



**CONSTRUCTION PERMIT APPLICATION
LUCK EDGEFIELD**

Luck Edgefield
Clarks Hill, South Carolina

Prepared by:

GEL Engineering, LLC
2040 Savage Road
Charleston, South Carolina 29407

March 2024

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BAQ PERMITTING

CONSTRUCTION PERMIT APPLICATION

LUCK EDGEFIELD
CLARKS HILL, SOUTH CAROLINA

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Matthew Wike, P.E.
SC State Registration No. 22843



GEL Engineering, LLC
Certificate of Authorization No. C02649

Affixed P.E. Seal only covers information provided in the following sections: Summary, Permit Application Forms, and Emission Assumptions and Calculations.

CONSTRUCTION PERMIT APPLICATION

LUCK EDGEFIELD CLARKS HILL, SOUTH CAROLINA

1.0 OVERVIEW OF PERMIT APPLICATION

Luck Edgefield is submitting this application to obtain a construction permit for a proposed aggregate mine and processing facility near Edgefield in Clarks Hill, South Carolina. This is the original construction permit application and no permit for this site has been issued by the South Carolina Department of Health and Environmental Control (DHEC) Bureau of Air Quality (BAQ).

The facility requests federally enforceable conditions limiting particulate matter (PM) and PM with an aerodynamic diameter of less than or equal to 10 microns (PM₁₀) to below Title V applicable major source levels of 100 tons per year. The facility will utilize wet suppression to achieve emissions below major source levels.

This construction permit application is being submitted for the following emission sources associated with the aggregates mine and processing operations:

- Mining and Material Handling;
- Material Storage;
- Haul Roads; and
- Customer Roads.

The site location and boundary map of the Luck Edgefield facility is shown as Figure 1. A process flow diagram is provided as Figure 2. A narrative summary of potentially applicable state and federal regulations is provided in Section 3.0.

2.0 DESCRIPTION OF PROCESSES AND EMISSIONS

Luck Edgefield will soon operate an aggregate mine and processing facility near Edgefield in Clarks Hill, South Carolina. The portable facility will be capable of crushing aggregate at a rate of 500 tons per hour from the primary crusher. The process starts inside the pit where the stone will be mined and transported in trucks using plant haul roads. The stone will be dumped into the primary jaw crushing station where stone will be initially crushed and conveyed to the first screening station. At the first screening station, the material will be screened and conveyed to storage piles or conveyed to the cone crusher or secondary screen. At the secondary screening station, the material will be screened and conveyed to storage piles or conveyed to a second cone crusher or tertiary screen. At the tertiary screening station, the material will be screened and then either conveyed to storage piles, recycled back to the crushers/screens, or conveyed to the wash plant. The wash plant is a totally wet process that is not expected to generate air emissions.

Lastly, the material will be transferred to customer trucks from one of the storage piles and the trucks will exit the site using the customer haul roads.

Emissions from the aggregates mine and processing plant will consist of the criteria pollutants PM, PM₁₀, and PM with an aerodynamic diameter of less than or equal to 2.5 microns (PM_{2.5}). Each crusher, screen, and conveyor will be equipped with wet suppression to reduce emissions. A more detailed description of the above operations is provided in the Emission Assumptions and Calculations (EA&C) section of this permit application.

3.0 SUMMARY OF REGULATORY COMPLIANCE

This section contains a comprehensive regulatory review for the air emissions from the proposed aggregates mine and processing plant at the Luck Edgefield facility. The regulations that were identified as being potentially applicable are summarized below and discussed in detail in Sections 3.1 through 3.14.

- South Carolina Emissions from Fuel Burning Operations (R.61-62.5, Standard No. 1);
- South Carolina Ambient Air Quality Standards (R.61-62.5, Standard No. 2);
- South Carolina Waste Combustion and Reduction (R.61-62.5, Standard No. 3) and South Carolina Hospital, Medical, Infectious Waste Incinerators (R.61-62.5, Standard No. 3.1);
- South Carolina Emissions From Process Industries Standard (R.61-62.5, Standard No. 4);
- South Carolina Volatile Organic Compounds Standard (R.61-62.5, Standard No. 5);
- South Carolina Control of Oxides of Nitrogen Standard (R.61-62.5, Standard No. 5.2);
- South Carolina Prevention of Significant Deterioration (PSD) Standard (R.61-62.5, Standard No. 7);
- South Carolina Nonattainment New Source Review (NSR) Standard (R.61-62.5, Standard 7.1);
- South Carolina Toxic Air Pollutants Standard (R.61-62.5, Standard No. 8);
- Standards of Performance for New Stationary Sources (40 CFR Part 60);
- National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61);
- National Emission Standards for Hazardous Air Pollutants for Source Categories (40 CFR Part 63);

- Compliance Assurance Monitoring (40 CFR Part 64); and
- Chemical Accident Prevention (40 CFR Part 68).

3.1 South Carolina Emissions from Fuel Burning Operations (Standard No. 1)

The South Carolina Emissions from Fuel Burning Operations Standard (R.61-62.5, Standard No. 1) establishes standards for fuel burning operations including limitations on visible emissions, PM emissions, and sulfur dioxide (SO₂) emissions (Sections I, II, and III, respectively). There are no fuel burning operations (with the exception of the insignificant activity generator that is exempt from this rule) associated with the proposed aggregates mining and processing operations at Luck Edgefield. Therefore, Luck Edgefield is not subject to this standard.

3.2 South Carolina Ambient Air Quality Standards (Standard No. 2)

The South Carolina Ambient Air Quality Standards (SCAAQS - R.61-62.5, Standard No. 2) establish ambient air quality standards for PM₁₀, PM_{2.5}, carbon monoxide (CO), SO₂, nitrogen dioxide (NO₂), ozone, and lead. Emissions from the Luck Edgefield facility will include PM₁₀ and PM_{2.5}. Compliance with Standard No. 2 is demonstrated using air dispersion modeling.

An air dispersion modeling demonstration was performed because PM₁₀ emissions from the group of mining and material handling emission sources are greater than 1.14 pounds per hour (lb/hr). The 1.14 lb/hr PM₁₀ and PM_{2.5} de minimis levels are established in the DHEC document "Modeling Guidelines for Air Quality Permits" dated October 2018 (revised April 2019). The entire group (as opposed to per source) of PM₁₀ emissions was used to conservatively ensure the aggregate mine and processing facility will comply with Standard No. 2. Therefore, an air dispersion modeling demonstration for PM₁₀ emissions is being submitted for the mining and material handling operations. As shown in the Air Dispersion Modeling Results section of this application, PM₁₀ emissions will comply with Standard No. 2.

The entire group of emissions of PM_{2.5} from the mining and material handling operations are less than 1.14 lb/hr, and therefore, no modeling is required for PM_{2.5} emissions. Additionally, modeling for PM₁₀ or PM_{2.5} emissions from the material storage, haul road process, or customer road process is not required since emissions from those processes (entire group of sources within each process) are less than 1.14 lb/hr. Therefore, no air dispersion modeling is required for PM_{2.5} emissions from this facility.

3.3 South Carolina Waste Combustion and Reduction (Standard No. 3) and South Carolina Hospital, Medical, Infectious Waste Incinerators (Standard No. 3.1)

Both the South Carolina Waste Combustion and Reduction Standard (Standard No. 3) and South Carolina Hospital, Medical, Infectious Waste Incinerators Standard (Standard No. 3.1) establish emission limits and standards for various types of waste combustion sources, hospital, medical, and infectious waste incinerators.

The aggregates mine and processing facility does not include any waste combustion and reduction sources. Additionally, the proposed aggregates mining and processing facility is not classified as a hospital, medical, or infectious waste incinerator. Therefore, Luck Edgefield is not subject to this standard.

3.4 South Carolina Emissions from Process Industries Standard (Standard No. 4)

The South Carolina Emissions from Process Industries Standard (R.61-62.5, Standard No. 4) establishes emission standards for specific process industries as well as for general process industries. None of the specific process industry categories listed in Sections II through VII apply to Luck Edgefield. The aggregates mine and processing operations at Luck Edgefield are subject to Standard No. 4, Section VIII - Other Manufacturing, Section IX - Visible Emissions (where not specified elsewhere), and Section X – Non-Enclosed Operations.

The following section discusses Luck Edgefield’s compliance with the applicable provisions of Standard No. 4.

Particulate Matter Emissions (Standard No. 4, Section VIII)

This standard requires that particulate emissions from general process industries be limited to the value in Table 1 of Standard No. 4, Section VIII regulation. Interpolation of Table 1 can be obtained by the following equation for process weight rates up to 30 tons per hour:

$$E = F \times 4.10 \times P^{(0.67)}$$

where:

E = allowable particulate emission rate in pounds per hour

F = effect factor (F = 0.25 for acid mists, F = 1.0 for all other pollutants)

P = process weight rate in tons per hour

For process weight rates greater than 30 tons per hour, this standard requires that particulate emissions from general process industries be interpolated by the following equation:

$$E = F \times (55.0 \times P^{(0.11)} - 40)$$

where:

E = allowable particulate emission rate in pounds per hour

F = effect factor (F = 0.25 for acid mists, F = 1.0 for all other pollutants)

P = process weight rate in tons per hour

The proposed aggregates mining and material handling operation is subject to and will comply with this standard as shown below:

Process	Process Weight Rate (tons/hour)	Estimated Controlled Hourly PM Emission Rate (lbs/hr)	Allowable Hourly PM Emission Rate (lbs/hr)
Mining and Material Handling	500	7.14	68.96

Visible Emissions (Standard No. 4, Section IX)

This standard requires that visible emissions, including fugitive emissions, not exceed 40 percent opacity for existing sources where construction began on or before December 31, 1985, or 20 percent for new sources if constructed after this date (Parts A and B, respectively). All sources are subject to the 20 percent opacity standard.

Non-Enclosed Operations (Standard No. 4, Section X)

This standard requires the following:

- A. *All non-enclosed operations shall be conducted in such a manner that a minimum of particulate matter becomes airborne. In no case shall established ambient air quality standards be exceeded at or beyond the property line.*
- B. *The owner or operator of all such operations shall maintain dust control of the premises and any roadway owned or controlled by the owner or operator by paving or other suitable measures. Oil treatment is prohibited.*
- C. *All crushing, drying, classification, and like operations shall employ a suitable control device acceptable to the Department, and shall discharge no more particulate matter than that specified in Section VIII of this standard.*

The facility will be in compliance with Standard No. 2 and therefore will not exceed the ambient air quality standards at or beyond the property line. Additionally, the facility will maintain wet suppression for dust control and will maintain a fugitive dust plan to demonstrate compliance with this regulation. Wet suppression on the mine hauling roads and customer access roads will be accomplished by spray from mobile water trucks. Each crusher, screen, and conveyor will be equipped with wet suppression valves. The wet suppression system will be operated by the control room. Water spray valves will be

activated prior to the initiation of operations. Operation of the water spray valves will be controlled to minimize water use such as closing water spray valves on non-operating equipment. The primary source of water for dust suppression systems will be the water that is collected in the sump of the mine pit, which is a combination of stormwater runoff and groundwater infiltration. If necessary, make-up water could be supplied by onsite wells or the County water distribution system.

3.5 South Carolina Volatile Organic Compounds Standard (Standard No. 5)

The South Carolina Volatile Organic Compounds Standard (R.61-62.5, Standard No. 5) applies to specific existing industrial sources constructed before July 1, 1979, or July 1, 1980, that have total potential volatile organic compounds (VOC) emissions of more than 550 pounds in any one day or more than 150 pounds in any one hour. This standard applies to existing processes statewide except in the following six counties: Anderson, Bamberg, Barnwell, Fairfield, Darlington, and Hampton (Standard No. 5, Part B.1).

The Luck Edgefield facility will be constructed after July 1, 1980, and is not expected to emit VOCs. Therefore, Luck Edgefield is not subject to this standard.

3.6 South Carolina Control of Oxides of Nitrogen Standard (Standard No. 5.2)

The South Carolina Control of Oxides of Nitrogen Standard (R.61-62.5, Standard No. 5.2) applies to any stationary source that emits or has the potential to emit NO_x generated from fuel combustion that has not undergone a Best Available Control Technology (BACT) analysis for NO_x in accordance with Regulation 61-62.5, Standard No. 7, and that meets one or more of the three criteria specified in Section I (a)(1) through (a)(3).

The proposed aggregates mine and processing operations will not emit NO_x from any stationary source. Therefore, Luck Edgefield is not subject to this standard.

3.7 South Carolina PSD Standard (Standard No. 7)

The South Carolina PSD Standard (R.61-62.5, Standard No. 7) applies if the facility is classified as a "major" source as defined under this regulation, or if the facility is classified as a "minor" source and is located in a county for which Minor Source Baseline Dates (MSBDs) for PM₁₀, PM_{2.5}, SO₂, and NO₂ have been established.

Major Source Review

Mining and aggregates plants are not one of the 28 source categories subject to the 100 tpy PSD major source threshold. Total uncontrolled potential emissions of particulates exceed the 250 tpy threshold. However, the facility requests federally enforceable facility-wide emission limits for PM to remain below the PSD major source threshold of 250 tpy and for PM and PM₁₀ Title V threshold of 100 tpy.

The major source applicability under the PSD regulations is determined based on a facility's potential to emit. Potential to emit is defined under Standard No. 7, Part D as:

The maximum capacity of a plant to emit a pollutant under its physical and operational design. Any physical or operational limitations on the capacity of the plant to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

Luck Edgefield will operate under the emission limitations described above. Therefore, Luck Edgefield will not be considered a major source under the PSD regulations.

MSBD Compliance

The facility will be in Edgefield County for which MSBDs have not been established for any pollutants. Per DHEC BAQ's document "Modeling Guidelines for Air Quality Permits" dated October 2018 (revised April 2019), no air dispersion modeling is required for Standard No. 7 for non-PSD projects unless specifically requested by DHEC BAQ.

3.8 South Carolina Nonattainment NSR Standard (Standard No. 7.1)

The South Carolina Nonattainment NSR Standard (R.61-62.5, Standard No. 7.1) applies to major sources constructed or modified in any nonattainment area designated in 40 CFR Part 81.341 if the emissions from such facility will cause or contribute to concentrations of a regulated NSR pollutant for which the nonattainment area was designated as nonattainment.

Since Edgefield County is not designated as a nonattainment area, Standard No. 7.1 is not applicable at this time. Therefore, Luck Edgefield is not subject to this standard.

3.9 South Carolina Toxic Air Pollutants Standard (Standard No. 8)

The South Carolina Toxic Air Pollutants (TAPs) Standard (R.61-62.5, Standard No. 8) requires Luck Edgefield to identify and quantify emissions of South Carolina TAPs to determine compliance with established ambient air quality standards for these TAPs. This regulation establishes standards for approximately 255 TAPs, including most of the 187 hazardous air pollutants (HAPs) established by Title III of the Clean Air Act Amendments.

Luck Edgefield is not subject to this standard since they will not emit TAPs.

3.10 Standards of Performance for New Stationary Sources (40 CFR Part 60)

The following sections describe New Source Performance Standards (NSPS) promulgated under 40 CFR Part 60 that could potentially apply to the aggregate operations included in this project.

Nonmetallic Mineral Processing Plants (Subpart OOO)

This NSPS applies to nonmetallic mineral processing plants that commenced construction, modification, or reconstruction after August 31, 1983.

A nonmetallic mineral processing plant is defined as any combination of equipment that is used to crush or grind any nonmetallic mineral wherever located, including lime plants, power plants, steel mills, aggregates concrete plants, portland cement plants, or any other facility processing nonmetallic minerals except as provided in §60.670 (b) and (c). Luck Edgefield will handle and crush nonmetallic minerals as defined in Subpart OOO and therefore, the aggregates mine and processing facility is subject to this standard.

Each crusher, screen, and conveyor is subject to the rule. Subpart OOO does not apply to drilling, non-enclosed truck loading, or storage piles as those sources are not listed in §60.670(a). Since the facility is comprised entirely of fugitive emissions, only the fugitive PM emission limits and compliance requirements of Table 3 and §60.672(b) apply. Table 3 of Subpart OOO lists the following requirements that are applicable to a facility that will commence construction after April 22, 2008:

- 7 percent opacity for conveyor transfer points and screens;
- 12 percent opacity for crushers;
- Initial Performance Test;
- Periodic inspections of water sprays per §60.674 (b); and
- Reporting and recordkeeping requirements of water sprays under §60.676.

Stationary Compression Ignition Internal Combustion Engines (Subpart IIII)

The NSPS for stationary compression ignition internal combustion engines, as outlined in 40 CFR Part 60, Subpart IIII, specifies standards to reduce PM, NO_x, CO, and non-methane hydrocarbons (NMHC) emissions.

The facility will be installing a portable 550-kilowatt diesel-fired generator that will not be subject to Subpart IIII since the generator will be a nonroad engine. 40 CFR Part 1068.30 states "(1) a nonroad engine is any internal combustion engine: (iii) that, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform."

In addition, 40 CFR Part 1068.30 states that which is not a nonroad engine: "(2) an internal combustion engine is not a nonroad engine if: (iii) [t]he engine otherwise included in paragraph (1)(iii) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e., at least two years) and that operates at that single location approximately three months (or more) each year."

Since the 550-kilowatt diesel-fired generator is portable and it will be moved and will not remain at a location for more than 12 consecutive months, the generator is not subject to this standard because it is not a stationary generator.

Stationary Spark Ignition Internal Combustion Engines (Subpart JJJJ)

The NSPS for stationary spark ignition internal combustion engines (Subpart JJJJ) specifies standards to reduce NO_x, CO, and VOC emissions.

Luck Edgefield will not maintain any stationary spark ignition internal combustion engines. Therefore, Luck Edgefield is not subject to this standard.

3.11 National Emission Standards for HAPs (40 CFR Part 61)

40 CFR Part 61 establishes National Emission Standards for Hazardous Air Pollutants (NESHAPs) in Subparts A through FF. None of the NESHAPs found in 40 CFR Part 61 applies to the emission sources at Luck Edgefield.

3.12 National Emission Standards for HAPs for Source Categories (40 CFR Part 63)

40 CFR Part 63 establishes technology-based regulations for specific source categories emitting any of the 187 compounds designated by the EPA as HAPs. The EPA regulates emissions of HAPs from major and area sources as promulgated under a NESHAP. Facilities that are required to demonstrate compliance with a particular NESHAP must employ Maximum Achievable Control Technology (MACT) as specified in the regulation.

Under 40 CFR Part 63, a major source is defined as any stationary source emitting 10 tpy or more of any individual HAP, or 25 tpy or more of any combination of HAPs. An area source of HAPs is a facility that is not a major source of HAPs, is not located at a major source, and is not part of a major source of HAP emissions.

Since the facility will not emit any HAPs, none of the 40 CFR Part 63 standards apply to Luck Edgefield. The generator is not subject to 40 CFR Part 63 Subpart ZZZZ for the same reason as the generator is not subject to 40 CFR Part 60 Subpart IIII. See a more detailed explanation in Section 3.10. Therefore, Luck Edgefield is not subject to this standard.

3.13 Compliance Assurance Monitoring

The 40 CFR Part 64 Compliance Assurance Monitoring (CAM) regulation was developed to provide reasonable assurance that facilities comply with emissions limitations by monitoring the operation and maintenance of their control devices. CAM applies to an emissions unit if all the following criteria are met:

- the unit is located at a major source for which a Title V permit is required; and
- the unit is subject to an emission limitation or standard; and
- the unit uses a control device to achieve compliance with a federally enforceable limit or standard; and
- the unit has potential pre-control or post-control emissions of at least 100% of the major source amount; and
- The unit is not otherwise exempt from CAM.

The Luck Edgefield facility will not be a major source and will not need a Title V permit due to federally enforceable emission limitations. Therefore, Luck Edgefield is not subject to this standard.

3.14 Chemical Accident Prevention (40 CFR Part 68)

The Chemical Accident Prevention regulation applies to chemicals listed in 40 CFR Part 68 that are stored in excess of the thresholds set in 40 CFR Part 68.

Luck Edgefield is not subject to 40 CFR Part 68 since the facility does not store chemicals over the applicability threshold.

Table 1
Facility Summary of Emissions
Luck Edgefield
Clarks Hill, South Carolina

Emissions Source Description	Uncontrolled PM		Controlled PM ¹		Uncontrolled PM ₁₀		Controlled PM ₁₀ ¹		Uncontrolled PM _{2.5}		Controlled PM _{2.5} ¹	
	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)
Mining and Material Handling	83.39	365.27	7.14	31.29	30.50	133.58	2.59	11.36	4.62	20.23	0.40	1.76
Material Storage	0.61	2.68	0.61	2.68	0.306	1.34	0.306	1.34	0.044	0.19	0.044	0.19
Haul Roads	2.87	12.56	0.29	1.26	0.82	3.57	0.08	0.36	0.08	0.36	0.01	0.04
Customer Roads	12.50	54.76	1.25	5.48	3.69	16.16	0.37	1.62	0.37	1.62	0.04	0.16
Totals	99.38	435.27	9.29	40.70	35.31	154.66	3.35	14.67	5.11	22.39	0.49	2.15

Notes:

1. PM emissions do not require modeling.
2. Controlled PM₁₀ emissions from Mining and Material Storage require modeling due to cumulative emission rate greater than 1.14 lbs/hr.
3. Cumulative PM_{2.5} emissions are below 1.14 lbs/hr and do not require modeling.



SECTION 1 - FACILITY IDENTIFICATION

SC Air Permit Number (8-digits only) <i>(Leave blank if one has never been assigned)</i>	Application Date March 2024
Facility Name/Legal Identity <i>(This should be the official legal name under which the facility is owned/operated and should be consistent with the name registered with the S.C. Secretary of State's office, as applicable.)</i> Luck Stone Corporation	
Facility Site Name (Optional) <i>(Please provide any alternative or additional identifier of the facility, such as a specific plant identifier (e.g., Columbia plant) or any applicable "doing business as" (DBA) identity. This name will be listed on the permit and used to identify the facility at the physical address listed below.)</i> Luck Edgefield	
Facility Federal Tax Identification Number <i>(Established by the U.S. Internal Revenue Service to identify a business entity)</i> 54-0630628	

REQUEST TYPE (Check all that apply)

Exemption Request: <input type="checkbox"/> Complete Section 1 and attach documentation to support exemption request.
Construction Application: <input type="checkbox"/> Minor New Source Review Project <input checked="" type="checkbox"/> Synthetic Minor Project <input type="checkbox"/> Prevention of Significant Deterioration Project <input type="checkbox"/> 112(g) Project
Expedited Review Request: <input type="checkbox"/> If checked, include Expedited Form D-2212 in the construction application package.
Construction Permit Modification: <input type="checkbox"/> Provide the construction permit ID (e.g. CA, CB, etc.) for which modification is requested:
Application Revision: <input type="checkbox"/>

CONSTRUCTION PERMIT APPLICATION FORMS BEING REVISED

(Amended construction permit forms must be filled out completely and attached to this modification request.)

Form #	Date of Original Submittal	Brief Description of Revision
D-2566	NA	NA
D-2573	NA	NA

FACILITY PHYSICAL ADDRESS

Physical Address: RD 659D (Temporary Address as no physical address has been designated yet)		County: Edgefield
City: Clarks Hill	State: SC	Zip Code: 29821
Facility Coordinates <i>(Facility coordinates should be based at the front door or main entrance of the facility)</i>		
Latitude: 33° 37' 24"		Longitude: 82° 05' 33"



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FACILITY'S PRODUCTS / SERVICES	
Primary Products / Services <i>(List the primary product and/or service)</i> Granite	
Primary <u>SIC Code</u> <i>(Standard Industrial Classification Codes)</i> 1423	Primary <u>NAICS Code</u> <i>(North American Industry Classification System)</i> 212313
Other Products / Services <i>(List other products and/or services)</i> NA	
Other SIC Code(s): NA	Other NAICS Code(s): NA

PROJECT DESCRIPTION
Project Description (What, why, how, etc.): Luck Edgefield will soon operate an aggregate mine and processing facility in Edgefield, South Carolina. The portable facility will be capable of crushing 500 tons per hour from the primary crusher. The process starts inside the pit where the stone will be mined and transported in trucks using plant haul roads. The stone will be dumped into the primary jaw crushing station where stone will be initially crushed and conveyed to the first screening station. At the first screening station, the material will be screened and conveyed to storage piles or conveyed to the cone crusher or secondary screen. At the secondary screening station, the material will be screened and conveyed to storage piles or conveyed to a second cone crusher or tertiary screen. At the tertiary screening station, the material will be screened and then either conveyed to storage piles, recycled back to the crushers/screens, or conveyed to the wash plant. The wash plant is a totally wet process that is not expected to have emissions. Lastly, the material will be transferred to customer trucks from one of the storage piles and the trucks will exit the site using the customer haul roads.

AIR PERMIT FACILITY CONTACT			
<i>(Person listed will be in our files as the point of contact for all air permitting related questions and will receive all air permitting notifications.)</i>			
Title/Position: Environmental Manager	Salutation: Mr.	First Name: Mark	Last Name: Williams
Mailing Address: P.O. Box 29682			
City: Richmond	State: VA	Zip Code: 23242	
E-mail Address: markdwilliams@luckcompanies.com	Primary Phone No.: 804-476-6404	Alternate Phone No.: 804-641-1457	

The signed permit will be e-mailed to the designated Air Permit Contact. If additional individuals need copies of the permit, please provide their names and e-mail addresses.	
Name	E-mail Address
Matthew Wike	Matthew.wike@gel.com

CONFIDENTIAL INFORMATION / DATA
Is <u>confidential information</u> or data being submitted under separate cover? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes*
<i>*If yes, submit ONLY ONE COMPLETE CONFIDENTIAL APPLICATION, with original signature, along with the public version of the application.</i>

CO-LOCATION DETERMINATION
Are there other facilities in close proximity that could be considered collocated? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes*
If yes, list potential collocated facilities, including air permit numbers if applicable: NA
<i>*If yes, please submit <u>collocation applicability determination</u> details in an attachment to this application.</i>



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OWNER OR OPERATOR			
Title/Position: Environmental Manager	Salutation: Mr.	First Name: Mark	Last Name: Williams
Mailing Address: P.O. Box 29682			
City: Richmond		State: VA	Zip Code: 23242
E-mail Address: markdwilliams@luckcompanies.com		Primary Phone No.: 804-476-6404	Alternate Phone No.: 804-641-1457

OWNER OR OPERATOR SIGNATURE	
I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, supporting documentation, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.	
	3/21/2024
Signature of Owner or Operator	Date

APPLICATION PREPARER (if other than Professional Engineer below)			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:

PROFESSIONAL ENGINEER INFORMATION			
Consulting Firm Name: GEL Engineering, LLC		SC Certificate of Authority License No.: C02649	
Title/Position: Senior Engineer	Salutation: Mr.	First Name: Matthew	Last Name: Wike
Mailing Address: 2040 Savage Road			
City: Charleston		State: SC	Zip Code: 29407
E-mail Address: matthew.wike@gel.com		Phone No.: 843-300-4252	Cell No.: 843-697-2205
SC License/Registration No.: 22843			

PROFESSIONAL ENGINEER SIGNATURE
I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this construction permit application as it pertains to the requirements of <i>South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards.</i>

3-22-24
Signature of Professional Engineer Date





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EQUIPMENT / PROCESS INFORMATION					
Equipment ID/ Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Emission Point ID(s)
See EA&C	<input checked="" type="checkbox"/> Add <input type="checkbox"/> Remove <input type="checkbox"/> Modify <input type="checkbox"/> Existing	500 tph crushed aggregate mine and processing facility with wet suppression (See Summary and EA&C for details)	500 tph	NA	Fugitive

CONTROL DEVICE INFORMATION								
Control Device ID	Action	Control Device Description	Maximum Design Capacity (Units)	Inherent/ Required/ Voluntary	Pollutants Controlled (Include CAS #)	Capture Efficiency	Destruction/ Removal Efficiency	Emission Point ID(s)
NA (Wet Suppression will be used)	<input checked="" type="checkbox"/> Add <input type="checkbox"/> Remove <input type="checkbox"/> Modify <input type="checkbox"/> Existing	NA (Wet Suppression will be used)	NA	Required	PM/PM10 /PM2.5	NA	Varies (See EA&C)	Fugitive



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Check Box for information addressed	Required Information
Source identification and emissions:	
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Name of each source, process, and control device.
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Assign each source an Equipment ID. The IDs must match the IDs listed in Section 2 of this application.
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Assign an Emission Point ID for each source.
<input type="checkbox"/>	<ul style="list-style-type: none"> Assign a Control Device ID for each control device.
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> List each pollutant the source will emit.
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> List the Uncontrolled, Controlled, and PTE emissions for each source or equipment in lb/hr and tons/year.
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Emission rates for each pollutant should be totaled and listed in lb/hr and tons/year.
<input type="checkbox"/>	<ul style="list-style-type: none"> Provide the CAS# for each Hazardous Air Pollutant (HAP) and/or Toxic Air Pollutant (TAP).
Information to support emission rates:	
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Sample calculations.
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Emission factors. Include the source, revision date, specific table and/or chapters. Include source test data if factors were derived from source testing.
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Explanation of assumptions, bottlenecks, etc.
<input type="checkbox"/>	<ul style="list-style-type: none"> Source test information: A copy of the source test results may be requested. If the test results are not included in the application, the application should cite whether this was a DHEC approved test, and if not, explain where the test was conducted and other identifying information.
<input type="checkbox"/>	<ul style="list-style-type: none"> Manufacturer's data.
<input type="checkbox"/>	<ul style="list-style-type: none"> Vendor guarantees that support control device efficiencies.
<input type="checkbox"/>	<ul style="list-style-type: none"> New Source Review (NSR) analysis.
<input type="checkbox"/>	<ul style="list-style-type: none"> Other (e.g. example particle size analysis)

Existing (Permitted) Facilities		
Check Box	Required Information	Location in Application
<input checked="" type="checkbox"/>	Facility-wide emissions prior to construction/modification: <ul style="list-style-type: none"> Include an explanation if these emissions do not match the facility-wide emissions submitted in the last application. 	EA&C and Summary Table
<input checked="" type="checkbox"/>	Facility-wide emissions after construction/modification: <ul style="list-style-type: none"> Include net change, if applicable. 	EA&C and Summary Table
As applicable for the construction/ modification:		
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Name of each source. 	EA&C
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Assign each source an Equipment ID. The IDs must match the IDs listed in Section 2 of this application or on your current construction / operating permit. 	EA&C



Existing (Permitted) Facilities		
Check Box	Required Information	Location in Application
<input type="checkbox"/>	<ul style="list-style-type: none"> Assign a Control Device ID for each control device. 	NA
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Assign an Emission Point ID for each source. 	EA&C
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> List each pollutant the source will emit. 	EA&C
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> List the Uncontrolled, Controlled, and PTE (if applicable) emissions for each source or equipment. 	EA&C
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Emission rates for each pollutant should be totaled and listed in lb/hr and tons/year. 	EA&C
<input type="checkbox"/>	<ul style="list-style-type: none"> Provide the CAS# for each HAP and/or TAP. 	NA
Information to support facility-wide emission rates:		
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Sample calculations. 	EA&C
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Emission factors. Include the source, revision date, specific table and/or chapters. Include source test data if factors were derived from source testing. 	EA&C
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Explanation of assumptions, bottlenecks, etc. 	EA&C
<input type="checkbox"/>	<ul style="list-style-type: none"> Source test information: A copy of source the test results may be requested. If the results are not included in the application, the application should cite whether this was a DHEC approved test and if not, explain where the test was conducted and other identifying information. 	NA
<input type="checkbox"/>	<ul style="list-style-type: none"> Manufacturer's data. 	NA
<input type="checkbox"/>	<ul style="list-style-type: none"> Vendor guarantees that support control device efficiencies. 	NA
<input type="checkbox"/>	<ul style="list-style-type: none"> NSR analysis. 	NA
<input type="checkbox"/>	<ul style="list-style-type: none"> Other (please explain) 	NA



Section 4 Completeness Checklist for Regulatory Review

State and Federal Air Pollution Control Regulations and Standards

Perform a review of all State and Federal Air Pollution Control Regulations and Standards for applicability and attach a detailed narrative from the regulatory review to the permit application. If the standard or regulation is not applicable, state the reason. Check all regulations and standards that have been reviewed and addressed in the narrative.

Check Box	State and Federal Air Pollution Control Regulations and Standards
<input checked="" type="checkbox"/>	S.C. Regulation 61-62.1 Section II.E Synthetic Minor Construction Permits
<input checked="" type="checkbox"/>	S.C. Regulation 61-62.5 Air Pollution Control Standards
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Standard No. 1 Emissions from Fuel Combustion
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Standard No. 2 Ambient Air Quality
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Standard No. 3 Waste Combustion and Reduction (state only)
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Standard No. 4 Emissions from Process Industries <i>(Note: If Section VIII of this Standard applies, include the process weight rate (PWR) in ton per hour for each applicable source or process.)</i>
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Standard No. 5 Volatile Organic Compounds
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Standard No. 5.2 Nitrogen Oxides Lowest Achievable Emission Rate
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Standard No. 7 Prevention of Significant Deterioration (PSD)
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Standard No. 7.1 Nonattainment New Source Review (NSR)
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Standard No. 8 Toxic Air Pollutants (TAPs) (state only)
<input checked="" type="checkbox"/>	S.C. Regulation 61-62.6 Control of Fugitive Particulate Matter
<input checked="" type="checkbox"/>	S.C. Regulation 61-62.60 and 40 CFR Part 60 New Source Performance Standards (NSPS)
<input checked="" type="checkbox"/>	S.C. Regulation 61-62.61 and 40 CFR Part 61 National Emission Standards for Hazardous Air Pollutants (NESHAP)
<input checked="" type="checkbox"/>	S.C. Regulation 61-62.63 and 40 CFR Part 63 National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories
<input checked="" type="checkbox"/>	40 CFR Part 64 Compliance Assurance Monitoring (CAM)
<input checked="" type="checkbox"/>	S.C. Regulation 61-62.68 and 40 CFR Part 68 Chemical Accident Prevention Provisions
<input checked="" type="checkbox"/>	S.C. Regulation 61-62.70 and 40 CFR Part 70 Title V Operating Program
<input checked="" type="checkbox"/>	Other S.C. Air Pollution Control Regulations, as applicable.
<input checked="" type="checkbox"/>	Other Federal Air Pollution Control Regulations, as applicable.
<input checked="" type="checkbox"/>	40 CFR 98 Green House Gas (GHG) emissions <i>(Note: Quantify GHG emissions, if S.C. Regulation 61-62.5, Standard No. 7 or S.C. Regulation 61-62.5, Standard No. 7.1 is triggered.)</i>



Completeness Checklist:

For applicable federal and state regulations, the narrative should address the specific limitations, monitoring, recordkeeping, and reporting requirements associated with the new or altered source(s). Include the specific regulatory citations. Check all that have been reviewed and addressed in the narrative.

Check Box	Completeness Checklist:
Applicability Determination:	
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Is this regulation <i>applicable, reasonably applicable, potentially applicable, or not applicable?</i>
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Is the basis for the applicability determination explained?
Affected Sources:	
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Is the name and identification of each emission source or process included?
Compliance Demonstration:	
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • How will compliance be demonstrated?
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Are specific methods or activities to be utilized by the facility to demonstrate compliance with each specific limitation and/or requirement provided?
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Are control devices and control device requirements included?
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Are monitoring, recordkeeping, and reporting requirements necessary to demonstrate compliance included?
Regulatory Citations:	
<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> • Are the regulatory citations identified?



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A. APPLICATION IDENTIFICATION	
1. Facility Name: Luck Edgefield	
2. SC Air Permit Number (if known; 8-digits only): -TBD	3. Application Date: March 2024
4. Project Description: Luck Edgefield will soon operate an aggregate mine and processing facility near Edgefield in Clarks Hill, South Carolina. The portable facility will be capable of crushing 500 tons per hour from the primary crusher. The process starts inside the pit where the stone will be mined and transported in trucks using plant haul roads. The stone will be dumped into the primary jaw crushing station where stone will be initially crushed and conveyed to the first screening station. At the first screening station, the material will be screened and conveyed to storage piles or conveyed to the cone crusher or secondary screen. At the secondary screening station, the material will be screened and conveyed to storage piles or conveyed to a second cone crusher or tertiary screen. At the tertiary screening station, the material will be screened and then either conveyed to storage piles, recycled back to the crushers/screens, or conveyed to the wash plant. The wash plant is a totally wet process that is not expected to have emissions. Lastly, the material will be transferred to customer trucks from one of the storage piles and the trucks will exit the site using the customer haul roads.	
5. Are other facilities collocated for air compliance? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. If Yes, provide permit numbers of collocated facilities: NA

B. AIR CONTACT			
Consulting Firm Name (if applicable): GEL Engineering, LLC			
Title/Position: Senior Engineer	Salutation: Mr.	First Name: Matthew	Last Name: Wike
Mailing Address: 2040 Savage Road			
City: Charleston		State: SC	Zip Code: 29407
E-mail Address: matthew.wike@gel.com		Phone No.: 843-300-4252	Cell No.: 843-697-2205

*See Air Dispersion Modeling Results Section of this application for all information required for Sections D through Section M below.



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M. EMISSION RATES						
Emission Point ID	Pollutant Name	CAS #	Emission Rate (lb/hr)	Same as Permitted? ⁽¹⁾	Controlled or Uncontrolled	Averaging Period
				<input type="checkbox"/> Yes <input type="checkbox"/> No		
				<input type="checkbox"/> Yes <input type="checkbox"/> No		
				<input type="checkbox"/> Yes <input type="checkbox"/> No		
				<input type="checkbox"/> Yes <input type="checkbox"/> No		
				<input type="checkbox"/> Yes <input type="checkbox"/> No		
				<input type="checkbox"/> Yes <input type="checkbox"/> No		
				<input type="checkbox"/> Yes <input type="checkbox"/> No		
				<input type="checkbox"/> Yes <input type="checkbox"/> No		
				<input type="checkbox"/> Yes <input type="checkbox"/> No		
				<input type="checkbox"/> Yes <input type="checkbox"/> No		

(1) Any difference between the rates used for permitting and the air compliance demonstration must be explained in the application report.

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AIR DISPERSION MODELING RESULTS

**LUCK EDGEFIELD
CLARKS HILL, SOUTH CAROLINA**

1.0 INTRODUCTION

Luck Edgefield plans to operate an aggregate mine and processing facility near Edgefield in Clarks Hill, South Carolina. Luck Edgefield currently has no construction permit issued for this facility by the South Carolina Department of Health and Environmental Control (DHEC) Bureau of Air Quality (BAQ) for this site.

This air dispersion modeling demonstration was performed because particulates with aerodynamic diameter less or equal to 10 microns (PM_{10}) emissions from the group of mining and material handling emission sources are greater than 1.14 pounds per hour (lb/hr). The entire group (as opposed to per source) of PM_{10} emissions was used to conservatively ensure the aggregate mine and processing facility complies with South Carolina Ambient Air Quality Standards (R.61-62.5, Standard No. 2).

The entire group of emissions of particulates with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$) from the mining and material handling operations are below 1.14 lb/hr and therefore, therefore, no modeling is required for $PM_{2.5}$ emissions. Additionally, modeling for PM_{10} or $PM_{2.5}$ emissions from the material storage, haul road process, or customer road process is not required since emissions from those processes are less than 1.14 lb/hr. The 1.14 lb/hr PM_{10} and $PM_{2.5}$ de minimis levels are established in the DHEC document "Modeling Guidelines for Air Quality Permits" dated October 2018 (revision April 2019).

This modeling analysis was performed to determine compliance with Standard No. 2. A South Carolina Prevention of Significant Deterioration (PSD) Minor Source Baseline Standard (R.61-62.5, Standard No. 7) modeling demonstration is not required since, per DHEC document "Modeling Guidelines for Air Quality Permits" dated October 2018 (revised April 2019), DHEC BAQ no longer requires a Standard No. 7 modeling demonstration for applications that have not triggered a PSD review.

Lastly, the facility is not expected to emit toxic air pollutants and thus a South Carolina Toxic Air Pollutants Standard (R.61-62.5, Standard No. 8) modeling demonstration is not required.

2.0 AIR DISPERSION MODELING DATA

Modeling was performed using the latest version (version 22112) of the U.S. Environmental Protection Agency (EPA)-approved AERMOD air dispersion model. No urban option was used in this demonstration. The model used Augusta, GA meteorological data for years 2015 through 2019 obtained from DHEC BAQ's website. The AERMOD air dispersion model inputs contain the onsite source coordinates, incorporates good engineering practices, and downwash calculations. All model options were chosen in accordance with the DHEC BAQ document "Modeling Guidelines for Air Quality Permits" dated October 2018 (revision April 2019) and AERMOD guidance from the DHEC BAQ website.

The analysis used one receptor grid which utilizes the AERMOD distance method. This method places discrete receptors at 50-meter intervals along the facility property boundary. Furthermore, receptors were placed in a grid outside the property boundary at no more than 100-meter spacing extending out 1,500 meters and in such a manner to ensure identification of the highest concentrations. The Edgefield County terrain data, in National Elevation Data 83 (NED83) format, required to run the AERMAP subprogram was obtained from DHEC's BAQ website <http://www.scdhec.gov/environment/air-quality/air-dispersion-modeling-data>. Terrain elevations were calculated within the AERMAP subprogram.

A receptor grid with 100-meter spacing was generated around the facility extending out to 1,500 meters. Discrete receptors were placed every 50 meters along the Luck Edgefield boundary. The volume sources and receptor coordinates used in the modeling were determined from conversations with Luck Edgefield and an aerial view of the site using Google Earth. The latest Edgefield NED terrain data was obtained from DHEC BAQ's website and used in this modeling demonstration. Terrain elevations were calculated within the AERMAP subprogram.

A summary of the modeled hourly emission rates and volume source parameters for the Luck Edgefield facility is included as Table 1. This table summarizes the pertinent modeling inputs and is included in lieu of the DHEC BAQ Emission Point Information form. A site location and boundary map is included as Figure 1.

3.0 AIR DISPERSION MODELING RESULTS

Copies of the AERMOD model input and output files will be submitted to DHEC BAQ via disk or electronic mail.

3.1 South Carolina Ambient Air Quality Standards (Standard No. 2)

The South Carolina Ambient Air Quality Standards (SCAAQS - R.61-62.5, Standard No. 2) establish ambient air quality standards for criteria pollutants, including PM₁₀, PM_{2.5}, carbon dioxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone, and lead.

As stated in Section 1.0, PM₁₀ was the only criteria pollutant requiring a modeling demonstration to comply with Standard No. 2. To determine compliance with the SCAAQS, the estimated maximum potential ground-level concentrations of criteria pollutants resulting from site emissions were added to corresponding background concentrations for the criteria pollutant. The 2020-2022 three-year average background concentration data for PM₁₀ was obtained from the most recent monitoring data provided on the DHEC BAQ website.

The resultant total PM₁₀ concentration (the 1st high was conservatively used even though only the 6th high is required) was then compared to the SCAAQS, as shown in Table 2. The modeling results demonstrate that PM₁₀ emissions from Luck Edgefield will comply with the applicable ambient air quality standards.

Table 1
Summary of Modeled Emission Rates and Volume Source Parameters

Luck Edgefield
 Clarks Hill, South Carolina

Volume Source ID	Equip ID	Source Description	PM ₁₀ ¹ (lbs/hr)	Source Release Height (ft)	Elevated Source Height (ft)	Horizontal Dimension (ft)	Vertical Dimension (ft)	Horizontal Modeling Parameter ² - σ_y (ft)	Vertical Modeling Parameter ³ - σ_z (ft)
V1	CR1/F1	Portable C125 Jaw Crusher	0.270	8.0	3.0	16.4	10.0	3.81	2.33
V2	F1	52" x 20" VGF Screen	0.370	8.0	3.0	3.2	10.0	0.75	2.33
V3	C1	Under Crusher Conveyor	0.023	6.5	5.0	4.0	3.0	0.93	0.70
V4	CR2	Cone Crusher	0.270	8.0	3.0	10.9	10.0	2.54	2.33
V5	S1	Scalping Screen	0.370	7.0	3.0	3.0	8	0.71	1.86
V6	C3	Under Screen Conveyor	0.023	5.5	3.0	5.0	5.0	1.16	1.16
V7	C8	Under Crusher Conveyor	0.023	7.5	5.0	4.0	5.0	0.93	1.16
V8	CR3	Cone Crusher	0.270	8.0	3.0	10.9	10.0	2.54	2.33
V9	S2	Finish Screen	0.370	7.0	3.0	3.0	8	0.71	1.86
V10	C11	Screen Feed Conveyor	0.023	8.0	6.0	3.0	4.0	0.70	0.93
V11	C12	Screen Feed Conveyor	0.023	7.5	5.0	3.0	5.0	0.70	1.16
V12	C13	Under Screen Conveyor	0.023	6.0	2.0	3.0	8.0	0.70	1.86
V13	C14	Under Screen Conveyor	0.023	5.5	3.0	3.0	5.0	0.70	1.16
V14	C2	Scalper Feed Conveyor	0.023	5.5	5.0	3.0	1.0	0.70	0.23
V15	C4	GAB Jack Belt Conveyor	0.023	6.0	4.0	2.5	4.0	0.58	0.93
V16	C5	GAB Stacker Conveyor	0.023	5.0	1.0	3.0	8.0	0.70	1.86
V17	C7	3s Stacker Conveyor	0.023	5.5	3.0	3.0	5.0	0.70	1.16
V18	C9	OTR Bin Feed Conveyor/Surge Bin	0.023	5.0	2.0	3.0	6.0	0.70	1.40
V19	C10	Discharge Belt Conveyor	0.023	6.0	2.0	3.5	8.0	0.81	1.86
V20	C15	Fines Jack Belt Conveyor	0.023	4.0	2.0	2.5	4.0	0.58	0.93
V21	C17	Fines Jack Belt Conveyor	0.023	3.5	1.0	2.5	5.0	0.58	1.16
V22	C20	Wash Screen Feed	0.023	3.0	1.0	3.0	4.0	0.70	0.93
V23	C19	789s Jack Belt Conveyor	0.023	3.5	1.0	2.5	5.0	0.58	1.16
V24	C18	Fines Jack Belt Conveyor	0.023	5.0	2.0	2.5	6.0	0.58	1.40
V25	C21	C33 Stacker Conveyor	0.023	4.5	2.0	3.0	5.0	0.70	1.16
V26	C16	Dry 10s Stacker Conveyor	0.023	3.5	1.0	3.0	5.0	0.70	1.16
V27	C22	Overs Jack Belt Conveyor	0.023	6.0	2.0	2.5	8.0	0.58	1.86
V28	C23	789 Stacker Conveyor	0.023	3.5	1.0	3.0	5.0	0.70	1.16
V29	C24	57s Stacker Conveyor	0.023	4.0	2.0	3.0	4.0	0.70	0.93
V30	C26	7s Stacker Conveyor	0.023	3.5	2.0	3.0	3.0	0.70	0.70
V31	C25	7s Jack Belt Conveyor	0.023	3.5	2.0	2.5	3.0	0.58	0.70
V32	Tload	Final Product Truck Loading	0.050	6.0	4.0	5.0	4.0	1.16	0.93
V33	Drill	Drilling inside the Quarry	0.040	22.5	15.0	2.5	15.0	0.58	3.49
V34	HaulLoad	Truck Loading at the Quarry	0.008	8.0	6.0	5.0	4.0	1.16	0.93

Notes:

- 1) Facility is not required to model PM_{2.5} emissions since emissions from each emission grouping (material handling, storage piles, etc.) are below 1.14 lb/hr.
- 2) Horizontal Modeling Parameter - σ_y = Horizontal dimension divided by 4.3 for a single volume source.
- 3) Vertical Modeling Parameter - σ_z = Vertical dimension divided by 4.3 since all sources are elevated at height greater than 0 ft.

Table 2

Comparison of Air Dispersion Modeling Results with
South Carolina Ambient Air Quality Standards No. 2

Luck Edgefield
Clarks Hill, South Carolina

Pollutant	Averaging Period	Modeled Concentration ($\mu\text{g}/\text{m}^3$)	Background Concentration ($\mu\text{g}/\text{m}^3$) ¹	Total Concentration ($\mu\text{g}/\text{m}^3$)	Allowable Concentration ($\mu\text{g}/\text{m}^3$)	Site in Compliance
PM ₁₀	24 hour	34.2	36	70.2	150	Yes

Note:

1) Background PM₁₀ concentration taken from DHEC's 2020-2022 average monitoring data gathered from Cayce City Hall.

**EMISSION ASSUMPTIONS AND CALCULATIONS I
AGGREGATE MINE AND PROCESSING**

**Luck Edgefield
Clarks Hill, South Carolina**

The following emissions assumptions and calculations (EA&C) are presented for emissions from the mining and material handling, transportation, and material storage operations associated with Luck Edgefield's proposed aggregate mine and processing facility near Edgefield in Clarks Hill, South Carolina. This application is being submitted to obtain a construction permit for the proposed crushers, screens, and conveyors that will be at the site. In addition, fugitive emissions from the wind erosion of storage piles are presented in this EA&C. Despite not being one of the 28 Prevention of Significant Deterioration source categories, fugitive emissions were quantified voluntarily for completeness and consistency with Luck Edgefield's previously submitted applications for other sites.

Emission calculations are presented for particulate matter (PM), particulates with aerodynamic diameter of less than or equal to 10 microns (PM₁₀) and particulates with aerodynamic diameter of less than or equal to 2.5 microns (PM_{2.5}). While the facility will have a 550-kilowatt diesel-fired generator (P5), the generator is not considered a stationary source as it will be a portable, nonroad, non-stationary engine. Therefore, the diesel-fired generator is not subject to air permitting and is not subject to 40 CFR Part 60 Subpart IIII or 40 CFR Part 63 Subpart ZZZZ.

1.0 Emission Assumptions

- The facility requests federally enforceable permit conditions limiting the potential to emit of PM and PM₁₀ to below 100 tons per year to avoid being a Title V major source.
- Emission sources at the facility can be broken into the following categories:
 - Mining and Material Handling – includes wet drilling and truck loading operations;
 - Material Storage; and
 - Transportation
 - Haul Roads; and
 - Customer Roads.
- The facility will have a wash plant that will be a totally wet process, which is not expected to have emissions. The wash plant will consist of the following equipment:
 - Belt Feeder;
 - Transfer Conveyor;
 - Wash Plant;
 - Chip Conveyor;
 - Course Conveyor;
 - Intermediate Conveyor; and

- Sand Conveyor.
- The facility does not currently have plans for any non-electric dewatering pumps.

Mining

- PM, PM₁₀, and PM_{2.5} are the only criteria pollutants emitted from the emission sources of wet drilling (Drill) and truck loading (HaulLoad) of materials in the mine.
- Emissions were calculated assuming 8,760 hours per year.
- Uncontrolled and controlled PM, PM₁₀, and PM_{2.5} emissions from wet drilling and truck loading at the mine are calculated based on the U.S. Environmental Protection Agency (EPA) Compilation of Air Pollutant Emission Factors, AP-42, Section 11.19.2, Table 11.19.2-2, dated August 2004.
- AP-42, Table 11.19.2-2 only provides truck loading emission factors for PM₁₀ emissions. PM emissions for the truck loading within the quarry were conservatively assumed to be three times PM₁₀ emissions from truck unloading of fragmented stone.
- AP-42 Section 11.19.2 does not provide PM_{2.5} emission factors for wet drilling or truck loading. In cases where PM_{2.5} emission factors were not determined, the PM₁₀ emission factor was used and adjusted based on the particle size multiplier (0.053 - PM_{2.5}/0.35 - PM₁₀) contained in AP-42 Section 13.2.4 for Aggregate Handling and Storage Piles.

Material Handling

- A summary of the revised portable material handling and storage related equipment to be installed at Luck Edgefield that will have PM emissions is shown below:

Equip ID	Description	Dimensions
CR1/F1	Portable C125 Jaw Crusher	NA
F1	52" x 20" VGF Screen	52" x 20'
C1	Under Crusher Conveyor	48" x 36"
CR2	Cone Crusher	NA
S1	Scalping Screen	6' x 16'
C3	Under Screen Conveyor	60" x 20'
C8	Under Crusher Conveyor	48" x 30'
CR3	Cone Crusher	NA
S2	Finish Screen	6' x 20'
C11	Screen Feed Conveyor	36" x 46'
C12	Screen Feed Conveyor	36" x 16'

Equip ID	Description	Dimensions
C13	Under Screen Conveyor	60" x 20'
C14	Under Screen Conveyor	36" x 34'
C2	Scalper Feed Conveyor	36" x 100'
C4	GAB Jack Belt Conveyor	30" x 40'
C5	GAB Stacker Conveyor	36" x 100'
C7	3s Stacker Conveyor	36" x 100'
C9	OTR Bin Feed Conveyor/Surge Bin	36" x 100'
C10	Discharge Belt Conveyor	42" x 50'
C15	Fines Jack Belt Conveyor	30" x 40'
C17	Fines Jack Belt Conveyor	30" x 60'
C20	Wash Screen Feed	36" x 80'
C19	789s Jack Belt Conveyor	30" x 20'
C18	Fines Jack Belt Conveyor	30" x 50'
C21	C33 Stacker Conveyor	36" x 100'
C16	Dry 10s Stacker Conveyor	36" x 100'
C22	Overs Jack Belt Conveyor	30" x 30'
C23	C33 Stacker Conveyor	36" x 100'
C24	789s Stacker Conveyor	36" x 100'
C26	57s Stacker Conveyor	36" x 100'
C25	7s Jack Belt Conveyor	30" x 20'
Tload	Final Product Truck Loading	NA
Drill	Drilling inside the Quarry	NA
HaulLoad	Truck Loading at the Quarry	NA

- PM, PM₁₀, and PM_{2.5} are the only criteria pollutants emitted.
- The hourly production rates were provided by Luck Stone. Annual emissions were calculated assuming 8,760 hours per year.
- Uncontrolled and controlled PM, PM₁₀, and PM_{2.5} emissions from material handling are calculated based on the EPA Compilation of Air Pollutant Emission Factors, AP-42, Section 11.19.2, Table 11.19.2-2, dated August 2004. Controlled emissions are based on wet suppression.
- AP-42, Table 11.19.2-2 only provides truck loading emission factors for PM₁₀ emissions. PM emissions for the final product truck loading were conservatively assumed to be three times PM₁₀ emissions.
- AP-42 Section 11.19.2 only provides PM_{2.5} emission factors for some operations. For other operations, PM_{2.5} emission factors were not determined. In cases where PM_{2.5} emission factors were not determined, the PM₁₀ emission factor was used and adjusted based on the particle size multiplier (0.053- PM_{2.5}

/0.35- PM₁₀) contained in AP-42 Section 13.2.4 for Aggregate Handling and Storage Piles.

- No PM emissions data was provided in AP-42 for primary or secondary crushing. It was conservatively assumed that primary and secondary crushing emissions were equal to tertiary crushing.

Material Storage

- Part of Luck Edgefield's operations will include up to eight storage piles for holding various materials that have been mined, crushed, and screened.
- The size of each storage pile in acres was provided by knowledgeable Luck staff.
- Emission factors of 3.2 lbs PM per day per acre, 1.6 lbs PM₁₀ per day per acre, and 0.23 lbs PM_{2.5} per day per acre were used for storage pile wind erosion calculations. The PM emission factor is based on an equation in the EPA Document 450/2-92-004 "Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures," Equation 2-12. Based on the referenced document, the fraction of PM which is PM₁₀ is estimated at 0.5. To obtain the PM_{2.5} emission factors, the PM emission factor was used and adjusted based on the particle size multiplier (0.053 PM_{2.5} / 0.74-PM) contained in AP-42 Section 13.2.4 for Aggregate Handling and Storage Piles.

- The wind erosion equation used to calculate the PM emission factor is shown below:

$$E = 1.7 \times (s/1.5) \times [(365-p)/235] \times (f/15)$$

Where,

E = lbs PM per day per acre

s = 3.9 silt content % (from AP-42 5th Edition Table 13.2.4-1 for various limestone products)

p = 110 number of days with ≥ 0.01 inches of precipitation per year (from AP-42 Figure 13.2.2-1)

f = 10 percentage of time that the unobstructed wind speed exceeds 5.4 m/s at the mean pile height (engineering estimate)

- Annual PM, PM₁₀, and PM_{2.5} emissions are calculated assuming 8,760 hours of operation per year.
- Hourly emissions were calculated using 24 hours per day. Annual emissions were calculated using 365 days per year.

Transportation (Haul and Customer Roads)

- Uncontrolled emissions from the haul roads and customer roads are based on the AP-42, Section 13.2.2 (Unpaved Roads), Equations 1a and 2, for vehicles traveling on unpaved surfaces at industrial sites. The equation is provided below and the variables are defined:

$$E_{ext} = [k (s/12)^a \times (W/3)^b] (365 - P/365)$$

Where:

E_{ext} = annual or other long-term average emission factor in the same units as k

k , a , and b = Constants (Table 13.2.2-2)

s = Surface material silt content (%) – (Table 13.2.2-1, mean = 8.3 haul roads and 10 for customer roads)

W = average weight of vehicles (tons)

P = number of days with at least 0.01 inches of precipitation during the averaging period. ($P = 109$ days/yr as taken from <https://www.currentresults.com/Weather/South-Carolina/average-yearly-precipitation.php#c> for Columbia, South Carolina)

Constant	PM _{2.5}	PM ₁₀	PM ₃₀
K (lb/VMT)	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45

- Controlled emissions from the haul roads and customer roads assume a control efficiency of 90% for keeping the roads wet suppressed during transportation activities.
- Vehicle Mile Traveled (VMT) for haul road and customer roads provided by knowledgeable Luck Edgefield staff.

2.0 Emission Calculations

Using the above assumptions and the following equations, PM, PM₁₀, and PM_{2.5} emissions from the mining and material handling equipment are calculated and shown in Tables 1, 2, and 3, respectively. PM, PM₁₀, and PM_{2.5} emissions from wind erosion on the storage piles are calculated and shown in Table 4. PM, PM₁₀, and PM_{2.5} emissions from unpaved roads are calculated and shown in Table 5. The boxed alpha codes in the equations refer to the appropriate columns in the tables.

Tables 1-3 – Material Handling - PM, PM₁₀, and PM_{2.5} Emissions

$$\boxed{A} \frac{\text{tons material}}{\text{hour}} \times \boxed{B} \frac{\text{lbs uncontrolled emissions}}{\text{ton material}} = \boxed{C} \frac{\text{lbs uncontrolled emissions}}{\text{hour}}$$

$$\boxed{C} \frac{\text{lbs uncontrolled emissions}}{\text{hour}} \times \frac{8760 \text{ hours}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lbs}} = \boxed{D} \frac{\text{tons uncontrolled emissions}}{\text{year}}$$

$$\boxed{A} \frac{\text{tons material}}{\text{hour}} \times \boxed{E} \frac{\text{lbs controlled emissions}}{\text{ton material}} = \boxed{F} \frac{\text{lbs controlled emissions}}{\text{hour}}$$

$$\boxed{F} \frac{\text{lbs controlled emissions}}{\text{hour}} \times \frac{8760 \text{ hours}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lbs}} = \boxed{G} \frac{\text{tons controlled emissions}}{\text{year}}$$

Table 4 – Storage Piles - PM, PM₁₀, and PM_{2.5} Emissions

$$\boxed{A} \text{ Pile Size (Acres)} \times \boxed{B} \frac{\text{lbs emissions}}{\text{day-acre}} \times \frac{\text{day}}{24 \text{ hour}} = \boxed{C} \frac{\text{lbs emissions}}{\text{hour}}$$

$$\boxed{C} \frac{\text{lbs emissions}}{\text{hour}} \times \frac{8760 \text{ hours}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lbs}} = \boxed{D} \frac{\text{tons emissions}}{\text{year}}$$

Table 5 – Unpaved Roads - PM, PM₁₀, and PM_{2.5} Emissions

$$E = [k (s/12)^a \times (W/3)^b]$$

$$E_{ext} = E(365 - P/365)$$

Where,

k = constant (lb/Vehicle Mile Traveled (VMT)) **A**

s = Surface Material Silt Loading Content (%) **B**

W = vehicle weight (tons) **C**

P = days with 0.01 inches of rain

E = emission factor (lb/VMT) **D**

E_{ext} = emission factor (lb/VMT) **E**

$$\text{E} \frac{\text{lbs emissions}}{\text{VMT}} \times \text{F} \frac{\text{VMT}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lbs}} = \text{G} \frac{\text{tons uncontrolled emissions}}{\text{year}}$$

$$\text{G} \frac{\text{tons uncontrolled emissions}}{\text{year}} \times \frac{\text{year}}{8760 \text{ hrs}} \times \frac{2000 \text{ lbs}}{\text{ton}} = \text{H} \frac{\text{lbs uncontrolled emissions}}{\text{hour}}$$

$$\text{G} \frac{\text{tons uncontrolled emissions}}{\text{year}} \times \text{I} \text{ 1-Wet Suppression Control Efficiency \%} = \text{J} \frac{\text{tons controlled emissions}}{\text{year}}$$

$$\text{H} \frac{\text{lbs uncontrolled emissions}}{\text{hour}} \times \text{I} \text{ 1-Wet Suppression Control Efficiency \%} = \text{K} \frac{\text{lbs controlled emissions}}{\text{hour}}$$

Table 1
Emission Assumptions and Calculations I: PM Emissions from Drilling and Material Handling
Luck Edgefield
Clarks Hill, South Carolina

Emission Source ID	Emissions Source Description	A Design Capacity (tons/hr)	B Uncontrolled PM Emission Factor (lbs/ton)	C Uncontrolled PM Hourly Emissions (lbs/hr)	D Uncontrolled PM Annual Emissions (tpy)	E Controlled PM Emission Factor (lbs/ton)	F Controlled PM Hourly Emissions (lbs/hr)	G Controlled PM Annual Emissions (tpy)
CR1	Portable C125 Jaw Crusher	500	0.0054	2.70	11.83	0.0012	0.60	2.63
F1	52" x 20" VGF Screen	500	0.025	12.50	54.75	0.0022	1.10	4.82
C1	Under Crusher Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
CR2	Cone Crusher	500	0.0054	2.70	11.83	0.0012	0.60	2.63
S1	Scalping Screen	500	0.025	12.50	54.75	0.0022	1.10	4.82
C3	Under Screen Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C8	Under Crusher Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
CR3	Cone Crusher	500	0.0054	2.70	11.83	0.0012	0.60	2.63
S2	Finish Screen	500	0.025	12.50	54.75	0.0022	1.10	4.82
C11	Screen Feed Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C12	Screen Feed Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C13	Under Screen Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C14	Under Screen Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C2	Scalper Feed Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C4	GAB Jack Belt Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C5	GAB Stacker Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C7	3s Stacker Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C9	OTR Bin Feed Conveyor/Surge Bin	500	0.003	1.50	6.57	0.00014	0.070	0.31
C10	Discharge Belt Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C15	Fines Jack Belt Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C17	Fines Jack Belt Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C20	Wash Screen Feed	500	0.003	1.50	6.57	0.00014	0.070	0.31
C19	789s Jack Belt Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C18	Fines Jack Belt Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C21	C33 Stacker Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C16	Dry 10s Stacker Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C22	Overs Jack Belt Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C23	789 Stacker Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C24	57s Stacker Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C26	7s Stacker Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
C25	7s Jack Belt Conveyor	500	0.003	1.50	6.57	0.00014	0.070	0.31
Tload	Final Product Truck Loading	500	0.0003	0.15	0.66	0.0003	0.150	0.66
Drill	Drilling inside the Quarry	500	0.00024	0.12	0.53	0.00024	0.120	0.53
Haul/Load	Truck Loading at the Quarry	500	0.000048	0.02	0.11	0.000048	0.024	0.11
Total	-	-		83.39	365.27		7.14	31.29

Table 2
 Emission Assumptions and Calculations: PM-10 Emissions from Drilling and Material Handling
 Luck Edgefield
 Clarks Hill, South Carolina

Emission Source ID	Emissions Source Description	A Design Capacity (tons/hr)	B Uncontrolled PM ₁₀ Emission Factor (lbs/ton)	C Uncontrolled PM ₁₀ Hourly Emissions (lbs/hr)	D Uncontrolled PM ₁₀ Annual Emissions (tpy)	E Controlled PM ₁₀ Emission Factor (lbs/ton)	F Controlled PM ₁₀ Hourly Emissions (lbs/hr)	G Controlled PM ₁₀ Annual Emissions (tpy)
CR1	Portable C125 Jaw Crusher	500	0.0024	1.20	5.26	0.00054	0.270	1.18
F1	52" x 20" VGF Screen	500	0.0087	4.35	19.05	0.00074	0.370	1.62
C1	Under Crusher Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
CR2	Cone Crusher	500	0.0024	1.20	5.26	0.00054	0.270	1.18
S1	Scalping Screen	500	0.0087	4.35	19.05	0.00074	0.370	1.62
C3	Under Screen Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C8	Under Crusher Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
CR3	Cone Crusher	500	0.0024	1.20	5.26	0.00054	0.270	1.18
S2	Finish Screen	500	0.0087	4.35	19.05	0.00074	0.370	1.62
C11	Screen Feed Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C12	Screen Feed Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C13	Under Screen Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C14	Under Screen Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C2	Scalper Feed Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C4	GAB Jack Belt Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C5	GAB Stacker Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C7	3s Stacker Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C9	OTR Bin Feed Conveyor/Surge Bin	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C10	Discharge Belt Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C15	Fines Jack Belt Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C17	Fines Jack Belt Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C20	Wash Screen Feed	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C19	789s Jack Belt Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C18	Fines Jack Belt Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C21	C33 Stacker Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C16	Dry 10s Stacker Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C22	Overs Jack Belt Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C23	789 Stacker Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C24	57s Stacker Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C26	7s Stacker Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
C25	7s Jack Belt Conveyor	500	0.0011	0.55	2.41	0.000046	0.023	0.10
Tload	Final Product Truck Loading	500	0.0001	0.05	0.22	0.0001	0.050	0.22
Drill	Drilling Inside the Quarry	500	0.00008	0.04	0.18	0.00008	0.040	0.18
HaulLoad	Truck Loading at the Quarry	500	0.000016	0.01	0.04	0.000016	0.008	0.04
Total	-	-	-	30.50	133.58	-	2.59	11.36

Table 3
Emission Assumptions and Calculations I: PM_{2.5} Emissions from Drilling and Material Handling
Luck Edgefield
Clarks Hill, South Carolina

Emission Source ID	Emissions Source Description	A Design Capacity (tons/hr)	B Uncontrolled PM _{2.5} Emission Factor (lbs/ton)	C Uncontrolled PM _{2.5} Hourly Emissions (lbs/hr)	D Uncontrolled PM _{2.5} Annual Emissions (tpy)	E Controlled PM _{2.5} Emission Factor (lbs/ton)	F Controlled PM _{2.5} Hourly Emissions (lbs/hr)	G Controlled PM _{2.5} Annual Emissions (tpy)
CR1	Portable C125 Jaw Crusher	500	0.00036	0.18	0.80	0.0001	0.050	0.22
F1	52" x 20" VGF Screen	500	0.0013	0.66	2.89	0.00005	0.025	0.11
C1	Under Crusher Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
CR2	Cone Crusher	500	0.00036	0.18	0.80	0.0001	0.050	0.22
S1	Scalping Screen	500	0.0013	0.66	2.89	0.00005	0.025	0.11
C3	Under Screen Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C8	Under Crusher Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
CR3	Cone Crusher	500	0.00036	0.18	0.80	0.0001	0.050	0.22
S2	Finish Screen	500	0.0013	0.66	2.89	0.00005	0.025	0.11
C11	Screen Feed Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C12	Screen Feed Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C13	Under Screen Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C14	Under Screen Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C2	Scalper Feed Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C4	GAB Jack Belt Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C5	GAB Stacker Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C7	3s Stacker Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C9	OTR Bin Feed Conveyor/Surge Bin	500	0.00017	0.08	0.36	0.000013	0.0065	0.0285
C10	Discharge Belt Conveyor	500	0.00017	0.08	0.36	0.000013	0.0065	0.0285
C15	Fines Jack Belt Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C17	Fines Jack Belt Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C20	Wash Screen Feed	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C19	789s Jack Belt Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C18	Fines Jack Belt Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.03
C21	C33 Stacker Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C16	Dry 10s Stacker Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C22	Overs Jack Belt Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C23	789 Stacker Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C24	57s Stacker Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C26	7s Stacker Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
C25	7s Jack Belt Conveyor	500	0.00017	0.08	0.36	0.000013	0.007	0.028
Tload	Final Product Truck Loading	500	0.000015	0.008	0.03	0.000015	0.008	0.03
Drill	Drilling inside the Quarry	500	0.000012	0.006	0.03	0.000012	0.006	0.03
HaulLoad	Truck Loading at the Quarry	500	0.000002	0.0012	0.005	0.000002	0.001	0.01
Total	-	-	-	4.62	20.23	-	0.40	1.76

Note:
1. Since all emissions from each source are below 1 pound per hour, no air dispersion modeling is required.

Table 4
Emission Assumptions and Calculation: Storage Pile Wind Emissions
Luck Edgefield
Clarks Hill, South Carolina

Emission Point ID	Emissions Point Description		A Pile Size (acres)	B Emission Factor			C Hourly Emissions			D Annual Emissions		
				(lbs PM/day/acre)	(lbs PM ₁₀ /day/acre)	(lbs PM _{2.5} /day/acre)	(lbs PM/hr)	(lbs PM ₁₀ /hr)	(lbs PM _{2.5} /hr)	(tons PM/yr)	(tons PM ₁₀ /yr)	(tons PM _{2.5} /yr)
STP1	Storage Pile No. 1	#3	0.16	3.2	1.6	0.23	0.021	0.011	0.002	0.09	0.05	0.01
STP2	Storage Pile No. 2	RipRap	0.19	3.2	1.6	0.23	0.025	0.013	0.002	0.11	0.06	0.01
STP3	Storage Pile No. 3	GAB	1.02	3.2	1.6	0.23	0.14	0.068	0.010	0.60	0.30	0.04
STP4	Storage Pile No. 4	Dry 10's	0.15	3.2	1.6	0.23	0.020	0.010	0.001	0.09	0.04	0.01
STP5	Storage Pile No. 5	C33	0.71	3.2	1.6	0.23	0.095	0.047	0.007	0.41	0.21	0.03
STP6	Storage Pile No. 6	7's	0.78	3.2	1.6	0.23	0.10	0.052	0.007	0.46	0.23	0.03
STP7	Storage Pile No. 7	57's	0.88	3.2	1.6	0.23	0.12	0.059	0.008	0.51	0.26	0.04
STP8	Storage Pile No. 8	789's	0.70	3.2	1.6	0.23	0.093	0.047	0.007	0.41	0.20	0.029
Total	-		-				0.61	0.306	0.044	2.68	1.34	0.19

Note:

1. Since PM₁₀ and PM_{2.5} emissions from each source are below 1.14 pounds per hour, no air dispersion modeling is required.

Table 5
Emission Assumptions and Calculations I: Unpaved Road Emissions
Luck Edgefield
Clarks Hill, South Carolina

Emission Source ID	Pollutants	A	B	C	D	E	F	G	H	I	J	K
		Particle Size Multiplier k (lb/VMT)	Surface Material Silt Loading Content (%)	Avg. Vehicle Weight W (tons)	Emission Factor E (lbs/VMT)	Emission Factor Eext (lbs/VMT)	VMT/yr	Uncontrolled (tons/yr)	Uncontrolled (lbs/hour)	Wet Suppression Control Efficiency (%)	Controlled (tons/yr)	Controlled (lbs/hr)
Haul	PM	4.9	8.3	138	21.20	14.87	1,690	12.56	2.87	90	1.26	0.29
	PM ₁₀	1.5	8.3	138	6.03	4.23	1,690	3.57	0.82	90	0.36	0.08
	PM _{2.5}	0.15	8.3	138	0.60	0.42	1,690	0.36	0.08	90	0.04	0.01
Customer	PM	4.9	10	13.75	8.56	6.00	18,250	54.76	12.50	90	5.48	1.25
	PM ₁₀	1.5	10	13.75	2.53	1.77	18,250	16.16	3.69	90	1.62	0.37
	PM _{2.5}	0.15	10	13.75	0.25	0.18	18,250	1.62	0.37	90	0.16	0.04
Total	PM	-	-	-	-	-	-	67.33	15.37	-	6.73	1.54
	PM ₁₀	-	-	-	-	-	-	19.74	4.51	-	1.97	0.45
	PM _{2.5}	-	-	-	-	-	-	1.97	0.45	-	0.20	0.05

Notes:

1) Emissions based on calculation found in AP-42, Section 13.2.2, Equation 1a: $E = [k (s/12)^a \times (W/3)^b]$ with an extension from Equation 2: $E_{ext} = E \times (365 - P / 365)$

Where: E_{ext} = annual or other long-term average emission factor in the same units as k,

k = particle size multiplier (Table 13.2.2-2)

s = surface material silt content (%) - Table 13.2.2-1, Quarry Haul/Plant (mean)

W = mean weight of vehicles (tons) - obtained from Winnseboro Quarry

a, b = empirical constants from AP-42 Table 13.2.2.2

P = number of days with at least 0.01 inches of precipitation during the averaging period, (P = 113 days/yr as taken from

<https://www.currentresults.com/Weather/South-Carolina/average-yearly-precipitation.php#c> for Spartanburg, South Carolina)

Constant	PM _{2.5}	PM ₁₀	PM ₃₀
k (lb/VMT)	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45

2) Controlled emissions are based on 90% control efficiency from use of wet suppression to keep the haul roads wet at all times.

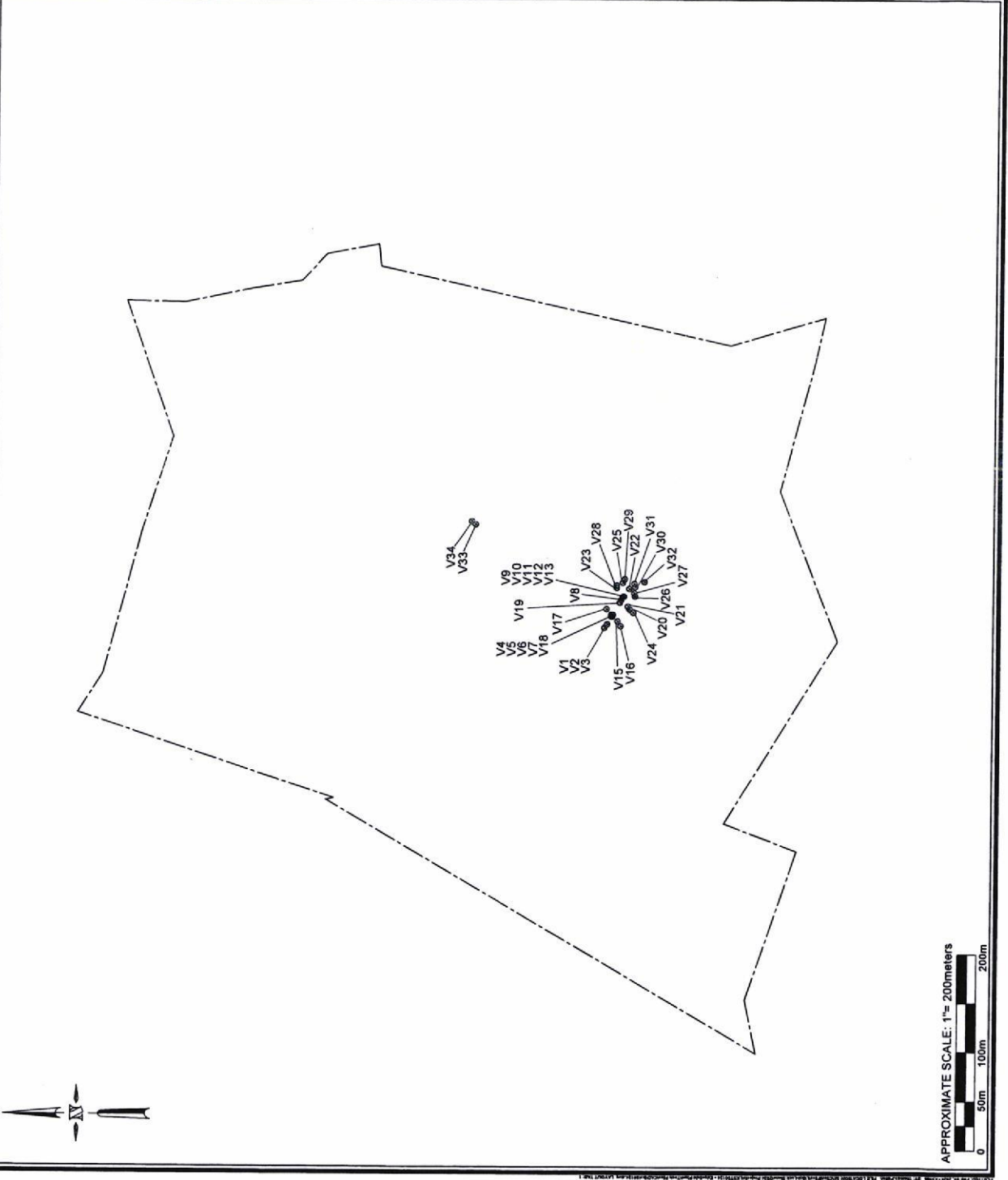
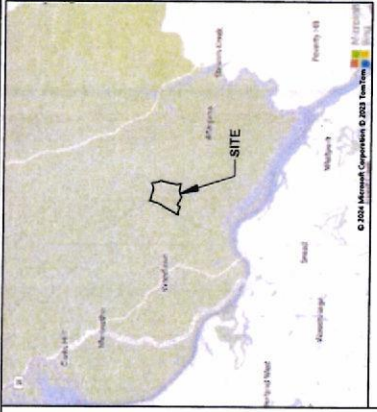
3) The vehicle miles traveled (VMT) data was provided by Luck Stone.

DATE: 01/30/2024
 DRAWN/ APPROVED BY: TJP / MMW
 PROJECT NUMBER: IK15100124
 TITLE: 1

LUCK EDGEFIELD
 CLARKS HILL, SOUTH CAROLINA

SITE LOCATION AND BOUNDARY MAP

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problem solved

FIGURE 2
PROCESS FLOW DIAGRAM
LUCK EDGEFIELD
CLARKS HILL, SOUTH CAROLINA

