# GROUNDWATER MONITORING PLAN: LUCK CHEROKEE

OLD POST ROAD
CHEROKEE COUNTY, SOUTH CAROLINA

LUCK COMPANIES

**Prepared For:**
Luck Stone Corporation
P.O. Box 29682
Richmond, Virginia 23242

SOUTH CAROLINA
BUNNELL-LAMMONS ENGINEERING, INC.
No. CO1452
CERTIFICATE OF AUTHORIZATION

BLE Project Number 24-24056

**May 12, 2025**

SOUTH CAROLINA
REGISTERED PROFESSIONAL GEOLOGIST
No. 2844
5/12/25
TIMOTHY JOHN DANIEL

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 27867
5/12/2025
DAVID R. LOFTIS

BUNNELL LAMMONS ENGINEERING
6004 Ponders Court | Greenville, SC 29615
864.288.1265 864.288.4330 info@blecorp.com
BLECORP.COM

BUNNELL LAMMONS ENGINEERING

May 12, 2025

Luck Companies
P.O. Box 29682
Richmond, Virginia 23242

Attention: Mr. Bruce Smith
Greenfield Development Manager

Subject: **Groundwater Monitoring Plan: Luck Cherokee**
Luck Companies
Cherokee County, South Carolina
BLE Project Number 24-24056

Dear Mr. Smith:

As authorized, Bunnell Lammons Engineering, Inc. (BLE) has prepared the Groundwater Monitoring Plan (GWMP) herein in association with the proposed Luck Companies aggregate quarry in Cherokee County, South Carolina (herein referred to as the "Site"). The plan herein provides details regarding the monitoring of groundwater elevation prior to and during operation of the proposed aggregate quarry in accordance with South Carolina Department of Environmental Services (SCDES) Form MR-400. A hydrogeologic assessment report including estimated drawdown of the water table surrounding the facility was submitted by BLE under a separate cover on May 1, 2025.

If you have any questions concerning this report, please contact Timothy J. Daniel at (864) 288-1265.

Sincerely,
**BUNNELL LAMMONS ENGINEERING INC.**

Timothy J. Daniel, P.G.
Project Geologist
Registered, South Carolina #2385

SOUTH CAROLINA REGISTERED PROFESSIONAL GEOLOGIST No. 2844 5/12/25 TIMOTHY JOHN DANIEL

David R. Loftis, P.E.
Senior Engineer
Registered, South Carolina #27867

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 27867 5/12/2025 DAVID R. LOFTIS

cc: Jeremy Eddy – South Carolina SCDES, Mining Reclamation
Mark Williams – Luck Companies
Clint Courson, CHMM – Hodges, Harbin, Newberry & Tribble
Brant Lane, P.E. – Hodges, Harbin, Newberry & Tribble

## TABLE OF CONTENTS



## FIGURES

# 1.0 INTRODUCTION

## 1.1 Background Information and Objective

BLE has prepared this GWMP on behalf of Luck Companies in association with the proposed Luck Cherokee aggregate quarry. The Site is located north of Old Post Road and interstate I-85, approximately five miles west of Gaffney, Cherokee County, South Carolina (see **Figure 1**).

This GWMP was prepared for submittal to the Mining Reclamation Section of the South Carolina Department Environmental Services (SCDES) as required by SCDES Form MR-400 (Application for a Mine Operating Permit). The GWMP provides details regarding the collection of baseline groundwater elevations prior to site development and to document changes in water table elevations during mining activities.

# 2.0 GROUNDWATER MONITORING

## 2.1 Groundwater Monitoring Well Locations

The proposed groundwater monitoring network for the Luck Cherokee facility consists of five (5) groundwater monitoring wells (see **Figure 2**). Four (4) wells (MW-1D, MW-2, MW-3, MW-4) will be installed to intersect water bearing fractures within the bedrock aquifer across the Site. One (1) well (MW-1S) will be installed to monitor groundwater in the shallow residuum in the general vicinity of private wells near the southern property boundary.

## 2.2 SCDES Well Permit Application

A monitoring well installation permit application will be submitted to SCDES for approval prior to performing well installation activities. The application package will include the following:

- SCDES Form D-3736;
- Drilling procedures;
- Monitoring well construction procedures;
- A typical monitoring well construction diagram;
- A site location map; and
- A site plan showing the proposed well locations.

Once a SCDES Permit has been issued, the monitoring wells will be scheduled for installation.

## 2.3 Groundwater Monitoring Well Construction

A South Carolina licensed well driller will perform the well installations, under the supervision of qualified field personnel at the direction of a South Carolina licensed Geologist or Engineer. The monitoring wells will be constructed in accordance with South Carolina Well Construction Standards – *SCDES Regulation No. 61-71.H*.

Groundwater monitoring wells set to intersect water bearing fractures within the bedrock aquifer will be constructed of 6-inch nominal diameter Schedule 40 PVC pipe (or similar) from the ground surface to the top

of competent bedrock. The remainder of each well will be completed "open hole", from the top of competent bedrock to the total depth. No well screen will be used unless site-specific conditions require it.

Groundwater monitoring wells installed in shallow residuum above the bedrock will be constructed of 2-inch nominal diameter Schedule 40 PVC casing inserted into a 6-inch (or larger) diameter borehole. The bottom 10-foot section will be a manufactured well screen with 0.010-inch-wide slots. Silica filter sand will be placed in the borehole annulus around the well screen. A hydrated bentonite seal will be placed on top of the filter sand backfill to seal the monitoring well at the desired level. The remaining well annulus will be grouted with a 5% bentonite-cement mixture to within one-foot of the ground surface.

The surface completion of each well will consist of a locking protective steel cover, with a 3-foot by 3-foot concrete pad. A vent hole will be drilled in the PVC casing near the top of the well and a weep hole will be drilled near the base of the steel cover. Each well will have an identification tag secured to the locking steel cover with its corresponding well number and construction details.

A licensed land surveyor registered in South Carolina will perform the as-built surveying for each well.

### 2.4 Monitoring Intervals, Data Collection, and Reporting

The proposed monitoring well locations were selected to monitor changes in water table elevation across the Site. Proposed monitoring wells MW-1S, MW-1D, MW-2, and MW-3 are located in the vicinity of private drinking water wells south, west, and north of the proposed extraction area (see **Figure 2**). Proposed monitoring well MW-4 is located between the proposed facility and Thicketty Creek Watershed Reservoir No. 19.

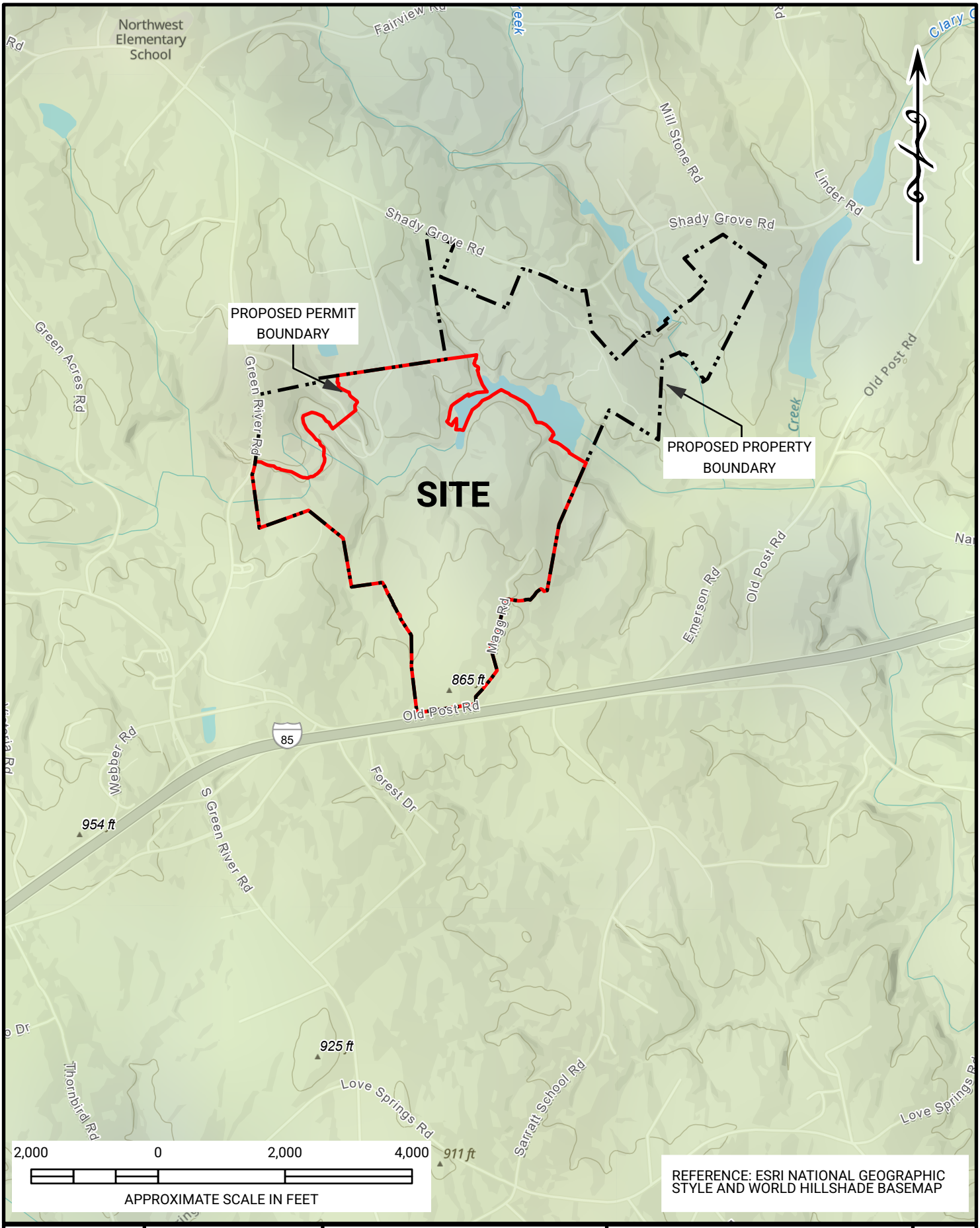
Monthly monitoring will consist of depth to groundwater measurements collected from each groundwater monitoring well at the facility and daily precipitation measurements from a tipping bucket rain gauge with integrated datalogger. Groundwater elevations will be normalized to the North American Vertical Datum of 1988 (NAVD88) and plotted over time for each monitoring well.

Quarterly data reports will be submitted to the Division of Mining and Solid Waste Management (DMSWM) by the 28th day of the month following the end of the quarter. Each quarterly report will include a description of the field procedures and observations, groundwater elevation data plotted over time, and a record of daily precipitation measurements with monthly rainfall totals presented in graphical form.

Should the DSMWM identify groundwater elevation trends that could cause significant adverse impacts to nearby wells, a South Carolina-licensed professional geologist or engineer will be retained to conduct a further investigation of the potential impacts.

No groundwater sampling activities for laboratory analysis are planned.

# FIGURES




| | | | |
|---|---|---|---|
| DRAWN: TAO | DATE: 4-30-25 | BUNNELL LAMMONS ENGINEERING | SITE LOCATION MAP<br>PROPOSED LUCK CHEROKEE<br>CHEROKEE COUNTY, SOUTH CAROLINA |
| CHECKED: TJD | FILE: 24-24056 SLM | | FIGURE 1 |
| APPROVED: DRL | JOB NO: 24-24056 | | |

## LEGEND

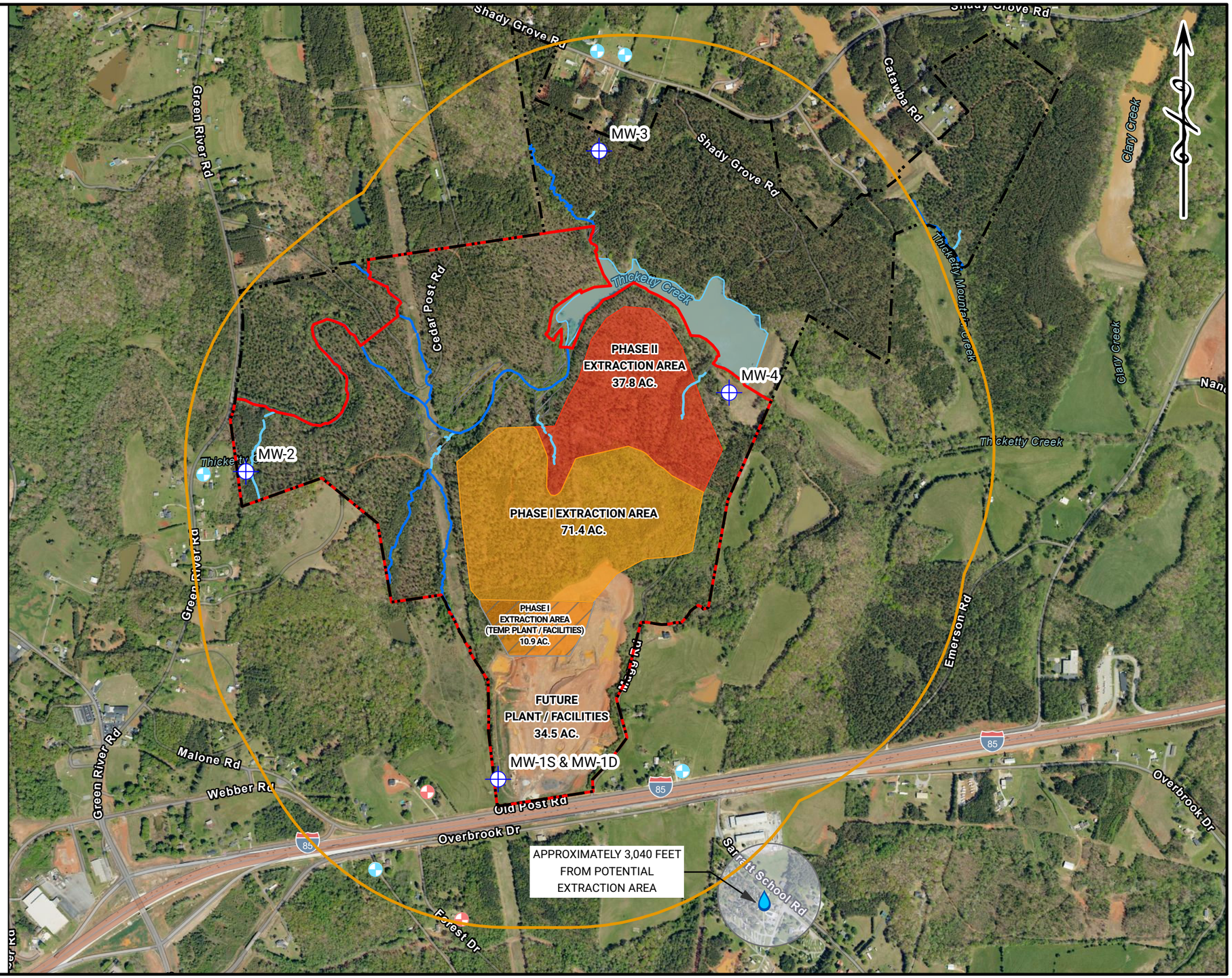
- PROPOSED GROUNDWATER MONITORING WELL
- PROPOSED PROPERTY BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PHASE 1 EXTRACTION AREA
- PHASE 1 EXTRACTION AREA AND TEMPORARY PLANT FACILITIES
- PHASE 2 EXTRACTION AREA
- 0.5 MILE RADIUS AROUND PROPOSED EXTRACTION AREA
- CONFIRMED PRIVATE DRINKING WATER WELL
- SUSPECTED PRIVATE DRINKING WATER WELL
- PUBLIC WATER SUPPLY WELL PWSW
- EXISTING LOW VOLUME BUFFER 500 FEET
- JURISDICTIONAL SURFACE WATER
- JURISDICTIONAL INTERMITTENT STREAM
- JURISDICTIONAL PERENNIAL STREAM
- JURISDICTIONAL WETLANDS

NOTES:
1. PROPOSED GROUNDWATER MONITORING WELL LOCATIONS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON SITE CONDITIONS ENCOUNTERED AT TIME OF DRILLING.
2. PRIVATE DRINKING WATER WELL LOCATIONS ARE APPROXIMATE.
3. VEHICULAR AREA RECONNAISSANCE PERFORMED BY BLE IN SEPTEMBER 2024.

REFERENCES:
PROPOSED BOUNDARIES PROVIDED BY HODGES, HARBIN, NEWBERRY TRIBBLE; PUBLIC WATER SUPPLY WELL AND PROTECTION ZONES SOUTH CAROLINA DEPT. OF ENVIRONMENTAL SERVICES FORMERLY SC DHEC GIS CLEARINGHOUSE; ROADS US CENSUS, TIGER 2023 ; BASEMAP US NAIP NATURAL COLOR IMAGERY DATED 4 26 2021

1,000 0 1,000 2,000

APPROXIMATE SCALE IN FEET




| | | | | | |
|---|---|---|---|---|---|
| DRAWN BY: | TAO | DATE: | 5-1-25 | REVISIONS | |
| CHECKED BY: | TJD | FILE NAME: | 24056 GWMN | No. / DESCRIPTION / BY | |
| APPROVED BY: | DRL | JOB NO: | 24-24056 | | |

BUNNELL LAMMONS ENGINEERING

PROPOSED GROUNDWATER MONITORING NETWORK
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
2