Healthy People. Healthy Communities

February 10, 2020

CERTIFIED LETTER
RETURN RECEIPT REQUESTED

Mr. Steve McKeel
American Materials Company, LLC
Suite 201
Wilmington, N.C. 28403
steve.mckeel@americanmaterialsco.com

RE: Transfer - I-002171, Andrews Quarry
RDA, LLC to American Materials Company, LLC

Dear Mr. McKeel:

The South Carolina Department of Health and Environmental Control (DHEC) acknowledges the transfer of the above referenced permit from RDA, LLC to American Materials Company, LLC. The Transfer Agreement is enclosed for your records. Any future modifications will be made in American Materials Company's name. Additionally, no changes to the bond covering this mine can be made without prior approval from DHEC.

To stay in compliance with the S.C. Mining Act and Regulations, the Annual Reclamation Report, the annual operating fees, and the NPDES permit fees must be submitted each year until the mining permit is cancelled by DHEC.

Should there be any questions or if I may be of further assistance, please do not hesitate to contact the project manager, Jeremy Eddy, at 803-898-7609 or by e-mail at *eddyje@dhec.sc.gov*.

Sincerely,

Juli E. Blalock, Director
Division of Mining and Solid Waste Management

Email to: Shawn Williams – Myrtle Beach Office Manager
Matt Maxwell – Regional Director
Mareesa Singleton - BOA
Brett Caswell - BOW
Jeff Phillips - MSHA
Dr. Tiffany Wright – Williamsburg County, tiffany.wright@wc.sc.gov
Craig Kennedy – KCS Consulting Services, LLC, craigkennedy.kcs@gmail.com

MINE OPERATING PERMIT

PART I:

Andrews Quarry
AMERICAN MATERIALS COMPANY, LLC

American Materials Company, LLC, a corporation, has been granted a Mine Operating Permit, Mine Permit Number I-002171, to operate the Andrews Quarry in accordance with the S.C. Mining Act (S.C. Code Ann., Section 48-20-10 *et seq.*, Rev. 2008 (Supp. 2018) and S.C. Code Ann. Regs. R.89-10 *et seq.* The operator shall conduct this operation as represented in documents submitted to The S.C. Department of Health and Environmental Control (DHEC) in the issuance of this permit.

Joe Koon

JOSEPH M. KOON, MANAGER
MINING AND RECLAMATION SECTION

PERMIT NUMBER: I-002171
ORIGINALLY ISSUED: March 25, 2019 – *Revised December 13, 2019*
MODIFIED: February 10, 2020

In accordance with Section 48-20-60 of the South Carolina Mining Act, this Mine Operating Permit shall remain valid unless it terminates, as set forth in R.89-270, or is revoked in accordance with Section 48-20-160 and R.89-280. The anticipated mining completion date is listed on the *Schedule for Conservation and Reclamation Practices* in the *Reclamation Plan.*

The approved *Permit Application, Reclamation Plan*, and all supplemental information referenced herein, are incorporated by reference into this permit. *Land Entry Agreements and Mine Maps* as identified in Part II and Part IV, respectively, are also incorporated into this permit.

AMERICAN MATERIALS COMPANY, LLC

Home Office Address: 1410 Commonwealth Drive
Suite 201
Wilmington, N.C. 28403

Local Office Address: 1566 Seaboard Road
Andrews, S.C. 29510

Address for Official Mail: Use Home Office Address

Listed below it the Company personnel and title for the contact of official business and correspondence for the Andrews Quarry. DHEC should be notified in writing immediately of any change in contact, address, telephone or fax numbers:

Steve McKeel
VP of Environ. Development

Telephone*:* 910-799-1411
Email: steve.mckeel@americanmaterialsco.com

LOCATION: The mine is located on the Trio Quadrangle, SC U.S.G.S. 7.5' Topographic Map. The approximate geographic coordinates for the site are:

Latitude: 33.48713 Longitude: -79.63996

The site is located off Seaboard Road in Williamsburg County, approximately five (5) miles northwest of Andrews, South Carolina. Specifically, the site is directly north of Seaboard Road at its junction with Jumpin Run Road.

Part II: MINE OPERATIONS

American Materials Company, LLC, also referred to as the operator, is permitted to mine limestone at the Andrews Quarry. The maximum depth to the pit floor shall be 65 feet below ground surface [to an elevation of -21 feet mean sea level (msl)] measured from the lowest ground surface elevation. Mining will take place on tracts of land owned by the referenced operator. These tracts of land are identified in the submitted *Land Entry Agreement*s (LEAs).

MINE/PIT CHARACTERIZATION: The mining process will begin with the timbering and clearing of existing vegetation and the stripping of overburden. The overburden will either be backfilled into mined out portions of the pit or placed in permanent storage areas at designated berm locations. The exposed limestone will be drilled, explosives loaded, and blasted to fragment stone into manageable sizes to facilitate loading into haul trucks for transport to the primary crusher. The material from the primary crusher will be conveyed by conveyor belt to the secondary crusher(s) for further processing.

PROCESSING PLANT LOCATED ON MINE SITE: The processing plant consists of primary and secondary crushers, screens, conveyors, and loading and hauling equipment. Waste screenings and other fines from crushing, washing, and screening the crushed stone will be used to backfill along the mined-out pit walls of mine segments.

MINE DEWATERING: The groundwater may be lowered within the active pit to a maximum depth of +5ft msl to facilitate the mining of limestone. Groundwater levels shall be maintained a minimum of two (2) feet above the top of the limestone surface at the Perimeter Monitoring Well (PMW) stations as shown on the approved mine map. The water removed from the active pit will be pumped into the *Sediment Retention and Water Storage Basin* as shown on the mine map. Water discharged from the *Sediment Retention and Water Storage Basin* to Murray Swamp must be discharged through an outfall regulated by a NPDES permit. See Part X: *Additional Terms and Conditions* and Appendix C for additional dewatering requirements.

BLASTING: Blasting operations are permitted at this mine site. Blasting activities shall be conducted in accordance with R. 89-150.H, under the direction of a S.C. Licensed Blaster and in compliance with S.C. Fire Marshall regulations. A minimum distance of 250 ft. shall be maintained between the blast area and adjacent property boundaries. Pursuant to R. 89-150, the operator shall conduct a pre-blast survey prior to the initiation of mining. The survey shall be offered to owners of structures within 0.5-mile radius of any blasting.

Pursuant to R.89-150.I, the operator must maintain a minimum distance of 1,000 feet between the nearest point of blasting and any structure not owned by the operator as of the completed application date. The operator may conduct blasting operations within 1,000 feet of a structure not owned or controlled by the Andrews Quarry, in which the structure owner has granted a waiver for blasting and the waiver is approved by DHEC. The operator shall be required to monitor each blasting event by seismograph and maintain blasting records documenting each blast. Blasting records shall be made available upon request to DHEC. DHEC shall be immediately notified following any incident of flyrock outside the permitted area or if seismographs measure ground vibration due to blasting in exceedance of 1.0 inch per second. This notice shall be made within 24 hours of the blast, and within five business days the notice shall be followed with a written report and plan to adequately control flyrock. Prior to conducting additional blasting, the report and plan regarding the flyrock incident must be approved by DHEC.

SIGNIFICANT CULTURAL OR HISTORICAL SITES: A *Cultural Resource Survey of the RDA Mine Tract* (Survey), dated June 2017, was conducted by Brockington Cultural Resources Consulting. The survey identified one new archaeological site (38WG185) and two isolated finds (Isolates 1-2). The survey recommended site 38WG185 eligible for the National Register of Historic Places (NHRP) and Isolates 1 and 2 ineligible. As recommended by the Survey, site 38WG185 shall be protected by 50 feet of undisturbed buffer, and prior to mining in segments 1, 2, and 3, a perimeter fence shall be installed outside the 50-foot buffer. The State Historic Preservation Office (SHPO) concurred with the protective measure recommended by the Survey.

VISUAL SCREEN: To appropriately screen the operation from view, the operator shall maintain the buffers and visual screen features as shown on the permitted mine map. Property line buffers shall be utilized leaving existing vegetation. Additionally, a vegetated earthen berm shall be placed on the inside perimeter of the 50-foot perimeter buffer.

NOISE MONITORING AND CONTROL: The operator shall use Best Management Practices (BMPs) to minimize noise from the mine site. These noise BMPs shall include, at a minimum, proper maintenance of mufflers on equipment (trucks, trackhoes, pumps, etc.) and consideration of special buffering measures if planning to operate equipment during nighttime hours.

OTHER STATE OR FEDERAL PERMITS: The operator must obtain, maintain, and update, as appropriate, all necessary State and Federal permits to construct and operate the mine.

LAND ENTRY AGREEMENTS: The operator is required to furnish and maintain up-to-date *Land Entry Agreements* on all lands covered under this permit. If there is any change in ownership on any portion of land covered by this permit, the operator is responsible for furnishing the appropriate and completed *Land Entry Agreements* (Forms MR-600 or MR-700) to DHEC within 30 days of the change of ownership.

Land Owner(s) as Listed on *Land Entry Agreement*(*s*):

TMS # 45-360-002, American Materials Company, LLC
TMS # 45-335-095, American Materials Company, LLC
TMS # 45-360-001, American Materials Company, LLC

Total acres of the contiguous tract(s) of land for which the permit is granted:

OWNED 968.40 LEASED 0.0 TOTAL 968.40

Part III: PERMITTED LAND

This permit allows the operator to conduct mining operations within the permitted land as defined through the *Land Entry Agreement* submitted as part of the application. Permitted land as defined by Section 48-20-40(18) is "the affected land in addition to (a) lands identified for future mining to become affected land; (b) and undisturbed or buffer area that is or may become adjacent to the affected land." Therefore, this permit grants the operator the right to conduct active mining operations within the specified affected land, delineate land for future mine areas as future reserves, and establish undisturbed buffer zones to mitigate any adverse effects to the surrounding environment.

AFFECTED LAND: 582.6 acres of land are to be affected by the operator under the current mine plan. Of the total affected land, 582.6 acres are currently bonded. Of the bonded acres, mining is initially limited to the 53.2-acre Segment 6; any mining outside of Segment 6 shall require pre-approval from DHEC. The affected land is derived from the operator's response in the *Application for a Mine Operating Permit* and is shown on the approved mine map.

FUTURE RESERVES: 158.1 acres are identified as future reserves and are specified on the mine map. Prior to the initiation of activity in future reserves, the operator shall submit detailed mine and reclamation plans to DHEC for approval.

BUFFER AREAS: 227.7 acres are identified as buffer areas, setbacks, or areas that shall not be disturbed beyond the pre-mine natural state. These buffer areas are identified on the mine site map. Acres designated as buffer areas are not bonded under the reclamation bond. Any activity within the buffer areas (e.g. removal of timber) shall require **prior** notification and approval by DHEC.

TOTAL PERMITTED AREA: 968.4 acres

Part IV: MAPS

The permitted maps are listed herein. The maps are dated and further identified with DHEC assigned map number as listed and are part of the operating permit.

GM-2171-1V2, General Permit Area Map – prepared by KCS, LLC revised 01/02/20

SM-2171-1V3, Mine Map - prepared by KCS, LLC revised 01/02/20

RM-2171-1V2, Reclamation Map - prepared by KCS, LLC revised 01/02/20

SedM-2171-1V2, ESCP for RDA East - prepared by KCS, LLC revised 01/02/20

SedM-2171-2V3, ESCP for Jumpin Run Tract - prepared by KCS, LLC revised 01/02/20

SedM-2171-3V3, ESCP for RDA South - prepared by KCS, LLC revised 01/02/20

Part V: RECLAMATION BOND

The Reclamation Bond is based upon the total affected acres. Pursuant to Section 48-20-70 and R.89-200 and Appendix C, the reclamation bond for this mining permit is set at $2,085,987.00. The reclamation bond shall remain in force and continuous throughout the life of the mining operation and shall only be released, partially or in full, back to the operator after the operator has completed reclamation in accordance with the approved *Reclamation Plan* and the minimum standards in R.89-330.

Part VI: PROTECTION OF NATURAL RESOURCES

1. Description of the area of and around the mine site. Such as topography, surface water systems, wildlife habitats, residential houses, commercial properties, recreational areas, and/or public roads.
The mine permit area is in the Carolina Flatwoods eco-region of the Coastal Plain within the Black River drainage of the Pee Dee watershed. The permit area was first utilized agriculturally, and subsequently has been used silviculturally for decades. Because of these past uses, there is limited potential habitat for listed threatened and endangered species. The primary surface drainage within the permit area is Murray Swamp which flows west to east into Johnson Swamp and finally the Black River. Seaboard Road borders the permit area to the south and Highway 521 is about 3,800 feet to the north. Tad Road is about 1,600 feet to the west and Wheeler Road, at its closest proximity, is about 400 feet to the east. Jumpin Run Road bisects the permit area running north/south between Seaboard Road and Highway 521.

2. Methods used to prevent physical hazards to persons and to any neighboring dwelling house, school, church, hospital, commercial or industrial building, or public road.
A gate shall be installed at the entrance to the mine site and kept locked during inactive periods. *Warning* and/or *Danger* signs shall be posted around the perimeter of the property. Pursuant to R.89-150.I, the nearest point of blasting shall be a minimum distance of 1,000 feet from the nearest structure not owned by the operator. Blasting operations shall be conducted under the direction of a S.C. Licensed Blaster to alleviate fly-rock from leaving the permitted area. At any time and where necessary, DHEC may require fencing or other safety measures to be installed.

The operator shall use BMPs to prevent accumulation of sediment/soil on public roads carried by trucks and other vehicles exiting the mine site; if needed, any accumulations shall be removed daily or more frequently by the operator. To reduce the potential of tracking debris on the highway, the operator shall provide and maintain an asphalt surfaced roadway from Seaboard Road to the office and scale area and a minimum of 100 feet on the approach to this area, from the direction of the processing plant. Roads interior to the plant and product stockpile

area shall be maintained with crushed stone. The operator shall establish a protected area or establish procedures to minimize fuel spillage or incidental spillage of other petroleum products during storage, refueling of equipment, or in the performance of routine maintenance on equipment. Contaminated materials resulting from contact with petroleum products shall be removed from the site and disposed of properly to prevent contamination to ground and surface water resources.

3. Methods used to prevent an adverse effect on the purposes of a publicly owned park, forest, or recreation area.
Public parks, forests, or recreation areas are located at greater than one mile and buffered appropriately to avoid any adverse effects from mining operations.

4. Measures taken to insure against substantial deposits of sediment in stream beds or lakes.
The operator shall comply with the *NPDES General Permit for Non-metallic Mineral Mining* and *Stormwater Pollution Prevention Plan* developed for the mine. Active pumping and discharge of water from the active pit through the Sediment Retention and Water Storage Basin shall cease if the dewatering discharge causes flooding conditions, more than the FEMA delineated flood plain, to property downstream of the mine site. Murray Swamp and its tributaries shall be protected by a minimum 175 feet undisturbed buffer, except where reasonable access to the discharge outfall is needed. Additionally, the operator shall install appropriate BMPs to ensure that no sediment encroaches the swamp and associated wetlands; BMPs shall be installed at the mine side of the undisturbed buffer.

5. Measures taken to insure against landslides or unstable mine walls.
Final slopes shall be 3H:1V to minimize potential for landslides or unstable mine walls. During active mining, the operator is responsible for maintaining stable mine walls to prevent significant slumping. Appropriate setbacks and buffers along the property lines shall be observed to be protective of adjacent properties.

6. Measures taken to minimize or eliminate fugitive dust emissions from the permitted area.
The operator shall comply with DHEC Air Quality Construction Permit. Prior to mine development; the operator shall implement a Fugitive Dust Control Plan (FDCP) in accordance with its Air Quality Construction Permit. The mine operator will use appropriate measures (e.g. water truck, dust suppressants) to control fugitive dust created by moving equipment along haul roads. The operator, where feasible, shall establish vegetation in non-active mine areas barren of vegetation to stabilize the soil and reduce potential for wind erosion and dust emissions.

Part VII: STANDARD CONDITIONS OF MINE OPERATING PERMIT

1) SURVEY MONUMENTS: In accordance with R.89-130, the operator shall install and maintain the two required permanent survey monuments, or control points, within the permitted area, as shown on the mine site map. At the discretion of DHEC, the operator may be required to mark the area that will be affected with flagging or other appropriate measures.

2) RIGHT OF ENTRY: Pursuant to Section 48-20-130 and R.89-240, the operator shall grant DHEC, and/or duly appointed representatives, access to the permitted area for inspection to determine whether the operator has complied with the reclamation plan, the requirements of this chapter, rules and regulations promulgated hereunder, and any terms and conditions of this permit.

3) RECORDS RETENTION: All records are to be maintained in accordance with this permit and with applicable regulations. Records shall be kept on site, or at the office identified for receipt of official mail, and open for inspection during normal business hours. The records shall be maintained for a minimum of three (3) years or as specified by DHEC. The operator shall furnish copies of the records upon request to DHEC.

4) PERMIT MODIFICATIONS: Pursuant to Section 48-20-80, the operator may modify the permit and/or *Reclamation Plan* upon approval by DHEC. Requests for permit and/or *Reclamation Plan* modifications may be made to DHEC on Form MR-1300. During DHEC's evaluation of the modification request, the operator shall

submit any requested supporting data for consideration. If a request is determined to be substantial by DHEC, the modification request will be public noticed, pursuant to R.89-100, and a modification fee will be required as specified in R.89-340. If DHEC determines activities proposed under the *Reclamation Plan* and other terms and conditions of the permit are failing to achieve the purpose and requirements of the S.C. Mining Act and Regulations, pursuant to Section 48-20-150, DHEC shall notify the operator of its intentions to modify the permit and/or *Reclamation Plan*.

5) TRANSFER OF PERMIT: Pursuant to Section 48-20-70, this permit may be transferred to another responsible party. The transfer of the permit must be conducted in accordance with R.89-230. The transferor of the permit will remain liable for all reclamation obligations until all required documents, plans, and the replacement reclamation bond have been submitted and approved by DHEC. The transfer will be considered complete when all parties have received notification, by certified letters, of the approval of the transfer by DHEC.

6) DURATION OF MINE OPERATING PERMIT: In accordance with Section 48-20-60, this Mine Operating Permit will remain valid unless this permit terminates, as set forth in R.89-270, or is revoked in accordance with Section 48-20-160 and R.89-280. The proposed anticipated mining completion date is shown on the *Schedule for Conservation and Reclamation Practices* in the *Reclamation Plan.*

Pursuant to R.89-80(B), the operator shall conduct reclamation simultaneously with mining whenever feasible. Reclamation shall be initiated at the earliest practicable time, but no later than 180 days following termination of mining of any segment of the mine and shall be completed within two years after completion or termination of mining on any segment of the mine.

Part VIII: ENFORCEMENT ACTIONS

Pursuant to Section 48-20-30 of the S.C. Mining Act, "DHEC has ultimate authority, subject to the appeal provisions of this chapter, over all mining, as defined in this chapter, and the provisions of the chapter regulating and controlling such activity." This allows DHEC to assist, cooperate with, or supersede other State agencies in taking enforcement action on violations of the State Regulations, or violations of the S.C. Mining Act, to ensure the purposes of this Act are enforced.

COMPLIANCE: At all times, the operator shall comply with all conditions of this mine operating permit. Non-compliance with this mining permit, statute, or regulations could lead to permit revocation and bond forfeiture pursuant to Sections 48-20-160 and 48-20-170 or other enforcement action allowed by law.

Compliance with the Mine Operating Permit requires the operator to conduct the mining operation as described in the approved *Application for a Mine Operating Permit*. Variance from the *Application for a Mine Operating Permit,* this permit, statute or regulation, without first receiving DHEC approval, shall be deemed non-compliant with the permit.

An operator or official representative of the mine operator, who willfully violates the provisions of the S.C. Mining Act, rules and regulations, or willfully misrepresents any fact in any action taken pursuant to this chapter, or willfully gives false information in any application or report required by this chapter, shall be deemed guilty of a misdemeanor and, upon conviction, shall be fined not less than one hundred dollars nor more than one thousand dollars for each offense. Each day of continued violation after written notification shall be considered a separate offense.

The operator is responsible for all mining activity on the permitted mine site.

Part IX: REPORTS

1) ANNUAL RECLAMATION REPORTS: The operator shall comply with Section 48-20-120 and Regulation 89-210 and submit an *Annual Reclamation Report* on Form MR-1100, as supplied by DHEC. The form for the report

will be sent by regular mail to the operator to the mailing address shown on the previous year's *Annual Reclamation Report*. The operator should receive the report form from DHEC by July 1 of each year; however, the operator is ultimately responsible for obtaining the *Annual Reclamation Report* form and is not excused from penalty fees for failure to submit the report timely.

The Annual Operating Fee is a part of the *Annual Reclamation Report*. Failure to submit a complete *Annual Reclamation Report* and fee, in accordance with Section 48-20-120 and R.89-340, will result in a late penalty payment. The *Annual Reclamation Report* and Annual Operating Fee are required if there is any permitted land not fully reclaimed and released by DHEC by June 30 of *each* year.

2) SPECIAL REPORTS: At any time, DHEC may request information, data, or explanations from the operator regarding conditions relating to the permitted mine site. Such requests from DHEC shall be made in writing, to the operator with an appropriate time frame stated for the submittal of the requested information to DHEC. The operator must produce the information requested within the timeframe specified by DHEC.

Part X: ADDITIONAL TERMS AND CONDITIONS

General

1. If archaeological materials are encountered prior to or during the construction of mine facilities or during mining, the S.C. Department of Archives and History and DHEC should be notified immediately. Archaeological materials consist of any items, fifty years or older, which were made or used by humans. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, oyster shell, worked wood, bone and stone, metal and glass objects, human skeletal remains, and concentrations of charcoal and stones below the ground surface. These materials may be present on the ground surface and/or under the surface of the ground.

2. Temporary or permanent placement of refuse and debris (e.g., concrete, brick, asphalt) from off-site locations is prohibited without approval by DHEC. Topsoil fill approved by DHEC may be brought in from off-site sources only for the purposes of mine land reclamation.

Wetland Buffers and Murry Swamp Crossing

3. The operator shall maintain a minimum fifty (50) foot undisturbed buffer between any land disturbance activity and wetland areas. Additionally, for onsite wetlands associated with Murray Swamp, the undisturbed buffer shall extend a minimum 175-feet except where the Sediment Retention and Water Storage Basin is located. These buffers shall be permanently flagged prior to the initiation of any mine activity or preparation. The flags shall be maintained throughout the active mine operation of the site.

- The conveyor system crossing Murray Swamp shall be designed and constructed to withstand flooding conditions (e.g., increased surface water levels, increased flow velocity, impacts from floating debris). The conveyor supports shall be designed and constructed to withstand a 100-year flooding event on Murray Swamp.
- Conveyor undercarriage, (e.g., drive head, return belt, motors) shall be constructed at an elevation above the 100-year flood event on Murray Swamp as based on the 2012 FEMA Flood Insurance Study.

4. The operator shall monitor the wetlands using methods described in the *Technical Standard for Water-Table Monitoring of Potential Wetland Sites* by the USACE and in accordance with Appendix D – *Wetland Monitoring Plan*, and Appendix C. Monitoring wells shall be installed to a depth of 18-24 inches in wetlands #4, #6 and #14, which are designated on the mine map. (Wetland #4 shall be used as a control group.)

Water Well Inventory

5. An inventory of all water wells for domestic or agricultural purposes within the pre-blast survey $^1/_2$ mile radii area shall be conducted prior to the initiation of mining. Ponds observed will also be inventoried. Additional inventories at a greater distance from the pit may be required during mining if deemed necessary by DHEC. The information collected at each well shall be used to establish the existence, condition, and productive

use(s) of the well. The inventory shall include the following information where available and as able to be determined, and as access is allowed by the property owner:

A. Location of well.
B. Name and address of property owner, use of the well water, use of property.
C. Well completion details as documented from drillers logs or DHEC well form 1903.
D. Pump details such as type and depth as documented.

Perimeter Compliance Monitoring Wells

6. Prior to the start of pit dewatering, the mine operator shall conduct additional investigative work to locate the top of limestone along the mine permit boundary, utilizing either geophysical methods or auger drilling. This additional information shall be used to adjust the nine Perimeter Monitoring Well (PMW) locations as identified on the approved mine map. Locations along the mine permit boundary, where the top of limestone has the highest elevations, shall be selected for monitoring well compliance points. Final PMW locations shall be approved by DHEC and installed prior to pit dewatering.

The PMWs shall be installed by a certified well driller in accordance with R.61-71, SC Well Standards and Regulations. Each well location shall be surveyed to establish the well's latitude, longitude, and elevation relative to msl. Monitoring Well Records (DHEC Form 1903) shall be submitted to DHEC in accordance with R.61-71. The elevations set in each compliance well shall be based upon either the driller's log recorded on form 1903 or a SC Professional Geologist's stratigraphic log.

Groundwater drawdown from pit dewatering operations shall remain at elevations equal to or greater than two (2) feet above the top of the limestone elevations at PMW compliance points along the permit boundary. Groundwater levels shall be measured to the nearest inch (0.08 ft.) and shall begin after well development is complete and continue thereafter. Automatic data recorders (ADRs) shall be utilized to measure water levels at all PMWs at a frequency of once per day. The measurement frequency may be adjusted upon DHEC approval. The data from the ADRs or manual measurements shall be maintained onsite and in accordance with Appendix C. A summary report with time/water graphs for each well shall be submitted to DHEC on a quarterly basis.

If at any time the groundwater level at a PMW falls below the compliance point, pit dewatering shall immediately cease and DHEC shall be notified within 24 hours. Within five (5) days of the notification, the operator shall submit a plan to maintain groundwater levels at or above the compliance point(s). DHEC will review the plan and pit dewatering shall not resume until DHEC has given written approval. See Appendix C for additional requirements.

Sinkhole Monitoring and Contingency Plan

7. The mine operator shall implement the *Sinkhole Monitoring and Contingency Plan* (SMCP) as set forth in Appendices B and C, and any amendments or revisions thereof as a condition of this permit. Any amendments to the SMCP will be under the direction of a S.C. Professional Geologist and approved by DHEC. DHEC shall regularly review sinkhole and monitoring well data to guide future modifications. Prior to mining outside Segment 6, the operator shall submit a revised SMCP to DHEC for review and approval. All wells, which are identified on the mine map, shall be installed by a certified well driller in accordance with R.61-71, S.C. Well Standards and Regulations.

Pit Water Flow Monitoring

8. The operator shall install and maintain an automatic shut off valve in the pipe that transfers pit water over Murray Swamp. The valve shall be installed on the north side of Murray Swamp. The operator shall continuously monitor upstream of the automatic shut-off valve on the north side of Murray Swamp and log the pumping rate and duration of water removed from the pit. This log shall be maintained onsite. The pit dewatering flow rate shall be adjusted per the SMCP; however, DHEC may impose pit dewatering flow rate limitations, if necessary.

Domestic or Agricultural Water Supply Protocol

9. Mine dewatering shall not adversely impact a neighboring domestic or agricultural water supply well. Upon receipt of a water well supply complaint reported to American Materials Company, LLC, the complaint(s) shall be reported to DHEC within 24 hours of receipt. DHEC will determine if dewatering activities at the Andrews

Quarry are the cause of the reported problem. If DHEC determines that dewatering activities at the Andrews Quarry are adversely impacting the function of the water well, the operator shall be responsible for deepening or re-drilling the well, installing a new well, or connecting the resident or commercial business to a public water supply, if available. Until a determination is made on the cause of the water well malfunction, DHEC has the discretion to require the operator to provide a temporary potable water supply. If the malfunction is determined to be caused by the mine, the temporary water supply will be continued until a permanent drinking water supply becomes available. If DHEC determines that the operator has caused an adverse effect to a pond, that effect shall be mitigated for by the operator.

Wildlife Monitoring Requirements

10. Spotted Turtle (*Clemmys guttatta*) – Prior to any land disturbance, a qualified consultant approved by SCDNR shall conduct a visual survey of Murray Swamp floodplain and associated wetland habitats within the initial mine permit site. The consultant shall look for spotted turtles within and near the conveyor corridor across Murray Swamp. If spotted turtles are in the project area, the mine operator shall consult with SCDNR to develop a project specific management plan, including but not limited to, collection and radio tracking, capture and relocation, or no further action. Mine operator shall train mine staff to identify the spotted turtle. Staff will be directed to protect any identified turtle and take pictures, if possible, without disrupting the turtle's activity. Upon confirmation of the turtle's identification by the mine operator's contract biologist(s), the siting shall be reported to SCDNR for consultation.

11. Gopher Frog (*Lithobates [Rana]capito*) and Eastern Tiger Salamander (*Ambystoma tigrinum*) – Prior to mine disturbances of US Army Corps of Engineers jurisdictional wetlands and non-jurisdictional wetlands, additional on-site surveys shall be conducted by a qualified consultant approved by SCDNR, to search for the gopher frog and tiger salamander. These surveys shall be conducted on an annual basis between January and May and include nocturnal vocalization studies. The jurisdictional (JW) and non-jurisdictional (NJW) wetlands subject to the surveys are identified as follows:

- JW, #5 and #27 in mine segment 3
- NJW, #1, #2, #3, and #13 in mine segment 4
- NJW, #15 and #38 in mine segment 7
- NJW, #11 in mine segment 2
- NJW, #12 and #18 in mine segment 1
- NJW, #39 through #45 in mine segment 10

If either of these species are in the project area, the mine operator shall consult with SCDNR to develop a project specific management plan, including but not limited to, collection and radio tracking, capture and relocation, or no further action. If none of these animals are identified during the two-year survey, then the operator can request to SCDNR that no additional work is needed and forward the response to DHEC for consideration.

Additional Terms and Conditions

12. Appendices C and D contain additional terms and conditions requested to be added by the Operator after issuance of the permit. Per Regulation 89-120.D., these conditions are binding and fully enforceable.

APPENDIX A

MODIFICATIONS TO MINE PERMIT I-002171

NUMBER	DATE	DESCRIPTION OF MODIFICATION (PA= Permitted Acreage; AA= Affected, Bonded Acreage; FR= Reserves Acreage, B= Buffer Acreage)
Issued	3/25/2019	Permit issued; PA = 968.4ac., AA = 582.6ac., FR = 158.1ac., B = 227.7ac. Permit revised on December 11, 2019 to include Appendices C and D at the Operator's request and adjust text to reflect additional terms and conditions.
Mod 20-1	02/10/20	Transferred from RDA, LLC to American Materials Company, LLC. Bond increased for full affected acreage amount, but mining is still limited to Segment 6 until further approval.

APPENDIX B

Sinkhole Monitoring and Contingency Plan

Revision of
Sinkhole Monitoring and Contingency Plan
RDA, LLC Facility
Williamsburg County, South Carolina

GMA Project #158007

Prepared for

RDA, LLC
PO Box 527
Newton Grove, North Carolina 28366

Prepared by

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March 18, 2019

Table of Contents

1.0 Introduction

This document is a revision of the Sinkhole Monitoring and Contingency Plan for the RDA, LLC (RDA) site. The original Sinkhole Monitoring and Contingency Plan was prepared by Groundwater Management Associates, Inc. (GMA) on November 20, 2017. The November 2017 document presented plans for mining to begin on a 45-acre tract known as Segment 5. The first revision of the Sinkhole Monitoring and Contingency Plan (SMCP) was issued on May 16, 2018, and it reflected a change in the mine plan wherein RDA will initially begin mining at Segment 6. The current document is a revision to the plan that reflects feedback comments from the South Carolina Department of Health and Environmental Control (SCDHEC) regarding the May 16, 2018 SMCP.

RDA is applying for a Mine Operating Permit to operate a limestone quarry in Williamsburg County, South Carolina (Figure 1). The mine site entails ten Segments that are proposed to be mined, with a total mine area of approximately 419 acres. Individual Segments range in size from 19.9 to 57.0 acres (Appendix I). The current plan is to begin mining at Segment 6, which is located in the interior of the overall mine property. Segment 6 comprises 53.2 acres, and mining is expected to progress at a rate of 7 acres per year.

The mine will produce crushed limestone aggregate, and the limestone ore will be recovered using open-pit mining. As a condition of mine permitting, RDA must demonstrate that sinkholes will not develop on land outside RDA Quarry's mine permit area as a result of mine dewatering operations. Groundwater Management Associates, Inc. (GMA) was contracted to develop a Sinkhole Monitoring and Contingency Plan that focuses on the initial mining of Segment 6. GMA is a hydrogeological and engineering consulting firm that has experience in mine dewatering, management of groundwater withdrawal effects, and mitigation planning for impacts associated with groundwater withdrawals. We have developed this monitoring and contingency plan to evaluate the hydrologic response of the groundwater system to dewatering withdrawals that are anticipated to support open-pit mining at Segment 6. This plan was prepared in consideration of GMA's prior exploration and aquifer testing in Segment 5 and predictive calculations that were presented in a Hydrogeologic Evaluation report (GMA, 2017). We also reviewed core drilling information and mine plans that were provided by RDA.

The South Carolina Department of Natural Resources (SCDNR) issued a letter dated 10/20/17 (Appendix IV) that expressed concern over the potential for sinkhole development associated with dewatering to support open pit mining at the RDA site (SCDNR, 2017). SCDNR cited a sinkhole event that occurred in Georgetown in 2011, approximately 20 miles east of the RDA site, as an example of the type of sinkhole episode that they are concerned about for the proposed aggregate mine at the RDA site.

The aim of this Sinkhole Monitoring and Contingency Plan is to present specific monitoring tasks that will evaluate the effects of mine dewatering at Segment 6 on a limited area of property within the mine site. Using detailed observations and testing of the areas proximal to Segment 6, RDA can refine mining practices and establish engineering controls to minimize the potential for sinkhole development and to protect surrounding properties from possible adverse impacts.

2.0 Background and Hydrogeologic Setting

GMA's Hydrogeologic Evaluation Report (GMA, April 2017) presented a detailed summary of the geologic setting, ages, lithologies, and formation names that occur beneath the site. The RDA site lies in the Coastal Plain physiographic province of South Carolina.

There are two primary lithologic units occurring beneath the RDA site that will be directly affected by the proposed mining activities. The surficial sediments are silty sands of the Socastee Formation of Middle Pleistocene age. The upper portions of the surficial sediments undoubtedly also include late Pleistocene age to Holocene age sediments that are not mappable on a regional scale. This sequence of shallow unconsolidated sediments comprises the overburden materials. Overburden thickness at the RDA site averages approximately 30 feet.

The Pleistocene Socastee Formation lies unconformably above a hard fossiliferous limestone that grades with depth to a sandy limestone (SGR, 2017). The limestone sequence has been attributed to the Paleocene age Chicora Member of the Williamsburg Formation, and this indurated unit is the ore that is to be mined for aggregate. Of particular interest for the Sinkhole Monitoring and Contingency Plan is the nature and location of indurated carbonate rocks that may chemically weather to produce subsurface voids or caverns.

2.1 Potential Karst Formation

Chemical weathering of carbonate rocks can preferentially dissolve calcium carbonate due to interaction of meteoric water with the rock. Meteoric water has a naturally low pH (typically 5 to 6) due to dissolved CO_2 and the formation of carbonic acid. Interaction of carbonic acid with limestone, made predominantly of Calcite ($CaCO_3$), will gradually dissolve the limestone. This dissolution results in a water-filled void in the rock that previously was filled with solid limestone. Tannins and other organic acids in shallow soil and surface water bodies may further reduce the pH of the water as it moves downward into the limestone, thereby accelerating dissolution rates.

The most common weathering that results from percolation of meteoric water into Tertiary-aged limestones in South Carolina is the dissolution of fossil shells that are made predominantly of the mineral aragonite. Aragonite has the same chemical composition as calcite, but aragonite has a different crystal structure. The aragonite shells are more soluble than the micritic to sparry calcite that fills the spaces between the shell fossils. This preferential weathering results in a moldic texture of the limestone, leaving void spaces where the original shells have been weathered away. Photographs of cores collected from exploratory drilling by SGR (2016) indicate that the upper portion of the limestone contains abundant mollusk shell molds. Moldic limestone porosity tends to develop where aragonitic shell materials are abundant.

If the lithologic composition of the limestone is uniform, weathering of the uppermost portion of the limestone may result in gradual land subsidence over a broad area. This weathering pattern typically

does not result in episodic sinkhole collapse. The contact between the overburden sediments and the limestone is marked by high-porosity low-cohesion sediments where residual siliceous mineral grains (sands and clays) derived from weathering of the underlying limestone will accumulate.

In contrast, if the limestone lithology is heterogeneous, there may be lateral variations across an ore body where some materials may weather more rapidly than other materials. These lateral variations may include differences in mineral composition (facies changes) or structural differences (such as fractures). Local dissolution of limestone to greater depths may occur where heterogeneities are present that foster accelerated weathering. When this occurs, larger voids or caverns may develop. These local cavities will gradually grow over time until they reach a size that cannot support the weight of the overburden materials. Collapse of these cavities results in sinkhole formation. Sinkholes may stabilize as water-filled depressions, or they may expand and coalesce with other similar depressions, ultimately forming headwaters of new drainage systems. Because water is nearly incompressible, a water-filled cavity is partially supported by pore pressure. Depressurization of the cavity may make the cavity unstable and subject to collapse. This may especially be the case when the cavity is partially dewatered. The depth of collapse is limited by the thickness of the limestone. The limestone ore at the RDA site is approximately 20 to 30 feet thick. This relatively thin rock layer, coupled with a shallow burial depth, will not lend itself to forming large, deep sinkhole structures.

The topography of a land surface that is characterized by sinkhole depressions, broad abnormal drainage headwaters, and disappearing streams is called Karst. The topographic features of a Karst terrain provide evidence of the heterogeneities of the subsurface carbonate rocks. Careful examination of topography can be extremely helpful for identifying areas that may be prone to future sinkhole development.

In GMA's Hydrogeologic Evaluation Report, we prepared two LIDAR topographic images of the RDA site and the surrounding area. One of these figures included our interpretations of potential karst areas (see attached Figure 3). This figure was produced based solely upon review of LIDAR data, and no field observations were made at that time to support or modify GMA's preliminary evaluation of potential karst features.

2.2 Site Reconnaissance Evaluation

On October 26, 2017, two GMA geologists, William L. Lyke and James K. Holley, visited the RDA site. The intent of the site visit was to perform a reconnaissance investigation of potential karst features identified in our previous study. Figure 4 presents specific sites of interest that were visited to perform field evaluations of possible karst features. Appendix II includes annotated photographs of features observed during our reconnaissance visit.

Depression areas observed north and east of Segment 5 (see Figure 4) included wide, shallow, wet areas with gently sloping sides. These areas did not exhibit the characteristics of active, or recently active,

local sinkhole formation. Although the depressions north and east of Segment 5 may represent paleokarst, we did not observe evidence in these locations of active sinkhole growth.

We did observe a grouping of sinkhole ponds east and south of Segment 5. These depressions were mapped previously, and they appear to follow a generally north to south linear structure that may indicate a subsurface limestone condition (possibly fracture or lithologic difference) that is prone to sinkhole formation. We photographed five of these ponds, and they are labeled Sinkhole Pond 1 through Sinkhole Pond 5 on Figure 4. These ponds were relatively steep-sided enclosed depressions that appeared to have been active sinkholes in the recent past. However, none of these features appeared to be unstable or actively growing. Most had relatively mature Tupelo and other swamp trees growing within the ponds. These trees indicate that the ponds likely have been stable for decades.

The site reconnaissance confirmed that karst features occur within 1000 feet of Segment 5. The majority of these features occur west and southwest of Segment 5, and most are within the RDA property boundaries. The observed Sinkhole Ponds provide easily accessible features to monitor during the initiation of mining.

Because RDA has updated the mining plan to begin mining at Segment 6, many of the identified karst features that were proximal to Segment 5 are now more than 1000 feet away from the proposed initial mine block at Segment 6. Furthermore, there is a desire to evaluate areas up to 2000 feet from the mine face for the potential for sinkhole development. Therefore, the monitoring plan must be modified to address the new initial mine area and the projected hydraulic effects of the initial mining operation.

3.0 Monitoring Plan

GMA has developed a multi-faceted monitoring plan to evaluate the potential formation of active sinkhole features associated with the proposed mine dewatering at the RDA site. The mining plan involves initial open-pit mining on a 53.2-acre tract in the interior of the site (Segment 6). Mining of Segment 6 will proceed at a rate of approximately 7 acres per year, meaning that completion of Segment 6 will take approximately 7.5 years to complete. The monitoring plan presented below focuses only on monitoring areas proximal to Segment 6 during the initial ~7.5 years of mining. Results of active monitoring during the mining of Segment 6 will guide monitoring procedures as mining progresses into other mine segments. The monitoring plan will be regularly updated as new observations are made of site conditions. Any update shall be reviewed and approved by DHEC before implementation. Depending upon the results of the monitoring program, mining procedures may be modified to help reduce the potential for sinkhole development.

3.1 Baseline Evaluation

It is essential to perform a detailed baseline evaluation of conditions in the vicinity of the RDA site prior to initiating mining. The baseline evaluation for areas near Segment 6 involves: 1) topographic

evaluation through interpretation of LIDAR data, 2) reconnaissance and documentation of the site features, 3) aerial surveillance of Segment 6 and the surrounding area within 1,000 feet of the proposed mine face, and 4) correlation of data and ground truthing. The 1,000-feet monitoring area surrounding Segment 6 is based upon site observations and considering hydraulic estimates of drawdown outside the mine. GMA's prior hydrogeologic evaluation predicted that approximately 20 feet of drawdown would occur within 1,000 feet of the mine. GMA recently completed groundwater modeling of dewatering at Segment 6 (GMA, 2019). The modeling results indicated that drawdown within 1000 feet of the mine would actually be less than 20 feet.

Item 1 of the baseline evaluation has been partially completed though prior and recent interpretations of LIDAR data. Figure 4 includes an updated karst feature interpretation on a LIDAR map for the area covering all of Segment 6 and the adjacent property within 1000 feet of the proposed mine face for Segment 6.

Item 2 (reconnaissance) was mostly completed on October 26, 2017. Since the reconnaissance investigation, GMA has identified 3 areas adjacent to Segment 6 where potential karst features may exist (Figure 6), but these features were not visited on October 26th. Prior to initiating mining in Segment 6, additional reconnaissance and documentation will be performed of the 3 areas identified on Figure 6.

For completing baseline **item 3**, an aerial drone survey will be performed over Segment 6 and the 1,000 feet area surrounding Segment 6. The aerial survey will include a gridded flyover and video documentation as well as local targeted aerial inspection of specific potential karst features identified.

Item 4 - LIDAR topographic data and field reconnaissance will be matched with the aerial imagery to develop a correlation between the three data sets. Ground-truthing will be conducted to test the validity of the correlations between the data sets. All of the located suspected karst features will be visited to verify if features are karst in nature. If verified as karst features, coordinates will be established, sites will be photographed, and dimensions will be measured and recorded. The baseline survey shall be submitted to DHEC prior to the start of dewatering activities.

3.2 Establish Monitoring Stations

Representative monitoring stations shall be established where physical monitoring of potential karst features will be performed on a regular schedule (see Fig. 7). These stations will be readily accessible to mine personnel to visually inspect, monitor, and measure on a periodic basis (per Fig. 7).

GMA has selected two existing representative sinkhole ponds (Labeled Sinkhole Pond 1 and Sinkhole Pond 5) that will be regularly monitored during the mining of Segment 6. Each of the sinkhole ponds will be equipped with a staff gauge for visual observation of pond water levels. In addition, each of the ponds will be surveyed by a registered land surveyor to establish the length, width, and depth of the ponds. Permanent reference survey stakes or pins will be established marking the edges of the ponds

and establishing the elevation (relative to mean sea level) of the survey stakes. These reference stakes will be tied to the pond level staff gauges so that the water elevations can be monitored over time. The stations will be resurveyed on a periodic basis (per Fig. 7) to evaluate changes in the sizes of the ponds and to determine if land subsidence occurs after mining commences.

GMA has proposed two sinkhole pond monitoring stations based upon available information. Three other features of interest have been identified that need to be further evaluated. Other stations could be added in the future, if warranted by field observations surrounding the mine.

3.3 Monitoring Tasks and Proposed Schedule

Regular monitoring of site conditions will be conducted per Fig. 7 to provide a mechanism for evaluating the potential for sinkhole development in response to mine dewatering. The monitoring program entails four elements of evaluations. Each of these elements is described in the following sections.

3.3.1 Groundwater Level Monitoring

Nine perimeter compliance wells have been selected around the perimeter of the RDA site, and these are designated as Perimeter Monitoring Well Stations (PMW well series). Figure 5 illustrates the locations of these Perimeter compliance wells. These stations are PMW-1, PMW-2, PMW-3, PMW-4, PMW-5, PMW-6, PMW-7, PMW-8, and PMW-9. These well locations are also shown on the RDA Mine Map. The Perimeter compliance wells will be constructed prior to mining, and the wells will be screened within the limestone ore. Each compliance well casing will be surveyed for elevation relative to mean sea level. This will allow for water-level measurements at the wells to be converted to groundwater elevation. A baseline equipotential map will be made for the limestone aquifer using pre-mining groundwater elevations collected from the compliance wells.

Most of the perimeter compliance wells are quite distant from the initial block to be mined at Segment 6. A minimum of three, possibly four, additional Sinkhole Monitoring Well Stations (SMWS well series) will be constructed less than 1000 feet from the mine area at Segment 6 (see Figure 5). These stations are SMWS-100, SMWS-101, SMWS-102 & SMWS-103 and are located on the RDA Mine Map. Each Sinkhole Monitoring Well Station will include one well screened in the limestone and a second well screened in the overburden layer. The casing elevations of these additional monitoring wells will also be surveyed so that water-level data collected from the wells can be incorporated into equipotential maps.

3.3.2 Pond Water Level Monitoring

Water-level monitoring will also be conducted at Sinkhole Ponds 1 and 5 using the surveyed staff gauges. Periodic water-level measurements will be made by RDA staff by simply taking a visual reading of the staff gauge per Fig. 7. An alternate means of water-level recording could be implemented via use of a pressure transducer/data logger.

3.3.3 Reconnaissance of Key Areas of Interest

Areas of interest identified during GMA's site reconnaissance on October 26, 2017 will be periodically revisited after mining commences per Fig. 7. A physical walkover and photographic inspection will be conducted to look for evidence of water-level changes and land surface subsidence. Figure 6 identifies the planned periodic reconnaissance area to be observed. Additional reconnaissance of the area between 1000 feet and 2000 feet from the mine face may be performed if aerial evaluation indicates changes that warrant closer inspection.

3.3.4 Aerial Evaluation

Periodic aerial drone survey investigation of the area within 1,000 feet of Segment 6 (Figure 6) will be conducted per Fig. 7. The aerial drone survey will include a repeat survey of the baseline aerial survey. The aerial survey approach should be adjusted, as necessary, to provide more intensive video surveillance of site features that appear to differ significantly from the baseline aerial investigation. Ground-truthing will occur of areas within the survey where significant differences are observed as compared to the baseline evaluation.

3.3.5 Monitoring Schedule

The planned monitoring schedule (Fig. 7) includes more frequent monitoring of features that will be less labor intensive. Monitoring tasks will include monthly, quarterly, and annual events. Figure 7 provides the planned monitoring schedule for evaluation of the Segment 6 mining over the proposed ~7.5 years of mining. The monitoring schedule may be adjusted, as appropriate, based upon observations in the first couple of years of mine operation. Results of monitoring tasks will be reported to SCDHEC.

4.0 Contingency Plan

If mine dewatering for Segment 6 results in development of new sinkholes or growth of existing sinkhole features, RDA will need to have an appropriate plan in place to respond to the occurrences. Potential sinkholes that could occur can be categorized as one of three scenarios: 1) Sinkholes within the active Segment 6 mine area, 2) Sinkholes outside Segment 6 but on the permitted property, and 3) Sinkholes outside of the permitted area. Each of these scenarios may warrant a different response depending on the nature of the sinkholes that may develop.

4.1 Sinkholes within the Active Segment 6 Mine Area

When overburden is stripped within an active limestone mine area, it is common for small local sinkholes to be encountered. Most of these features are not an obstacle to mine progression, and they do not require any response. If larger sinkhole features are encountered within the Segment 6 active mine block, the mine Superintendent will determine the significance of the features and devise appropriate response plans to maintain a safe working environment in the mine while continuing to mine through the sinkhole area. If significant cavities (>10 feet diameter or >5 feet vertical thickness) are encountered in the opening of the Segment 6 mine pit, these features will be measured and documented to gain additional understanding of the nature of cavernous voids that may occur at the site. The vertical and horizontal dimensions should be measured, and the features will be photographed. In addition, the location (latitude and longitude) of each significant feature will be documented using a GPS. The mine Superintendent will develop a cataloguing system to record the location and attributes of each significant void so that future statistical analyses can be made on the prevalence of cavernous voids that occur in the limestone. These records shall be made available to DHEC upon request.

4.2 Sinkholes Outside Segment 6 but Within the Permit Boundary

If sinkholes develop, or grow, in areas outside Segment 6 but on the permitted property, the mine Superintendent will catalogue the location and size of the sinkholes and determine if the existence or growth of the feature(s) poses an imminent risk to mining roads and other on-site infrastructure. This catalogue shall be made available to DHEC upon request. If mine infrastructure is at risk, then steps will need to be taken to either relocate the road or equipment or to attempt to stabilize the sinkhole. If the formation or reactivation of sinkholes is observed within the 50 foot undisturbed perimeter buffer of the mine permit area, the operator shall report the sinkhole to DHEC within 24 hours, noting the size, depth and location. The operator shall submit a written report to DHEC within 5 business days, recommending actions to prevent any potential off-site impacts. DHEC may require additional measures to prevent any potential off-site impacts, if needed. Evidence for reactivation of a sinkhole depression would include: 1) Any obvious change in the depression where there is an increase in area covered by the depression, 2) an increase in depth or the appearance of a scarp on the edge of a depression, and 3) If the depression was originally water filled, any significant lowering of water level greater than seasonal fluctuation in groundwater levels. Seasonal groundwater level fluctuations will be determined from observations of the perimeter monitoring well network.

Based upon the nature and occurrence of any new or growing sinkholes outside Segment 6, but on permitted property, modified mining methods may be undertaken to reduce the development or growth of sinkholes on the property. The modified mining methods would be undertaken if it is determined by the operator or DHEC that there is a risk of sinkholes occurring outside the permit boundary. Modified mining methods could include, but are not limited to: 1) reduced dewatering accompanied by more frequent water-level monitoring responses outside Segment 6, and/or 2) construction of re-infiltration trenches outside the active mine block to rehydrate the limestone and

minimize drawdown effects outside the active mine. A reduction in dewatering will require partial wet-mining techniques to be implemented.

The SMWS wells will provide important water-level data in areas on the RDA property where sinkhole potential is considered higher, and these data will be used to gauge the groundwater responses to reduced dewatering and re-infiltration. The water-level observations will be used, along with aerial reconnaissance and LIDAR data, to evaluate the relationship between dewatering levels in the active mine pit and the potential effects on sinkhole developments. If a clear relationship can be developed, then this relationship will guide future mining scenarios, including establishing a threshold pumping water level in the active mine.

4.3 Sinkholes on Land Outside the Permit Boundary

In the unlikely event that sinkholes develop, or sinkhole development becomes likely, on property outside the permit boundary, it will be vital to ensure that public safety is protected. The operator shall report a sinkhole occurrence on property outside the permit boundary to DHEC within 24 hours and file a written report to DHEC within 5 business days. If the sinkhole is located on land adjacent to the permitted land, the operator shall immediately implement the contingency plan below. If the sinkhole is located beyond adjacent parcels, DHEC shall make a determination if modifications to the mining methods are required. Rapid modifications to mining methods will be needed to mitigate the occurrence, or threat of occurrence, of sinkholes outside the mine permit area. The requirement to modify mining methods will not apply to lands outside the permit boundary where land owner(s) have granted the mine operator a waiver to damages, approved by DHEC, for the occurrence or threatened occurrence of sinkholes on their property. Contingencies for operational modifications will progressively include the following, as needed:

1) Reduction by 25% in the amount of dewatering used for mining,
2) Construction of re-infiltration trenches to minimize drawdown outside the mine, and
3) Converting to wet-mining.

DHEC may require additional measures to prevent any potential off-site impacts, if needed.

The first modification to mine operations in response to off-site sinkhole threat will entail an immediate 25% reduction in mine withdrawal volumes. This reduction in pumping is expected to result in a 25% rebound of water level in the active mine pit. A rebound in water level will require partial wet-mining methods to allow continued extraction of the ore to the desired mine depth. The reduction in groundwater withdrawals will also trigger an increased frequency of water-level monitoring (weekly) in the SMWS and PMW wells to determine the water-level recovery that results from the reduced mine withdrawal. Water-level monitoring frequency may be reduced over time at DHEC's discretion as water-levels re-equilibrate with the reduced withdrawal rate.

If the 25% reduction in withdrawal does not mitigate sinkhole threat or growth on properties outside the permit boundary, then construction of a re-infiltration trench may be implemented between the active mine area and the direction of off-site sinkhole threat. The re-infiltration trench will be excavated

to the top of the limestone ore, and water withdrawn from the mine will be directed into the trench to provide a local groundwater mound between the active mine and the area of off-site sinkhole threat. The re-infiltration trench water level should initially be kept a minimum of 10 feet above the limestone. The re-infiltration trench water level may be increased, as needed, to a maximum level of 5 feet below original land surface. Diligent (weekly) water-level monitoring in the trench and in SMWS and PMW wells will continue as water-levels in the trench are raised, until DHEC approves a reduction in monitoring.

If re-infiltration does not provide the desired reduction in sinkhole threat, then the mine will switch to a complete wet-mining operation that does not require continuous groundwater withdrawals. Wet mining involves extracting ore without the need for pit dewatering.

The mine Superintendent will maintain detailed records of new occurrences, or threats, of sinkhole development on properties outside the permitted area, and on the results of modified mining methods. These records shall be made available to DHEC upon request. The records of mine modifications implemented for Segment 6 will guide future mining strategies for expanded mining into other segments of the site.

5.0 Conclusions

The RDA facility will involve mining of limestone for aggregate production. The most efficient means of mining is to dry mine using dewatering of the active pit. In dry mining, the water level in the pit is lowered close to the bottom of the ore being extracted. Tertiary Period limestones in South Carolina tend to have high secondary porosity due to partial dissolution of minerals in the rock. Local chemical weathering may result in naturally occurring open voids or cavities in the rock. When these open voids are filled with groundwater, the water helps to support the cavity and make it less prone to collapse and sinkhole development. When dewatering of the limestone is necessary to support dry mining, the area surrounding the open pit will be depressurized. If existing voids in the rock become unstable due to depressurization, the roof of the void may collapse, allowing the overlying unconsolidated sediments to collapse into the void, thereby forming a sinkhole. This is a common attribute of limestone aggregate mines in the Atlantic Coastal Plain of North America.

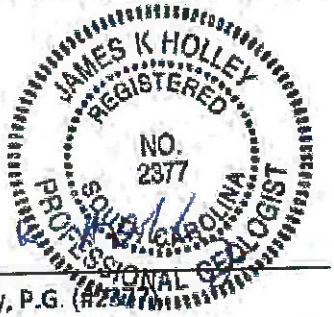
The Sinkhole Monitoring and Contingency Plan presented herein is based upon extensive experience with numerous similar facilities in the region. The monitoring plan focuses on diligent baseline evaluations followed by regular follow-up monitoring to detect changes that may occur in proximity to the active mine. The RDA mine plan will focus initial mining on an interior segment of the property that is more than 1000 feet away from any occupied structures. Diligent regular monitoring of groundwater levels will be made to ascertain if the groundwater system surrounding the initial mine pit responds in a manner that is consistent with predictive calculations developed in the Hydrogeologic Evaluation of the site. Existing sinkhole features will be carefully measured and regularly monitored to determine if and how these features respond to mine groundwater withdrawals. The monitoring plan also includes

broader investigative methods, include periodic reconnaissance as well as aerial surveillance and ground truthing, to investigate potential sinkhole development in areas surrounding the mine pit that do not already exhibit characteristic karst topography. Observations from the initial ~7.5 years of mining at Segment 6 will lead to a better understanding of the tendency, or lack thereof, for sinkholes to develop in response to mining at the site. The experience gained from mining at Segment 6 will be used to develop refined monitoring plans for expansion of mining into other segments of the site. The monitoring plan will be updated, as needed, based upon site observations and approval from DHEC.

A response plan has also been developed that presents appropriate steps to be taken for three scenarios of potential sinkhole formation. The most important part of the response plan is to act immediately to protect public safety and private property outside the mine. The response plan elements presented herein have been used successfully by other mining entities in the region to address issues with off-site sinkhole threats. The primary goal of the monitoring plan for the RDA site is to understand how and if sinkholes will develop in response to mining at the site. Equipped with this understanding, RDA can implement mining methods and establish optimum buffers to prevent off-site sinkhole development.

6.0 Report Certification

This Revised Sinkhole Monitoring and Contingency Plan was prepared by Groundwater Management Associates, Inc., a professional consulting company that employs geologists and engineers that are licensed in South Carolina. The document is a revision to the May 16, 2018 SMCP, and the text incorporates responses to comments from SCDHEC on the May 16, 2018 SHCP. This report was prepared by James K. Holley and William L. Lyke.



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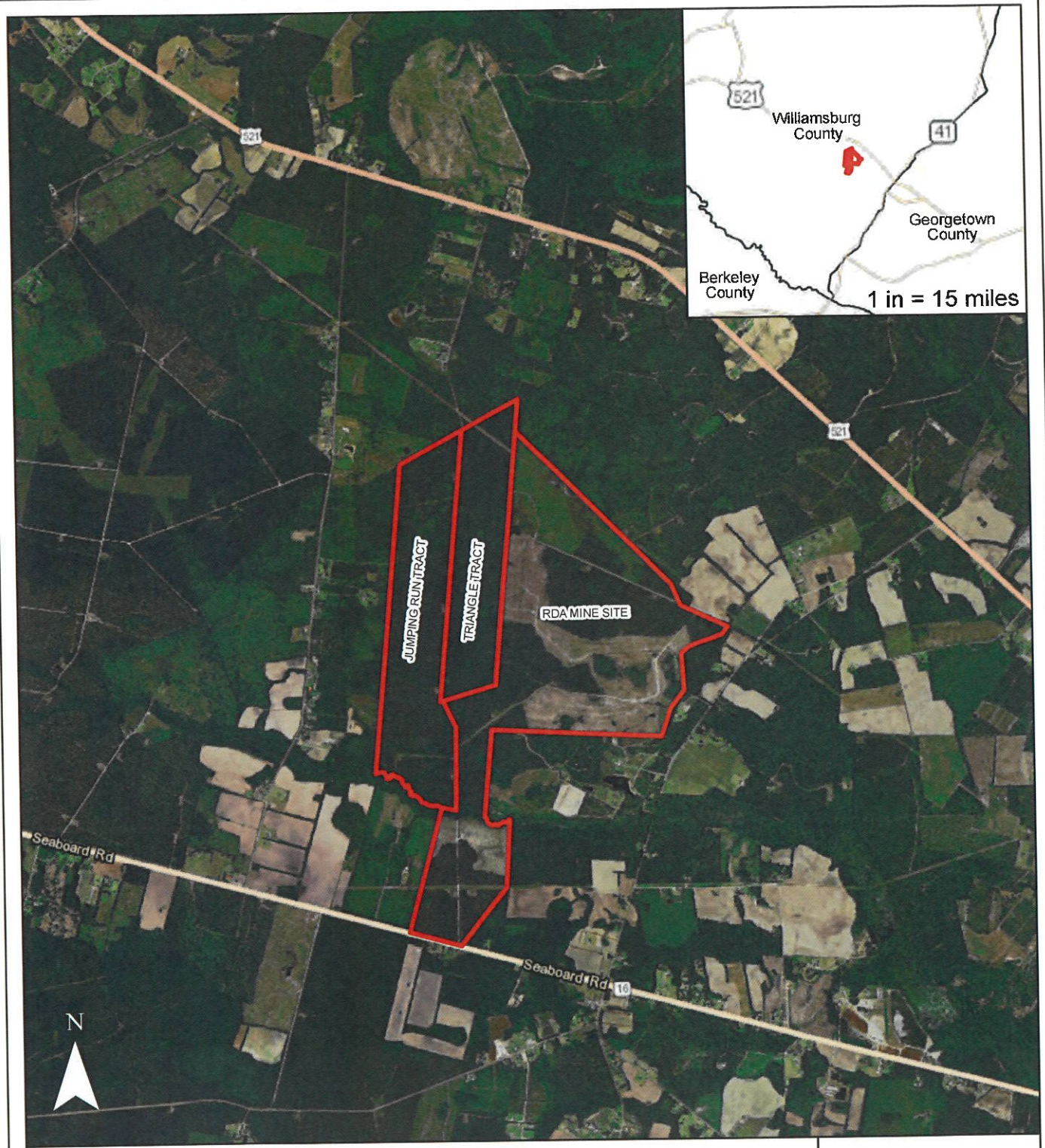


LEGEND

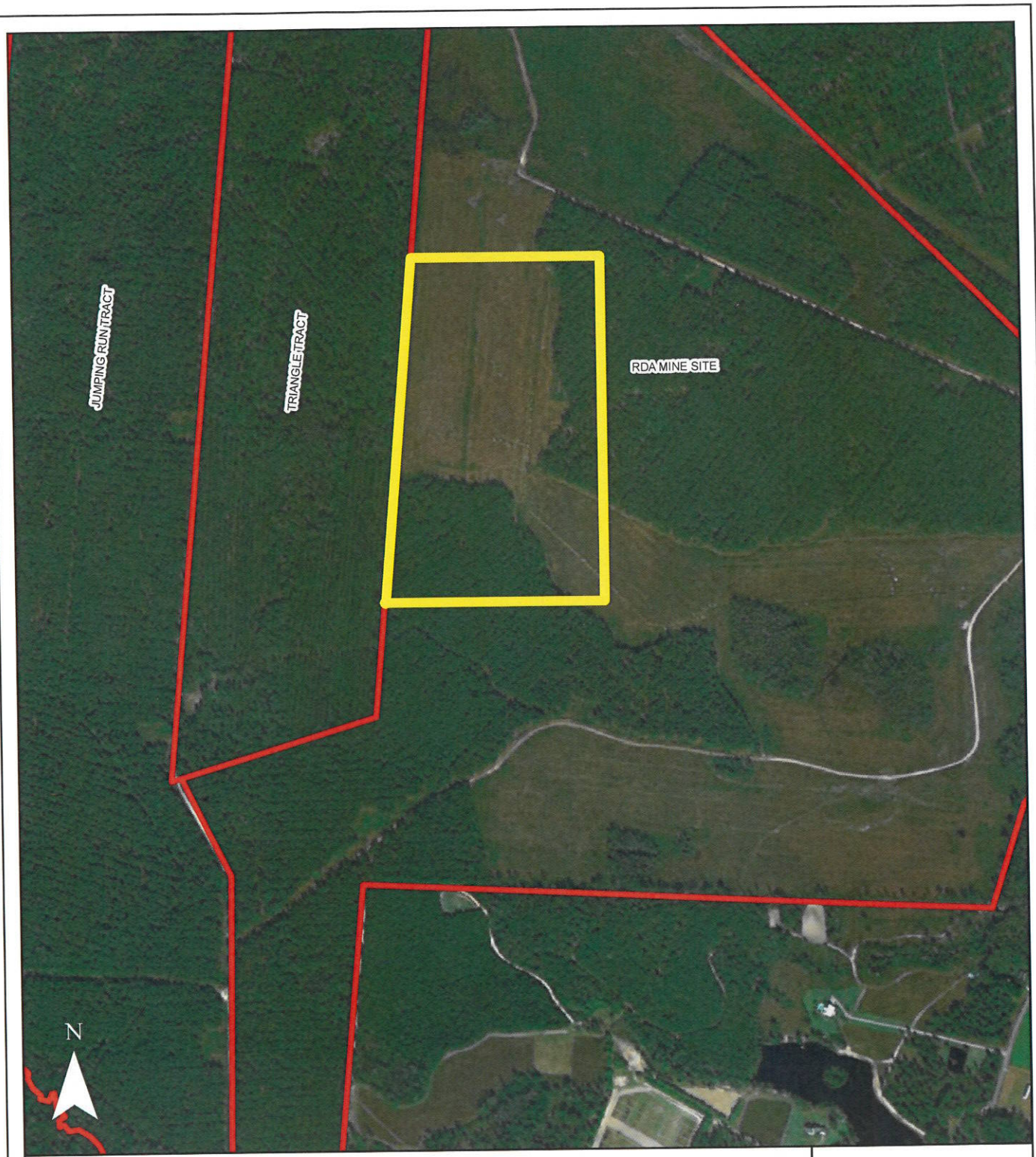
RDA PROPERTY BOUNDARY

0 3000'

SCALE IN FEET

GMA

DRAWINGS/158007/ FIG1_KAS_Site_Location_20171108.mxd	SITE LOCATION MAP	DATE: 11/15/2017
PROJECT NO.: 158007	RDA, LLC - ANDREWS, WILLIAMSBURG CO., SC	FIGURE 1



LEGEND

SEGMENT 6

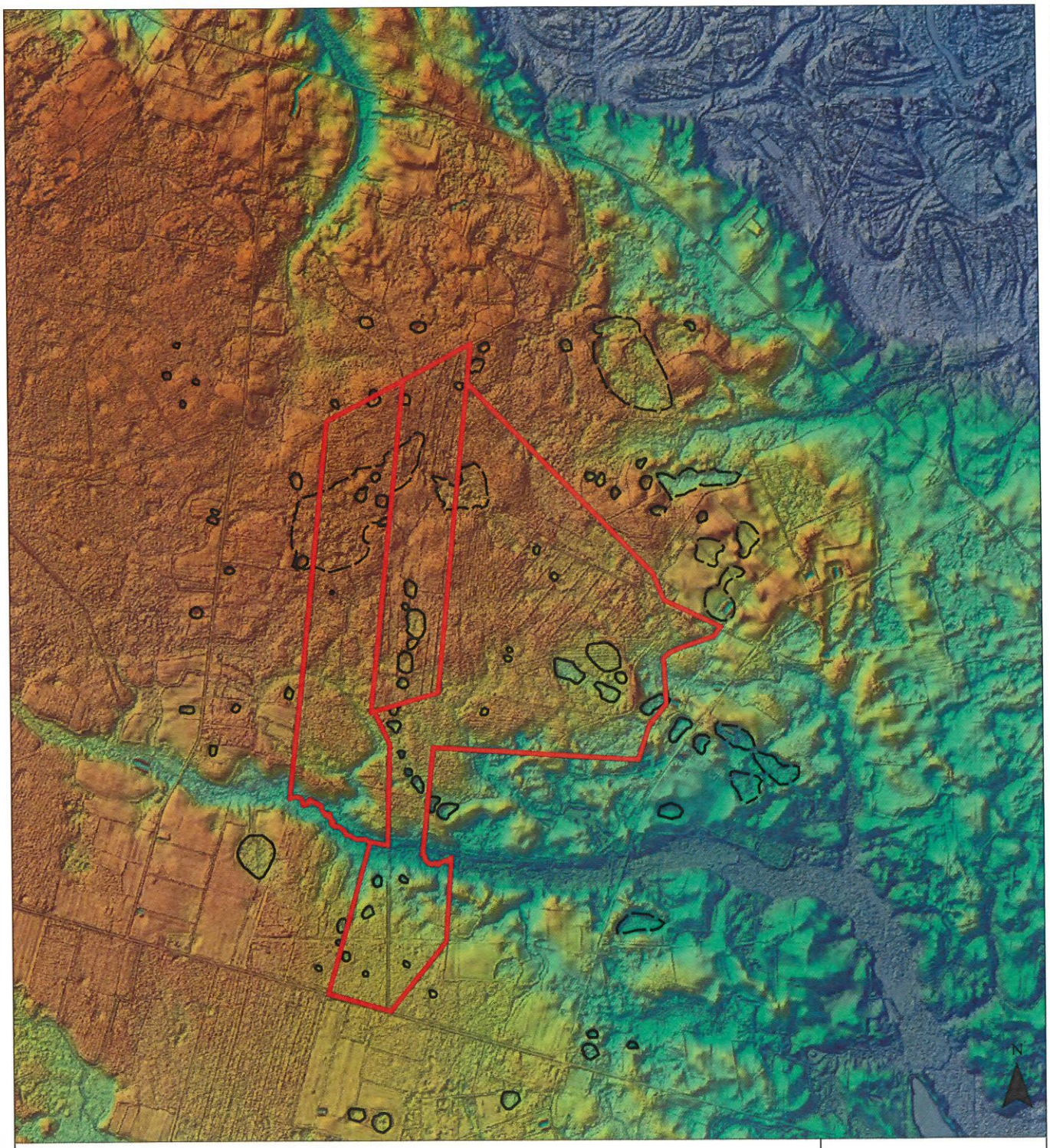
RDA PROPERTY BOUNDARY

0 800'

SCALE IN FEET

GMA

DRAWINGS/158007/ FIG2REV_KAS_Aerial_Segment_6_20180515.mxd	AERIAL PHOTOGRAPHY OF THE RDA PROPERTY AND PROPOSED SEGMENT 6 INITIAL MINE SITE	DATE: 05/15/2018
PROJECT NO.: 158007	RDA, LLC - ANDREWS, WILLIAMSBURG CO., SC	FIGURE 2



LEGEND

High : 50 FT ABS

Low : 10 FT ABS

INTERPRETED KARST FEATURE

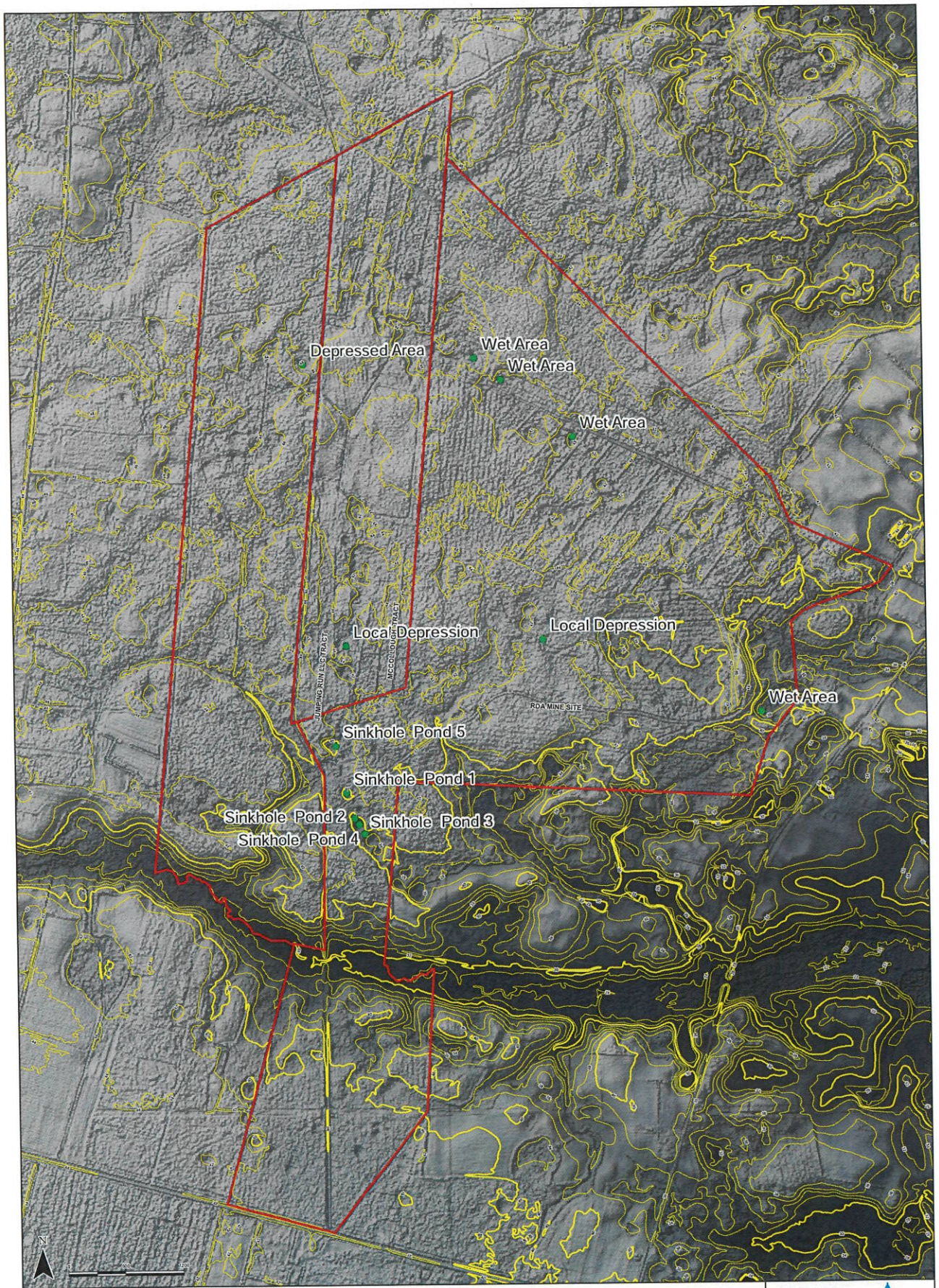
LOW AREA (PALEO KARST?)

MINE PROPERTY BOUNDARY

0 1,500 3,000 Feet

GMA

DRAWINGS/158007/ FIG3_KAS_Karst_Features_20171108.mxd	POTENTIAL KARST FEATURES IDENTIFIED FROM LiDAR DATA	DATE: 11/8/2017
PROJECT NO. 158007	RED MOUNTAIN TIMBER TRACT, WILLIAMSBURG CO., SC	FIGURE 3



LEGEND

- MINE PROPERTY BOUNDARY
- TOPOGRAPHIC CONTOUR

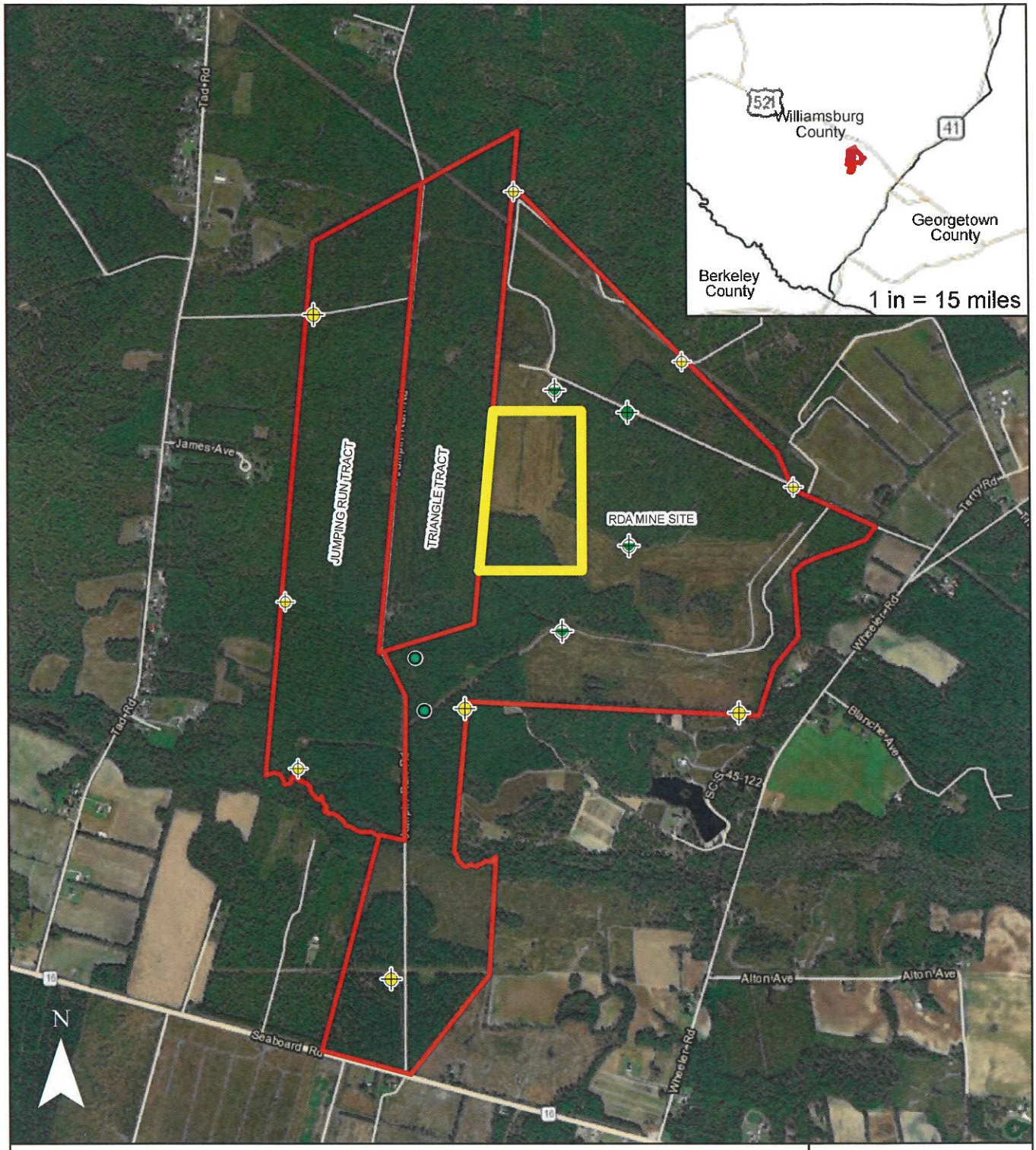
ELEVATION (FT)

- HIGH : 67 FT ABS
- LOW : 6 FT ABS

● RECONNAISSANCE LOCATION

GMA
GROUNDWATER MANAGEMENT ASSOCIATES, INC.

FILE: DRAWINGS/158007/ KAS_Recon_Location_map_20171109.mxd	LIDAR MAP OF AREA NEAR SEGMENT 5 WITH LOCAL KARST FEATURES VISITED ON 10/26/2017	DATE: 11/15/2017
PROJECT NO. 158007	RDA, LLC - ANDREWS, WILLIAMSBURG CO., SC	FIGURE 4



LEGEND

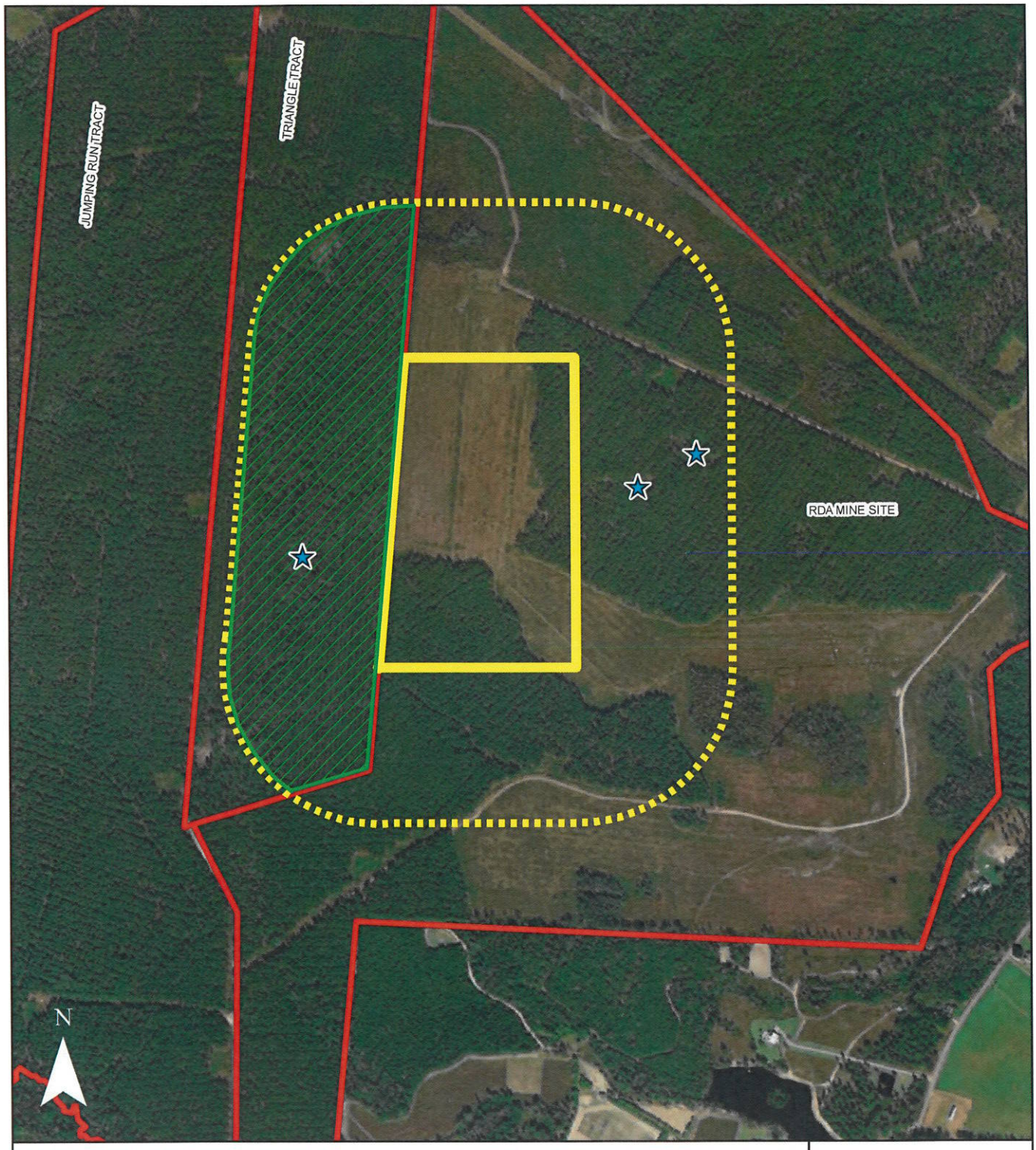
- SINKHOLE MW STATIONS FOR SINKHOLE EVALUATION
- STAFF GAUGE AT SINKHOLE PONDS 1 & 5
- PERIMETER MW STATIONS
- SEGMENT 6
- RDA PROPERTY BOUNDARY

0 1750'

SCALE IN FEET

GMA

DRAWINGS/158007/ FIG5REV2_KAS_MWs_Guage_20190318.mxd	MAP SHOWING PROPOSED MONITORING WELLS AND SINKHOLE POND MONITORING STATIONS	DATE: 03/18/2019
PROJECT NO.: 158007	RDA, LLC - ANDREWS, WILLIAMSBURG CO., SC	FIGURE 5



LEGEND

- ★ SUPPLEMENTAL BASELINE RECONNAISSANCE FEATURES
- SEGMENT 6
- RDA PROPERTY BOUNDARY
- SEGMENT 6 1000 ft BUFFER & BASELINE EVALUATION AREA
- PROPOSED QUARTERLY RECONNAISSANCE AREA

0 900'

SCALE IN FEET

GMA

DRAWINGS/158007/ FIG2REV3_KAS_Prop_Recon_20190318.mxd	PROPOSED AREAS FOR RECONNAISSANCE AND AERIAL EVALUATIONS NEAR SEGMENT 6	DATE: 03/18/2019
PROJECT NO.: 158007	RDA, LLC - ANDREWS, WILLIAMSBURG CO., SC	FIGURE 6

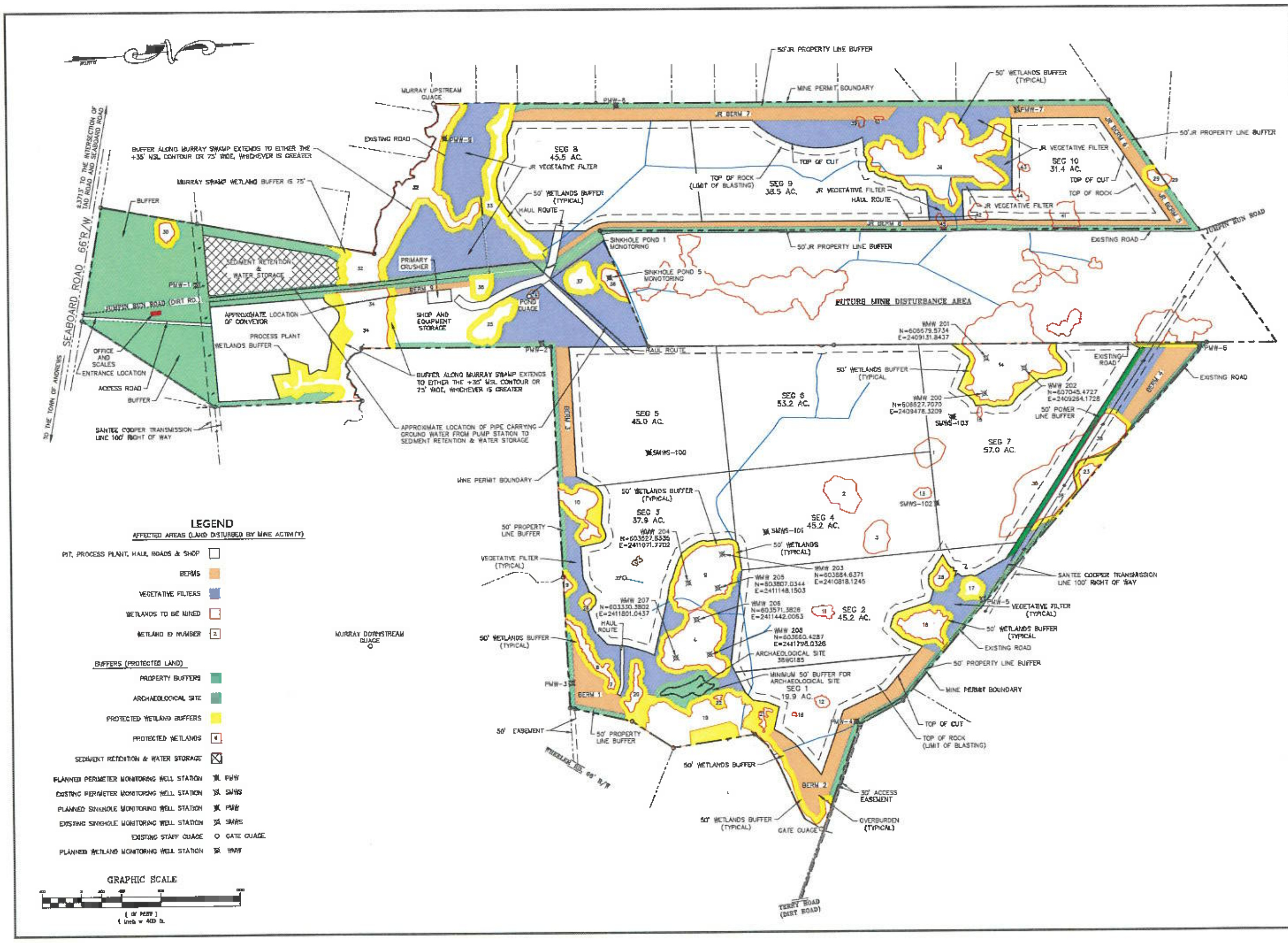
Figure 7. Schedule for Monitoring

Monitoring Task	Prior to Mining	Continuous	Monthly	Quarterly	Annually	Comments
Reconnaissance and Baseline Evaluation	■					Locate & characterize karst features in baseline evaluation area. Submit to DHEC prior to start of mining.
Groundwater Level Monitoring		■				Monitor continuously. Summarize & submit data quarterly to DHEC.
Pond Level Monitoring			■			Monitor monthly and report quarterly during active mining of Segment 6.
Reconnaissance of Key Areas				■		Monitor quarterly for the duration of active mining in Segment 6 and report annually.
Aerial Evaluation					■	Perform drone flyover on an annual basis. Submit analysis to DHEC in annual report. Initial survey results submitted to DHEC prior to dewatering.
Survey Selected Features					■	Select representative existing features (ponds). Survey baseline dimensions (length, width, & elevation) using permanent markers and report in annual report.
Segment 6 Sinkhole and Void Space Inventory		■				After overburden is removed and limestone exposed on each cut, but prior to drilling & blasting. Summarize data in annual report.

Continuous water level monitoring will employ automatic data recorders.

Appendix I

RDA Mine Map Prepared by Kennedy Consulting Services, LLC



REVISIONS			
	Description	Date	By
1	ADD BUFFER TO WETLAND 28, MINING WILL AVOID	7/30/17	BC
2	LOCATE, AVOID AND BUFFER JUMPIN RUN ROAD	9/08/17	BC
3	ADD PRIMARY CRUSHER AND CONVEYOR ACROSS MURRAY SWAMP	9/08/17	BC
4	INCREASE BUFFER ALONG MURRAY SWAMP, ADD MONITORING WELLS	12/05/17	BC
5	RELOCATE SWMS FOR SEGMENT 6 START UP	5/25/18	BC
6	ADD MONITORING WELLS DRILLED OCTOBER 2018	11/16/18	BC

Kennedy Consulting Services, LLC
Craig Kennedy, P.G.
KCS
Office: 403 Seaside court Lexington, SC 29072 • Mail: PO Box 364 Irmo, SC 29063
Tel 803.391.1833 • Cell 803.960.2562 • craigkennedy.KCS@gmail.com

RDA, LLC
RDA Mine
Prepared for
RDA, LLC
Anderson Township, Williamsburg County, South Carolina

Project No.: KCS 16-88
Date: 01-24-17
Approved by: RCK
Drawn by: B.C.
Scale: 1"=400'

Sheet No. 1 of 2

Appendix II

Site Photographs from GMA Site Visit Dated 10/26/17

Sinkhole Pond 1 located in a drainage system southwest of the initial quarry pit area. The pond is located immediately north of the access road.

Sinkhole Pond 1 located in a drainage system southwest of the initial quarry pit area. The pond is located immediately north of the access road.

Sinkhole Pond 2 located in a drainage system southwest of the initial quarry pit area. The pond is located immediately south of the access road.

Sinkhole Pond 2 located in a drainage system southwest of the initial quarry pit area. The pond is located immediately south of the access road.

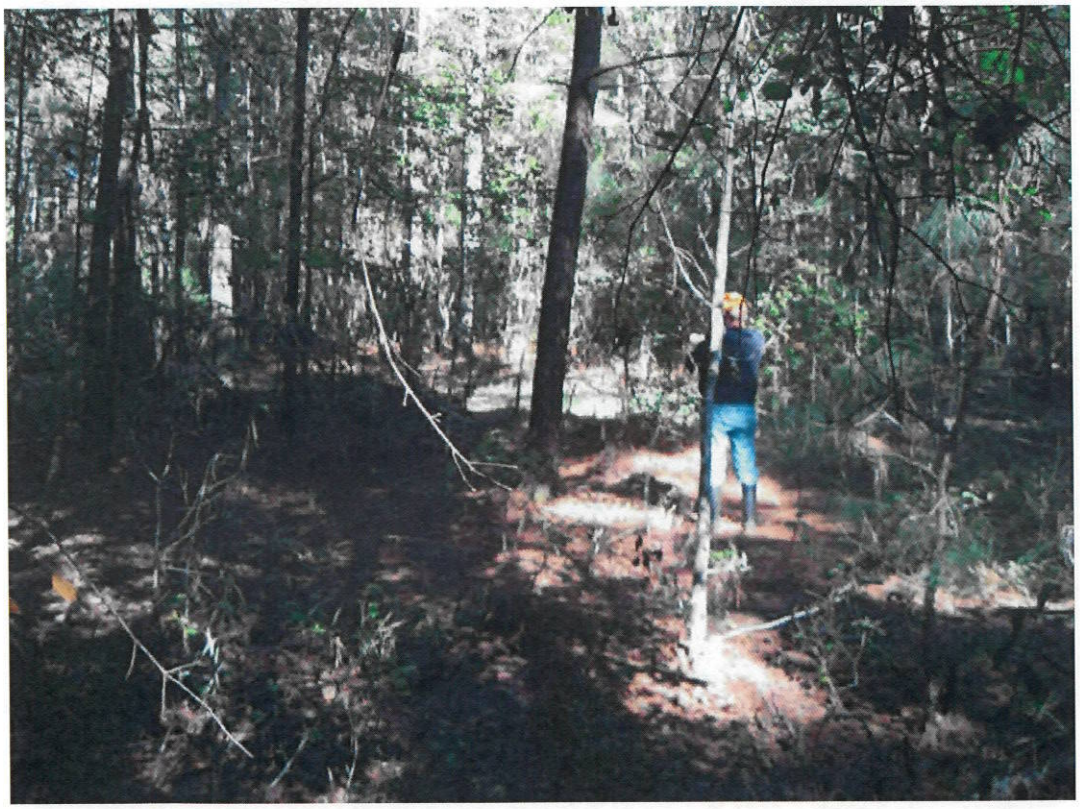
Sinkhole Pond 3 located in a drainage system southwest of the initial quarry pit area. The pond is located southwest of Sinkhole Pond 2.

Sinkhole Pond 3 located in a drainage system southwest of the initial quarry pit area. The pond in located southwest of Sinkhole Pond 2.

Sinkhole Pond 3 located in a drainage system southwest of the initial quarry pit area. The pond is located southwest of Sinkhole Pond 2.

Sinkhole Pond 4 located in a drainage system southwest of the initial quarry pit area. The pond is located southwest of Sinkhole Pond 3.

Sinkhole Pond 5 located in a drainage system southwest of the initial quarry pit area. The pond in located northwest of Sinkhole Pond 1.



Local depression located west of the initial quarry pit area.

Wet area east of the initial quarry pit area.

Wet area north of the initial quarry pit area.

Appendix III

SCDNR Letter Dated 10/20/17

South Carolina Department of
Natural Resources

1000 Assembly Street Suite 336
PO Box 167
Columbia, SC 29202

Alvin A. Taylor
Director
Lorianne Riggin
Director, Office of
Environmental Programs

October 20, 2017

Mr. Joe Koon
SCDHEC
BLWM/DMSWM
2600 Bull Street
Columbia, SC 29201-1708

REFERENCE: Mining Application # I-002171, RDA LLC
RDA Mine, Williamsburg County

Dear Mr. Koon:

Personnel with the South Carolina Department of Natural Resources (SCDNR) have reviewed the proposed project, including a site visit with the applicant's agents on October 9, 2017, and evaluated its impact on natural resources. As such, SCDNR offers the following preliminary items of concern.

Project Description
The proposed mine is located approximately 5 miles northwest of Andrews near the intersection of US 521 and Jumping Run Road in Williamsburg County. The applicant proposes to mine limestone from a 622.7 acre affected area. The proposed site also includes 158.1 acres of future impacts/reserves and 187.6 acres of undisturbed buffers for a total permitted area of 968.4 acres. The average depth of mining will be approximately 55 feet from the ground surface with a maximum depth of 65 feet and a maximum pit floor elevation of 21 feet below mean sea level. The proposed mine will involve the pumping of groundwater and require a NPDES permit for point source discharge. The application states that jurisdictional wetlands will be affected, but mine plans are to first avoid wetlands. The information provided indicates that there are 92.8 acres of jurisdictional wetlands and 25.47 acres of isolated wetlands on the tract. The applicant has submitted a request for a jurisdictional determination to the U.S. Army Corps of Engineers. The wetlands outside the proposed disturbance areas are planned for protection with a 50-foot (typical) upland buffer. A proposed reclamation plan has been submitted, indicating the site will be restored to lakes and grasslands after mining.

Agency Concerns
Isolated wetlands, as those found on the site, provide important habitat for herpetofauna for breeding and foraging, as well as provide source water for other wildlife. Wetlands function to provide nutrient cycling, filtering water and improving its quality, as well as serves a sink to promote groundwater recharge. Excavating around the wetland areas on the mining site will likely lead to degradation of these important functions as a result of the lowering of groundwater elevations.

Due to the nature of limestone interacting with groundwater, SCDNR has concerns regarding the projected groundwater withdrawals, inducing sinkholes. If a sinkhole should open, it could harm the wetland avoidance and buffer areas, as well as surrounding properties. Our review of the Hydrogeologic Evaluation document (Appendix D) reveals that the pump tests indicate a leaky aquifer condition and Figure 6 shows potential existing karst features within, and near, to the proposed mine area. If the overlying Pleistocene sediments are in hydraulic connection with the limestone, as proposed

in the preliminary hydrologic testing, and the groundwater levels are lowered for mining, there is risk of sinkhole reactivation or formation. This could occur by the removal of water from known and unidentified dissolution cavities within the limestone.

The total removal of water or lowering of its head pressure within the limestone could weaken it and foster collapse. Thence, the overlying unconsolidated sediments could then flow into the cavities and cause surface collapse. This is the model used to describe the induced sinkholes that occurred in Georgetown, SC in 2011. In Georgetown, a dewatering project lowered the head pressure in the same geological unit this mine proposes to excavate. Prior to pumping, the hydrostatic head was above the elevation of the limestone. Therefore, the water was pushing up on the overlying materials; head pressure in the limestone was partially supporting the overlying unconsolidated sediments. When the head pressure was lowered, the limestone collapsed under the weight of the overlying material and the sediments flowed downward into the cavities. If the material on the proposed mine site is under similar hydrostatic head conditions (a positive head elevation higher than the upper elevation of the limestone), then a similar condition with its associated risks could occur.

Additionally, SCDNR has concerns regarding the potential for significant water quality impacts to Murray Swamp associated with the use of the existing road crossing and the proposed location of the process plant, shop and equipment storage areas. Murray Swamp is a tributary to the Black River, a State Scenic River, located approximately 6 miles downstream from the site. Volatile organic compounds, dust and other pollutants from these areas could adversely impact downstream water quality and aquatic life if these areas are not adequately buffered and managed. Water quality data from the SCDNR State Stream Assessment indicates the pH of the water in Murray Swamp is already close to the upper (more alkaline) tolerance thresholds for water tupelo and bald-cypress. Substantial limestone dust or mine runoff inputs to Murray Swamp would likely result in increased mortality of these dominant tree species and should, therefore, be minimized. The construction of a new road crossing, if required, will result in direct fill of wetlands in Murray Swamp as well as significant habitat loss due to the segmentation of the swamp and impacts to hydrologic flow and connectivity.

SCDNR recommends that the above concerns be researched and addressed prior to the issuance of any federal or state permits and certifications. SCDNR reserves the right to provide additional comments and will provide a final permit recommendation as more information becomes available regarding project impacts, details of operation or response to agency concerns.

Should you have any questions or need more information, please do not hesitate to contact me by email at mixong@dnr.sc.gov or by phone at 803.734.3282.

Sincerely,

Greg Mixon

Greg Mixon
Inland Environmental Coordinator

APPENDIX C

Additional Terms and Conditions Requested by Operator

Kennedy

Consulting KCS Services, LLC

P.O. Box 364
Irmo, SC 29063
Tel. 803.399.1133

403 Seaside Ct
Lexington, SC 29072
Cell 803.960.2562

craigkennedy.KCS@gmail.com

September 18, 2019

Via Electronic and U.S. Mail

Mr. Joe Koon
SC Dept. of Health & Environmental Control
Bureau of Land & Waste Management
Mining and Reclamation Section
2600 Bull Street
Columbia, SC 29201
Koonjm@dhec.sc.gov

Re: RDA, LLC Mine Operating Permit # I-002171
Williamsburg County, SC

Dear Joe:

RDA, LLC was issued Mine Operating Permit No. I-002171 ("Mine Permit") from the South Carolina Department of Health and Environmental Control (DHEC) on March 25, 2019. [**Attachment A in Settlement Agreement**] In early April 2019, Requests for Final Review (RFRs) were filed with the DHEC Board by South Carolina Environmental Law Project ("SCELP") representing the South Carolina Coastal Conservation League (SCCCL), South Carolina Wildlife Federation (SCWF) and Winyah Rivers Alliance (WRA) and by Williamsburg County relating to the Mine Permit and associated air and water permits. On July 16, 2019, the DHEC Board denied the RFR requests. RDA and the parties that filed RFRs have reached settlements on the issues raised in the RFRs. RDA and Williamsburg County entered into a Settlement Agreement on July 16, 2019. RDA and SCCCL, SCWM and WRA entered into a Settlement Agreement on August 9, 2019. The Settlement Agreements with Williamsburg County and SCCCL, SCWM and WRA require RDA to request DHEC make the following modifications to its Mine Permit:

1. RDA will maintain groundwater levels at or above 5 feet mean seal level (msl) in the active pit and 2 feet or greater above the top of limestone at the property boundary;

2. Groundwater monitoring well data, including Perimeter Monitoring Well (PMW) groundwater monitoring data, shall be posted on a publicly accessible website maintained by RDA at the time it is submitted to DHEC and shall be maintained on the website for three years after it is posted;

3. If data from Mine Permit monitoring wells show groundwater levels are not being maintained at the levels set forth in paragraph 1 above, RDA will cease withdrawal of groundwater and implement a response action plan that must be approved by DHEC. Upon written request of ten (10) or more citizens of Williamsburg County, RDA shall hold a public meeting to inform citizens that groundwater levels are not being maintained and present their plan to remediate prior to or simultaneously with DHEC approval;

4. If a sinkhole forms at or near RDA site, RDA shall notify DHEC as required by the Sinkhole Monitoring Contingency Plan (SMCP). If the sinkhole is located on land adjacent to the permitted land, RDA shall immediately implement the contingency plan outlined in Section 4.3 of the SMCP;

5. If a localized die-off of fish populations ("fish-kill") occurs in wetlands or streams downstream and within one (1) stream mile of the boundary of the quarry under-going active mining within permitted land, RDA shall within twenty-four (24) hours of receiving notice of fish-kill, notify DHEC, investigate the mine discharge with DHEC oversight to determine if mining activities are a cause of the fish kill, and commence review of onsite discharge records. If within five (5) days thereafter, DHEC determines in writing the fish-kill is the result of mine drainage or stormwater discharges from the mine, RDA shall implement a response plan to remediate the fish -kill that must be approved by DHEC;

6. Add the October 18, 2018, Wetland Monitoring Plan (WMP)[**Attachment B in Settlement Agreement**] submitted by RDA to DHEC as an attachment to the Mine Permit;

7. Modify the WMP's section on Monitoring Wetland Hydrology and Recharge attached to the Mine Permit as follows:

    a. Prior to initiating mining activities, RDA shall use the methods and standards set forth by the U.S. Army Corps of Engineers, including the technical guidance entitled "Technical Standard for Water-Table Monitoring of Potential Wetland Sites" ("Technical Standard Guidance") to map, define and begin to establish baseline wetland hydrology information for a representative sample of offsite jurisdictional wetlands wholly contained within 1,500 feet of the RDA Site property boundaries, inclusive of neighboring properties owned by RDA or the mine operator. To the extent access to any applicable offsite property is denied after reasonable efforts to obtain (with the assistance of Williamsburg County, SCCCL, SCWF, and/or WRA), RDA shall have no obligation to include applicable property in determining the baseline.

    b. Unless otherwise approved by DHEC, wetland hydrology "recharge" shall occur during the Spring and late Fall of the year, unless wetlands have perennial inundations and saturation;

    c. Unless otherwise approved by DHEC, the "recharge" trench shall be shallow, no more than 3 feet deep, and pumped full and maintained, as necessary, during the critical hydrology maintenance period from February 1st to May 1st and from November 1st to December 15th of each year ("Critical Periods");

    d. Consistent with the Technical Standard Guidance, onsite jurisdictional wetlands shall be monitored every 2 weeks during the Critical Periods outlined above and reported on the RDA website for a period of three years. Wetlands located completely between 1,000 and 1,500 feet from the active mine segment shall be monitored and reported monthly during the same Critical Periods. If any of the onsite jurisdictional wetlands show wetland hydrology is not considered to be present under the Technical Standard Guidance (the water table is not within 12" or less of the surface for 14 or more consecutive days during these Critical Periods), RDA will hire an independent contractor to perform an investigation to determine if the cause of the wetland water table level is the result of mining operations. RDA will provide a copy of the results of the investigation to DHEC. If the investigation or DHEC determines the wetland water table level is the result of RDA's mining operations, RDA will develop a plan to restore the affected wetland(s) using either recharge trench or some alternate means. RDA will provide a copy of the plan to DHEC;

    e. RDA will maintain all wetland monitoring data on its publicly accessible website for at least three years after it is posted; and

    f. Once mining activities have permanently ceased at the mine permitted area and permitted land in the Mine Permit, the mine operator shall monitor onsite wetland wells installed prior to mining and

dewatering to establish wetland hydrologic conditions for onsite wetlands subject to avoidance in Corps Pre-Construction Notification No. SAC-2017-00109 (December 6, 2017) and approved February 22, 2018, as Nationwide Permit No. 44, are as close as practical to conditions either found and documented prior to mining and dewatering activities, or that may then exist on onsite wetlands unaffected by mining or dewatering. To the extent those wetland hydrological conditions do not establish within three years after cessation of mining, RDA shall undertake reasonable restoration activities in accordance with the pre-mining wetland determination [**Attachment C in Settlement Agreement**].

8. Data generated pursuant to the requirements of the Sinkhole Monitoring and Contingency Plan (SMCP) and water quality monitoring data required by its NPDES permit shall be maintained by RDA on a publicly accessible website for at least three years after it is posted;
9. RDA's Reclamation Plan be modified as follows:
    a. Reclamation Bond increased to $2,085,987;
    b. Reclamation Bond requirement to be reviewed by DHEC as mining operations progress from the initial work in Segment 6 to other segments of the mine RDA Site, and adjustments to the bond requirement, if any, may be made as reasonably necessary based on a demonstration of actual cots and actual land disturbed by mining; and
    c. Onsite wetlands to be restored as described in paragraph 7.f. above.
10. RDA will maintain an undisturbed buffer of 175 feet around onsite wetlands associated with Murray Swamp except where the Sediment Retention and Water Storage Basin is located.

This letter revises the initial submittal dated August 13, 2019 to incorporate minor editorial changes for clarification. RDA is available to meet to go over these changes as soon as possible. Thank you in advance for your time and attention to this matter.

Sincerely,

Craig Kennedy

cc: Clark Wooten
Ethan R. Ware
Jessie King
Etta Williams Linen (*via electronic mail only*)

APPENDIX D

Wetland Monitoring Plan

Kennedy
Consulting KCS Services, LLC

P.O. Box 364
Irmo, SC 29063
403 Seaside Ct
Lexington, SC 29072
Tel. 803.399.1133 Cell 803.960.2562 craigkennedy.KCS@gmail.com

October 18, 2018

Mr. Joe Koon, Manager
SC Department of Health and Env Control
Division of Mining and Solid Waste Management
2600 Bull Street
Columbia, SC 29201

RE: RDA Quarry, Mine Permit No. I-002171
Wetland Hydrology of Protected Wetlands

Dear Mr. Koon:

As requested in your September 28, 2018 letter to Mr. Wooten, this letter provides information on the requested monitoring and measures to maintaining wetland hydrology of protected wetlands at the RDA Quarry during mining. The other requested information related to the Red Cockaded Woodpecker and update of the reclamation plan will be forthcoming in separate submittals.

As recommended by SC Department of Natural Resources (DNR) to the SC Department of Health and Environmental Control (DHEC), the hydrology within the nearby wetlands should be maintained. The DNR comments specifically references wetlands #6 & #14 that are Corps jurisdictional wetlands. (Wetland numbers are shown on the Andrews Quarry Map.)

Maintaining wetland hydrology will retain wetland functions by ensuring the hydric soils remain primarily under anaerobic conditions and in a reducing environment during growing seasons. RDA proposes to install shallow monitoring wells within wetlands #6 & #14, as shown on attached Figures 1 & 2, to track the water tables within each of these wetlands. These wetlands are the closest significant wetlands to where mining will begin and operate in the early life of the RDA Quarry. Furthermore, RDA is providing information to maintain the water table levels within these wetlands if the monitoring well data indicate the water table within the wetlands are not meeting a prescribed wetland hydrology standard.

Groundwater monitoring plan for RDA is multifaceted and will have multiple layers of groundwater monitoring and data. The perimeter monitoring wells (PMW series) will be located at the mine permit boundary perimeter. The perimeter wells are intended to provide groundwater data over a large area and determine if domestic wells are being or about to be adversely impacted by mine dewatering. The *Sinkhole Monitoring and Contingency Plan* (SMWS series) monitoring wells will be closer to the start of mining in segment 6. Each SMWS location will have a well cluster of one well monitoring groundwater in limestone and a second monitoring well in the shallow aquifer system that is the overlying sediments of the limestone and is considered to be "overburden". Additionally, staff gauges will be set in 2 sinkhole ponds that will provide further groundwater level data. The data from these data sets will be available to assist in evaluating impacts to wetland hydrology.

RDA plans to generally follow the U.S. Army Corps of Engineers' technical guidance document titled, *Technical Standard for Water-Table Monitoring of Potential Wetland Sites*. This document sets, "... *national standards for the collection, analysis, interpretation and reporting of hydrologic data, which may be used to help determine whether wetlands are present on disturbed or problematic sites...."* The document provides methods and standards for determining if wetlands are present on disturbed sites or on sites where naturally occurring wetland types may lack typical indicators or may have indicators present only at certain times of the year. The methods and standards appear to applicable to the RDA site where wetland hydrology needs to be directly monitored. The document defines wetland hydrology and establishes wetland hydrology criteria.

Wetland Types at RDA

The predominate wetland type at the RDA site is seasonally flooded palustrine wetlands. These are typically shallow depressions without direct surface water connections. The hydrology in these wetlands primarily originate from groundwater and stormwater. However, that depends on the local geology as to which component is most significant in maintaining hydrology. The hydrology for these wetlands may be susceptible to alteration from mine dewatering if there is a significant hydrologic connection with the underlying shallow aquifer system. These shallow depressions could be perched water tables and hydrologically independent of the underlying shallow aquifer.

Wetlands associated with Murray Swamp are upper perennial riverine type wetland where the RDA site is located. The wetlands receive flow not only from groundwater, but a major source of water is from surface flows along Murray Swamp and overbank flows during flooding events. During mining and dewatering operations, clean water discharges from the quarry, compliant with NPDES permit effluent limitations, will be routed into Murray Swamp. These wetlands should be less likely to be impacted from mine dewatering.

Monitoring Wetland Hydrology

Segment 6 is a 53 acre mine block where mining will begin and advance north. Wetlands most susceptible to dewatering are wetlands #6 & #14. Wetland #6 is located 700 feet east of the southeast corner of Segment 6. Wetland #14 is 500 feet north of the northern end of segment 6. Anticipated rate of mining is 6 to 7 acres per year. To assess and track the hydrology in wetlands # 6 & #14, three shallow monitoring wells will be set within each wetland on 300 - 400 foot centers, as shown in Figures 1 & 2. To provide reference data three shallow monitoring wells will be placed in wetland #4 which is east of wetland # 6. The distance to mining from wetland #4 ranges between 1,400 to 2,600 feet from the south side of Segment 6. Information on the strata beneath the wetlands will be determined during well construction. Clay substrate beneath the wetland soils would be indicative of a perched water table and possibly the wetland hydrology is independent of the shallow aquifer system.

Groundwater will be monitored with continuous water level loggers (HOBO U20 or equivalent) installed in shallow (18-24”) monitoring wells, consisting of a well cap with drainage and vent holes, 0.010in schedule 40 well screen with a 2’ riser and top cap. Wells will be assembled and installed in accordance with the “Technical Standard for Water-Table Monitoring of Potential Wetland Sites” [U.S. Army Corps of Engineers. (2005). *WRAP Technical Notes Collection* (ERDC TN-WRAP-05-2), U.S. Army Engineer Research and Development Center, Vicksburg, MS.].

Data will be downloaded from wells annually at the end of the growing season in order to calculate frequency and duration. These parameters will be defined as:

Frequency - Total number of days in which the groundwater is recorded within the upper 12 inches below the soil surface during the growing season.

Duration - Longest consecutive period in which the groundwater is recorded within the upper 12 inches below the soil surface during the growing season.

Recharge
Should the wetland monitoring wells indicate wetland hydrology are not meeting the above prescribed standard, RDA will have the means to provide groundwater recharge to the areas adjacent to the wetlands. Figures 1 & 2 indicate the proposed locations for the recharge trenches. Depth of recharge trench will be approximately10 feet and 5 - 10 feet wide. These trenches would be flooded to within 1 foot of ground surface to produce a hydraulic head and gradient to promote water infiltration into the soils.

A follow on function of the recharge trenches would be to provide a water source for direct inundation of the wetlands. Water would be either pumped from the recharge trench into the wetland or a weir type outlet constructed on the recharge trench to allow water from the trench to flow across the upland buffer directly into the wetlands. The direct inundation of the wetland will be conducted in a manner to minimize the water's energy with rip rap, splash pads to minimize scouring and erosion in the wetland soils. The water quality used for inundation would meet TSS standards of the NPDES permit.

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

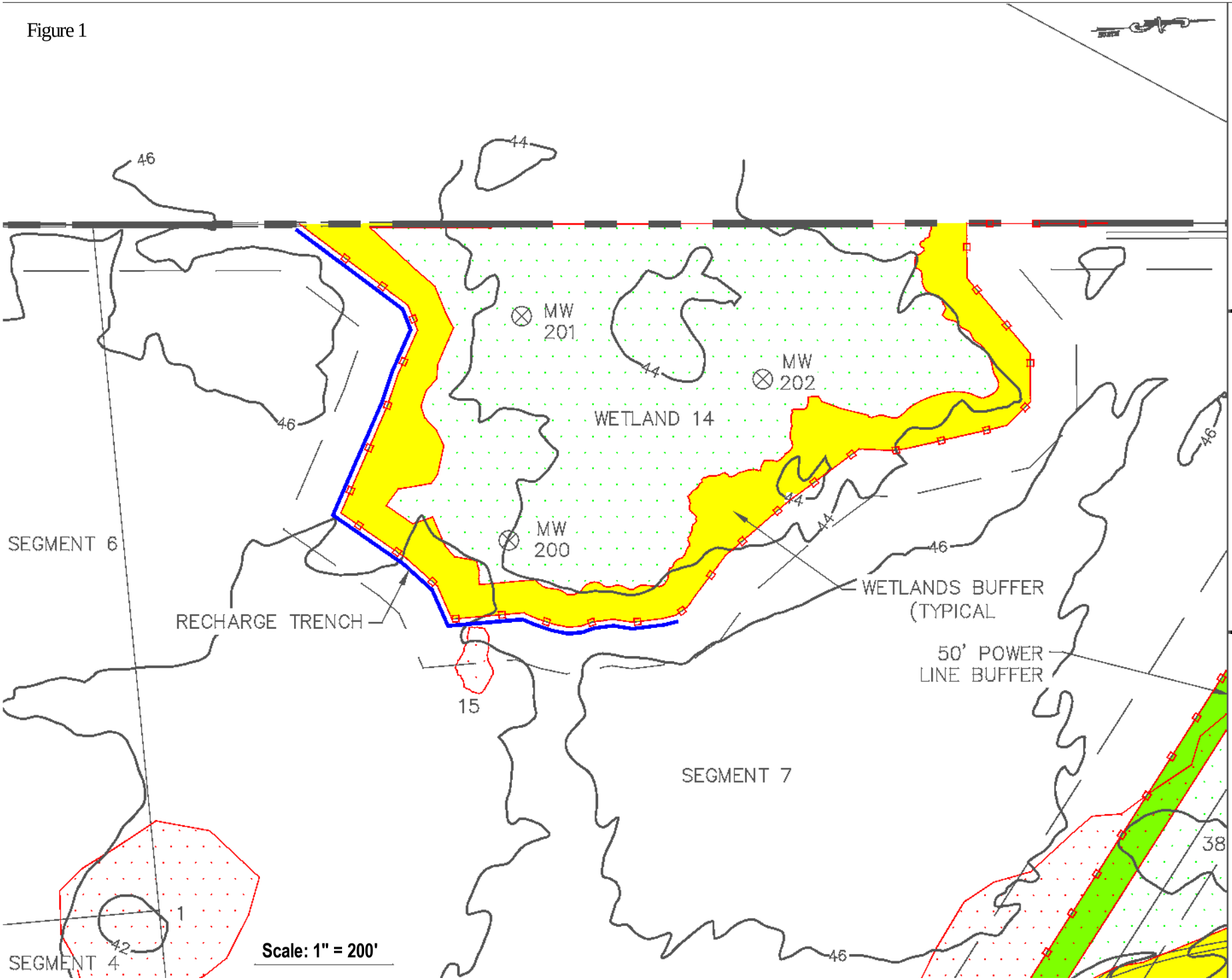
Sincerely,

Craig Kennedy, PG
KCS Principal

Attachments

cc Clark Wooten

Figure 1



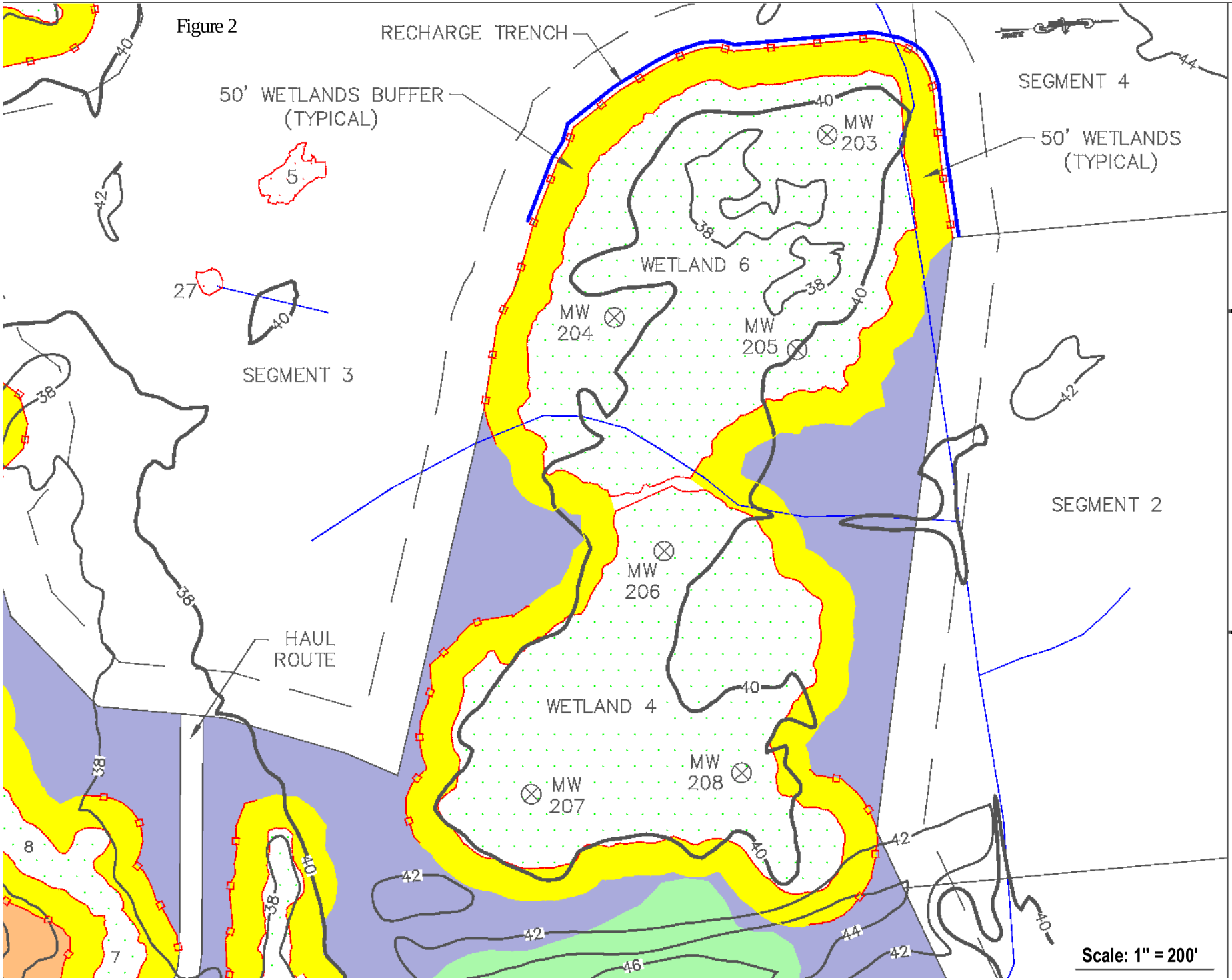
Revisions

By	Date	Description

Prepared by
Kennedy Consulting Services, LLC
Craig Kennedy, P.G.
Office: (803) 399-1133
Cell: (803) 960-2562

RDA, LLC
Wetland Monitoring Well Locations
Wetland 14
Prepared for: RDA, LLC
Williamsburg County, SC

Figure 2



Revisions			
Description	Date	By	

Prepared by
Kennedy Consulting Services, LLC
Craig Kennedy, P.G.
Office: (803) 399-1133
Cell: (803) 960-2562

RDA, LLC
Wetland Monitoring Well Locations
Wetlands 4 and 6
Prepared for: RDA, LLC
Williamsburg County, SC

NORTH

N/F CHARLES INGRAM LUMBER CO; INC. TMS#45-336-009

N/F SEABOARD POLO GROUNDS, LLC TMS #45-336-013

±37'13' TO THE INTERSECTION OF TAD ROAD AND SEABOARD ROAD

N/F ZIAJA JULIE R TMS#45-336-023

N/F RESCH JOHN W TMS#45-336-024

N/F HMW SOD, LLC TMS#45-336-014

N/F HMW SOD, LLC TMS#45-336-016

SEABOARD ROAD 66' R/W

JUMPIN RUN ROAD (DIRT ROAD)

N/F SEABOARD POLO GROUNDS, LLC TMS#45-336-013

N/F BROWN ELAINE TMS #45-336-015

N/F TRUSTEES OF TRIO CHARGE OF THE TMS#45-336-012

ACCESS ROAD

TO THE TOWN OF ANDREWS

N/F BRUORTON NORMA ETAL TMS#45-361-024

SANTEE COOPER TRANSMISSION LINE 100' RIGHT OF WAY

N/F McCLARY WILLIAM L III TMS#45-361-023

N/F LINDER INEZ W TMS#45-336-006

N/F GILLESPIE ANDREW R & BENJAMIN D TMS#45-336-026

EXISTING ROAD

N/F RESCH HERMAN L TMS#45-336-025

N/F MORRIS ALBERTA TMS#45-335-055

(NO DATA ON THIS PARCEL)

N/F GEORGE MINNIE & STAFFORD GEORGE TMS#45-335-054

(NO DATA ON THIS PARCEL)

N/F DARBY JAMES & ISAAC & HARRY L DARBY TMS#45-335-039

N/F DARBY HARRY L TMS#45-335-066

N/F DARBY SOLOMAN TMS#45-335-036

MINE PERMIT BOUNDARY

N/F WEARING RUBY TMS#45-335-031

N/F SHOATE THELMA D TMS#45-335-024

N/F DAVIS MARY D & SHERLINE N TMS#45-335-023

N/F DAIL INVESTMENT PROPERTIES LLC & GLENNIE H DAIL TMS#45-335-021

N/F THOMSON JOHN C TMS#45-334-037

JUMPIN RUN ROAD WILL BE CLOSED AT THIS APPROXIMATE LOCATION

JUMPIN RUN ROAD

N/F THOMPSON JOHN C TMS #45-334-042

N/F McCREA ANNA JANE TMS#45-359-056

N/F WASHINGTON LENITA M TMS #45-359-055

EXISTING ROAD

EXISTING ROAD

Jumpin Run Tract

SEG 8

SEG 9

SEG 10

HAUL ROUTE

JUMPIN RUN ROAD (DIRT ROAD)

EXISTING ROAD

HAUL ROUTE

MHS Tract

FUTURE MINE DISTURBANCE AREA

RDA South

Formerly Feagin Tract

HAUL ROUTE

N/F MORRIS WILLIAM C JR & JUDY M TMS#45-361-119

MINE PERMIT BOUNDARY

SEG 5 45.0 AC.

SEG 6 53.2 AC.

SEG 7 57.0 AC.

RDA East

SEG 4 45.2 AC.

SEG 3 37.9 AC.

SEG 2 46.9 AC.

SEG 1 19.9 AC.

N/F GOWDY WILFORD B JR LIFE & BARBARA M LIFE TMS#45-359-004

SANTEE COOPER TRANSMISSION LINE 100' RIGHT OF WAY

EXISTING ROAD

MINE PERMIT BOUNDARY

N/F MORRIS WILLIAM ROBERT TMS#45-361-001

HAUL ROUTE

HAUL ROUTE

ARCHAEOLOGICAL SITE 38WG185

HAUL ROUTE

50' EASEMENT

WHEELER RD. 66' R/W

N/F HASELDEN JOSEPH R & AMY S TMS#45-360-012

N/F WOODARD RALPH F & DONNA C TMS#45-360-008

N/F CAMLIN MARY SUE LIFE ETAL & MARY SUE CAMLIN TMS#45-360-003

30' ACCESS EASEMENT

TERRY ROAD (DIRT ROAD)

LEGEND

PERIMETER MONITORING WELL STATION PMW-1

SINKHOLE MONITORING WELL STATION SMWS-100

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)

1 inch = 400 ft.

APPROVED BY
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
DIVISION OF MINING AND SOLID WASTE MGT

BY _____

TITLE GM-2171-1V2

DATE APPROVED 2-7-2020

PERMIT NO. I-002171

REVISIONS

	Description	Date	By
1	ADJUSTMENTS IN MINE FACILITIES	6/3/18	BC
2	TRANSFER PERMIT AND MAPS TO AMC	01/02/20	BC

Kennedy Consulting Services, LLC
Craig Kennedy, P.G.
KCS
Office: 403 Seaside court Lexington, SC 29072 Tel 803.399.1133 • Cell 803.960.2562
Mail: P.O. Box 364 Irmo, SC 29063 • craigkennedy.KCS@gmail.com

Andrews Quarry
Genaral Mine Permit Area & Adjacent Landowners

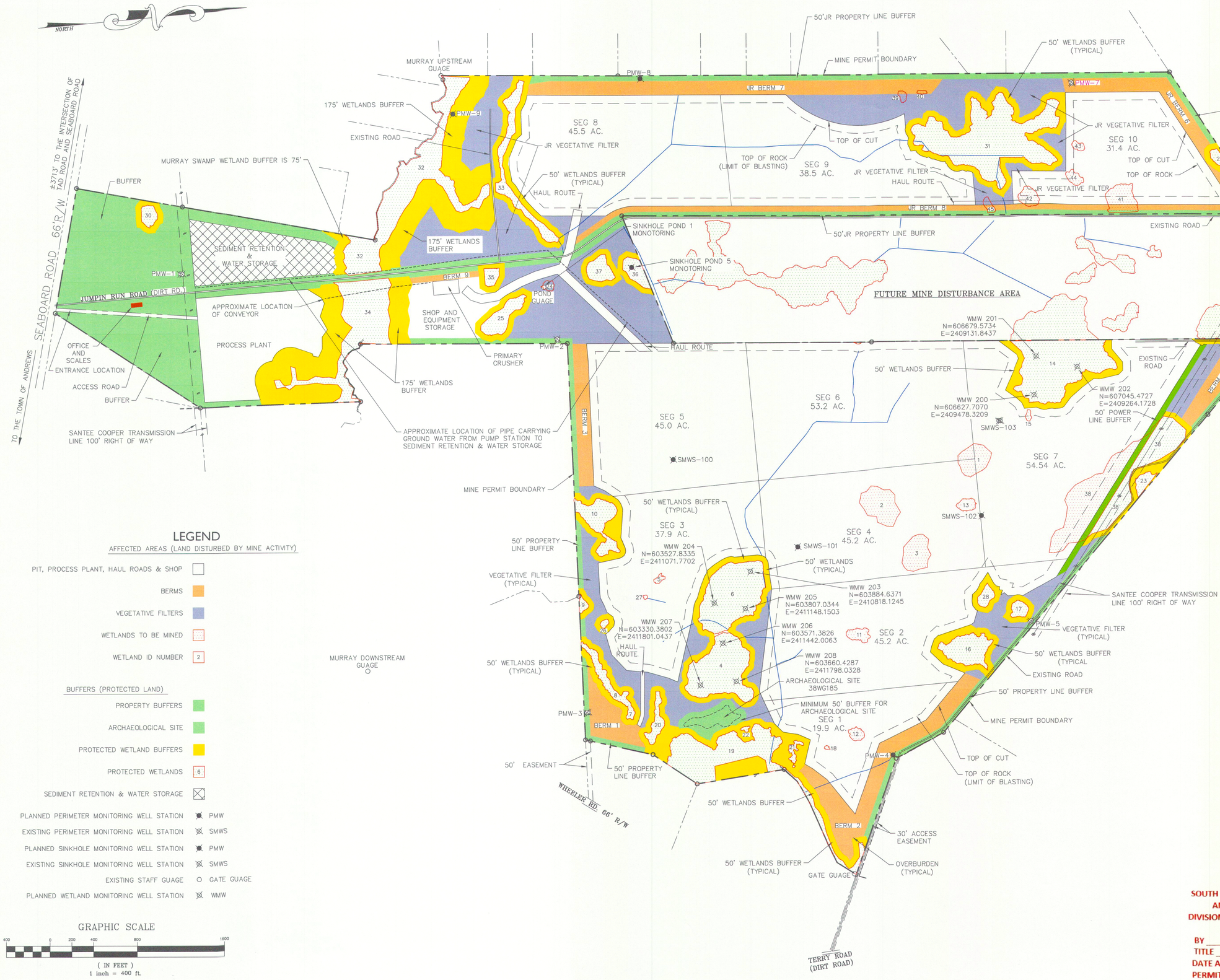
Prepared for

American Materials Company, LLC

Anderson Township, Willlasburg County :: South Carolina

Project No.: KCS 16-88
Date: 01-24-17
Approved by: RCK
Drawn by: B.C.
Scale: 1"=400'

Sheet No. 1 of 1



LEGEND

AFFECTED AREAS (LAND DISTURBED BY MINE ACTIVITY)

- PIT, PROCESS PLANT, HAUL ROADS & SHOP
- BERMS
- VEGETATIVE FILTERS
- WETLANDS TO BE MINED
- WETLAND ID NUMBER (2)

BUFFERS (PROTECTED LAND)

- PROPERTY BUFFERS
- ARCHAEOLOGICAL SITE
- PROTECTED WETLAND BUFFERS
- PROTECTED WETLANDS (6)
- SEDIMENT RETENTION & WATER STORAGE
- PLANNED PERIMETER MONITORING WELL STATION — PMW
- EXISTING PERIMETER MONITORING WELL STATION — SMWS
- PLANNED SINKHOLE MONITORING WELL STATION — PMW
- EXISTING SINKHOLE MONITORING WELL STATION — SMWS
- EXISTING STAFF GUAGE — GATE GUAGE
- PLANNED WETLAND MONITORING WELL STATION — WMW

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

APPROVED BY
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
DIVISION OF MINING AND SOLID WASTE MGT
BY Joe Kom
TITLE SM-2171-1V3
DATE APPROVED 2-7-2019
PERMIT NO. I-002171

REVISIONS

	Description	Date	By
1	ADD BUFFER TO WETLAND 28; MINING WILL AVOID	7/30/17	BC
2	LOCATE, AVOID AND BUFFER JUMPIN RUN ROAD	9/08/17	BC
3	ADD PRIMARY CRUSHER AND CONVEYOR ACROSS MURRAY SWAMP	9/08/17	BC
4	INCREASE BUFFER ALONG MURRAY SWAMP; ADD MONITORING WELLS	12/05/17	BC
5	RELOCATE SMWS FOR SEGMENT 6 START UP	11/26/18	BC
6	ADD MONITORING WELLS; DRILLED OCTOBER, 2018	1/25/19	BC
7	INCREASE MURRAY SWAMP BUFFER TO 175 FEET	8/12/19	BC
8	TRANSFER MINE PERMIT TO AMC	01/02/20	BC

Kennedy Consulting Services, L.L.C.
Craig Kennedy, P.G.
KCS
Office:
403 Seaside court Lexington, SC 29072 • P.O. Box 364 Irmo, SC 29063
Tel. 803.399.1133 • Cell 803.960.2562 • craigKennedy.KCS@gmail.com

Andrews Quarry

Prepared for
American Materials Company, LLC

Anderson Township, Willasburg County ... South Carolina

Project No.: KCS 16-88
Date: 01-24-17
Approved by: RCK
Drawn by: B.C.
Scale: 1"=400'

Sheet No. 1 of 2

NORTH

GRADE 3:1, TOPSOIL AND REVEGETATE

GRADE 3:1 TO WATER, TOPSOIL AND REVEGETATE

±3713' TO THE INTERSECTION OF TAD ROAD AND SEABOARD ROAD

SEABOARD ROAD 66' R/W

TO THE TOWN OF ANDREWS

LAKE

LAKE

GRADE 3:1, TOPSOIL AND REVEGETATE

GRADE 3:1 TO WATER, TOPSOIL AND REVEGETATE

MINE PERMIT BOUNDARY

JUMPIN RUN ROAD (DIRT ROAD)

JUMPIN RUN ROAD (DIRT ROAD)

GRADE 3:1 TO WATER, TOPSOIL AND REVEGETATE

GRADE 3:1 TO WATER, TOPSOIL AND REVEGETATE (TYPICAL)

MINE PERMIT BOUNDARY

EXISTING ROAD

REMOVE EQUIPMENT AND STOCKPILES GRADE TOPSOIL AND REVEGETATE

EXISTING ROAD

GRADE 3:1, TOPSOIL AND REVEGETATE

SANTEE COOPER TRANSMISSION LINE 100' RIGHT OF WAY

REMOVE EQUIPMENT AND STOCKPILES GRADE TOPSOIL AND REVEGETATE

MINE PERMIT BOUNDARY

GRADE 3:1, TOPSOIL AND REVEGETATE

LAKE

GRADE 3:1 TO WATER, TOPSOIL AND REVEGETATE (TYPICAL)

GRADE 3:1 TO WATER, TOPSOIL AND REVEGETATE (TYPICAL)

SANTEE COOPER TRANSMISSION LINE 100' RIGHT OF WAY

EXISTING ROAD

MINE PERMIT BOUNDARY

GRADE 3:1, TOPSOIL AND REVEGETATE

50' EASEMENT

ARCHAEOLOGICAL SITE 38WG185

OVERBURDEN BACKFILL INTO PIT TO APPROXIMATE ORIGINAL GRADE, GRADE TOPSOIL AND REVEGETATE

GRADE 3:1, TOPSOIL AND REVEGETATE

WHEELER RD. 66' R/W

GRADE 3:1 TO WATER, TOPSOIL AND REVEGETATE (TYPICAL)

30' ACCESS EASEMENT

TERRY ROAD (DIRT ROAD)

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)

1 inch = 400 ft.

APPROVED BY
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
DIVISION OF MINING AND SOLID WASTE MGT

BY _____

TITLE RM-2171-1V2

DATE APPROVED 2-7-2020

PERMIT NO. I-002171

REVISIONS

	Description	Date	By
1	ADD BUFFER TO WETLAND 28; MINING WILL AVOID	7/30/17	BC
2	LOCATE JUMPIN RUN ROAD	9/08/17	BC
3	PERMIT TRANSFER TO AMC	01/02/20	BC

Kennedy Consulting Services, LLC
Craig Kennedy, P.G.
KCS
Office: 403 Seaside court Lexington, SC 29072 Tel. 803.399.1133 • Call 803.960.2562
Mail: P.O. Box 364 Irmo, SC 29063 • craigkennedy.KCS@gmail.com

Andrews Quary
Conceptual Reclamation Map
Prepared for
American Materials Company, LLC
Anderson Township, Williasburg County , South Carolina

Project No.: KCS 16-88
Date: 01-24-17
Approved by: RCK
Drawn by: B.C.
Scale: 1"=400'

Sheet No. 2 of 2

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

AFFECTED AREAS (LAND DISTURBED BY MINE ACTIVITY)

- PIT, PROCESS PLANT, HAUL ROADS & SHOP
- BERMS
- VEGETATIVE FILTERS
- WETLANDS TO BE MINED
- WETLAND ID NUMBER 2

BUFFERS (PROTECTED LAND)

- PROPERTY BUFFERS
- ARCHAEOLOGICAL SITE
- PROTECTED WETLAND BUFFERS
- PROTECTED WETLANDS 6
- CONTOUR (2' INTERVAL) 40

APPROVED BY
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
DIVISION OF MINING AND SOLID WASTE MGT

BY Joe Kosa
TITLE SedM-2171-1V2
DATE APPROVED 2-7-2020
PERMIT NO. I-002171

REVISIONS

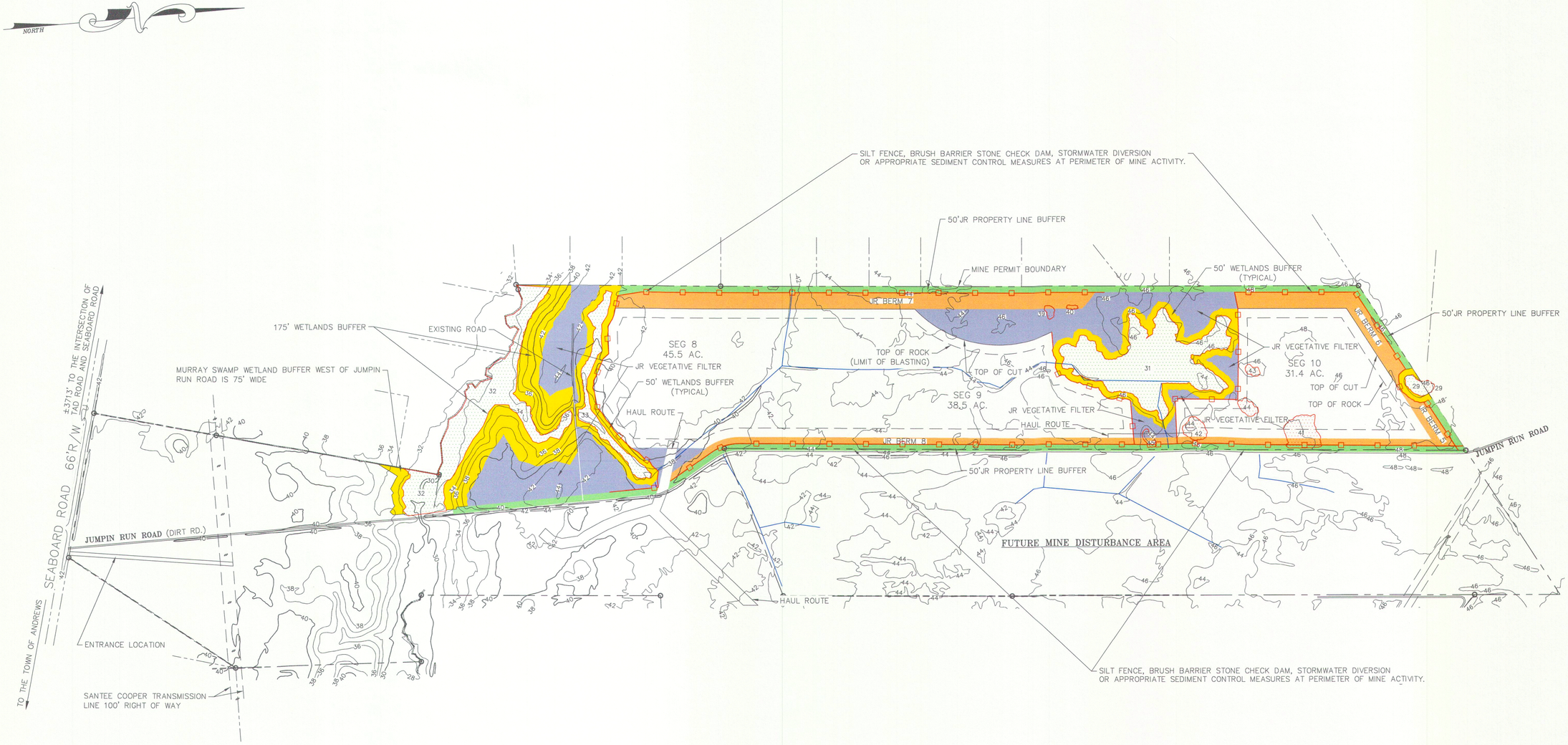
	Description	Date	By
1	ADD BUFFER TO WETLAND 28; MINING WILL AVOID	7/30/17	BC
2	MINE PERMIT TRANSFER TO AMC	01/02/20	BC

Kennedy Consulting Services, LLC
Craig Kennedy, P.G.
KCS
Office: 403 Seaside court Lexington, SC 29072 Tel. 803.399.1133 • Cell 803.960.2562
Mail: P.O. Box 364 Irmo, SC 29063 • craigkennedy.KCS@gmail.com

Andrews Quarry
Erosion & sediment control plan for RDA-East
Prepared for
American Materials Company, LLC
Anderson Township, Willisburg County .. South Carolina

Project No.: KCS 16-88
Date: 01-24-17
Approved by: RCK
Drawn by: B.C.
Scale: 1"=400'

Sheet No. 1 of 3



LEGEND

AFFECTED AREAS (LAND DISTURBED BY MINE ACTIVITY)

- PIT, PROCESS PLANT, HAUL ROADS & SHOP
- BERMS
- VEGETATIVE FILTERS
- WETLANDS TO BE MINED
- WETLAND ID NUMBER (2)

BUFFERS (PROTECTED LAND)

- PROPERTY BUFFERS
- ARCHAEOLOGICAL SITE
- PROTECTED WETLAND BUFFERS
- PROTECTED WETLANDS (6)
- CONTOUR (2' INTERVAL) (40)

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

APPROVED BY
SOUTH CAROLINA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL CONTROL
DIVISION OF MINING AND SOLID WASTE MGT

BY _____
TITLE SedM-2171-2V3
DATE APPROVED 2-7-2020
PERMIT NO. I-002171

REVISIONS

	Description	Date	By
1	LOCATE JUMPIN RUN ROAD	9-8-17	BC
2	ADJUST SEDIMENT CONTROL FOR JUMPIN RUN ROAD	9-8-17	BC
3	INCREASE BUFFER ALONG MURRAY SWAMP	12-05-17	BC
4	INCREASE MURRAY SWAMP BUFFER TO 175 FEET	8-12-19	BC
5	MINE PERMIT TRANSFER TO AMC	01-02-20	BC

Craig Kennedy Consulting Services, LLC
Craig Kennedy, P.G.
KCS
Office: 403 Seaside court Lexington, SC 29072 Tel. 803.399.1133
Mail: P.O. Box 364 Irmo, SC 29063 • Cell 803.960.2562 • craigkennedy.KCS@gmail.com

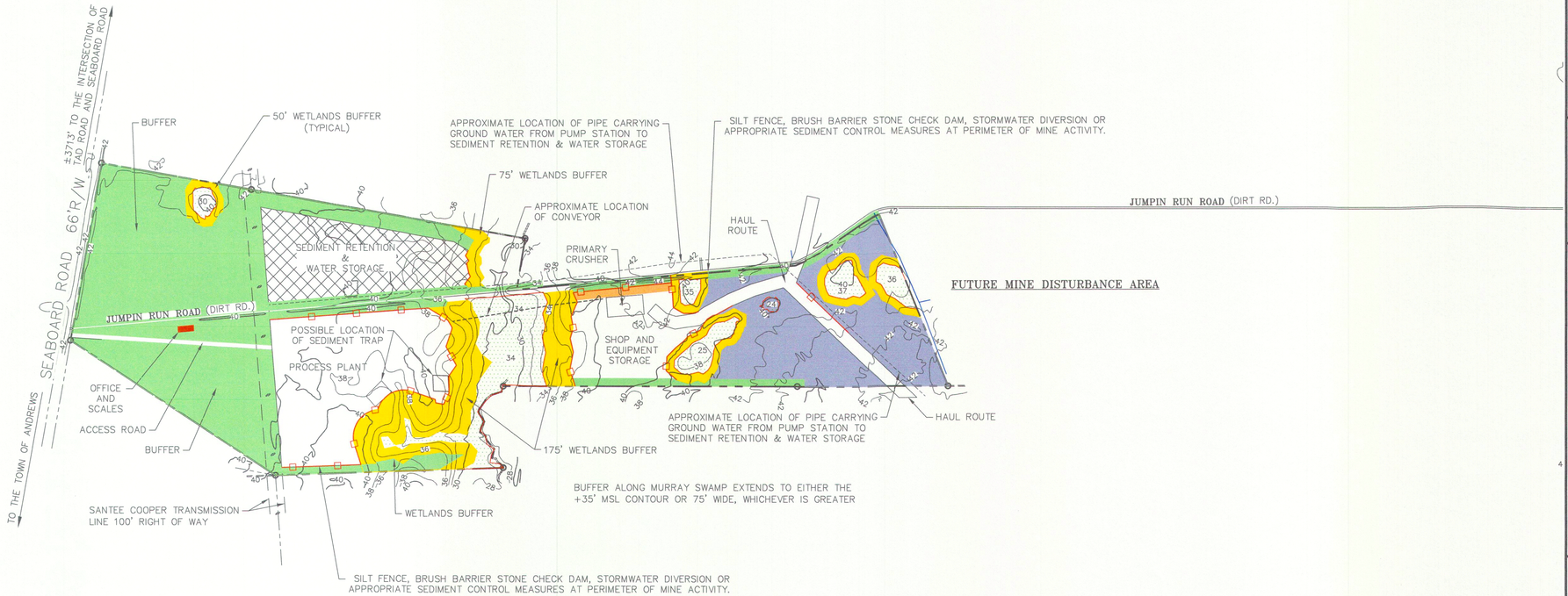
Andrews Quarry
Erosion & sediment control plan for Jumpin Run Tract

Prepared for
American Materials Company, LLC
Anderson Township, Williasburg County , South Carolina

Project No.: KCS 16-88
Date: 01-24-17
Approved by: RCK
Drawn by: B.C.
Scale: 1"=400'

Sheet No. 3 of 3

NORTH



GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)

1 inch = 400 ft.

LEGEND

AFFECTED AREAS (LAND DISTURBED BY MINE ACTIVITY)

- PIT, PROCESS PLANT, HAUL ROADS & SHOP
- BERMS
- VEGETATIVE FILTERS
- WETLANDS TO BE MINED
- WETLAND ID NUMBER 2

BUFFERS (PROTECTED LAND)

- PROPERTY BUFFERS
- ARCHAEOLOGICAL SITE
- PROTECTED WETLAND BUFFERS
- PROTECTED WETLANDS 6
- CONTOUR (2' INTERVAL) 40

APPROVED BY
SOUTH CAROLINA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL CONTROL
DIVISION OF MINING AND SOLID WASTE MGT

BY Joe Kerr
TITLE SedM-2171-3V3
DATE APPROVED 2-7-2020
PERMIT NO. I-002171

REVISIONS

	Description	Date	By
1	ADD SEDIMENT RETENTION POND AND PIPE LOCATION	8-3-17	BC
2	LOCATE JUMPIN RUN ROAD	9-8-17	BC
3	ADJUST CONTOURS ALONG MURRAY SWAMP - SOUTH	9-26-17	BC
4	INCREASE BUFFER ALONG MURRAY SWAMP	1-24-17	BC
5	INCREASE MURRAY SWAMP BUFFER TO 175 FEET	8-12-19	BC
6	MINE PERMIT TRANSFER TO AMC	01-02-10	BC

Kennedy Consulting Services, LLC
Craig Kennedy, P.G.
KCS
Office: 403 Seaside court Lexington, SC 29072 Tel. 803.399.1133
Mail: P.O. Box 364 Irmo, SC 29063 • Call 803.960.2562 • craigkennedy.KCS@gmail.com

Andrews Quarry
Erosion & Sediment Control Plan
for RDA-South
Prepared for
American Materials Company, LLC
Anderson Township, Williasburg County ... South Carolina

Project No.: KCS 16-88
Date: 01-24-17
Approved by: RCK
Drawn by: B.C.
Scale: 1"=400'

Sheet No. 2 of 3

D H E C PROMOTE PROTECT PROSPER	Mining Form MR-500	S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL BUREAU OF LAND AND WASTE MANAGEMENT DIVISION OF MINING AND SOLID WASTE MANAGEMENT 2600 Bull Street, Columbia, SC 29201 Telephone Number(803) 869-4261 Fax Number: (803) 896-4001

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
BUREAU OF LAND AND WASTE MANAGEMENT
DIVISION OF MINING AND SOLID WASTE MANAGEMENT
2600 Bull Street; Columbia, SC 29201
Telephone Number (803) 896-4261 Fax Number (803) 896-4001

RECLAMATION PLAN

FORM MR-500 DATE VERSION ADOPTED: 7/1/94

****

As required in Section 48-20-90 of the South Carolina Mining Act, "An operator shall submit with his application for an operating permit a proposed reclamation plan. The reclamation plan for an operating permit only must be furnished to the local soil and water conservation district in which the mining operation is to be conducted. The plan must include as a minimum each of the elements specified in the definition of 'reclamation plan' in Section 48-20-40 and information required by the department. The reclamation plan must provide that reclamation activities, particularly those relating to control of erosion, to the extent feasible, must be conducted simultaneously with mining operations and be initiated at the earliest practicable time after completion or termination of mining on a segment of the permitted land. The plan must provide that reclamation activities must be completed within two years after completion or termination of mining on each segment of the area for which an operation permit is requested unless a longer period specifically is permitted by the department."

****

I. APPLICANT INFORMATION

1. Name of Company: American Materials Company, LLC

2. Name of Proposed Mine: Andrews Quarry County: Williamsburg

3. Home Office Address: 1410 Commonwealth Dr., Suite 201 — 910-799-1411
(Street **and** P.O. Box) — (Telephone No.)

Wilmington — NC — 28403 — 910-799-5411
(City) — (State) — (Zip Code) — (Fax. No.)

4. Local Office Address: 1566 Seaboard Rd. — Not Established
(Street **and** P.O. Box) — (Telephone No.)

Andrews — SC — 29510 — Not Established
(City) — (State) — (Zip Code) — (Fax. No.)

5. Designate to which office Official Mail is to be sent:

Home Office: x Local Office:

6. Name of company personnel and their title to be the contact for official business and correspondence: Steve McKeel, VP Environmental Development

II. ENVIRONMENTAL PROTECTION

1. Describe practices to protect adjacent resources such as roads, wildlife areas, woodland, cropland and others during mining and reclamation.

The mine permit area is located in a rural area with land cover consisting of hardwood and managed pine forests for timber. On land neighboring the mine permit area, the land uses include agricultural, managed timberlands, rural residential. Of the 968.4 acres of permitted land, undisturbed buffers are used to provide additional protections to adjacent properties, creeks and other sensitive areas. The nearest public road, Seaboard Road, fronts a relatively small area of the mine permit area to the south, will be buffered with a 200 foot wide undisturbed buffer.

Spotted turtle (*Clemmys guttata*)

A visual survey of Murray Swamp floodplain and associated wetland habitats will be conducted within the initial mine permit site prior to any land disturbance for the Spotted turtle. Experienced field biologists will look for spotted turtles within and near the proposed conveyor corridor across Murray Swamp. The work will be done over a period of two days in late winter (mid March) and two days in mid-spring (early May). If spotted turtles are located in the project area, mine operator will work with SCDNR to develop a project specific management plan including, but not limited to, collection and radio tracking, capture and relocation, or no further action. Mine staff will be trained to identify the spotted turtle. Staff will be directed to protect any identified turtle and take pictures if possible without disrupting the turtles activity. Upon confirmation of the turtle's identification by mine operator's contract biologist(s), the siting will be reported to SCDNR.

Carolina gopher frog (*Lithobates [Rana] capito*); eastern tiger salamander (*Ambystoma tigrinum*)

Annual surveys for the Carolina gopher frog and the eastern tiger salamander will be conducted for two years following the initial mining work. The survey will occur from mid-winter through spring locate and identify breeding adult or larval individuals. Vocalization surveys will also be conducted at night for gopher frog calls during the same time period. If either animal is identified, the mine operator will work with SCDNR to develop a project specific management plan including, but not limited to, collection and radio tracking, capture and relocation, or no further action. If none of the animals are identified during the two survey years, no additional work will be performed until such time, mining progresses toward any of the below identified wetlands. Prior to any land disturbance of the below identified wetlands, final on-site surveys will be conducted to search for the gopher frog and tiger salamander. The jurisdictional and non-jurisdictional wetlands subject to the surveys are identified as follows:

- Non-jurisdictional wetlands, #5 & #27 (segment 3)
- Non-jurisdictional wetlands, #1, #2, #3, & #13 (segment 4)
- Non-jurisdictional wetlands #15 & # 38 (segment 7)
- Non-jurisdictional wetland #11 (segment 2)
- Non-jurisdictional wetlands #12, & #18 (segment 1)
- Non-jurisdictional wetlands #39, #40, #41, #43, #44 & #45 (segment 10)

2. Describe proposed methods to limit significant adverse effects on adjacent surface water and groundwater resources.

Proper reclamation of the mine site will include stabilizing all overburden storage piles with vegetation, removal of mine equipment both mobile and stationary, clean up of any spillage of petroleum products, removal of scrap material. Once mining is terminated, groundwater levels will rebound to approximate original levels. The mining process will not use chemicals in the mining or processing of crushed stone; consequently, there is no potential for chemical contamination to groundwater resources. Additionally, vegetative filters of existing vegetation will provide redundancy to active sediment control measures to further protect adjacent surface water resources.

3. Describe proposed methods to limit significant adverse effects on known significant cultural or historic sites within the proposed permitted area.

An intensive archaeological survey of the proposed permit area was conducted by Brockington and Associates. One archaeological site, 38WG185, was identified during the survey as being eligible for inclusion in the National Registry of Historic Place (NRHP). This 1.2 acre site will be "green spaced" and protected with a 50 foot undisturbed buffer around the site. Permanent markers will be established to locate and protect the site.

4. **Describe method to prevent or eliminate conditions that could be hazardous to animal or fish life in or adjacent to the permitted area.**

Proper reclamation of the mine site will include stabilizing all overburden storage piles with vegetation, removal of mine equipment both mobile and stationary, clean up of any spillage of petroleum products, removal of scrap material. Setbacks, established buffers and soil stabilization along stream banks will provide protection to fisheries in nearby streams. Establishing 3:1 slopes around the pit and overburden storage areas will remove hazardous conditions for the public and indigenous animal populations.

Vegetative filters will be established consisting of existing woodlands to provide redundant sediment control to protect wetlands and adjacent properties from mining activities.

5. **Describe how applicant will comply with State air quality and water quality standards as established by the S.C. Department of Health and Environmental Control.**

To operate the mine and processing plant, the mine operator will obtain the Air Quality Construction Permit and ultimately the Air Quality Operating Permit. These permits set the quantity of air particulates that can be emitted to be protective of air quality standards.

With the termination of mining all mobile mine equipment and processing plant equipment will be removed from site. Once the process plant equipment is removed from site, the Air Quality Operating Permit can be terminated. Stone stockpiles, fines and barren soils, potential sources of dust after mining, will be either removed (stone stockpiles) or stabilized with vegetation to eliminate windblown dust.

III. RECLAMATION OF AFFECTED AREA

6. **State useful purpose(s) the affected land is being proposed to be reclaimed to. More than one purpose may be checked, but information should be submitted to support the feasibility for each proposed purpose.**

a. Lake or pond ___x_____	**f. Grassland** _____x_____
b. Agriculture_____	**g. Recreation**_____
c. Woodlands_____ _____	**h. Wetlands**_____
d. Residential_____	**i. Park**_____
e. Commercial_____	**j. Other**_____

7. **State the final maximum surface gradient(s) (slope) in soil, sand, or other unconsolidated materials on reclaimed land. Surface gradients steeper than 3H:1V (18 degrees or 33 percent) may be required to submit geotechnical data and studies to demonstrate that the steeper slopes will remain stable following final reclamation.**

The final maximum surface gradient for slopes in overburden storage areas and slopes in overburden in the pit will be 3:1.

8. **How will the final slopes in unconsolidated material be accomplished? If the slope will be by backfilling, demonstrate that there is adequate material to accomplish the stated final gradient. If gradient is to be achieved by bring in material from outside the permitted area, state the nature of the material and approximate quantities. If the gradient is to be achieved by grading, show that there is adequate area for grading to achieve gradient (ie. adequate distance between the property line and edge of highwall). Operator should show calculations or other appropriate information to demonstrate that there is adequate materials in backfilling and grading to meet the requirements for final slope.**

The overburden stripped either will be placed in berms or backfilled into the pit. The primary post mine land use for the pit will be a lake with most, if not all of the backfill covered by water at depths greater than 4 feet.

9. **Describe the plan for revegetation or other surface treatment of affected area(s). The revegetation plan shall include but not be limited to the following: (a) planned soil test; (b) site preparation and fertilization; (c) seed or plant selection; (d) rate of seeding or amount of planting per acre; (e) maintenance.**

Soil test, seed bed preparation, seed mix selection, soil amendments (fertilizer, lime, growth stimulants, etc.), cover and seeding rates will be based upon SC DOT's *Supplemental Technical Specification (SC-M-810-2(04/11)) for Seeding*.

Revegetated sites will be maintained with periodic inspections to detect areas with significant erosion, seed germination failure or significant plant die off. Site will be inspected after significant storm events to detect wash outs or gullies in planted areas. Damaged area will be repaired where necessary by fixing erosion damage and reseeding as necessary.

10. **Provide, as a separate document, a closure plan of the mine and permitted facilities to prevent a release of contaminants from being harmful to the environment. A closure plan is not necessary for all mines, but is required where the possibility exist for (a) acid rock drainage; (b) where the National Pollutant Discharge Elimination Systems (NPDES) Permit have discharge limitation parameters other than pH and Total Suspended Solids (TSS); (c) chemically treated tailings or stockpiles (excludes fertilizer or lime for revegetation purposes).**

Reclamation for the pit will not require a closure plan. A) The limestone does not oxidize to form acid and thus, create acid mine drainage. B) This mine qualifies for coverage under the *NPDES General Permit for Discharges Associated with Nonmetal Mineral Mining Facilities (SG-730000)* with no additional parameters other than pH and TSS. C) No chemicals will be used in the mining process.

11. **Method of control of contaminants and disposal of mine waste soil, rock, mineral, scrap, tailings, slimes, and other material directly connected with the mining, cleaning, and preparation of mineral substances mined and includes all waste materials deposited on or in the permit area from any source.**

Fines created from processing limestone are not "clay slime"; thus, they will not create an unstable sediment mass in settling ponds. These fines will accumulated in the clarification ponds of the wash circuit and periodically removed and either sold as a by-product or backfilled into the pit.

12. **Method of reclaiming settling and/or sediment ponds.**

Any process ponds associated with the process plant will be backfilled to original grade, topsoiled and revegetated.

13. **Describe method of restoration or establishment of stream channels, stream banks and site drainage to a condition minimizing erosion, siltation and other pollution.**

Appropriate setbacks and buffers will be established to protect the streams and wetlands that will be avoided by mining. Wetlands to be impacted by mining will be permitted by US Army Corps of Engineer's 404 permit or appropriate Nationwide permitting with appropriate mitigation measures utilized.

14. **What are the maintenance plans to insure that the reclamation practices established on the affected land will not deteriorate before released by the Department?**

Areas that have undergone final reclamation practices will be maintained through periodic inspections and conducting any necessary repairs in a timely manner.

15. **For final reclamation, submit information about practices to provide for safety to persons and to adjoining property in all excavations. Identify areas of potential danger (vertical walls, unstable slopes, unstable surface on clay slimes, etc.) and provide appropriate safety provisions. These provisions can include but are not limited to setbacks, fencing, signs, benching, guardrails and boulders.**

The following mine segments will be reclaimed to provide safety to persons and adjoining areas.

Highwalls -- The relative shallow overburden will be sloped to a 3:1 gradient around the pit perimeter. With the sloped overburden and high water table, there will not be any exposed vertical highwalls.

Unstable Slopes -- All overburden storage areas (i.e., berms) will be sloped to 3h:1v gradient and vegetated. Soils place to 3:1 gradients are stable and are not prone to landslides.

16. **What provisions will be taken to prevent noxious, odious, or foul pools of water from collecting and remaining on the mined area? For mines to be reclaimed as lakes or ponds, provide supporting information that a minimum water depth of four (4) feet on at least fifty percent (50%) of the pond surface area can be maintained.**
The final pit will be reclaimed as a lake and will meet the above referenced regulatory requirement for sufficient depth. Areas of the affected land not reclaimed to ponds will be properly graded to prevent unwanted pools of water from collecting and prevent foul water from forming.

17. **Identify any structures (e.g. buildings, roads) that are proposed to remain as part of final reclamation. Provide justification for leaving any structures.**
The office building and other support buildings may be left upon final reclamation. Also, some of the haul roads may be left to provide access to the property. All areas will be sloped and stabilized to prevent erosion and control sediment.

18. Attach <u>two (2)</u> copies of a map of the area (referred to as the RECLAMATION MAP) that shows the reclamation practices and conservation practices to be implemented. The following should be shown:

A. The outline of the proposed final limits of the excavation, during the number of years for which the permit is requested.

B. The approximate final surface gradient(s) and contour(s) of the area to be reclaimed. This would include the sides and bottoms of mines reclaimed of ponds and lakes.

C. The outline of the tailings disposal area.

D. The outline of disposal areas for spoil and refuse (exclusive of tailings ponds).

E. The approximate location of the mean shore line of any impoundment or water body and inlet and/or outlet structures which will remain upon final reclamation.

F. The approximate locations of access roads, haul roads, ramps or buildings which will remain upon final reclamation.

G. The approximate locations of various vegetative treatments.

H. The proposed locations of re-established streams, ditches or drainage channels to provide for site drainage.

I. The proposed locations of diversions, terraces, silt fences, brush barriers or other Best Management Practices to be used for preventing or controlling erosion and off-site siltation.

J. Proposed locations of the measures to provide safety to persons and adjoining property.

K. Segments of the mine that can be mined and reclaimed as an ongoing basis.

L. The boundaries of the permitted area.

M. The boundaries of the affected area for the anticipated life of the mine.

N. The boundaries of the 100-year floodplain, where appropriate.

O. Identify sections of mine where the final surface gradient will be achieved by grading and/or backfilling.

P. A legend showing the name of the applicant, the name of the proposed mine, the north arrow, the county, the scale, the date of preparation and the name and title of the person who prepared the map.

THE REQUIRED RECLAMATION MAP SHALL HAVE A NEAT, LEGIBLE APPEARANCE AND BE OF SUFFICIENT SCALE TO CLEARLY SHOW THE REQUIRED INFORMATION LISTED ABOVE. THE BASE FOR THE MAP SHALL BE EITHER A SPECIALLY PREPARED LINE DRAWING, AERIAL PHOTOGRAPH, ENLARGED USGS TOPOGRAPHIC MAP OR A RECENTLY PREPARED PLAT. RECLAMATION MAP SHOULD BE THE SAME SCALE USED FOR THE SITE MAP.

IV. SCHEDULE FOR IMPLEMENTATION OF CONSERVATION AND RECLAMATION PRACTICES

19. As stated in Section 48-20-90 of the S.C. Mining Act, reclamation activities, to the extent feasible, must be conducted simultaneously with mining operations. Identify which areas or segments of the mine are <u>not</u> feasible to reclaim simultaneously with mining. Provide reasons why reclamation can not proceed simultaneously with mining in these areas.

Not applicable

20. **Section 48-20-40(16)(l) of the S.C. Mining Act requires a, "time schedule, including the anticipated years for completion of reclamation by segments". This time schedule should meet the requirements of Section 48-20-90 of the Mining Act.**

SCHEDULE FOR IMPLEMENTING CONSERVATION AND RECLAMATION PRACTICES

Conservation & Reclamation Practices	Segment or Area	Planned		*Applied		Notes
		Amount	Year	Amount	Month/Year	
Establish minimum 75' wide upland buffers for wetlands to be avoided along the access and haul roads	Access Road Process Plant & Murray Swamp Crossing	1,200 ft	2020			
Locate archaeological site 38WG185; mark site with two permanent marker post; establish 50' buffer around site.	38WG185	2.4 ac	2020			Prior to start of mining
Deploy silt fencing, Sediment traps and/or other sediment control BMPs	Process Plant	~2,400 ft	2020			
Excavate Sediment & Water Storage Pond	Process Plant	9.9 ac	2020			
Establish 50' wide upland buffers for wetlands to be avoided and mark buffers.	Wetland 10	200 ft	2020			Prior to constructing Berm 3
Mark 50' undisturbed buffer along property line.	Berm 3	1,300 ft	2020			Prior to constructing Berm 3
Deploy silt fencing and/or other sediment control BMPs	Berm 3	1,300 ft	2020			Prior to constructing Berm 3
Conduct Spotted Turtle Survey	Murray Swamp Area		2018		2018	
Conduct Annual Surveys for Gopher Frog & Eastern Tiger Salamander	Segs 1, 2, 3, 4, 7 & 10	Varies	2019 - 2020			Wetlands identified in item# 1, page 2 of this Reclamation Plan
Strip and stockpile topsoil need for reclamation	Seg 6	As needed	2020			
Strip overburden and mine limestone	Seg 6	53.2 ac	2020-2026			Use sloping & diversions and other appropriate BMPs
Route stormwater into pit	Seg 6		All times			
Backfill overburden in mine out section of pit	Seg 6	~3.5 ac.	2020 - 2026			
Spread topsoil, seed & fertilize as necessary in areas above the planned ultimate pool level lake surface water	Seg 6	As needed	When feasible			Concurrent reclamation with mining will occur as soon as feasible in each segment.
Strip and stockpile topsoil need for reclamation	Seg 5	As needed	TBD			
Strip overburden and mine limestone	Seg 5	45.0 ac	TBD			
Slope overburden to 3:1 slope along terminal pit wall	Seg 5	~ 2.0 ac	TBD			South side of Segment 5
Route stormwater into pit	Seg 5		All times			Use sloping & diversions and other appropriate BMPs
Spread topsoil, seed & fertilize as necessary in areas above the planned ultimate pool level lake surface water	Seg 5	As needed	When feasible			Concurrent reclamation with mining will occur as soon as feasible in each segment.

AA – Affected Area; BMPs – Best Management Practices; Fert. – Fertilize; PL – Property Line; SB – Sediment Basin; ST – Sediment Traps SW – Stormwater; TS – Topsoil; WL – Wetlands;

NOTE: The year and amount for deployment of conservation & reclamation practices are estimates and subject to change depending on market conditions and rate of mining.

* Completed by the Department

SCHEDULE FOR IMPLEMENTING CONSERVATION AND RECLAMATION PRACTICES

Conservation & Reclamation Practices	Segment or Area	Planned		*Applied		Notes
		Amount	Year	Amount	Month/Year	
Follow-up survey for Gopher Frog & Eastern Tiger Salamander	Segs 1, 2, 3, 4, 7 & 10	Varies	TBD			Prior to land disturbance of identified wetlands in these segments. Wetlands identified in item# 1, page 2 of this Reclamation Plan
Establish 50' wide upland buffers for wetlands to be avoided and mark buffers.	Other mine segments and berms	TBD	TBD			Establishing dates and amount of conservation & reclamation practices will depend on market conditions and rate of mining.
Mark 250' property line blasting setback		TBD	TBD			
Mark 50' undisturbed buffer along property line.		TBD	TBD			
Deploy silt fencing and/or other sediment control BMPs		TBD	TBD			
Strip and stockpile topsoil need for reclamation		TBD	TBD			
Strip overburden and mine limestone		TBD	TBD			
Route stormwater into pit		TBD	TBD			
Slope overburden to 3:1 slope along terminal pit wall		TBD	TBD			
Spread topsoil, seed & fertilize as necessary in areas above the planned ultimate pool level lake surface water		TBD	TBD			
Remove mine equipment, process plant equipment, and stone stockpiles	All areas	TBD	TBD			At end of mining and final reclamation
Stabilize barren soils by sloping to minimum 3:1 slope and establishing vegetation						Concurrent reclamation with mining will occur as soon as feasible in each segment.
Cease pumping of groundwater to fill last pit to final pool elevation						
Monitor vegetation to establish 75% coverage over two growing seasons. Inspect vegetation and repair as necessary.	All non-water areas					During active mining and reclamation activities.

AA – Affected Area BMPs – Best Management Practices Fert. – Fertilize PL – Property Line SB – Sediment Basin ST – Sediment Traps SW – Stormwater TS – Topsoil WL – Wetlands

NOTE: The year and amount for deployment of conservation & reclamation practices are estimates and subject to change depending on market conditions and rate of mining.

* Completed by the Department

YOU ARE NOTIFIED THAT:

1) you, the operator, must file an application to modify the reclamation plan in the event actual reclamation varies from the set forth hereinabove, and

2) if at any time it appears to the Department that the activities under the reclamation plan are failing to achieve the purposes and requirements of the S.C. Mining Act, the Department may modify the RECLAMATION PLAN in accordance to Section 48-20-150.

Signature of Applicant/Operator or his Authorized Representative

RICHARD A. MOSES

Printed Name of Applicant/Operator or his Authorized Representative

PRESIDENT

Title

12-26-19

Date

Department Use Only

Permit No. _____ Date Application Approved _____ Date Bond Rec'd_____

Bond Amount_____ Blanket or Single Bond Permit Issuance Date_____

ACTION TAKEN ON THIS RECLAMATION PLAN

_____ Approved _____ Denied _____ Approved with Additional Terms and Conditions

By: Lee Koon

~~DIVISION DIRECTOR~~
Section Manager

Date: 2-7-2020