the Caswell County Well Ordinance

D W Shelton
Signature of Contractor

2240
Certification #

8-1-02
Date

Inspection Completed By Donnie Powell Date: 8/1/02

Location #28 – 1209 Carver Road

ANDREWS,CHRISTOPHER M & CARRIE 2019 58,659 MKT CARD 001
PID R 0134.00.00.0104.0000 58,659 PY Val USE 18,374 LAND 002
1273 CARVER RD DEF 40,285 BLDG 001
LISTER 11/21/2015 MW PROSPECT HILL NC 27314 2.620 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 15 248 PLAT ADDRESS 0001209 CARVER RD PROSPECT HILL 27314
NBHD 00000000 USE 000102 RESIDENTIAL VAC DEED 439 462 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF CARVER RD ~9999 ESMT 596-1119

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

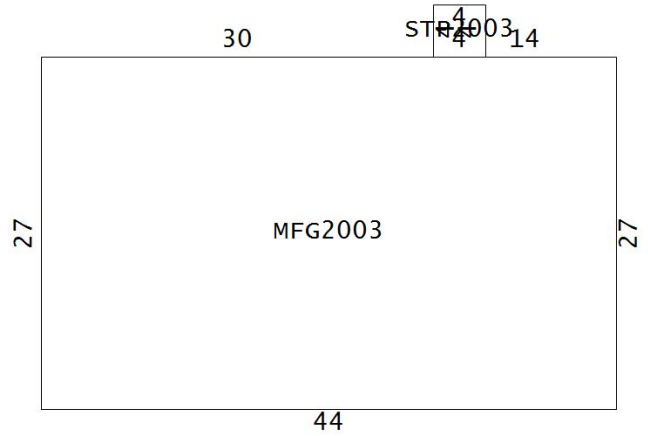
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	05 MFG HOUSE	BVAL	0005C6 MFG HSE/DW	ARCH	01 D/W	QUAL	C4 GRADE C-5	STYS		SIZE	N/A
FNDN	01 BRICK	FRME	02 STEELFRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	01 CENTRALA/C	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	08 CARPT/VYNL	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	06	BATH		BDRM	3	ROOM	5	SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH	C2 2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%	AYB 2003	EYB	2003

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
D/W M/H	1188	1188	1188	1188			74.00	
STOOP	16	3					74.00	
LUMP						54440	74.00	40,285
TOTAL	1204		1188		45.82		74.00	
TOTAL		1191		1188		54440		40,285

TRAVERSE

MFG2003=N27E30 STP2003=E4N4W4 S4$ E14S27W44$.



ANDREWS,CHRISTOPHER M & CARRIE 2019 58,659 MKT CARD 002
PID R 0134.00.00.0104.0000 58,659 PY Val USE 18,374 LAND 002
1273 CARVER RD DEF 40,285 BLDG 001
LISTER 11/21/2015 MW PROSPECT HILL NC 27314 2.620 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 15 248 PLAT ADDRESS 0001209 CARVER RD PROSPECT HILL 27314
NBHD 00000000 USE 000102 RESIDENTIAL VAC DEED 439 462 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF CARVER RD ~9999 ESMT 596-1119

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number	Type	Description
WD	U	0E		V	9/11/2003				

BUILDING PERMITS

Issued	Schd Complt	Revisit	Act Complt	Amount

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020KAC		HS W/UTIL					1.000	AC	14,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	14,000.000	14,000
2		080KAC		2-4 ACRE					1.620	AC	2,700.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,700.000	4,374

#7 (0134 104)

Caswell County Health Department
Well Permit

Date: 11-19-90 This Permit Void After 5 Years

Owner: Donnie Carver SR# 1721

Location/Directions: 86 S (L) Ridgeville Rd (R) on Carver Rd. at end of Carver Rd

Subdivision Name: Lot #

Drilling Contractor: Evans Well Co

WELL CONSTRUCTION

Distance from Nearest Property Line 25 plus Distance from Source of Pollution 160 plus

Total Depth: 145 Ft. Yield: 20 GPM Static Water Level ____ Ft.

Water Bearing Zones: Depth 90 Ft. 110 Ft. 130 Ft. ____ Ft.

Casing: Depth: From 0 to 64 Ft. Diameter: 6¼ Inches

TYPE: Steel ____ Galvanized Steel ✓

If Steel, does owner approve: Yes ____ No ____

Weight: 13 Thickness: 188 Height Above Ground: 12 Inches

Drive Shoe: Yes ✓ No ____

Were Problems Encountered in Setting the Casing? Yes ____ No ✓

If "yes" give reason: ____

Grout: Type: Neat ✓ Sand/Cement ____ Concrete ____

Annular Space Width 3 Inches

Water in Annular Space: Yes ____ No ✓

Method: Pumped ____ Pressure ____ Poured ✓

Depth: From 0 to 20 Ft.

Materials Used: No. Bags Portland Cement 4 Weight of 1 bag 94 lbs.

If mixture (sand, gravel, cuttings) - Ratio: 2 to 1

ID Plates: Yes ✓ No ____

4 x 4 slab: Yes ✓ No ____

DRILLING LOG

Depth From	Depth To	Formation Description
0	5	Red Soil
5	20	Sandy Soil
20	50	Sand
50	62	Sand Rock
62	145	Granite

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT AND THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH REGULATIONS SET FORTH BY THE CASWELL COUNTY HEALTH DEPARTMENT.

Evans Well Co. 11-27-90
Signature of Contractor Date

BJG Jordan 11-19-90
Sanitarian's Signature Date Issued

BJG Jordan 11-27-90
Sanitarian's Signature Date Completed

Sketch well location on reverse side.

map# Parcel# PIN Permit# YC 11-19-90-1

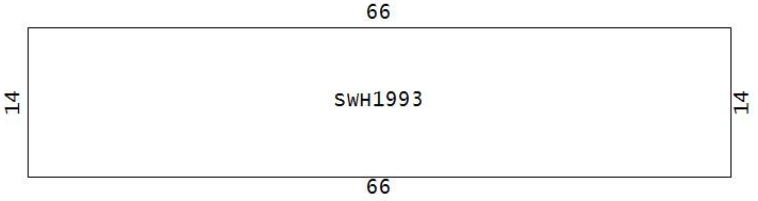
Location #29 – 989 Carver Road

CARVER,JOHN T & PATRICIA JR 2019 98,274 MKT CARD 001
PID R 0134.00.00.0077.0000 98,274 PY Val 73,898 USE 84,126 LAND 011
981 CARVER RD 24,376 DEF 13,548 BLDG 001
LISTER 11/21/2015 MW PROSPECT HILL NC 27314 30.870 ACRES 600 XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 2 BLK PL BK/PG 16 558 PLAT ADDRESS 0000989 CARVER RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 564 632 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: 1043 CARVER RD DEEDS:265-521 ESMT 596-1117 X 8/3/12 -32.87AC TO TM 134-113
BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	05 MFG HOUSE	BVAL	0005C7 MFG HSE/SW	ARCH	02 S/W	QUAL	D3 GRADE D	STYS		SIZE	N/A
FNDN	04 PIER	FRME	02 STEELFRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	08 CENT H&AC	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	05 CARPET	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	07	BATH		BDRM	3	ROOM	4	SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH C2	2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%	AYB 1993		EYB 1993

AREA CALCULATION TRAVERSE

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD	SWH1993=N14E66S14W66$.
S/W M/H	924	924	924	924			30.00		
LUMP						45162	30.00	13,548	
TOTAL	924		924		48.87		30.00		
TOTAL		924		924		45162		13,548	



CARVER,JOHN T & PATRICIA JR 2019 98,274 MKT CARD 002
PID R 0134.00.00.0077.0000 98,274 PY Val 73,898 USE 84,126 LAND 011
981 CARVER RD 24,376 DEF 13,548 BLDG 001
LISTER 11/21/2015 MW PROSPECT HILL NC 27314 30.870 ACRES 600 XFOB 001
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT 2 BLK PL BK/PG 16 558 PLAT ADDRESS 0000989 CARVER RD PROSPECT HILL 27314
NBHD 00000000 USE 000200 AGRICULTURE DEED 564 632 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: 1043 CARVER RD DEEDS:265-521 ESMT 596-1117 X 8/3/12 -32.87AC TO TM 134-113

SALES

IN	Q	RC	M	V	Sale Date	Sale Price	Number	Type
WD	U	0E		I	8/14/2012		14983	COMM
WD	U	0E		V	8/03/2012			

BUILDING PERMITS

Description	Issued	Schd Complt	Revisit	Act Complt	Amount
COMMBUILD	4/28/2016				

EXTRA FEATURES

Seq	Bldg	Code	Description	Length	Width	Height	#Units	UT	Qty	Qual	UTPrice	Year	Adj1	Adj2	Adj3	Adj4	%Good	Value
001		000006	CARPORT/INEXPEN	21	18		1.000	UT	1		600.000	0000	1.00	1.00	1.00	1.00	100.00	600

LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020KAC	N	HS W/UTIL					2.000	AC	14,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	14,000.000	28,000
2		280BAC		OPEN ON PAVED ROAD					18.300	AC	1,600.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,600.000	29,280
3		660AUV	U	USE VALUE OPEN					18.300	AC	590.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	590.000	10,797
4		420KAC	N	WOOD ON DIRT ROAD					4.700	AC	1,400.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,400.000	6,580
8		280AAC		OPEN ON PAVED ROAD					4.870	AC	1,800.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	1,800.000	8,766
9		660AUV	U	USE VALUE OPEN					4.870	AC	590.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	590.000	2,873
10		520KAC	N	COMMERCIAL LAND					1.000	AC	11,500.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	11,500.000	11,500

Location #30 – 981 Carver Road

CARVER,JONATHON B 2019 101,993 MKT CARD 001
PID R 0134.00.00.0114.0000 101,993 PY Val USE 16,700 LAND 002
981 CARVER ROAD DEF 85,293 BLDG 001
LISTER 11/21/2015 MW PROSPECT HILL NC 27314 2.000 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 16 689 PLAT ADDRESS 0001095 CARVER RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 567 1544 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF CARVER ROAD X X 1/18/13 DB 567-1544 PB 16-689

BUILDING CHARACTERISTICS for BldgSeq# 001 (Item# 001)

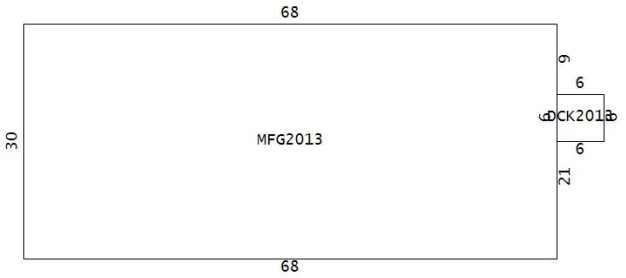
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
MODL	05 MFG HOUSE	BVAL	0005C6 MFG HSE/DW	ARCH	01 D/W	QUAL	C2 GRADE C+5	STYS		SIZE	N/A
FNDN	01 BRICK	FRME	01 WOOD FRAME	WNDO	N/A	EXW1	03 VINYL	EXW2	N/A	EXW2%	
HEAT	02 HEAT PUMP	A/C	N/A	RSTR	01 GABLE	RCV1	01 ASPSHINGLE	RCV2	N/A	RCV2%	
INT1	01 SHEETROCK	INT2	N/A	INT2%		FLR1	N/A	FLR2	N/A	FLR2%	
KTCH	N/A	DPRT	06	BATH		BDRM		ROOM		SPCD	N/A
UD-1	N/A	FRPL	N/A	CHMN	N/A	HBTH	N/A	BATH	C2 2 BATHS	FUEL	04 ELECTRIC
FXTR	N/A	UD-8	N/A	RMYR	N/A	RMYR	N/A	UD-9%		AYB 2013	EYB 2013

AREA CALCULATION

Subarea	Actual	Adj	Heated	Prime	Rate	Value	%Good	RCNLD
D/W M/H	2040	2040	2040	2040			94.00	
DECK	36	9					94.00	
LUMP						90738	94.00	85,293
TOTAL	2076		2040		44.47		94.00	
TOTAL		2049		2040		90738		85,293

TRAVERSE

MFG2013=W68N30E68S9 DCK2013=E6S6W6N6$ S21$.



CARVER,JONATHON B 2019 101,993 MKT CARD 002
PID R 0134.00.00.0114.0000 101,993 PY Val USE 16,700 LAND 002
981 CARVER ROAD DEF 85,293 BLDG 001
LISTER 11/21/2015 MW PROSPECT HILL NC 27314 2.000 ACRES XFOB 000
TWP HIGHTOWER CITY FIRE RESCUE OTHER
LOT BLK PL BK/PG 16 689 PLAT ADDRESS 0001095 CARVER RD PROSPECT HILL 27314
NBHD 00000000 USE 000100 RESIDENTIAL DEED 567 1544 AICUZ PRINTED 6/07/2019 BY THOMAS
LEGAL: OFF CARVER ROAD X X 1/18/13 DB 567-1544 PB 16-689
14383 DOUB DOUBLEWIDE 1/16/2013 2/18/2013 82,583
LAND

Seq	Zone	Code	Use	Description	Front	Depth	Back	FT	#Units	UT	UTPrice	Adj1	Adj2	Adj3	Adj4	Fadj	Dadj	Nbhd Adj	Eff Rate	Value
1		020KAC		HS W/UTIL					1.000	AC	14,000.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	14,000.000	14,000
2		080KAC		2-4 ACRE					1.000	AC	2,700.000	1.00	1.00	1.00	1.00	1.00	1.00	1.000	2,700.000	2,700

#8 (0134 114)

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Dennis Cummings
Well Contractor Name

2537A
NC Well Contractor Certification Number

Cummings Developments, Inc.
Company Name

2. Well Construction Permit #: P11201501
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
- ☐ Agricultural
- ☐ Municipal/Public
- ☐ Geothermal (Heating/Cooling Supply)
- ☒ Residential Water Supply (single)
- ☐ Industrial/Commercial
- ☐ Residential Water Supply (shared)
- ☐ Irrigation

Non-Water Supply Well:
- ☐ Monitoring
- ☐ Recovery

Injection Well:
- ☐ Aquifer Recharge
- ☐ Groundwater Remediation
- ☐ Aquifer Storage and Recovery
- ☐ Salinity Barrier
- ☐ Aquifer Test
- ☐ Stormwater Drainage
- ☐ Experimental Technology
- ☐ Subsidence Control
- ☐ Geothermal (Closed Loop)
- ☐ Tracer
- ☐ Geothermal (Heating/Cooling Return)
- ☐ Other (explain under #21 Remarks)

4. Date Well(s) Completed: 8-1-16 **Well ID#** _____

5a. Well Location:

John Carver
Facility/Owner Name

Facility ID# (if applicable)

981 Carver Rd Prospect Hill 27314
Physical Address, City, and Zip

Caswell
County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

36° 17.273' N 79° 10.110' W

6. Is (are) the well(s): ☒ Permanent or ☐ Temporary

7. Is this a repair to an existing well: ☐ Yes or ☒ No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: One
For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 200 (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: 23 (ft.)
If water level is above casing, use "+"

11. Borehole diameter: 6 (in.)

12. Well construction method: Rotary
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) 43 **Method of test:** Air Rotary

13b. Disinfection type: HTH **Amount:** 18oz.

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
22 ft.	184 ft.	
210 ft.	194 ft.	

15. OUTER CASING (or main casing for multi-cased wells OR liner if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
+1 ft.	87 ft.	6 in.		PVC

16. INNER CASING OR LINING (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
ft.	ft.	in.			
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	20 ft.	Portl Cement	Pour
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
ft.	ft.		
ft.	ft.		

20. DRILLING LOG (attach additional sheet if needed)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	79 ft.	Soils
ft.	ft.	
79 ft.	200 ft.	Rock
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

Signature of Certified Well Contractor: [signature] Date: 8-1-16

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

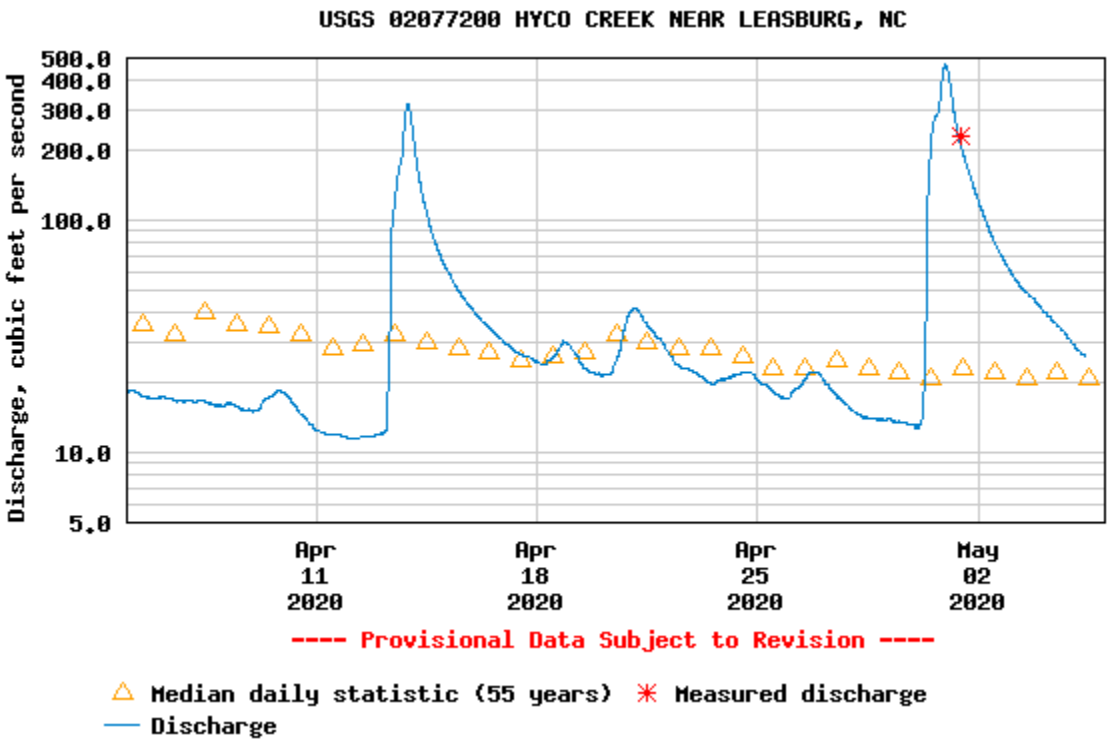
Division of Water Resources, Underground Injection Control Program, 1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

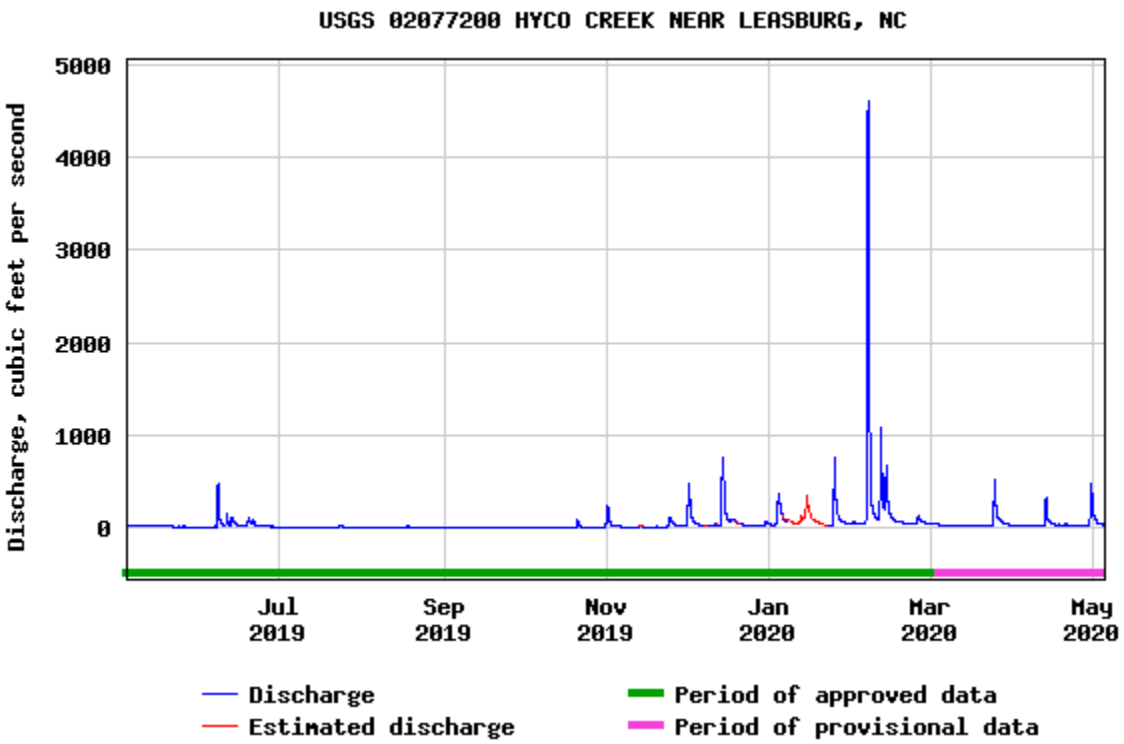
APPENDIX I

USGS DATA FOR STREAM AND WATERSHED ANALYSIS

1-Month Discharge (April 4, 2020 - May 4, 2020):

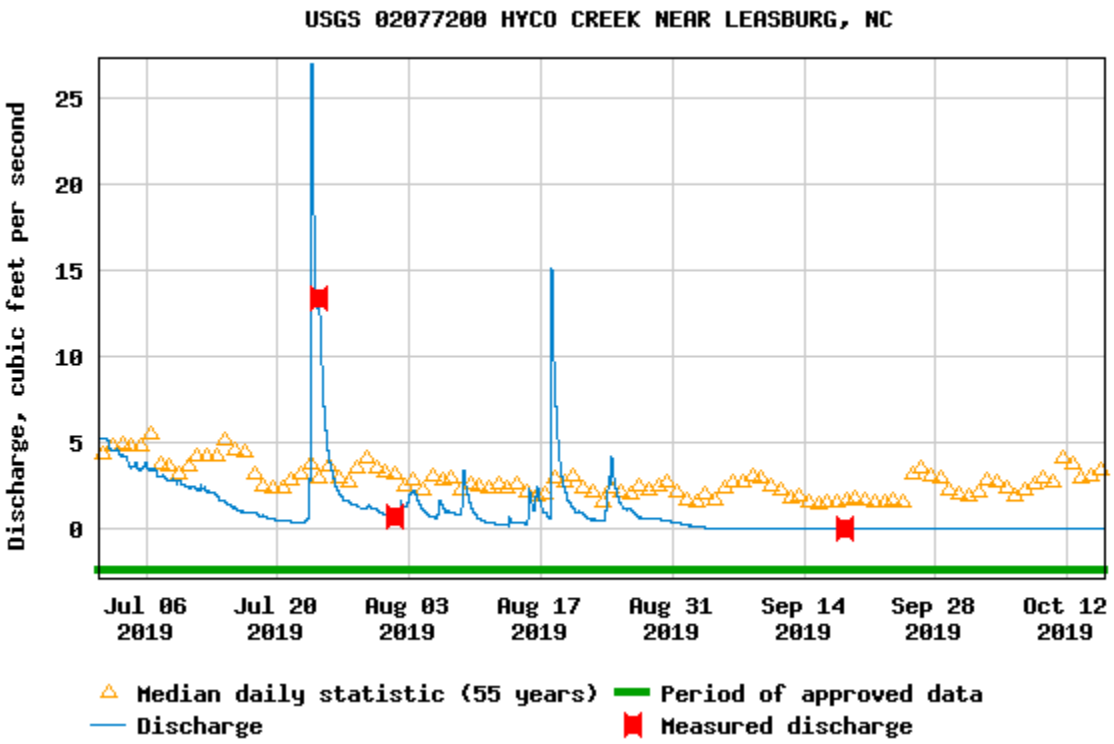


1-Year Discharge (May 4, 2019 – May 4, 2020):

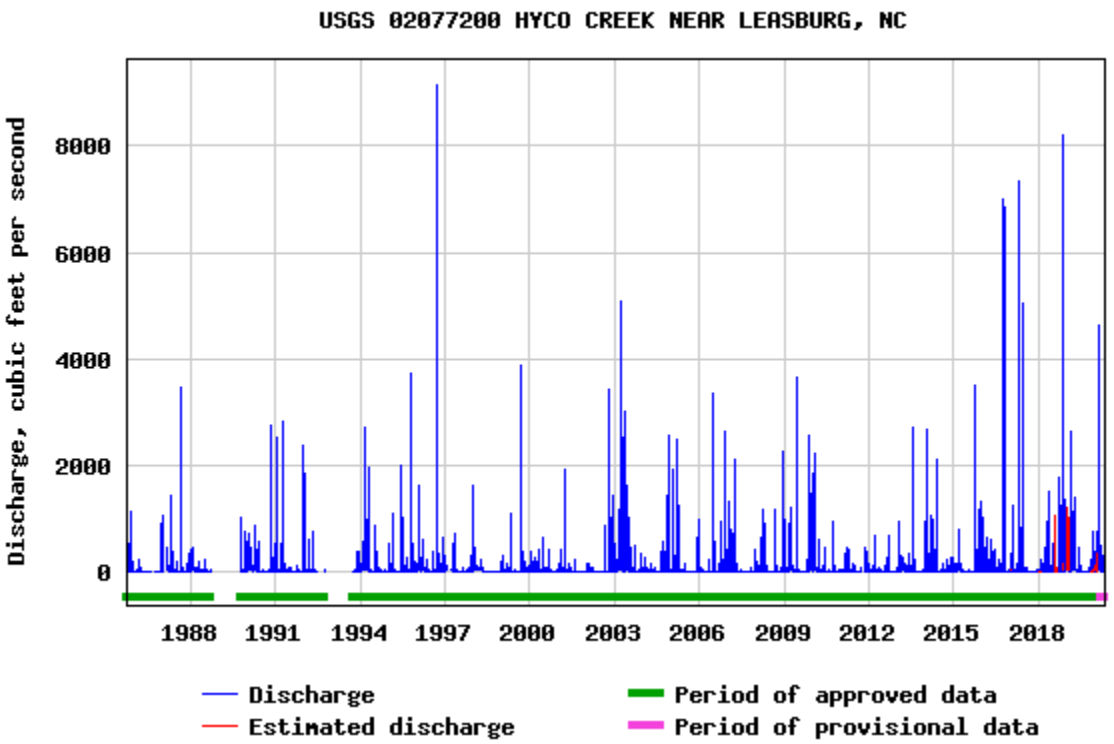


https://nwis.waterdata.usgs.gov/nwis/uv?cb_00060=on&format=gif_default&site_no=02077200

July 1, 2019 – October 15, 2019 Discharge (showing low-flow period):



All Discharge Data for Station (1985 - Present):



https://nwis.waterdata.usgs.gov/nwis/uv?cb_00060=on&format=gif_default&site_no=02077200

StreamStats Data-Collection Station Report

USGS Station Number	**02077200**
Station Name	**HYCO CREEK NEAR LEASBURG, NC**

Click here to link to available data on NWIS-Web for this site.
Click here to link to available Iowa stream flow statistics.
Click here to link to available flow-duration statistics by period of record, calendar day and month, and selected seasonal periods.

Descriptive Information

Station Type	Streamgage, continuous record
Location	
Gage	
Regulation and Diversions	
Regulated?	False
Period of Record	July 1964 to current
Remarks	
Latitude (degrees NAD83)	36.399
Longitude (degrees NAD83)	-79.197
Hydrologic unit code	03010104
County	033-Caswell
HCDN2009	Yes

Physical Characteristics

Characteristic Name	Value	Units	Citation Number
Descriptive Information			
Datum_of_Latitude_Longitude	NAD83	dimensionless	30
District_Code	37	dimensionless	30
ROI_Region_ID	0	dimensionless	29
Begin_date_of_record	1965	days	88
End_date_of_record	2006	days	88
Number_of_days_of_record	14305	days	41
Number_of_days_GT_0	13598	days	41
Precipitation Statistics			
24_Hour_2_Year_Precipitation	3.43	inches	88
24_Hour_10_Year_Precipitation	4.96	inches	88
24_Hour_25_Year_Precipitation	5.87	inches	88
24_Hour_50_Year_Precipitation	6.6	inches	88
24_Hour_100_Year_Precipitation	7.34	inches	88
Mean_Annual_Precipitation	46.44	inches	88
Climate Characteristics			
Climate_Factor	2.8	dimensionless	29
Temperature Statistics			
Mean_Min_January_Temperature	32.000	degrees F	31
Topographical Characteristics			
Latitude_of_Basin_Centroid	36.296043	decimal degrees	88
Longitude_of_Basin_Centroid	-79.227448	decimal degrees	88
Maximum_Basin_Elevation	769.66	feet	88
Mean_Basin_Elevation	615.58	feet	88
Mean_Basin_Slope_ft_per_ft	6.84	feet per foot	88
Minimum_Basin_Elevation	425.7	feet	88
Land Cover Characteristics			
Percent_Forest	59.19	percent	88
Percent_Impervious	0.6	percent	88
Percent_Lakes_and_Ponds	5.0000	percent	31
Percent_Storage	5.0000	percent	31

Soil Properties			
Mean_Basin_Hydrologic_Soils_Index	2.74	dimensionless	88
Drainage_Quality_Index_from_STATSGO	3.27	dimensionless	88
Stream Channel Properties			
Main_Channel_Length	18.41	miles	88
Basin_Drainage_Density	3.35	miles per square mile	88
Basin Dimensional Characteristics			
Contributing_Drainage_Area	45.600	square miles	31
Drainage_Area	45.9	square miles	30
Basin_Shape_Factor	7.23	dimensionless	88
Basin_Perimeter	57.4	miles	88

Streamflow Statistics

Statistic Name	Value	Units	Citation Number	Preferred?	Years of Record	Standard Error, percent	Variance log-10	Lower 95% Confidence Interval	Upper 95% Confidence Interval	Start Date	End Date	Remar
Peak-Flow Statistics												
Mean_Annual_Flood	2259	cubic feet per second	88	Y								
2_Year_Peak_Flood	1960	cubic feet per second	88	Y								
5_Year_Peak_Flood	3800	cubic feet per second	88	Y								
10_Year_Peak_Flood	5310	cubic feet per second	88	Y								
25_Year_Peak_Flood	7530	cubic feet per second	88	Y								
50_Year_Peak_Flood	9400	cubic feet per second	88	Y								
100_Year_Peak_Flood	11400	cubic feet per second	88	Y								
200_Year_Peak_Flood	13700	cubic feet per second	88	Y								
500_Year_Peak_Flood	16900	cubic feet per second	88	Y								
Weighted_5_Year_Peak_Flood	3710	cubic feet per second	88	Y								
Weighted_10_Year_Peak_Flood	5090	cubic feet per second	88	Y								
Weighted_25_Year_Peak_Flood	6980	cubic feet per second	88	Y								
Weighted_50_Year_Peak_Flood	8520	cubic feet per second	88	Y								
Weighted_100_Year_Peak_Flood	10000	cubic feet per second	88	Y								
Weighted_200_Year_Peak_Flood	11600	cubic feet per second	88	Y								
Weighted_500_Year_Peak_Flood	13800	cubic feet per second	88	Y								
Log_Mean_of_Annual_Peaks	3.2836	Log base 10	88	Y								
Log_STD_of_Annual_Peaks	0.3491	Log base 10	88	Y								
Log_Skew_of_Annual_Peaks	-0.277	Log base 10	88	Y								
WRC_Mean	3.2836	Log base 10	88	Y								
WRC_STD	0.3491	Log base 10	88	Y								
WRC_Skew	-0.144	Log base 10	88	Y								
Systematic_peak_years	39	years	88	Y								
Weighted_2_Year_Peak_Flood	1950	cubic feet per second	88	Y								
Low-Flow Statistics												
7_Day_2_Year_Low_Flow	0.01	cubic feet per second	274	Y	47					4/1/1965	3/31/2012	
7_Day_10_Year_Low_Flow	0	cubic feet per second	274	Y	47					4/1/1965	3/31/2012	
30_Day_2_Year_Low_Flow	0.41	cubic feet per second	274	Y	47					4/1/1965	3/31/2012	
Flow-Duration Statistics												

1_Percent_Duration	583	cubic feet per second	325	N	51	10/1/1964 9/30/2015
1_Percent_Duration	583	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
2_Percent_Duration	334	cubic feet per second	325	N	51	10/1/1964 9/30/2015
2_Percent_Duration	334	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
3_Percent_Duration	240	cubic feet per second	325	N	51	10/1/1964 9/30/2015
3_Percent_Duration	240	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
5_Percent_Duration	159	cubic feet per second	325	N	51	10/1/1964 9/30/2015
5_Percent_Duration	159	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
10_Percent_Duration	84	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
10_Percent_Duration	84	cubic feet per second	325	N	51	10/1/1964 9/30/2015
15_Percent_Duration	59	cubic feet per second	325	N	51	10/1/1964 9/30/2015
15_Percent_Duration	59	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
20_Percent_Duration	46	cubic feet per second	325	N	51	10/1/1964 9/30/2015
20_Percent_Duration	46	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
25_Percent_Duration	37	cubic feet per second	325	N	51	10/1/1964 9/30/2015
25_Percent_Duration	37	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
30_Percent_Duration	31	cubic feet per second	325	N	51	10/1/1964 9/30/2015
30_Percent_Duration	31	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
35_Percent_Duration	26	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
35_Percent_Duration	26	cubic feet per second	325	N	51	10/1/1964 9/30/2015
40_Percent_Duration	21	cubic feet per second	325	N	51	10/1/1964 9/30/2015
40_Percent_Duration	21	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
45_Percent_Duration	18	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
45_Percent_Duration	18	cubic feet per second	325	N	51	10/1/1964 9/30/2015
50_Percent_Duration	14	cubic feet per second	325	N	51	10/1/1964 9/30/2015
50_Percent_Duration	14	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
55_Percent_Duration	12	cubic feet per second	325	N	51	10/1/1964 9/30/2015
55_Percent_Duration	12	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
60_Percent_Duration	9.3	cubic feet per second	325	N	51	10/1/1964 9/30/2015
60_Percent_Duration	9.3	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
65_Percent_Duration	7.2	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
65_Percent_Duration	7.2	cubic feet per second	325	N	51	10/1/1964 9/30/2015
70_Percent_Duration	5.4	cubic feet per second	325	N	51	10/1/1964 9/30/2015
70_Percent_Duration	5.4	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
75_Percent_Duration	4	cubic feet per second	325	N	51	10/1/1964 9/30/2015
75_Percent_Duration	4	cubic feet per second	365	Y	51	10/1/1964 9/30/2015
80_Percent_Duration	2.8	cubic feet per	325	N	51	10/1/1964 9/30/2015

		second					
80_Percent_Duration	2.8	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
85_Percent_Duration	1.6	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
85_Percent_Duration	1.6	cubic feet per second	325	N	51	10/1/1964	9/30/2015
90_Percent_Duration	0.71	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
90_Percent_Duration	0.71	cubic feet per second	325	N	51	10/1/1964	9/30/2015
95_Percent_Duration	0	cubic feet per second	325	N	51	10/1/1964	9/30/2015
95_Percent_Duration	0	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
97_Percent_Duration	0	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
97_Percent_Duration	0	cubic feet per second	325	N	51	10/1/1964	9/30/2015
98_Percent_Duration	0	cubic feet per second	325	N	51	10/1/1964	9/30/2015
98_Percent_Duration	0	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
99_Percent_Duration	0	cubic feet per second	325	N	51	10/1/1964	9/30/2015
99_Percent_Duration	0	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Annual Flow Statistics							
Mean_Annual_Flow	44	cubic feet per second	325	N	51	10/1/1964	9/30/2015
Mean_Annual_Flow	44	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Median_Annual_Flow	44	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Stand_Dev_of_Mean_Annual_Flow	21	cubic feet per second	325	N	51	10/1/1964	9/30/2015
Stand_Dev_of_Mean_Annual_Flow	21	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Maximum_Annual_Mean_Flow	113	cubic feet per second	325	N	51	10/1/1964	9/30/2015
Maximum_Annual_Mean_Flow	113	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Minimum_Annual_Mean_Flow	8.7	cubic feet per second	325	N	51	10/1/1964	9/30/2015
Minimum_Annual_Mean_Flow	8.7	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Monthly Flow Statistics							
January_Mean_Flow	74	cubic feet per second	365	Y	51	1/1/1965	1/31/2015
February_Mean_Flow	79	cubic feet per second	365	Y	51	2/1/1965	2/28/2015
March_Mean_Flow	91	cubic feet per second	365	Y	51	3/1/1965	3/31/2015
April_Mean_Flow	62	cubic feet per second	365	Y	51	4/1/1965	4/30/2015
May_Mean_Flow	31	cubic feet per second	365	Y	51	5/1/1965	5/31/2015
June_Mean_Flow	26	cubic feet per second	365	Y	51	6/1/1965	6/30/2015
July_Mean_Flow	21	cubic feet per second	365	Y	51	7/1/1965	7/31/2015
August_Mean_Flow	19	cubic feet per second	365	Y	51	8/1/1965	8/31/2015
September_Mean_Flow	24	cubic feet per second	365	Y	51	9/1/1965	9/30/2015
October_Mean_Flow	22	cubic feet per second	365	Y	51	10/1/1964	10/31/2014
November_Mean_Flow	33	cubic feet per second	365	Y	51	11/1/1964	11/30/2014
December_Mean_Flow	50	cubic feet per second	365	Y	51	12/1/1964	12/31/2014
January_Minimum_Mean_Flow	6.1	cubic feet per second	365	Y	51	1/1/1965	1/31/2015

February_Minimum_Mean_Flow	13	cubic feet per second	365	Y	51	2/1/1965	2/28/2015
March_Minimum_Mean_Flow	9.5	cubic feet per second	365	Y	51	3/1/1965	3/31/2015
April_Minimum_Mean_Flow	8.5	cubic feet per second	365	Y	51	4/1/1965	4/30/2015
May_Minimum_Mean_Flow	2.6	cubic feet per second	365	Y	51	5/1/1965	5/31/2015
June_Minimum_Mean_Flow	0.14	cubic feet per second	365	Y	51	6/1/1965	6/30/2015
July_Minimum_Mean_Flow	0	cubic feet per second	365	Y	51	7/1/1965	7/31/2015
August_Minimum_Mean_Flow	0.0026	cubic feet per second	365	Y	51	8/1/1965	8/31/2015
September_Minimum_Mean_Flow	0	cubic feet per second	365	Y	51	9/1/1965	9/30/2015
October_Minimum_Mean_Flow	0	cubic feet per second	365	Y	51	10/1/1964	10/31/2014
November_Minimum_Mean_Flow	0.1	cubic feet per second	365	Y	51	11/1/1964	11/30/2014
December_Minimum_Mean_Flow	2.3	cubic feet per second	365	Y	51	12/1/1964	12/31/2014
January_Median_Mean_Flow	64	cubic feet per second	365	Y	51	1/1/1965	1/31/2015
February_Median_Mean_Flow	71	cubic feet per second	365	Y	51	2/1/1965	2/28/2015
March_Median_Mean_Flow	81	cubic feet per second	365	Y	51	3/1/1965	3/31/2015
April_Median_Mean_Flow	50	cubic feet per second	365	Y	51	4/1/1965	4/30/2015
May_Median_Mean_Flow	18	cubic feet per second	365	Y	51	5/1/1965	5/31/2015
June_Median_Mean_Flow	9.8	cubic feet per second	365	Y	51	6/1/1965	6/30/2015
July_Median_Mean_Flow	7.8	cubic feet per second	365	Y	51	7/1/1965	7/31/2015
August_Median_Mean_Flow	5.2	cubic feet per second	365	Y	51	8/1/1965	8/31/2015
September_Median_Mean_Flow	4.3	cubic feet per second	365	Y	51	9/1/1965	9/30/2015
October_Median_Mean_Flow	7.3	cubic feet per second	365	Y	51	10/1/1964	10/31/2014
November_Median_Mean_Flow	15	cubic feet per second	365	Y	51	11/1/1964	11/30/2014
December_Median_Mean_Flow	44	cubic feet per second	365	Y	51	12/1/1964	12/31/2014
January_Maximum_Mean_Flow	278	cubic feet per second	365	Y	51	1/1/1965	1/31/2015
February_Maximum_Mean_Flow	244	cubic feet per second	365	Y	51	2/1/1965	2/28/2015
March_Maximum_Mean_Flow	266	cubic feet per second	365	Y	51	3/1/1965	3/31/2015
April_Maximum_Mean_Flow	194	cubic feet per second	365	Y	51	4/1/1965	4/30/2015
May_Maximum_Mean_Flow	184	cubic feet per second	365	Y	51	5/1/1965	5/31/2015
June_Maximum_Mean_Flow	233	cubic feet per second	365	Y	51	6/1/1965	6/30/2015
July_Maximum_Mean_Flow	274	cubic feet per second	365	Y	51	7/1/1965	7/31/2015
August_Maximum_Mean_Flow	264	cubic feet per second	365	Y	51	8/1/1965	8/31/2015
September_Maximum_Mean_Flow	193	cubic feet per second	365	Y	51	9/1/1965	9/30/2015
October_Maximum_Mean_Flow	131	cubic feet per second	365	Y	51	10/1/1964	10/31/2014
November_Maximum_Mean_Flow	201	cubic feet per second	365	Y	51	11/1/1964	11/30/2014
December_Maximum_Mean_Flow	189	cubic feet per second	365	Y	51	12/1/1964	12/31/2014
Seasonal Flow Statistics							
Nov_to_Mar_7_Day_10_Year_Low_Flow	0.72	cubic feet per second	274	Y	47	4/1/1965	3/31/2012

General Flow Statistics							
Minimum_daily_flow	0	cubic feet per second	325	N	51	10/1/1964	9/30/2015
Minimum_daily_flow	0	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Maximum_daily_flow	7400	cubic feet per second	325	N	51	10/1/1964	9/30/2015
Maximum_daily_flow	7400	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Std_Dev_of_daily_flows	143	cubic feet per second	325	N	51	10/1/1964	9/30/2015
Std_Dev_of_daily_flows	143	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Average_daily_streamflow	46.447	cubic feet per second	41	Y	40		
Harmonic_Mean_Streamflow	1.5	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Harmonic_Mean_Streamflow	1.5	cubic feet per second	325	N	51	10/1/1964	9/30/2015
Mean_of_Logs_of_Daily_Values	1.124755	Log base 10	365	Y	51	10/1/1964	9/30/2015
Mean_of_Logs_of_Daily_Values	1.124755	Log base 10	325	N	51	10/1/1964	9/30/2015
Std_Dev_of_Logs_of_Daily_Values	0.733648	Log base 10	365	Y	51	10/1/1964	9/30/2015
Std_Dev_of_Logs_of_Daily_Values	0.733648	Log base 10	325	N	51	10/1/1964	9/30/2015
Skew_of_Logs_of_Daily_Values	-0.557619	Log base 10	365	Y	51	10/1/1964	9/30/2015
Skew_of_Logs_of_Daily_Values	-0.557619	Log base 10	325	N	51	10/1/1964	9/30/2015
Non_Zero_Adjusted_Harmonic_Mean_Flow	1.5	cubic feet per second	325	N	51	10/1/1964	9/30/2015
Non_Zero_Adjusted_Harmonic_Mean_Flow	1.5	cubic feet per second	365	Y	51	10/1/1964	9/30/2015
Base Flow Statistics							
Number_of_years_to_compute_BFI	39	years	42	Y	40		
Average_BFI_value	0.284	dimensionless	42	Y	40		
Std_dev_of_annual_BFI_values	0.068	dimensionless	42	Y	40		
Flow Percentile Statistics							
5th_Percentile_Flow	0	cubic feet per second	274	Y	48	10/1/1964	9/30/2012
10th_Percentile_Flow	0.68	cubic feet per second	274	Y	48	10/1/1964	9/30/2012
25th_Percentile_Flow	4	cubic feet per second	274	Y	48	10/1/1964	9/30/2012
50th_Percentile_Flow Median	15	cubic feet per second	274	Y	48	10/1/1964	9/30/2012
75th_Percentile_Flow	37	cubic feet per second	274	Y	48	10/1/1964	9/30/2012
90th_Percentile_Flow	84	cubic feet per second	274	Y	48	10/1/1964	9/30/2012
95th_Percentile_Flow	160	cubic feet per second	274	Y	48	10/1/1964	9/30/2012
Probabillity Statistics							
Probability_flow_durations_are_zero	0.050035	dimensionless	325	N	51	10/1/1964	9/30/2015
Probability_flow_durations_are_zero	0.050035	dimensionless	365	Y	51	10/1/1964	9/30/2015

Citations

Citation Number	***Citation Name and URL***
29	Imported from ROI file
30	Imported from NWIS file
31	Imported from Basin Characteristics file
41	Wolock, D.M., 2003, Flow characteristics at U.S. Geological Survey streamgages in the conterminous United States: U.S. Geological Survey Open-File Report 03-146, digital data set
42	Wolock, D.M., 2003, Base-flow index grid for the conterminous United States: U.S. Geological Survey Open-File Report 03-263, digital data set
88	Weaver, J.C., Feaster, T.D., and Gotvald, A.J., 2009, Magnitude and frequency of rural floods in the Southeastern United States, through 2006—Volume 2, North Carolina: U.S. Geological Survey Scientific Investigations Report 2009—5158, 111 p.
274	Weaver, J.C., 2015, Low-flow characteristics and flow-duration statistics for selected USGS continuous-record streamgaging stations in North Carolina through 2012: U.S. Geological Survey Scientific Investigations Report 2015—5001, 89 p.
325	Granato G.E., Ries, K.G., III, and Steeves, P.A., 2017, Compilation of streamflow statistics calculated from daily mean streamflow data collected during water years 1901—2015 for selected U.S. Geological Survey streamgages: U.S. Geological

Survey Open-File Report 2017-1108, 17 p.

365 Weaver, J.C., Granato, G.E., and Fitzgerald, S.A., 2019, Assessing water quality from highway runoff at selected sites in North Carolina with the Stochastic Empirical Loading and Dilution Model (SELDM): U.S. Geological Survey Scientific Investigations Report 2019–5031, 99 p., https://doi.org/10.3133/sir20195031.

Basin characteristics from USGS StreamStats extracted April 30, 2020
https://streamstats.usgs.gov/ss/

"Unnamed Stream 1"

Workspace ID	NC20200430154444165000	
Latitude	36.30814	
Longitude	-79.15726	
Time	4/30/2020	11:45:01 AM

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BASINPERIM	Perimeter of the drainage basin as defined in SIR 2004-5262	7.95	miles
BSLDEM30FT	Mean basin slope, based on slope percent grid	6.73	percent
CSL10_85fm	Change in elevation between points 10 and 85 % of length along main channel to basin divide divided by length between points ft/mi	58.12	feet per mi
DRNAREA	Area that drains to a point on a stream	1.08	square miles
ELEV	Mean Basin Elevation	641	feet
ELEVMAX	Maximum basin elevation	715	feet
I24H50Y	Maximum 24-hour precipitation that occurs on avg once in 50 years	6.55	inches

Application Version: 4.3.11

Long term avg flow from Hyco Creek unit flow (0.88 cfs/mi^2)
0.9504 cfs

"Unnamed Stream 2"

Workspace ID	NC20200430175312560000	
Latitude	36.30805	
Longitude	-79.15768	
Time	4/30/2020	1:53:29 PM

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.84	square miles
PCTREG1	Percentage of drainage area located in Region 1	100	percent
PCTREG2	Percentage of drainage area located in Region 2	0	percent
PCTREG3	Percentage of drainage area located in Region 3	0	percent
PCTREG4	Percentage of drainage area located in Region 4	0	percent
PCTREG5	Percentage of drainage area located in Region 5	0	percent
LC06IMP	Percentage of impervious area determined from NLCD 2006 impervious dataset	0.39	percent

Peak-Flow Statistics Parameters 100 Percent Region 1 Piedmont rural under 1 sqmi 2014 5030

Parameter Code	Parameter Name	Value	Units
DRNAREA	Drainage Area	0.84	square miles
LC06IMP	Percent Impervious NLCD2006	0.39	percent

Application Version: 4.3.11

Long term avg flow from Hyco Creek unit flow (0.88 cfs/mi^2)
0.7392 cfs

Basin characteristics from USGS StreamStats extracted April 30, 2020
https://streamstats.usgs.gov/ss/

"Sugartree Creek"

Workspace ID	NC20200430175951346000	
Latitude	36.30427	
Longitude	-79.15137	
Time	43951	2:00:07 PM

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	17.5	square miles

Application Version: 4.3.11

Long term avg flow from Hyco Creek unit flow (0.88 cfs/mi^2)
15.4 cfs

USGS 02077200 HYCO CREEK NEAR LEASBURG, NC

Long term avg flow (average of daily mean flows 1964-present) = 40.55902 cfs

Hyco Creek watershed area from USGS 02077200 = 45.9 sq mi

Unit flow = 40.55902/45.9 = **0.88 cfs/mi^2**

https://waterdata.usgs.gov/nwis/uv?02077200

SUNROCK®
CAROLINA SUNROCK LLC

Appendix E

USACE Jurisdictional Approval

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. **SAW-2019-00888** County: **Caswell** U.S.G.S. Quad: **NC- Ridgeville**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Requestor: **Carolina Sunrock, LLC**
Attn: Scott Martino
Address: **200 Horizon Drive, Suite 100**
Raleigh, NC 27615

Size (acres)	**~628**	Nearest Town	**Prospect Hill**
Nearest Waterway	**Sugartree Creek**	River Basin	**Roanoke**
USGS HUC	**03010104**	Coordinates	**36.300071, -79.162188**

Location description: **The project area is located on the north side of Wrenn Road and the east side of Ridgeville Road, in Prospect Hill, Caswell County, North Carolina. The project area is defined as the area within the solid orange outline on the attached figure entitled "Plat of Survey Showing 'Wetland Delineation' for The Sunrock Group", sheets 1 through 14**

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 revised dated 1/21/2020. 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 wetlandson 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.

☐ 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 DATE. 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 Preliminary Jurisdictional Determination form dated 02/19/2020.

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 **Not applicable**.
It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.

Corps Regulatory Official: David E Bailey Date: 2020.02.19 13:26:58 -05'00'

Date of JD: **02/19/2020** Expiration Date of JD: **Not applicable**

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:
Sue Homewood, NCDEQ-DWR, 450 West Hanes Mill Road, Suite 300, Winston-Salem, NC 27105
Robert H. Bunch, Jr., PWS, Palmetto Environmental Consulting, Inc., PO Box 1730, Lexington, SC 29071

LEGEND

EIP	EXISTING IRON PIPE
EIS	EXISTING IRON STAKE
I.S.	IRON STAKE SET
MON.	CONCRETE MONUMENT
℄	CENTER LINE
M.H.	MAN HOLE
R/W	RIGHT-OF-WAY
	OVERHEAD ELECTRIC
PT.	POINT
	UTILITY POLE
BG	BELOW GRADE
AG	ABOVE GRADE
EX.	EXISTING
R/OAK	RED OAK

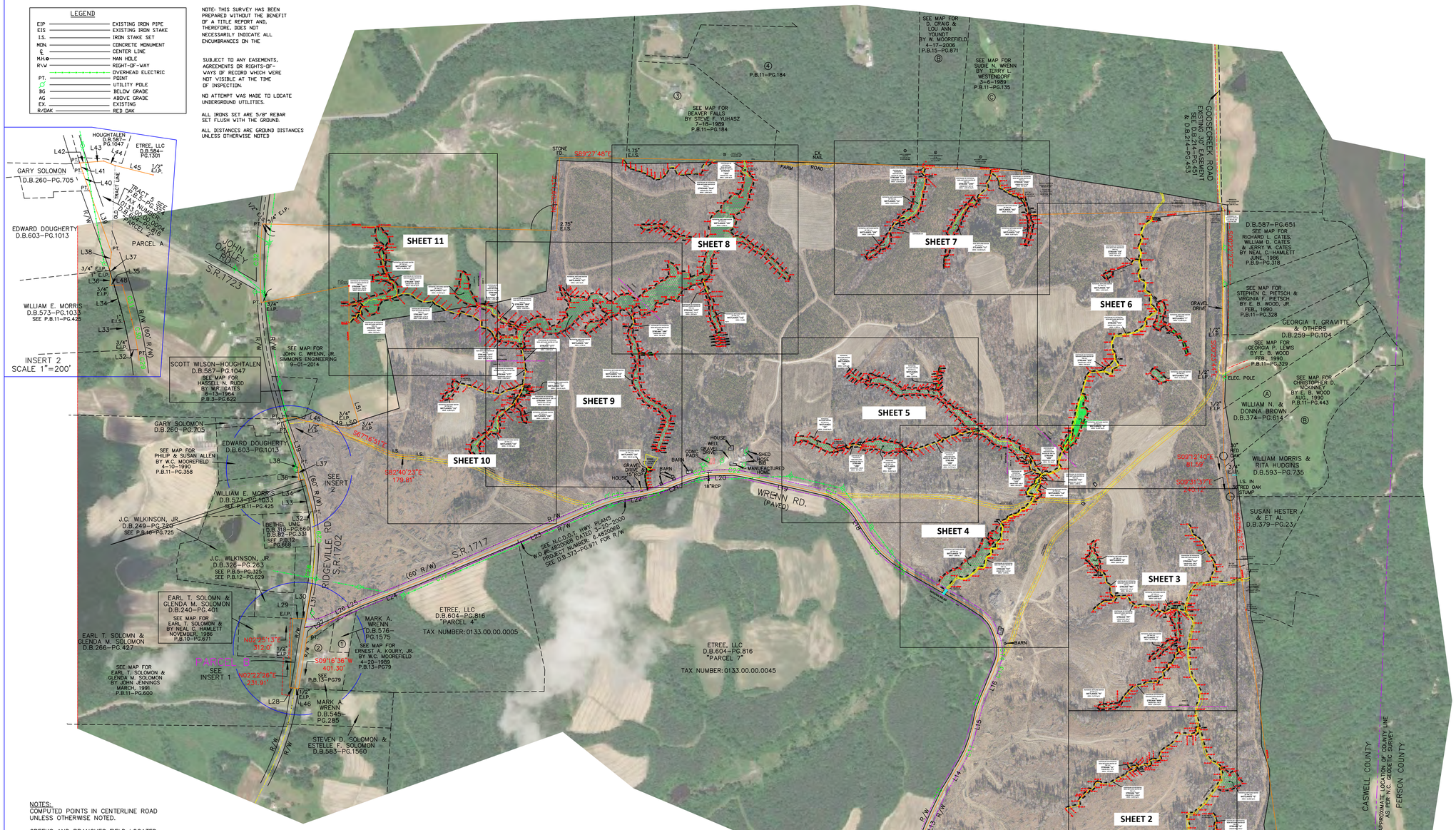
NOTE: THIS SURVEY HAS BEEN PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND, THEREFORE, DOES NOT NECESSARILY INDICATE ALL ENCUMBRANCES ON THE

SUBJECT TO ANY EASEMENTS, AGREEMENTS OR RIGHTS-OF-WAY'S OF RECORD WHICH WERE NOT VISIBLE AT THE TIME OF INSPECTION.

NO ATTEMPT WAS MADE TO LOCATE UNDERGROUND UTILITIES.

ALL IRONS SET ARE 5/8" REBAR SET FLUSH WITH THE GROUND.

ALL DISTANCES ARE GROUND DISTANCES UNLESS OTHERWISE NOTED


INSERT 2
SCALE 1"=200'
SHEET 1
SHEET 2
SHEET 3
SHEET 4
SHEET 5
SHEET 6
SHEET 7
SHEET 8
SHEET 9
SHEET 10
SHEET 11
WRENN RD. (PAVED)
RIDGEVILLE RD. S.R.1702
JOHN OAKLEY RD. S.R.1723
S.R.1717
COOSECREEK ROAD
CASWELL COUNTY
PERSON COUNTY
GARY SOLOMON D.B.260-PG.705
EDWARD DOUGHERTY D.B.603-PG.1013
WILLIAM E. MORRIS D.B.573-PG.1033
SCOTT WILSON-HOUGHTALEN D.B.587-PG.1047
J.C. WILKINSON, JR. D.B.249-PG.220
J.C. WILKINSON, JR. D.B.326-PG.263
EARL T. SOLOMN & GLENDA M. SOLOMON D.B.240-PG.401
EARL T. SOLOMN & GLENDA M. SOLOMON D.B.266-PG.427
ETREE, LLC D.B.604-PG.816 "PARCEL 4" TAX NUMBER:0133.00.00.0005
ETREE, LLC D.B.604-PG.816 "PARCEL 7" TAX NUMBER:0133.00.00.0045
MARK A. WRENN D.B.576-PG.1575
MARK A. WRENN D.B.545-PG.285
STEVEN D. SOLOMON & ESTELLE F. SOLOMON D.B.583-PG.1560
NATHANIEL C. TALLEY & JESSE D. TALLEY D.B.632-PG.1333
WILLIAM N. & DONNA BROWN D.B.374-PG.614
WILLIAM MORRIS & RITA HUDGINS D.B.593-PG.735
SUSAN HESTER & ET AL. D.B.379-PG.23
GEORGIA T. GRAVITTE & OTHERS D.B.259-PG.104
D.B.587-PG.651
PARCEL A
PARCEL B
PARCEL C
N02°25'13"E 312.0'
N02°22'26"E 231.91'
S09°16'36"W 401.30'
S62°40'23"E 179.81'
S89°27'48"E
S62°46'49"W 1046.89'
S37°27'04"W 281.78'
S00°52'59"W 111.31'
S17°31'15"W 79.19'
S23°48'23"E 83.19'
S17°01'26"W 45.57'
S79°10'18"W 61.37'
N68°20'18"W 52.53'
S77°44'07"W 157.61'
S80°29'45"W 47.25'
N33°34'40"W 489.19'
N18°53'15"W 106.04'
N23°57'35"E 290.88'
N30°43'41"E 150.07'
N14°25'50"E 161.29'
N24°57'41"E 122.65'
N60°04'31"W 537.65'
N31°20'45"W 121.81'
N77°04'18"W 595.23'
S87°44'54"W 59.32'
S68°35'04"W 137.56'
S79°37'01"W 103.73'
S09°11'45"W 27.86'
S87°22'23"W 32.27'
S82°39'56"E 229.61'
N71°11'37"E 84.54'
N17°05'08"W 274.69'
N00°05'31"W 605.79'
N00°05'31"W 219.85'
S09°11'45"W 27.86'
S09°14'39"W
S09°13'45"E 81.52'
S09°13'37"E 210.14'
S09°13'45"E 81.52'
S09°13'37"E 210.14'
S09°13'45"E 81.52'
S09°13'37"E 210.14'

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 2/19/2020

B. NAME AND ADDRESS OF PERSON REQUESTING PJD: Scott Martino, 200 Horizon Dr, Ste 100, Raleigh, NC 27615

C.DISTRICT OFFICE, FILE NAME, AND NUMBER:
SAW-2019-00888 (Carolina Sunrock quarry / Ridgeville Road and Wrenn Road / Prospect Hill / Caswell County / industrial)

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: NC County/parish/borough: Caswell City: Prospect Hill

Center coordinates of site (lat/long in degree decimal format):

Lat.: 36.3019 Long.: -79.1654

Universal Transverse Mercator:

Name of nearest waterbody: Sugartree Creek

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

- ☐ Office (Desk) Determination. Date:
- ☒ Field Determination. Date(s): 7/30/2019 and 7/31/2019

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
			See attached Table		

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)		Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Wetland 1A	36.29862	-79.15978	6825	SQ_FT	Wetland	Section 404
Wetland 1C - West	36.301105	-79.165233	3749	SQ_FT	Wetland	Section 404
Wetland 1C - East	36.300761	-79.163176	1.473	ACRE	Wetland	Section 404
Wetland 1D - East	36.299706	-79.164454	19452	SQ_FT	Wetland	Section 404
Wetland 1D - West	36.299772	-79.166464	12645	SQ_FT	Wetland	Section 404
Wetland 1F	36.30026	-79.15889	21307	SQ_FT	Wetland	Section 404
Wetland 1G	36.30479	-79.16088	3567	SQ_FT	Wetland	Section 404
Wetland 1J	36.30383	-79.16256	16366	SQ_FT	Wetland	Section 404
Wetland 1L	36.30461	-79.16379	23613	SQ_FT	Wetland	Section 404
Wetland 1M	36.30378	-79.16451	7348	SQ_FT	Wetland	Section 404
Wetland 1N	36.30428	-79.1688	6.782	ACRE	Wetland	Section 404
Wetland 1Q	36.30193	-79.16856	11001	ACRE	Wetland	Section 404
Wetland 1S	36.30075	-79.17077	32589	SQ_FT	Wetland	Section 404
Wetland 1U	36.3009	-79.17579	4945	SQ_FT	Wetland	Section 404
Wetland 1W	36.3004	-79.17404	2424	SQ_FT	Wetland	Section 404
Wetland 1X	36.29984	-79.17493	17729	SQ_FT	Wetland	Section 404
Wetland 1Y	36.30288	-79.17642	27854	SQ_FT	Wetland	Section 404
Wetland 1Z - Sheet 11	36.30376	-79.178	41905	SQ_FT	Wetland	Section 404
Wetland 1Z - Sheet 9	36.3027	-79.17295	2011	SQ_FT	Wetland	Section 404
Wetland 2A	36.30138	-79.15725	6124	SQ_FT	Wetland	Section 404
Wetland 2B	36.29915	-79.1699	506.85	SQ_FT	Wetland	Section 404
Wetland 2C	36.30096	-79.17394	3269.31	SQ_FT	Wetland	Section 404
Wetland 4G	36.30504	-79.16108	46	SQ_FT	Wetland	Section 404
Wetland B	36.288536	-79.161922	8782	SQ_FT	Wetland	Section 404
Wetland C	36.289119	-79.16162	13406	SQ_FT	Wetland	Section 404
Wetland G	36.292484	-79.155241	16988	SQ_FT	Wetland	Section 404
Wetland H	36.29103	-79.15464	1043	SQ_FT	Wetland	Section 404
Wetland N	36.29409	-79.15808	3273	SQ_FT	Wetland	Section 404
Pond	36.29942	-79.16968	0.17	ACRE	Non-wetland Water	Section 404
Wetland Q	36.2967	-79.15829	8810	SQ_FT	Wetland	Section 404
Wetland S	36.29604	-79.15648	6651	SQ_FT	Wetland	Section 404
Wetland T	36.29512	-79.15664	12770	SQ_FT	Wetland	Section 404
Wetland W	36.30362	-79.15831	1553	SQ_FT	Wetland	Section 404
Wetland Y	36.30272	-79.15685	11293	SQ_FT	Wetland	Section 404
Wetland Z	36.29684	-79.16222	1.204	ACRE	Wetland	Section 404
Stream 1BB - West	36.2996	-79.1655	407	FOOT	Non-wetland Water	Section 404
Stream 1BB - Middle	36.2995	-79.1637	2279	FOOT	Non-wetland Water	Section 404
Stream 1BB - East	36.2991	-79.1605	259.6	FOOT	Non-wetland Water	Section 404
Stream 1EE - South	36.2992	-79.1606	181.6	FOOT	Non-wetland Water	Section 404
Stream 1EE - North	36.3014	-79.1585	126.9	FOOT	Non-wetland Water	Section 404
Stream 1HH	36.30493	-79.16197	537.31	FOOT	Non-wetland Water	Section 404
Stream 1KK	36.30525	-79.16339	670.9	FOOT	Non-wetland Water	Section 404
Stream 1PP	36.30246	-79.16899	114.3	FOOT	Non-wetland Water	Section 404
Stream 1RR	36.30152	-79.17094	110.6	FOOT	Non-wetland Water	Section 404
Stream 1TT	36.30085	-79.17499	915.6	FOOT	Non-wetland Water	Section 404
Stream 1VV	36.30045	-79.1744	647.86	FOOT	Non-wetland Water	Section 404
Stream 1YY	36.30211	-79.17338	1221.6	FOOT	Non-wetland Water	Section 404
Stream 1ZZ	36.30167	-79.17876	183.4	FOOT	Non-wetland Water	Section 404
Stream 2AA	36.30524	-79.17009	942	FOOT	Non-wetland Water	Section 404
Stream 2BB	36.30222	-79.17368	408	FOOT	Non-wetland Water	Section 404
Stream 2CC	36.30274	-79.17958	369.94	FOOT	Non-wetland Water	Section 404
Stream 2DD	36.30298	-79.17827	364.64	FOOT	Non-wetland Water	Section 404
Stream 2EE	36.30556	-79.16786	148	FOOT	Non-wetland Water	Section 404
Stream 2GG	36.3053	-79.16144	372.8	FOOT	Non-wetland Water	Section 404
Stream AA	36.287824	-79.160888	1076.2	FOOT	Non-wetland Water	Section 404
Stream DD	36.288602	-79.158208	140	FOOT	Non-wetland Water	Section 404
Stream EE	36.289983	-79.158012	864.4	FOOT	Non-wetland Water	Section 404
Stream FF - Sugartree Creek - North	36.293338	-79.155991	2955.6	FOOT	Non-wetland Water	Section 404
Stream JJ	36.29123	-79.15523	209.2	FOOT	Non-wetland Water	Section 404
Stream KK	36.29222	-79.15825	1410	FOOT	Non-wetland Water	Section 404
Stream LL	36.29292	-79.15719	79	FOOT	Non-wetland Water	Section 404
Stream MM	36.29467	-79.15692	796.6	FOOT	Non-wetland Water	Section 404
Stream PP	36.29604	-79.15819	844.1	FOOT	Non-wetland Water	Section 404
Stream RR	36.29634	-79.15781	276.1	FOOT	Non-wetland Water	Section 404
Stream Sugartree Creek - South	36.287374	-79.159049	1200	FOOT	Non-wetland Water	Section 404
Stream UU	36.29704	-79.15568	536.9	FOOT	Non-wetland Water	Section 404
Stream VV	36.3045	-79.15738	4157.6	FOOT	Non-wetland Water	Section 404
Stream XX	36.30403	-79.15775	78.8	FOOT	Non-wetland Water	Section 404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- [x] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
  Map: Aerial, soils, and topo maps (Palmetto), "Plat of Survey Showing 'Wetland Delineation' for The Sunrock Group" sheets 1-14 (CE Robertson and Associates)
- [x] Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - [x] Office concurs with data sheets/delineation report.
  - [ ] Office does not concur with data sheets/delineation report. Rationale: _____.
- [ ] Data sheets prepared by the Corps: _____.
- [x] Corps navigable waters' study: 1977 Navigability Study.
- [x] U.S. Geological Survey Hydrologic Atlas: HA 730-G, 1990.
  - [ ] USGS NHD data.
  - [ ] USGS 8 and 12 digit HUC maps.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: 1:24,000 USGS Ridgeville Quad.
- [x] Natural Resources Conservation Service Soil Survey. Citation: via ESRI.
- [x] National wetlands inventory map(s). Cite name: via ESRI.
- [ ] State/local wetland inventory map(s): _____.
- [x] FEMA/FIRM maps: www.webgis.net/nc/caswell.
- [ ] 100-year Floodplain Elevation is: _____.(National Geodetic Vertical Datum of 1929)
- [x] Photographs: [x] Aerial (Name & Date): NC CGIA 2018.
  or [ ] Other (Name & Date): _____.
- [ ] Previous determination(s). File no. and date of response letter: _____.
- [x] Other information (please specify): LiDAR (NC Floodmaps).

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Date: 2020.02.19 12:56:02 -05'00'

Signature and date of Regulatory staff member completing PJD

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

Appendix F

DENR/Division of Parks & Recreation Correspondence

RECEIVED

SEP 27 2019

LAND QUALITY
MINING PROGRAM

Log In #: 1134

DPR/RRS Mining Permit Application Review

RRS Contact: J. BEEDLE-MUNLEY

Name of project: MINING PERMIT APPLICATION CAROLINA SUNROCK LLC (PROSPECT HILL QUARRY)

County: CASWELL

Proposed activity is ____ is not ☑ within 5 miles of a public park or recreation area.

If yes, identify the park:

Manager/agency name:

(contact name):

(phone; fax):

(e-mail):

Review conducted by: Jennifer Beedle-Munley Digitally signed by Jennifer Beedle Date: 2019.09.23 14:39:42 -04'00' Date: 9/22/19

PLEASE RETURN COVER SHEET ONLY WITH YOUR REVIEW/COMMENTS. YOU MAY ALSO E-MAIL YOUR RESPONSE AND/OR COMMENTS/QUESTIONS TO:

steve.livingstone@ncparks.gov

THANKS!

Return to:
Steve Livingstone
(919) 707-9331
steve.livingstone@ncparks.gov
DENR/Division of Parks & Recreation
1615 MSC
Raleigh, NC 27699-1615

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CAROLINA SUNROCK LLC

Appendix G

City of Roxboro Correspondence

From: Tommy Warren [mailto:twarren@cityofroxboro.com]
Sent: Friday, September 27, 2019 12:42 PM
To: wbcates@roxboro.net
Subject: Letter of Sunrock

Walter,

Attached is a memo that was sent to City Council as part of a weekly report.

Thank you for offering the application information.

If you have any questions, please call.

Tommy

Thomas S. Warren, Jr.

Assistant City Manager

City of Roxboro

PO Box 128

Roxboro, NC 27573

P 336-503-0489

F 336-503-0588

Weekly Report

September 13, 2019

Sunrock Quarry in Caswell County – Sunrock held a community meeting in Prospect Hill to discuss the proposed rock and sand quarry in Caswell County on Wednesday September 11 at 6:30. Brooks Lockhart, John Williford and myself attended the meeting. Sunrock presented an overview of the project and the potential impacts to the surrounding property.

The proposed quarry will be located near the southern end of Lake Roxboro. This area has a unique feature in that there is sand located on top of the rock. It is part of the overburden that has to be removed to get to the rock.

The closest point of the quarry will over 1,000' from Lake Roxboro. The concerns for the city are water quality in the discharge from the quarry and lowering of the ground water level.

Information presented by Sunrock indicate that the runoff will be captured on site and used as process water. This limits runoff to the buffer area around the streams. The erosion control plans indicate that the buffer areas along the creeks will be approximately 60% larger than required by the state. In addition, there will be a 200' buffer around the entire property. This plus the distance from the property line to the lake should provide adequate protection to the lake from sediment.

The other concern was the effect the quarry might have on ground water levels. The geologist working on the site performed a draw down test to determine the cone of impact. That is the area that would be affected by the quarry. The test revealed that with a 500' deep quarry, the cone of impact would be limited to 1,300' from the wall of the quarry. Any area beyond that would not see a drop in ground water level.

Lake Roxboro is a surface impoundment and receives it water from runoff in its watershed. Ground water levels do not impact the lake levels. This information was verified by an independent soil scientist that I had spoken too.

The watershed for Lake Roxboro is measured in square miles. It is over 25 sq. miles. The quarry site is 488 acres or 0.74 sq. miles. If there is no runoff from the site, it will not impact Lake Roxboro water levels.

The quarry will have monitoring wells around the site and will conduct water quality test quarterly. These results will be reported to the state.

Based on the current information, the impacts to Lake Roxboro will be minimum if any.

Appendix H

North Carolina State Geological Survey Correspondence

NCGS Mine Permit Application Review Check Sheet

Mining is to complete this Section

Mine ID No. _____ Type of Application: New / Mod / Transfer

Mine Name: Prospect Hill Quarry

Permittee: Carolina Sunrock LLC

Attached page 1-3 of the mine application.

Suspense Data for Comment: 9/27/19

NCGS to complete this Section

_____ No Geological significance.

Commodity: Aggregate Mineral Resources: diorite, diabase, granodiorite

County: CASWELL 7.5 Quad RIDGEVILLE

Lat: 36.300266°N Long: -79.167534°W

1985 Geological Map Unit: PzZg

Other Geological Map Units: Metamorphosed gabbro and diorite

Lithology: metamorphosed igneous rocks.

Geochemistry Hazardous Minerals: As part of the Carolina Slate Belt, this site could have arsenic in the mafic rocks.

Subsidence: N/A

Slope Stability: N/A

Seismic Hazard: LOW Hazard.

Hydrogeology: WITHIN 1 mile of impounded Lake on South Hyco Creek

Flood Plain Deposits: " " " permanent creek feeding Hyco creek
intermittent creek N of proposed quarry

Comments: _____

Reviewer: Jennifer B. Taylor Date: 8/2/2019

H:\Procedures\Permit application\20190430 NCGS Mine Review.docx

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CAROLINA SUNROCK LLC

Appendix I

Subhorizon Geologic Resources – Radon and Naturally occurring Asbestos Potential

Carolina Sunrock
Prospect Hill Property
Caswell County, North Carolina
Radon and Naturally Occurring Asbestos Potential

Introduction and Geologic Setting

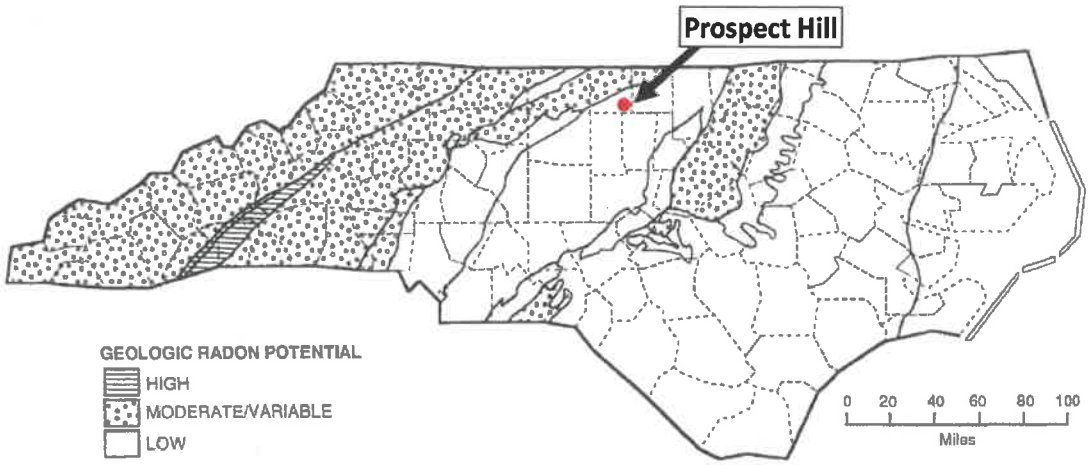
The property evaluated is in southeastern Caswell County, N.C. approximately three miles north of Prospect Hill on Wrenn Road. The evaluated property consists of three tracts totaling 620.56 acres. Geologically, the property is in the western portion of the Carolina Slate Belt. Geologic mapping by Carpenter (1982) indicates the property is underlain by a mix of igneous and metamorphic rocks that includes granites, diorites, and gabbro, intruded by diabase dikes. Site specific coring, up to depths of approximately 300 feet, show the lithologies dominated by diorite and granodiorite with diabase and minor greenstone and gabbroic rocks.

Radon Potential

The Environmental Protection Agency (EPA) has classified Caswell County in Radon Zone 2 (https://geopub.epa.gov/Radon/). Counties that are grouped in Radon Zone 2 are "Counties with predicted average indoor radon screening levels from 2 to 4 pCi/L." The EPA recommends radon remediation and reduction systems for indoor radon concentrations exceeding 4 pCi/L. Summaries of indoor radon screening data for Caswell County show an average radon concentration of 2.8 pCi/L (n = 105) (Schumann, 1993). However, specific location data for these testing sites within Caswell County are not available.

Using aeroradiometric data acquired through the National Uranium Resource Evaluation (NURE) Program can provide some information on the radon potential in an area based on the concentrations of uranium (Schumann, 1993). Using the raw aeroradiometric data (Hill et al., 2009), there is a clear distinction between the higher concentrations of uranium in western Caswell County compared to the eastern areas. This distinction reflects differences in the underlying geology. The boundary between the Carolina Slate Belt and the Charlotte/Milton Belt roughly bisects Caswell County from the northeast to the southwest. The aeroradiometric data for the Carolina Slate Belt portion of Caswell County shows uranium concentrations approximately half of the uranium concentrations in the Charlotte/Milton Belt. Thus, radon concentrations recorded from parts of Caswell County that are in the Charlotte/Milton Belt are likely higher than radon concentrations in the Carolina Slate Belt.

This interpretation is supported by the Geologic Radon Potential Map of Schumann (1993) that shows southeastern Caswell County with a low radon potential compared to northwestern Caswell County with moderate/variable radon potential. In addition, Schumann (1993) calculated a Radon Index score for the geological provinces within North Carolina utilizing a combination of radon indoor testing data, geologic information, and soil permeability data. The Carolina Slate Belt has a Radon Index Score of 6 which is considered low potential and with probable screening indoor radon averages of less than 2 pCi/L. As a result, **the radon potential on the Prospect Hill site is considered low**.



Geologic radon potential map of North Carolina. From Schumann (1993).

Naturally Occurring Asbestos (NOA)

The Occupational Safety and Health Administration definition of asbestos "includes the minerals chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered". An asbestiform fiber is a particle "5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1". (https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1001). Although these regulations were established to address occupational and industrial exposures to asbestiform minerals, there are natural occurrences of asbestos that can pose a health risk.

Naturally occurring asbestos (NOA) is a term used to describe fibrous minerals that are natural components of rocks and soils but may include fibrous minerals that do not meet the regulatory definition of asbestos (Harper, 2008). Occurrences of NOA in North Carolina have been cataloged by Van Gosen (2005) with additional sites added by the North Carolina Department of Health and Human Services (NCDHHS) (https://epi.dph.ncdhhs.gov/oee/a_z/noa.html). These localities are associated with ultramafic bodies in the western counties of North Carolina and document the presence of anthophyllite asbestos and chrysotile. The NCDHHS does not list any NOA occurrences in Caswell County (https://epi.dph.ncdhhs.gov/oee/by_county.html) and the geologic mapping of Carpenter (1982) does not identify ultramafic rocks on the Prospect Hill property. Furthermore, there are no ultramafic rock occurrences in the upstream areas of the drainages that cross the property.

Logging of core samples from seven drill holes on the property did not identify any ultramafic rocks or any fibrous minerals. Petrographic analysis using polarized light microscopy (PLM) was completed on seven rock samples from five of the drill holes. These rock types were primarily granodiorite and diabase. No fibrous minerals were identified during the PLM analysis.

Based on the geologic mapping, core drilling program and petrographic analysis **the potential for naturally occurring asbestos on the Prospect Hill property is considered very low.**

References

Carpenter, P.A. III, 1982, Geologic map of Region G (Alamance, Caswell, Davidson, Guilford, Randolph, and Rockingham counties), North Carolina: North Carolina Geological Survey, Regional Geology Series 2, scale 1:125000.

Harper, M, 2008, 10th Anniversary critical review: Naturally occurring asbestos: Journal of Environmental Monitoring, v. 10, p. 1394–1408. doi:10.1039/b810541n

Hill, P.L., Kucks, R.P., and Ravat, D., 2009, Aeromagnetic and aeroradiometric data for the conterminous United States and Alaska from the National Uranium Resources Evaluation (NURE) Program of the U.S. Department of Energy: U.S. Geological Survey Open-File Report 2009–1129, https://pubs.usgs.gov/of/2009/1129/.

Schumann, R. R., 1993, Geologic radon potential of EPA Region 4; Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee: U.S. Geological Survey Open File Report 93-292-D, 274 p., https://pubs.er.usgs.gov/publication/ofr93292D

Van Gosen, B, 2005, Reported historic asbestos mines, historic asbestos prospects, and natural asbestos occurrences in the Eastern United States: U.S. Geological Survey Open-File Report 2005-1189 https://pubs.usgs.gov/of/2005/1189/

Signature Page

All interpretations are based on literature review, core analysis and petrographic analysis of samples taken from core drilling. Geological conditions can vary across a site and the rock types observed and mineralogical constituents may not necessarily apply to other intervals and/or areas.

Date 12/13/2019

Brett T. McLaurin, Ph.D., P.G.

NORTH CAROLINA LICENSED SEAL 2348 GEOLOGIST BRETT T. McLAURIN