

MARYLAND DEPARTMENT OF THE ENVIRONMENT

**AIR AND RADIATION ADMINISTRATION
APPLICATION FOR A PERMIT TO CONSTRUCT**

DOCKET #06-21

COMPANY: Bluegrass Materials Company, LLC dba Martin Marietta, Inc
LOCATION: North East Quarry, 233 Stevenson Road, North East, MD 21901
APPLICATION: Modification of the existing 900 ton per hour crushing and screening plant that will result in an increase in production rate to 1400 tons per hour.

<u>ITEM</u>	<u>DESCRIPTION</u>
1	Notice of Application and Opportunity to Request an Informational Meeting
2	Permit to Construct Application Forms – Form 5 Application Form, Form 5T Summary for meeting ambient and T-BACT requirements, Form 5EP Emissions Data, plant diagram, and crusher specifications.
3	Evidence of Zoning Approval.

**DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION**

**NOTICE OF APPLICATION AND
OPPORTUNITY TO REQUEST AN INFORMATIONAL MEETING**

The Maryland Department of the Environment, Air and Radiation Administration (ARA) received a permit-to-construct application from Bluegrass Materials Company, LLC dba Martin Marietta, Inc on April 7, 2021 for the modification of their crushing and screening plant to increase throughput from 900 tons per hour to 1400 tons per hour. The proposed modification is located at 233 Stevenson Road, North East Maryland 21901.

The application and other supporting documents are available for public inspection on the Department's website. Look for Docket #06-21 at the following link:

<https://mde.maryland.gov/programs/Permits/AirManagementPermits/Pages/index.aspx>

Pursuant to the Environment Article, Section 1-603, Annotated Code of Maryland, the Department will hold an informational meeting to discuss the application and the permit review process if the Department receives a written request for a meeting within 10 working days from the date of the second publication of this notice. All requests for an informational meeting should be emailed to Ms. Shannon Heafey at shannon.heafey@maryland.gov.

Further information may be obtained by contacting Ms. Shannon Heafey by email at shannon.heafey@maryland.gov or by phone at (410) 537-4433.

George S. Aburn, Jr., Director
Air and Radiation Administration



April 7, 2021

Maryland Department of the Environment
Air and Radiation Management Administration, Air Quality Permits Program
1800 Washington Boulevard
Baltimore, MD 21230
Attn: Dennis Borie
[Sent via email to Dennis.Borie@maryland.gov](mailto:Dennis.Borie@maryland.gov)

Re: Permit to Construct Application: Plant Modification
North East Quarry, Permit No: 015-0005
Bluegrass Materials Company, LLC (DBA Martin Marietta)

Dear Mr. Borie,

Please find enclosed a *Permit to Construct Application*, in addition to all necessary supporting forms and information, for the replacement of the primary crusher associated Plant 2E at the North East Quarry (ARMA Registration Number 015-0005-6-0299). This project proposes to replace the **One (1) Metso C140 primary crusher** with **One (1) Metso C160 primary crusher**. Further details regarding the existing and proposed equipment are attached to this application. All Plant 2E equipment will continue to be powered by the electric grid. Overall plant throughput will increase as a result of the modification, from 900 tons per hour to approximately 1400 tons per hour (see attached "Material Balance Data & Emissions Calculations" for details). Please note that estimated overall plant throughput is greater than the design capacity/projected throughput of the primary crusher because a percentage of total plant feed is scalped (pre-screened) at ID#1, and by-passes the primary crusher. The goal of this project is to reduce the number of operating hours necessary for the plant to operate in order to meet market demand. Please also note that this application includes a *Crystalline Silica Air Quality Modeling Analysis* (AERMOD) prepared by RTP Environmental Associates, which demonstrates ambient impact requirements under the Toxic Air Pollutant (TAP) Regulations of COMAR 26.11.15.06.

The associated permit for this facility includes a flexible 600 tons per hour Portable Plant (ARMA Registration Number 015-0005-6-0364). This plant was very conservatively incorporated into premises emissions calculations and modelling, by assuming: (1) that all possible permitted portable equipment would operate; (2) that the portable plant would operate at 600 tons per hour simultaneously with Plant

2E, and; (3) that the portable plant would be located east of Plant 2E (closer to the nearest property boundary).

This application package contains the following information:

- Application Checklist
- Form 5
- Form 5T
- Form 5EP
- Vendor/Manufacturer Specifications
- Process Flow Diagram & Equipment List
- Site Plan map
- Material Balance Data & Emissions Calculations
- Crystalline Silica Air Quality Modeling Analysis (AERMOD)
 - Email includes AERMOD input files
- (Material) Safety Data Sheets (for crushed stone)
- Letter of Zoning (no changes from 2017 application)
- Certificate of Insurance (workers compensation)

If you have any questions or concerns regarding any part of this application, please do not hesitate to contact me. Thank you in advance for your assistance with this application.

Respectfully,



Gustaf Buttar

Senior Environmental Engineer

Martin Marietta

10000 Beaver Dam Road

Cockeysville, MD 21030

m. (443) 802-2769

e.gus.buttar@martinmarietta.com

www.martinmarietta.com

Cc: Kevin Cantalupo, Martin Marietta (Kevin.Cantalupo@martinmarietta.com)
Andrew Bena, MDE (Andrew.Bena1@maryland.gov)
MDE Air Permits (MDE.Submit-AirPermits@maryland.gov)
File



FORM 5



AIR QUALITY PERMIT TO CONSTRUCT APPLICATION CHECKLIST

OWNER OF EQUIPMENT/PROCESS	
COMPANY NAME:	Bluegrass Materials Company, LLC (DBA Martin Marietta Materials, Inc)
COMPANY ADDRESS:	Local Mailing Address: 10000 Beaver Dam Road, Cockeysville, MD 21030
LOCATION OF EQUIPMENT/PROCESS	
PREMISES NAME:	North East Quarry (existing Permit to Operate No. 015-0005)
PREMISES ADDRESS:	233 Stevenson Road, North East, MD 21901
CONTACT INFORMATION FOR THIS PERMIT APPLICATION	
CONTACT NAME:	Gustaf Buttar
JOB TITLE:	Senior Environmental Engineer
PHONE NUMBER:	(443) 802-2769
EMAIL ADDRESS:	gus.buttar@martinmarietta.com
DESCRIPTION OF EQUIPMENT OR PROCESS	
Equipment replacement: Primary Crusher (Metso C160 Jaw Crusher) for Registration No. 015-0005-6-0299	

Application is hereby made to the Department of the Environment for a Permit to Construct for the following equipment or process as required by the State of Maryland Air Quality Regulation, COMAR 26.11.02.09.

Check each item that you have submitted as part of your application package.

- Application package cover letter describing the proposed project
- Complete application forms (Note the number of forms included or NA if not applicable.)

No. <u> 1 </u> Form 5	No. <u> NA </u> Form 11
No. <u> 1 </u> Form 5T	No. <u> NA </u> Form 41
No. <u> 1 </u> Form 5EP	No. <u> NA </u> Form 42
No. <u> NA </u> Form 6	No. <u> NA </u> Form 44
No. <u> NA </u> Form 10	
- Vendor/manufacturer specifications/guarantees
- Evidence of Workman's Compensation Insurance
- Process flow diagrams with emission points
- Site plan including the location of the proposed source and property boundary
- Material balance data and all emissions calculations
- Material Safety Data Sheets (MSDS) or equivalent information for materials processed and manufactured.
- Certificate of Public Convenience and Necessity (CPCN) waiver documentation from the Public Service Commission ⁽¹⁾
- Documentation that the proposed installation complies with local zoning and land use requirements ⁽²⁾
 - (1) Required for emergency and non-emergency generators installed on or after October 1, 2001 and rated at 2001 kW or more.
 - (2) Required for applications subject to Expanded Public Participation Requirements.

APPLICATION FOR FUEL BURNING EQUIPMENT

Information Regarding Public Outreach

For Air Quality Permit to Construct applications subject to public review, applicants should consider the following information in the initial stages of preparing a permit application.

If you are not sure at the time you are applying for a permit whether public review of your application is required or for information on steps you can take to engage the surrounding community where your planned project will be located, please contact the Air Quality Permits Program at 410-537-3225 and seek their advice.

Communicating and engaging the local community as early as possible in your planning and development process is an important aspect of your project and should be considered a priority. Environmental Justice or "EJ" is a movement to inform, involve, and engage communities impacted by potential and planned environmental projects by affording citizens opportunities to learn about projects and discuss any concerns regarding impacts.

Although some permit applications are subject to a formal public review process prescribed by statute, the Department strongly encourages you to engage neighboring communities separate from and well ahead of the formal permitting process. Sharing your plans by way of community meetings, informational outreach at local gatherings or through local faith-based organizations can initiate a rewarding and productive dialogue that will reduce anxiety and establish a permanent link with your neighbors in the community.

All parties benefit when there is good communication. The Department can assist applicants in developing an outreach plan that fits the needs of both the company and the public.

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪ 1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct

Registration Update

Initial Registration

1A. Owner of Equipment/Company Name

Bluegrass Materials Company, LLC (DBA Martin Marietta)

Mailing Address

10000 Beaver Dam Road

Street Address

Cockeysville MD 21030
City State Zip

Telephone Number

(443) 802-2769

Signature

Ronald M. Kopplin

Ronald M. Kopplin, East Division President, Martin Marietta

Print Name and Title

DO NOT WRITE IN THIS BLOCK

2. REGISTRATION NUMBER

County No.

Premises No.

1-2

3-6

Registration Class

Equipment No.

7

8-11

Data Year

12-13

Application Date

4-5-2021

Date

1B. Equipment Location and Telephone Number (if different from above)

233 Stevenson Road

Street Number and Street Name

North East MD 21901 (443) 802-2769
City/Town State Zip Telephone Number

North East Quarry

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
B	0 9 2 1		
15	16-19	20-23	20-23

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
One (1) Metso C160 Primary Jaw Crusher (replacing Metso C140) rated 1260 stph (see attached for details), powered by electric grid.

5. Workmen's Compensation Coverage See attached COI

Company _____ Binder/Policy Number _____ Expiration Date _____

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1 (fugitive)

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name Same as Numer 1 on Page 1 Title _____

Company _____

Mailing Address/Street _____

City/Town _____ State _____ Telephone (____) _____

8. Major Activity, Product or Service of Company at this Location

Quarrying and processing of stone (primarily trap rock and granite) aggregate for use in the construction industry. Material is produced by the use of crushers, screens, conveyors, and associated ancillary equipment to produce various specifications of aggregate product.

SIC Code 1429 (Crushed and Broken Stone, Note Elsewhere Classified)

9. Control Devices Associated with this Equipment

None

24-0

Simple/Multiple Cyclone

24-1

Spray/Adsorb Tower

24-2

Venturi Scrubber

24-3

Carbon Adsorber

24-4

Electrostatic Precipitator

24-5

Baghouse

24-6

Thermal/Catalytic Afterburner

24-7

Dry Scrubber

24-8

Other

Describe Wet suppression (wet dust suppression, carryover, and wet material processing)
24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 26-31	SULFUR % <input type="text"/> <input type="text"/> <input type="text"/> 32-33	GRADE <input type="text"/> 34	NATURAL GAS-1000 FT ³ <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 35-41	LP GAS-100 GALLONS <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 42-45	GRADE <input type="text"/> 43-44
COAL - TONS <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 46-52	SULFUR % <input type="text"/> <input type="text"/> <input type="text"/> 53-55	ASH% <input type="text"/> <input type="text"/> <input type="text"/> 56-58	WOOD-TONS <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59-63	MOISTURE % <input type="text"/> <input type="text"/> <input type="text"/> 64-65	
OTHER FUELS (Specify Type) <input type="text"/> 66-1	ANNUAL AMOUNT CONSUMED (Specify Units of Measure) _____	OTHER FUEL (Specify Type) <input type="text"/> 66-2	ANNUAL AMOUNT CONSUMED (Specify Units of Measure) _____		

1=Coke 2=COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation <input checked="" type="checkbox"/> 67-1	Batch Process <input type="checkbox"/> 67-2	Hours per Batch <input type="text"/> <input type="text"/> 68-69	Batch per Week <input type="text"/> 70-71	Hours per Day <input type="text"/> <input type="text"/> 72	Days Per Week <input type="text"/> 73-75	Days per Year <input type="text"/> <input type="text"/> <input type="text"/> 76
Seasonal Variation in Operation: No Variation <input type="checkbox"/> 76	Winter Percent <input type="text"/> <input type="text"/> 77-78	Spring Percent <input type="text"/> <input type="text"/> 79-80	Summer Percent <input type="text"/> <input type="text"/> 81-82	Fall Percent <input type="text"/> <input type="text"/> 83-84	(Total Seasons= 100%)	

12. Equivalent Stack Information- is Exhaust through Doors, Windows, etc. Only? (Y/N) 85

If not, then Height Above Ground (FT) Inside Diameter at Top Exit Temperature (°F) Exit Velocity (FT/SEC)

	2 5	N A	N A	N A
	86-88	89-91	92-95	96-98

NOTE:
 Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment)
 Is any of this data to be considered confidential? (Y or N)

	NAME	CAS NO. (IF APPLICABLE)	PER HOUR	INPUT RATE		UNITS
				UNITS	PER YEAR	
1.	Quarried stone	NA (mixture)	1,260 max rated	stph	2,000,000	tons
2.			1,120 projected	stph	(varies based on	
3.					market demand)	
4.						
5.						
6.						
7.						
8.						
9.						
TOTAL						

14. Output Materials (for this equipment)
 Process/Product Stream

	NAME	CAS NO. (IF APPLICABLE)	PER HOUR	OUTPUT RATE		UNITS
				UNITS	PER YEAR	
1.	Quarried stone	NA (mixture)	1260 max rated	stph	2,000,000	tons
2.			1,120 projected	stph	(varies based on	
3.					market demand)	
4.						
5.						
6.						
7.						
8.						
9.						
TOTAL						

15. Waste Streams- Solid and Liquid

	NAME	CAS NO. (IF APPLICABLE)	PER HOUR	OUTPUT RATE		UNITS
				UNITS	PER YEAR	
1.	Note: Crushed stone fines					
2.	(sediment/particulates) captured in					
3.	water from wet suppression & wash					
4.	plant system. All process water					
5.	managed on site in accordance with					
6.	approved mining plan and NPDES					
7.	permit. Output rate not applicable.					
8.						
9.						
TOTAL						

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter

99-104

Oxides of Sulfur

105-110

Oxides of Nitrogen

111-116

Carbon Monoxide

177-122

Volatile Organic Compounds

123-128

PM-10

129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter

 1 6 . 1 3

135-139

Oxides of Sulfur

140-144

Oxides of Nitrogen

145-149

Carbon Monoxide

150-154

Volatile Organic Compounds

155-159

PM-10

 7 . 2 6

160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP

 1

165

SOX

166

NOX

167

CO

168

VOC

169

PM10

 1

170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local

Date Rec'd. State

Return to Local Jurisdiction

Date _____ By _____

Reviewed by Local Jurisdiction

Date _____ By _____

Reviewed by State

Date _____ By _____

19. Inventory Date

Month/Year

171-174

Equipment Code

175-177

SCC Code

178-185

20. Annual

Operating Rate

186-192

Maximum Design

Hourly Rate

193-199

Permit to Operate

Month

200-201

Transaction Date

(MM/DD/YR)

202-207

Staff Code

208-210

VOC Code

211 212

SIP Code

213 214

Regulation Code

215-218

Confidentiality

219

Point Description

220-238

Action

239

A: Add
 C: Change



FORM 5T

MARYLAND DEPARTMENT OF THE ENVIRONMENT
 Air and Radiation Management Administration • Air Quality Permits Program
 1800 Washington Boulevard • Baltimore, Maryland 21230
 (410)537-3225 • 1-800-633-6101 • www.mde.maryland.gov

FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Applicant Name: Bluegrass Materials (Martin Marietta)

Step 1: Quantify premises-wide emissions of Toxic Air Pollutants (TAP) from new and existing installations in accordance with COMAR 26.11.15.04. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Class I or Class II?	Screening Levels ($\mu\text{g}/\text{m}^3$)			Estimated Premises Wide Emissions of TAP			
						Actual Total Existing TAP Emissions	Projected TAP Emissions from Proposed Installation	Premises Wide Total TAP Emissions	
			1-hour	8-hour	Annual	(lb/hr)	(lb/hr)	(lb/hr)	(lb/yr)
<i>ex. ethanol</i>	64175	II	18843	3769	N/A	0.60	0.15	0.75	1500
<i>ex. benzene</i>	71432	I	80	16	0.13	0.5	0.75	1.00	400
SILICA, CRYSTALLINE - QUARTZ	14808607	NOT LISTED		0.25		0.0071	0.0007	0.0103	30.96

(attach additional sheets as necessary.)

Note: Screening levels can be obtained from the Department's website (<http://www.mde.maryland.gov>) or by calling the Department.

Step 2: Determine which TAPs are exempt from further review. A TAP that meets either of the following Class I or Class II small quantity emitter exemptions is exempt from further TAP compliance demonstration requirements under Step 3 and Step 4.

Class II TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(a))

A Class II TAP is exempt from Step 3 and Step 4 if the Class II TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour, and any applicable 1-hour or 8-hour screening level for the TAP must be greater than $200 \mu\text{g}/\text{m}^3$.

Class I TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(b))

A Class I TAP is exempt from Step 3 and Step 4 if the Class I TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour and 350 pounds per year, any applicable 1-hour or 8-hour screening level for the TAP must be greater than $200 \mu\text{g}/\text{m}^3$, and any applicable annual screening level for the TAP must be greater than $1 \mu\text{g}/\text{m}^3$.

If a TAP meets either the Class I or Class II TAP Small Quantity Emitter Exemption Requirements, no further review under Step 3 and Step 4 are required for that specific TAP.

FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Step 3: Best Available Control Technology for Toxics Requirement (T-BACT, COMAR 26.11.15.05)

In the following table, list all TAP emission reduction options considered when determining T-BACT for the proposed installation. The options should be listed in order beginning with the most effective control strategy to the least effective strategy. Attach supporting documentation as necessary.

Target Pollutants	Emission Control Option	% Emission Reduction	Costs		T-BACT Option Selected? (yes/no)
			Capital	Annual Operating	
<i>ex. ethanol and benzene</i>	<i>Thermal Oxidizer</i>	99	\$50,000	\$100,000	no
<i>ex. ethanol and benzene</i>	<i>Low VOC materials</i>	80	0	\$100,000	yes
CS - QUARTZ	WET SUPPRESSION	77.7 - 95.9	Nominal (existing)	~\$5,000 - \$30,000	YES

(attach additional sheets as necessary)

Step 4: Demonstrating Compliance with the Ambient Impact Requirement (COMAR 26.11.15.06)

Each TAP not exempt in Step 2 must be individually evaluated to determine that the emissions of the TAP will not adversely impact public health. The evaluation consists of a series of increasingly non-conservative (and increasingly rigorous) tests. Once a TAP passes a test in the evaluation, no further analysis is required for that TAP. "Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06)" provides guidance on conducting the evaluation. Summarize your results in the following table. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Screening Levels (µg/m ³)			Premises Wide Total TAP Emissions		Allowable Emissions Rate (AER) per COMAR 26.11.16.02A		Off-site Concentrations per Screening Analysis (µg/m ³)			Compliance Method Used?
		1-hour	8-hour	Annual	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	1-hour	8-hour	Annual	AER or Screen
<i>ex. ethanol</i>	64175	18843	3769	N/A	0.75	1500	0.89	N/A	N/A	N/A	N/A	AER
<i>ex. benzene</i>	71432	80	16	0.13	1.00	400	0.04	36.52	1.5	1.05	0.12	Screen
CS - QUARTZ	14808607		0.25		0.0103	30.96	0.001	NA		0.18		Screen
							(per MDE					(see attached
							guidance					AERMOD
							document)					report)

(attach additional sheets as necessary)

If compliance with the ambient impact requirement cannot be met using the allowable emissions rate method or the screening analysis method, refined dispersion modeling techniques may be required. Please consult with the Department's Air Quality Permit Program prior to conducting dispersion modeling methods to demonstrate compliance.



FORM 5EP

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Bluegrass Materials (Martin Marietta)

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
ID #2 (Metso C-160 Primary Jaw Crusher)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Metso C-160 Primary Jaw Crusher equipped with wet suppression system

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	Seasonal Variation Check box if none: <input type="checkbox"/> Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	20
Hours per day:	12	Spring Percent	26
Days per week:	5-6	Summer Percent	28
Weeks per year:	40-52	Fall Percent	26

4. Emission Point Information

Height above ground (ft):	~25'	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:
Height above structures (ft):	NA		NA	NA
Exit temperature (°F):	NA	Inside diameter at top of round stack (ft):	NA	
Exit velocity (ft/min):	NA	Distance from emission point to nearest property line (ft):	1822 ft	
Exhaust gas volumetric flow rate (acfm):	NA	Building dimensions if emission point is located on building (ft)	Height NA	Length Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. **A Form 6 is also required for each control device.** If none check none:

- | | | | |
|---|-----------|--|--|
| <input type="checkbox"/> None | | <input type="checkbox"/> Thermal Oxidizer | No. _____ |
| <input type="checkbox"/> Baghouse | No. _____ | <input type="checkbox"/> Regenerative | |
| <input type="checkbox"/> Cyclone | No. _____ | <input type="checkbox"/> Catalytic Oxidizer | No. _____ |
| <input type="checkbox"/> Elec. Precipitator (ESP) | No. _____ | <input type="checkbox"/> Nitrogen Oxides Reduction | No. _____ |
| <input type="checkbox"/> Dust Suppression System | No. _____ | <input type="checkbox"/> Selective | <input type="checkbox"/> Non-Selective |
| <input type="checkbox"/> Venturi Scrubber | No. _____ | <input type="checkbox"/> Catalytic | <input type="checkbox"/> Non-Catalytic |
| <input type="checkbox"/> Spray Tower/Packed Bed | No. _____ | <input checked="" type="checkbox"/> Other | No. _____ |
| <input type="checkbox"/> Carbon Adsorber | No. _____ | Specify: <u>Wet suppression system</u> | |
| <input type="checkbox"/> Cartridge/Canister | | | |
| <input type="checkbox"/> Regenerative | | | |

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	0.68	0.60	7.26	0.91
Particulate Matter (filterable as PM2.5)	0.13	0.11	1.34	0.17
Particulate Matter (condensables)	NA (electric grid)			
Volatile Organic Compounds (VOC)	NA (electric grid)			
Oxides of Sulfur (SOx)	NA (electric grid)			
Oxides of Nitrogen (NOx)	NA (electric grid)			
Carbon Monoxide (CO)	NA (electric grid)			
Lead (Pb)	NA (electric grid)			
Greenhouse Gases (GHG)	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Carbon Dioxide (CO ₂)	NA (electric grid)			
Methane (CH ₄)	NA (electric grid)			
Nitrous Oxide (N ₂ O)	NA (electric grid)			
Hydrofluorocarbons (HFCs)	NA (electric grid)			
Perfluorocarbons (PFCs)	NA (electric grid)			
Sulfur Hexafluoride (SF ₆)	NA (electric grid)			
Total GHG (as CO ₂ e)	NA (electric grid)			
List individual federal Hazardous Air Pollutants (HAP) below:	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
NA				

(Attach additional sheets as necessary.)



Vendor/Manufacturer Specifications

HIGH PERFORMANCE

Capacities & Technical specifications

	C80	C100	C96	C106	C116	C3054	C120	C125	C140	C150	C160	C200		
Feed opening width mm (in)	800 (32)	1000 (40)	930 (37)	1060 (42)	1150 (45)	1375 (54)	1200 (47)	1250 (49)	1400 (55)	1400 (55)	1600 (63)	2000 (79)		
Feed opening depth mm (in)	510 (20)	760 (30)	580 (23)	700 (28)	800 (32)	760 (30)	870 (34)	950 (37)	1070 (42)	1200 (47)	1200 (47)	1500 (59)		
Power kW (HP)	75 (100)	110 (150)	90 (125)	110 (150)	132 (175)	160 (200)	160 (200)	160 (200)	200 (250)	200 (300)	250 (350)	400 (500)		
Speed (rpm)	350	260	330	280	260	260	230	220	220	220	220	200		
Product size mm (in)	Closed side setting mm (in)	Mtph (Stph)	Mtph (Stph)	Mtph (Stph)	Mtph (Stph)	Mtph (Stph)	Mtph (Stph)	Mtph (Stph)	Mtph (Stph)	Mtph (Stph)	Mtph (Stph)	Mtph (Stph)		
0-30	20													
0-1 1/8	1/2													
0-35	25													
0-1 1/4	1													
0-45	30													
0-1 1/2	1 1/8													
0-60	40	55 - 75												
0-2 1/4	1 1/4	60 - 80												
0-75	50	65 - 95												
	0-3	2	75 - 100											
0-90	60	80 - 110		105 - 135										
	0-3 1/2	2 1/2	90 - 120	115 - 150										
0-105	70	95 - 135	125 - 175	125 - 155	150 - 185	165 - 205	210 - 270	175 - 240						
	0-4 1/8	2 1/8	110 - 145	140 - 190	135 - 170	160 - 205	180 - 225	230 - 295	195 - 265					
0-120	80	110 - 150	145 - 200	140 - 180	165 - 215	180 - 235	240 - 300	195 - 270						
	0-4 1/4	3 1/4	120 - 165	160 - 215	155 - 200	185 - 240	200 - 260	260 - 330	215 - 295					
0-135	90	125 - 175	160 - 220	160 - 200	190 - 235	205 - 255	260 - 330	210 - 305						
	0-5 1/8	3 1/8	140 - 190	175 - 240	175 - 220	205 - 260	225 - 280	285 - 360	235 - 330					
0-150	100	140 - 190	180 - 250	175 - 225	205 - 265	225 - 285	285 - 365	235 - 325	245 - 335					
	0-6	4	150 - 210	200 - 275	195 - 250	230 - 295	245 - 315	315 - 400	260 - 360	270 - 370				
0-185	125	175 - 245	220 - 310	220 - 280	255 - 325	270 - 345	345 - 435	285 - 395	295 - 405	325 - 445	340 - 470			
	0-7	5	195 - 270	245 - 340	240 - 310	280 - 360	295 - 380	375 - 480	315 - 435	325 - 445	355 - 490	375 - 515		
0-225	150	210 - 290	265 - 365	265 - 335	305 - 385	320 - 405	405 - 515	340 - 475	345 - 475	380 - 530	400 - 555	430 - 610		
	0-9	6	230 - 320	290 - 400	290 - 370	335 - 428	350 - 450	445 - 565	375 - 515	380 - 525	420 - 580	440 - 610	475 - 670	
0-260	175	245 - 335	310 - 430	310 - 390	355 - 450	370 - 465	465 - 595	385 - 540	395 - 545	435 - 605	460 - 635	495 - 695	630 - 890	
	0-10	7	270 - 370	340 - 470	340 - 430	390 - 495	405 - 515	515 - 650	430 - 595	435 - 600	480 - 665	505 - 700	545 - 765	695 - 980
0-300	200		355 - 490		395 - 500	410 - 520	530 - 670		445 - 615	495 - 685	520 - 720	560 - 790	710 - 1000	
	0-12	8		390 - 535		445 - 560	460 - 580	580 - 740		490 - 675	545 - 750	570 - 790	615 - 870	780 - 1100
0-340	225								495 - 685	550 - 760	580 - 800	625 - 880	785 - 1105	
	0-13	9							545 - 750	605 - 835	640 - 880	685 - 965	860 - 1215	
0-375	250								545 - 755	610 - 840	640 - 880	685 - 965	865 - 1215	
	0-15	10							600 - 830	670 - 925	705 - 970	755 - 1060	950 - 1340	
0-410	275											745 - 1055	940 - 1320	
	0-16	11										820 - 1160	1030 - 1455	
0-450	300											815 - 1145	1015 - 1435	
	0-18	12										865 - 1260	1120 - 1575	

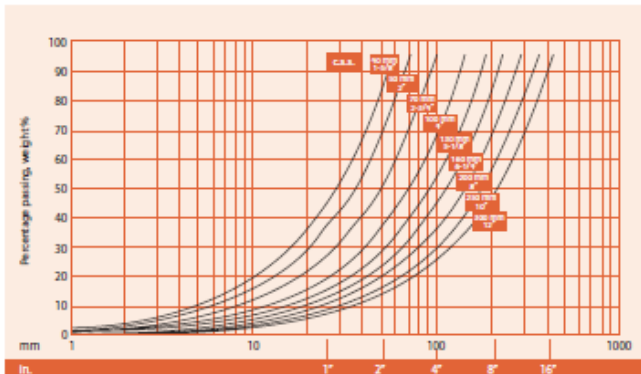
* Smaller closed side settings can be often used depending on application and production requirements. For a performance estimation for your specific application, please contact Metso.

The above figures represent through the crusher capacities, which are based on a feed material with an average specific gravity of 2.7 t/m³, a maximum feed size that will enter the crusher without bridging and material finer than the crushers closed side setting removed. The capacities may vary depending on the feeding method and on feed characteristics such as gradation, bulk density, moisture, clay content and crushability.

Measurement of the crusher's closed side setting varies depending on the jaw profile that is being used and has an impact on the crusher's capacity and product gradation. The following factors will enhance crusher capacity and performance:

1. Proper selection of the jaws.
2. Proper feed gradation.
3. Controlled feed rate.
4. Sufficient feeder capacity and width.
5. Adequate crusher discharge area.
6. Discharge conveyor sized to convey maximum crusher capacity.

Indicative product gradation



Nordberg C Series jaw crushers fits perfectly for primary crushing stations.



Process Flow Diagram



North East Quarry - Equipment List

Business Unit: 31111

Air Permit to Operate No.: 015-0005

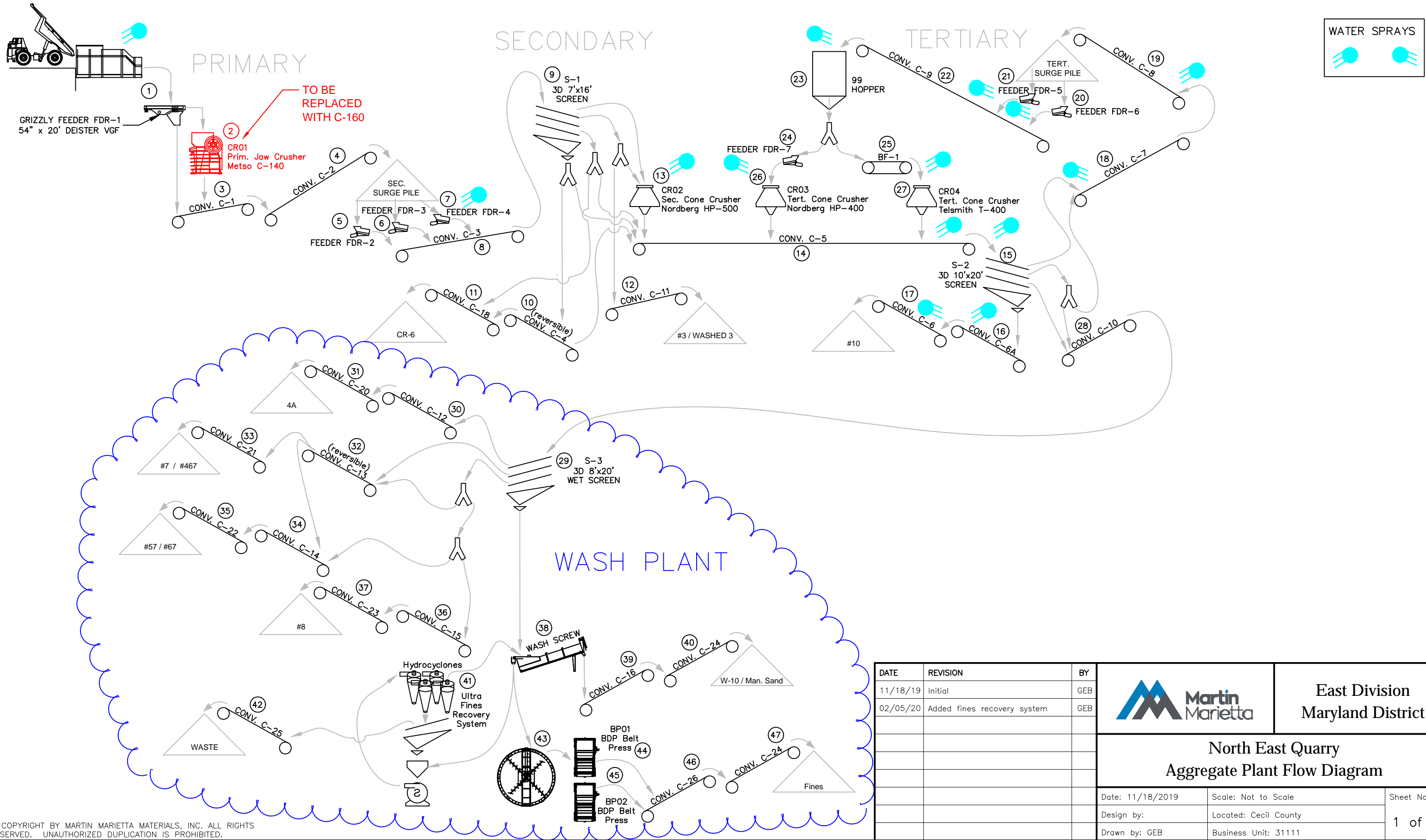
Plant 2E (ARMA 015-0005-6-0299)

ID No.	DESCRIPTION	Rated Capacity	Comments
2	CR01 METSO C140 JAW CRUSHER	925	To be removed
2	CR01 METSO C160 JAW CRUSHER	1,260	New equip. replacing C140
13	CR02 Metso Nordberg HP 500 S/M	880	Note: Permit is for 750
26	CR03 Metso Nordberg HP 400 SH/M	700	
27	CR04 Telsmith T-400 Crusher	585	
9	S1 Metso 7x16 Triple Deck	1500	
15	S2 Diester BHM-31020-O3T	2281	
29	S3 Diester BHM-3820-OT	1750	
3	C-1 CONV 48X60		
4	C-2 CONV 48X323		
8	C-3 CONV 48X360		
10	C-4 CONV 36X27 (reversible)		
14	C-5 CONV 48X360		
17	C-6 CONV 30X164		Stacker, #10
16	C-6A CONV 30X40		
18	C-7 CONV 36X190		
19	C-8 CONV 36X283		
22	C-9 CONV 36X283		
28	C-10 CONV 36x145		
12	C-11 CONV, 36X85		Stacker, ASTM #3
30	C-12 CONV 36X50		
32	C-13 CONV 30X43 (reversible)		
34	C-14 CONV 30X65		
36	C-15 CONV 30X85		
39	C-16 CONV 30X55		
11	C-18 CONV 36X150		Stacker, CR-6
31	C-20 CONV 30X120		Stacker, 4A
33	C-21 CONV 30X123		Stacker, #7 / #467
35	C-22 CONV 30X123		Stacker, #57 / #67
37	C-23 CONV 30X123		Stacker, #8
40	C-24 CONV 30X123		Stacker, W-10 / Man. Sand
42	C-25 CONV 24X63		Stacker, Fines
1	FDR-1 METSO 58X24 VL-14 Vibrating Grizzly Feeder		
5	FDR 2 SYNTRON MF200-C 48X84		Inside Surge Tunnel
6	FDR 3 SYNTRON MF200-C 48X84		Inside Surge Tunnel
7	FDR 4 SYNTRON MF200-C 48X84		Inside Surge Tunnel

21	FDR 5 SYNTRON 36X72 MF200-C		Inside Surge Tunnel
20	FDR 6 SYNTRON MF200-C 36X72		Inside Surge Tunnel
24	FDR 7 SYNTRON MF400-2 48X118		
25	BF-1 99 SYNTRON F480A Belt Feeder		
38	WASHER 44X33 DFMSW		
23	99 HOPPER (FOR BF-1)		
41	WASH ULTRA FINES RECOVERY		
43	TC01 THICKENER / CLARIFIER		
44	BP01 BDP BELT PRESS		
45	BP02 BDP BELT PRESS		
46	C-26 CONV 30x80		
47	C-27 CONV 30x80		
A-1	R-2 30" Conveyor Belt		Rail Facility
A-2	R-3 30" Conveyor Belt		Rail Facility
A-3	R-4 48" Conveyor Belt		Rail Facility
A-4	R-5 48" Conveyor Belt		Rail Facility
A-5	Syntron Feeder		Rail Facility
TU	Truck Unloading		
TL	Truck Loading		
SP	Storage Piles		

Portable Plant (up to 600 tons per hour, ARMA 015-0005-6-0364)

PP-CR-1	One (1) Primary Crusher		
PP-CR-2	One (1) Secondary Crusher		
PP-CR-3	One (1) Tertiary Crusher		
PP-VS-1	One (1) Screen		
PP-VS-2	One (1) Screen		
PP-CONV	Associated Conveyors (approx. 21)		
PP-GRIZ	Primary Grizzly Feeder		
PP-GRIZ	Vibrating Grizzly Feeder		
PP-GRIZ	Vibrating Grizzly Feeder		
PP-FEED	Apron/Belt Feeder		
PP-EN540	Up to Four (4) Diesel Fired Engines, <= 540 HP, Tier III or better		
PP-EN174	Up to Two (2) Diesel Fire Engines, <= 174 HP, Tier III or better		
PP-EN51	One (1) Diesel Fired Engine, <=51 HP, Teir III or better		



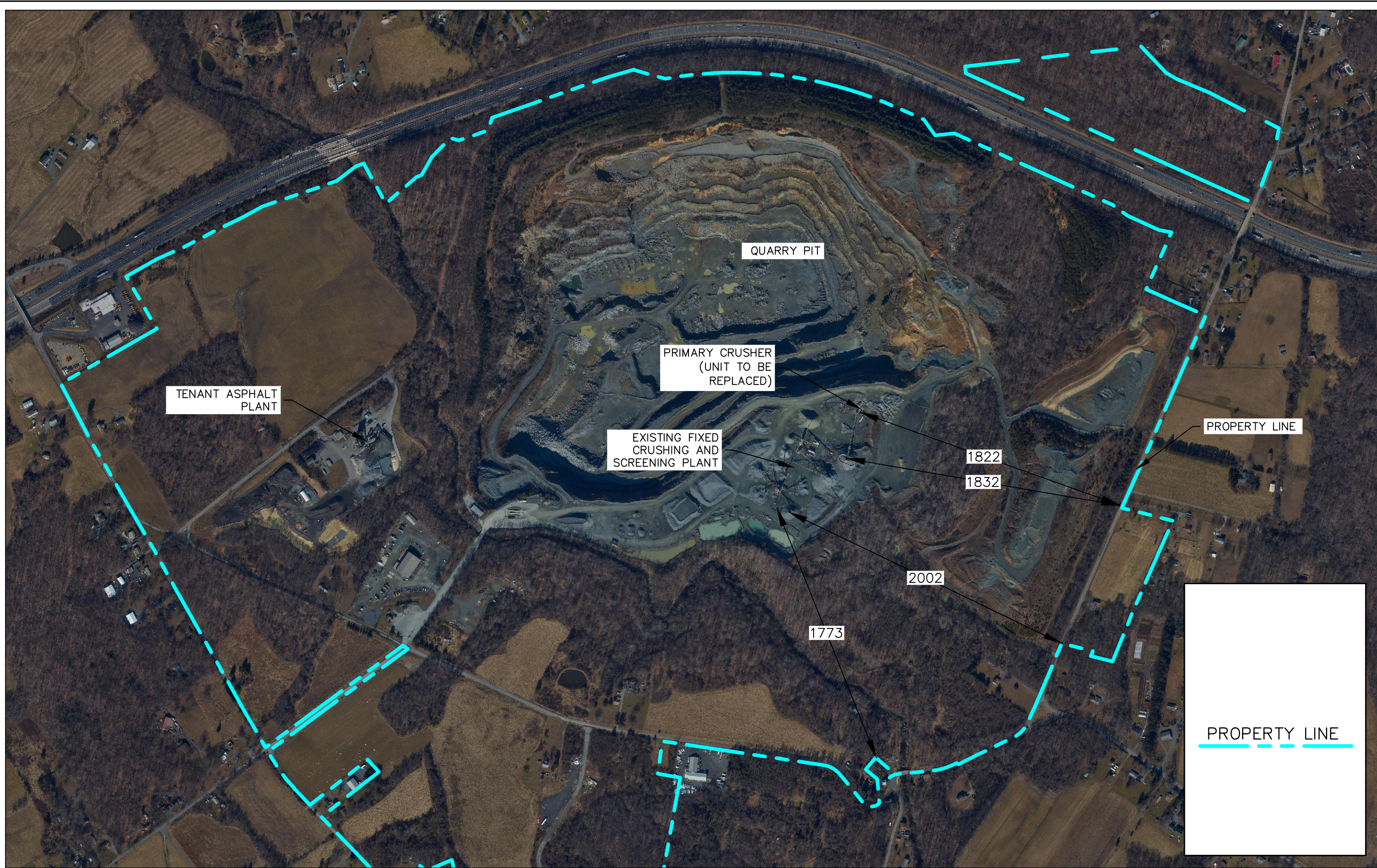
WATER SPRAYS

DATE	REVISION	BY
11/18/19	Initial	GEB
02/05/20	Added fines recovery system	GEB

	East Division Maryland District	
	North East Quarry Aggregate Plant Flow Diagram	
Date: 11/18/2019	Scale: Not to Scale	Sheet No.:
Design by:	Located: Cecil County	1 of 1
Drawn by: GEB	Business Unit: 31111	



Site Plan



REV.	DATE	DESCRIPTION

DATE: 03/18/2021
 DRAWN BY: GEB
 REVIEW BY:
 BU: 31111

Gas Butler, Engineer
 Senior Environmental Specialist
 10000 Beaver Dam Road
 Cockeysville, MD 21030
 t: (410) 802-2769
 e: gasbutler@martinmarietta.com
 www.martinmarietta.com



AIR PERMIT EXHIBIT - AREA MAP
 NORTH EAST QUARRY
 MARYLAND DISTRICT
 233 Stevenson Road, North East, MD 21001

Sheet Name
 FIGURE
 1
 Sheet No.
 1 of 1

PROPERTY LINE



Material Balance Data & Emissions Calculations

Bluegrass Materials Company, LLC (C/o Martin Marietta Materials, Inc.)

North East, Permit to Operate 015-0005

Permit to Construct Application

Form 5 / SEP Calculations

Date: 03/16/2021

Description	Make	Model	Design Capacity (stph) (*1)	Projected Operations (*2)			Particulate Matter Emissions (*3)				
				Rate (stph)	Daily Op. Hours (hrs/day)	Annual Op. Hours (hrs/yr)	Emissions Factor (lb/Ton)	Design Capacity Hrly Emissions (lb/hr)	At Projected Operations		
									Hourly Emissions (lb/hr)	Daily Emissions (lb/day)	Annual Emissions (Tons/yr)
CR01 METSO C160 JAW CRUSHER	Metso	C-160	1260	1,120	12	3000	0.00120	1.51	1.34	16.13	2.02
TOTAL								1.51	1.34	16.13	2.02

Description	Make	PM-10 Emissions (*3)					PM-2.5 Emissions (*3)				
		Emissions Factor (lb/Ton)	Design Capacity Hrly Emissions (lb/hr)	At Projected Operations			Emissions Factor (lb/Ton)	Design Capacity Hrly Emissions (lb/hr)	At Projected Operations		
				Hourly Emissions (lb/hr)	Daily Emissions (lb/day)	Annual Emissions (Tons/yr)			Hourly Emissions (lb/hr)	Daily Emissions (lb/day)	Annual Emissions (Tons/yr)
CR01 METSO C160 JAW CRUSHER	Metso	0.000540	0.68	0.60	7.26	0.91	0.00010	0.13	0.112	1.344	0.17
TOTAL			0.68	0.60	7.26	0.91		0.13	0.11	1.34	0.17

(*1) "Design Capacity" is based on vendor or manufacturer provided information, or educated estimates where information is not available.

(*2) "Projected Operations" represent conservative estimates based on computer flow modeling, equipment configuration, past operational records, and interviews with knowledgeable personnel.

(*3) PM, PM-10, & PM-2.5 emissions based on 100% equipment availability, and AP-42 emissions factors (AP-42 11.19.2, Table 11.19.1-2 (English Units) revised 08/04).

(*4) WMPO = Wet Material Processing Operations

(*5) Capacity / Rate = Input Rate = Output Rate for all of the above.

Bluegrass Materials Company, LLC (C/o Martin Marietta Materials, Inc.)

North East, Permit to Operate 015-0005

Permit to Construct Application

Form 5T & Crystalline Silica Emissions Calculations

Date: 03/16/2021

Total Stage Throughputs - Current (Existing Equipment):

Primary 900 tph
Secondary 750 tph
Tertiary 700 tph

Proposed:

Primary 1400 tph
Secondary 1400 tph
Tertiary 1050 tph

ID No.	DESCRIPTION	PM-10 Emission Factor (lb/Ton)	Current (Existing) Equipment				Proposed Equipment			
			Equip. Capacity (stph)	Projected Operating Rate (stph)	PM-10 Emissions @ Proj. Operating Rate (lbs/hr)	Crystalline Silica Emissions (lbs/hr)	Equip. Capacity (stph)	Projected Operating Rate (stph)	PM-10 Emissions @ Proj. Operating Rate (lbs/hr)	Crystalline Silica Emissions (lbs/hr)
2	CR01 METSO C140 JAW CRUSHER	0.00054	925	765	0.41	0.00046				
2	CR01 METSO C160 JAW CRUSHER	0.00054					1,260	1,120	0.60	0.00067
13	CR02 Metso Nordberg HP 500 S/M	0.00054	880	469	0.25	0.00028	880	875	0.47	0.00052
26	CR03 Metso Nordberg HP 400 SH/M	0.00054	700	385	0.21	0.00023	700	578	0.31	0.00035
27	CR04 Telsmith T-400 Crusher	0.00054	585	315	0.17	0.00019	585	473	0.26	0.00028
9	S1 Metso 7x16 Triple Deck	0.00074	1500	750	0.56	0.00061	1500	1,400	1.04	0.00115
15	S2 Diester BHM-31020-O3T	0.00074	2281	1,400	1.04	0.00115	2281	2,100	1.55	0.00172
29	S3 Diester BHM-3820-OT	WMPO	1750	609	0.00	0.00000	1750	914	0.00	0.00000
3	C-1 CONV 48X60	0.000046	-	900	0.04	0.00005	-	1,400	0.06	0.00007
4	C-2 CONV 48X323	0.000046	-	900	0.04	0.00005	-	1,400	0.06	0.00007
8	C-3 CONV 48X360	0.000046	-	750	0.03	0.00004	-	1,400	0.06	0.00007
10	C-4 CONV 36X27 (reversible)	0.000046	-	188	0.01	0.00001	-	350	0.02	0.00002
14	C-5 CONV 48X360	0.000046	-	1,400	0.06	0.00007	-	2,100	0.10	0.00011
17	C-6 CONV 30X164	0.000046	-	91	0.00	0.00000	-	137	0.01	0.00001
16	C-6A CONV 30X40	0.000046	-	91	0.00	0.00000	-	137	0.01	0.00001
18	C-7 CONV 36X190	0.000046	-	700	0.03	0.00004	-	1,050	0.05	0.00005
19	C-8 CONV 36X283	0.000046	-	700	0.03	0.00004	-	1,050	0.05	0.00005
22	C-9 CONV 36X283	0.000046	-	700	0.03	0.00004	-	1,050	0.05	0.00005
28	C-10 CONV 36x145	0.000046	-	609	0.03	0.00003	-	914	0.04	0.00005
12	C-11 CONV, 36X85	0.000046	-	53	0.00	0.00000	-	98	0.00	0.00000
30	C-12 CONV 36X50	WMPO	-	21	0.00	0.00000	-	32	0.00	0.00000
32	C-13 CONV 30X43 (reversible)	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
34	C-14 CONV 30X65	WMPO	-	245	0.00	0.00000	-	368	0.00	0.00000
36	C-15 CONV 30X85	WMPO	-	189	0.00	0.00000	-	284	0.00	0.00000
39	C-16 CONV 30X55	WMPO	-	119	0.00	0.00000	-	179	0.00	0.00000
11	C-18 CONV 36X150	0.000046	-	135	0.01	0.00001	-	252	0.01	0.00001
31	C-20 CONV 30X120	WMPO	-	21	0.00	0.00000	-	32	0.00	0.00000
33	C-21 CONV 30X123	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
35	C-22 CONV 30X123	WMPO	-	245	0.00	0.00000	-	368	0.00	0.00000
37	C-23 CONV 30X123	WMPO	-	189	0.00	0.00000	-	284	0.00	0.00000
40	C-24 CONV 30X123	WMPO	-	119	0.00	0.00000	-	179	0.00	0.00000
42	C-25 CONV 24X63	WMPO	-	7	0.00	0.00000	-	11	0.00	0.00000
1	FDR-1 METSO 58X24 VL-14 Vibrating Grizzly Feeder	0.000016	-	900	0.01	0.00002	-	1,400	0.02	0.00002
5	FDR 2 SYNTRON MF200-C 48X84	*(8)	-	250	0.00	0.00000	-	467	0.00	0.00000
6	FDR 3 SYNTRON MF200-C 48X84	*(8)	-	250	0.00	0.00000	-	467	0.00	0.00000
7	FDR 4 SYNTRON MF200-C 48X84	0.000046	-	250	0.01	0.00001	-	467	0.02	0.00002
21	FDR 5 SYNTRON 36X72 MF200-C	*(8)	-	700	0.00	0.00000	-	1,050	0.00	0.00000
20	FDR 6 SYNTRON MF200-C 36X72	*(8)	-	350	0.00	0.00000	-	525	0.00	0.00000
24	FDR 7 SYNTRON MF400-2 48X118	0.000046	-	350	0.02	0.00002	-	525	0.02	0.00003
25	BF-1 99 SYNTRON F480A Belt Feeder	0.000046	-	350	0.02	0.00002	-	525	0.02	0.00003
38	WASHER 44X33 DFMSW	WMPO	-	126	0.00	0.00000	-	189	0.00	0.00000
23	99 HOPPER (FOR BF-1)	N/A	-	700	0.00	0.00000	-	1,050	0.00	0.00000
41	WASH ULTRA FINES RECOVERY	WMPO	-	21	0.00	0.00000	-	32	0.00	0.00000
43	TC01 THICKENER / CLARIFIER	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
44	BPO1 BDP BELT PRESS	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
45	BPO2 BDP BELT PRESS	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
46	C-26 CONV 30x80	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
47	C-27 CONV 30x80	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
A-1	R-2 30" Conveyor Belt	*(7)	-	0	0.00	0.00000	-	0	0.00	0.00000
A-2	R-3 30" Conveyor Belt	*(7)	-	0	0.00	0.00000	-	0	0.00	0.00000
A-3	R-4 48" Conveyor Belt	*(7)	-	0	0.00	0.00000	-	0	0.00	0.00000
A-4	R-5 48" Conveyor Belt	*(7)	-	0	0.00	0.00000	-	0	0.00	0.00000
A-5	Syntron Feeder	*(7)	-	0	0.00	0.00000	-	0	0.00	0.00000
TU	Truck Unloading	0.000016	N/A	765	0.01	0.00001	N/A	1,400	0.02	0.00002
TL	Truck Loading	0.0001	N/A	765	0.08	0.00008	N/A	1,400	0.14	0.00015
SP	Storage Piles	0.00159	N/A	765	1.22	0.00135	N/A	1,400	2.23	0.00246
PM-10 TOTAL:					4.33				7.24	
CRYSTALLINE SILICA TOTAL:					0.0048					0.0080
PM-10 TOTAL (MODIFICATION EQUIPMENT ONLY):									0.06	
CRYSTALLINE SILICA (MODIFICATION EQUIPMENT ONLY)									0.0007	

Portable Plant (up to 600 tons per hour, ARMA 015-0005-6-0364)

Portable Plant, Fugitive Emis. From Processing	VARIOUS	600	600	2.09	0.00231	600	600	2.09	0.00231
--	---------	-----	-----	------	---------	-----	-----	------	---------

NOTE: Portable Plant PM-10 emissions from approved 2017 Air Permit to Construct Application (assuming all possible equipment covered by flexible permit operates)

TOTAL EXISTING (FIXED EQUIPMENT + PORTABLE PLANT):

	PM-10	6.42	lbs/hr
	CRSYTALINE SILICA	0.0071	lbs/hr
		21.32	lbs/yr (assumes 3000 operating hours)

TOTAL PROPOSED (FIXED EQUIPMENT + PORTABLE PLANT):

	PM-10	9.33	lbs/hr
	CRSYTALINE SILICA	0.0103	lbs/hr
		30.96	lbs/yr (assumes 3000 operating hours)

Comments:

- (1) Crushed Stone Processing equipment emissions factors from AP-42 11.19.2, Table 11.19.1-2 (English Units) revised 08/04.
- (2) Storage Pile emissions factors from AP-42, Section 13.2.4 - Assuming a moisture content of 2.1%, a mean wind speed of 6.9 miles per hour, < 10 micrometer particale size multiplier, and the number of tons processed (max design capacity) is equal to the number of tons handled.
- (3) WMPO = Wet Material Processing Operation.
- (4) Equipment associated with PTC modification is highlighted yellow.
- (5) "Equip. Capacity" is based on vendor or manufacturer provided information, or educated estimates where information is not available.
- (6) "Projected Operations" represent high-range estimates based on computer flow modeling, equipment configuration, past operational records, and interviews with knowledgeable personnel. Actual throughput may vary based on plant configuration and other factors.
- (7) Equipment associated with rail yard facility (A-1 thru A-5) operates only intermittently, and is located approximately 4000 feet from fixed facility. This equipment only conveys finished product into rail cars (no crushing or screening at facility). Therefore, emissions from this equipment was assumed to be negligible for the purposes of this evaluation.
- (8) Vibrating feeders, located underneath of surge piles (in surge tunnels).

Crystalline Silica Emissions Calculations:

The above crystalline silica emissions calculations are based on guidance provided from the Maryland Department of the Environment (MDE) Air and Radiation Management Administration (ARMA) Air Quality Permits Program, in the September 2013 guidance document entitled Procedures for Estimating PM-10 Emissions and Demonstrating Compliance with the Air Toxics Ambient Impact Requirement for Crystalline Silica Emissions from Crushing and Screening Operations.

Hourly Emissions = 0.01 * CS * PM-10

Where

0.01 = Percent of PM-10 emissions that is respirable, expressed as a decimal (from Appendix C of the 2009 ACGIH TLV Booklet)

CS = Percent by weight of total crystalline silica in material expressed as a decimal (ex. 1% = 0.01)

PM-10 = Total PM-10 emissions in pounds/hour (from table adjacent column)

CS = 0.111 % crystalline silica expressed as a decimal (quartz, average of three available site bulk sample XRD analyses in 2018, 2019, & 2020)



AERMOD Report

**CRYSTALLINE SILICA AIR QUALITY MODELING ANALYSIS
FOR THE PROPOSED MODIFICATIONS TO THE
MARTIN MARIETTA NORTH EAST QUARRY**



Prepared for:

**Martin Marietta Materials, Inc.
10000 Beaver Dam Road
Cockeysville, Maryland 21030**

Prepared by:

**RTP Environmental Associates
304A West Millbrook Road
Raleigh, NC 27609**

March 2021

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1.0 INTRODUCTION

Martin Marietta Materials, Inc. is proposing modifications to its North East Quarry in Cecil County. An air quality modeling analysis was conducted for emissions of crystalline silica (silica, CAS No. 14808607) from the proposed facility. The modeling analysis was conducted to assess the compliance status of the facility with respect to the Maryland Department of Environment (MDE) ambient impact requirement under the Toxic Air Pollutant (TAP) Regulations of COMAR 26.11.15.06. Potential emissions from each source at the facility were calculated and modeled pursuant to “Test 4, Refined Computer Models” under the MDE’s TAP guidance document ¹. The resultant total concentrations were compared to the 8-hour average silica screening level of the TAP regulations. The results of the modeling analysis demonstrate that potential emissions from the proposed facility will result in an ambient concentration below the silica screening level.

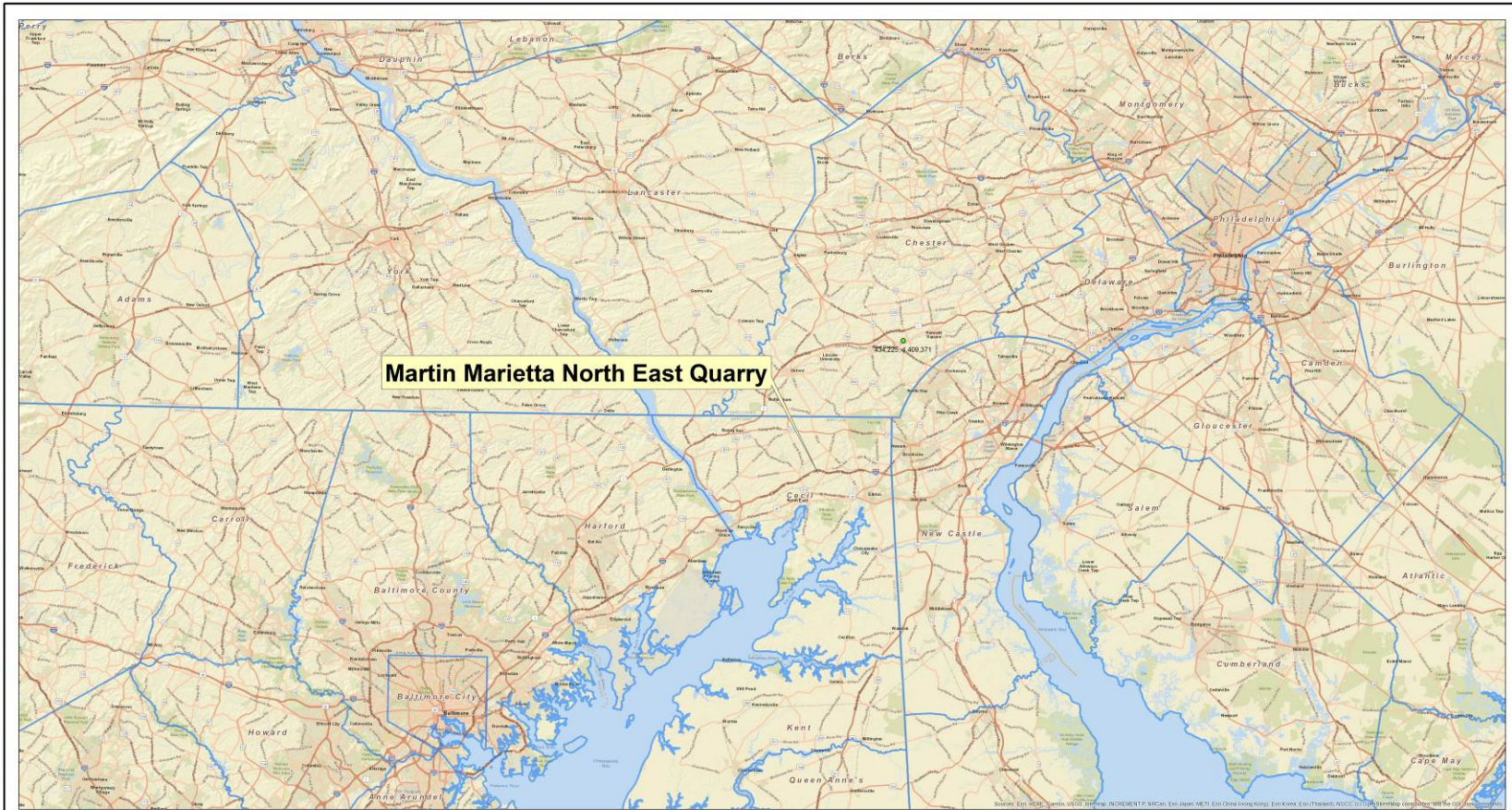
This report describes the modeling methodology and results of the air quality analysis. The ambient impacts analyses conformed to the procedures MDE’s Guideline and the EPA’s Guideline on Air Quality Models (Revised, 2017).²

1.1 Facility Location and Description

The Martin Marietta facility is located at 233 Stevenson Road in North East, MD in Cecil County, approximately 65 kilometers northeast of Baltimore and 32 kilometers southwest of Wilmington, DE. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 421,040 meters east and 4,388,077 meters north (UTM Zone 18, NAD 83) at an elevation of 75 meters (250 feet) above mean sea level. Figure 1 shows the general location of the facility. Figure 2 shows a more detailed location on a USGS topographical map.

¹Maryland Department of the Environment, Guidance Document for Demonstrating Compliance with the Ambient Impact Requirement Under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06), undated.

²Guidelines on Air Quality Models, Appendix W of 40 CFR Part 51, U.S. Environmental Protection Agency. January 2017.



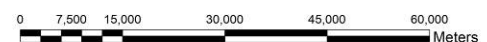

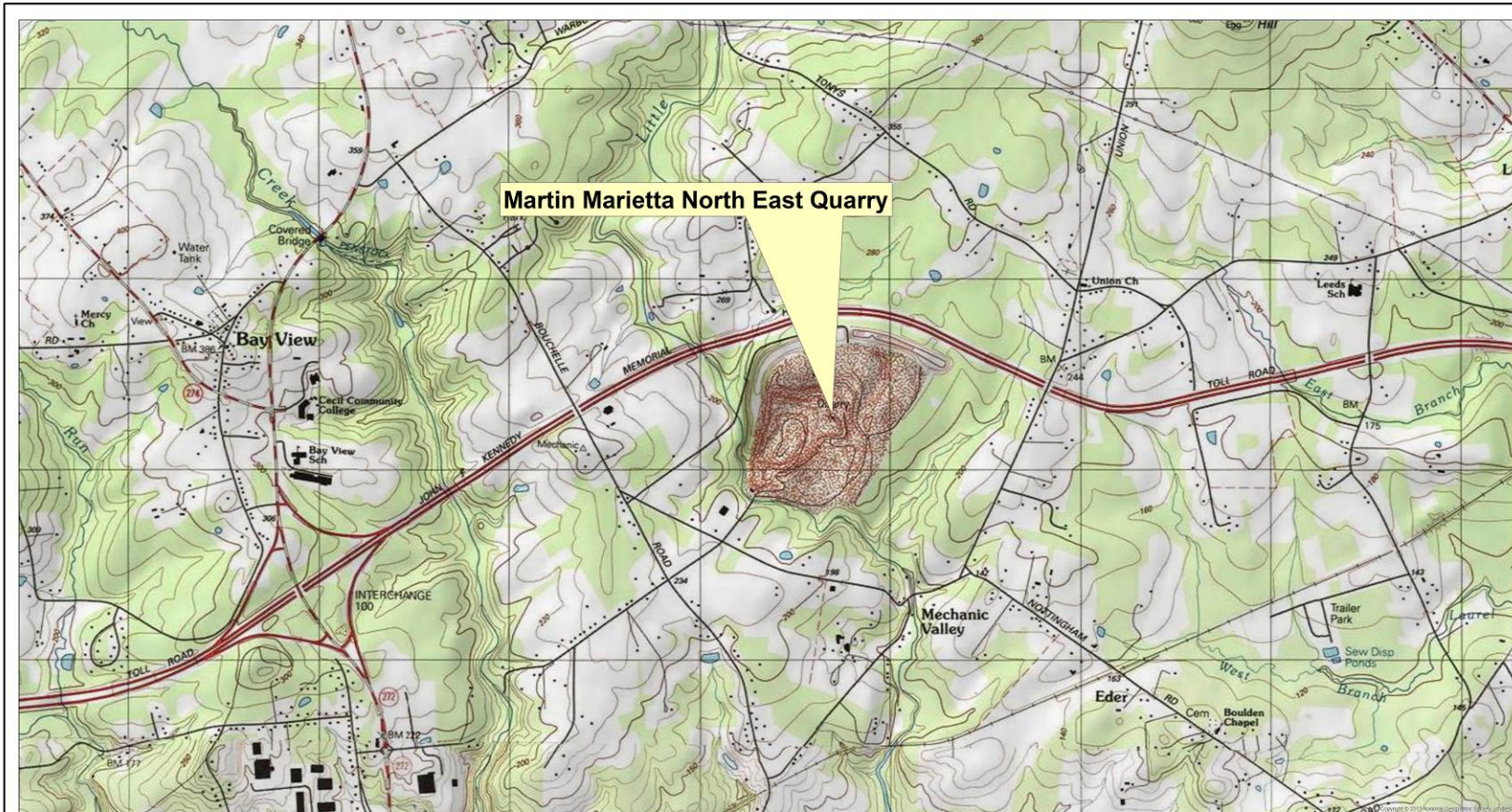
RTP ENVIRONMENTAL ASSOCIATES, INC.®			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: right;">Sheet No.</td> <td style="width: 50%; text-align: left;">Drawn By:</td> </tr> <tr> <td></td> <td style="text-align: left;">Checked by:</td> </tr> <tr> <td></td> <td style="text-align: left;">Date:</td> </tr> </table>	Sheet No.	Drawn By:		Checked by:		Date:
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Figure 1. General Location of the Martin Marietta North East Quarry



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0 250 500 1,000 1,500 2,000 Meters



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Figure 2. Specific Location of the Martin Marietta North East Quarry

2.0 MODEL SELECTION, SETUP, AND APPLICATION

2.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 19191) was selected for conducting the dispersion modeling analysis. AERMOD is the most appropriate model for calculating ambient concentrations near the Martin Marietta facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. While not as important for this evaluation, the model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. It is also one of the models recommended for such studies by the MDE. All model options were selected as recommended in the EPA [Guidelines on Air Quality Models](#).

AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principals for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor, and AERMOD includes the dispersion modeling algorithms.

AERMOD was developed to calculate concentrations in both simple and complex terrain. As with CTDMPLUS, AERMOD uses the dividing streamline concept to address plume interactions with elevated terrain.

2.2 Model Setup and Application

AERMOD contains three modules: two pre-processors and the dispersion model. Model receptor elevations and height scales are developed with the AERMAP pre-processor, meteorological data are developed with the AERMET pre-processor, and the model algorithms are applied with AERMOD. Application of each of these three modules is discussed in the following sections.

AERMAP

The terrain pre-processor AERMAP was used to extract receptor elevations data from USGS National Elevation Data (NED) files for use as input to AERMOD. One degree-resolution NED dataset files were obtained. Receptor locations were based on North American Datum of 1983 (NAD 83). AERMAP (Version 18081) was used to generate the elevation and height scale for each receptor. The height scale is a measure of the height and distance of the local terrain feature that has the greatest influence on dispersion for that receptor.

The modeled receptor grid included a total of 5,058 receptors. The grid consisted of two cartesian grids and discrete receptors placed along the facility property boundary at 50m intervals. The first cartesian grid extended approximately 2,500m from the property in all directions, with a dense receptor spacing of 100m. The second cartesian grid extended from 2,500 to 5,000m from the property, with receptor spacing of 250m. Any public roadway, even if it is within the Martin Marietta property boundary, was treated as ambient air.

Generally, a fine-mesh receptor grid is placed around the location of maximum concentrations to pinpoint the absolute maximum concentrations calculated from a facility. Additional modeling using a fine-mesh receptor grid was not necessary however, because the maximum pollutant concentrations occurred within 500m of the property. The receptor spacing in this region is 100m; therefore, no fine mesh receptor grid was required. Figure 3 shows the near field receptors that were employed in the analysis.



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Figure 3. Near Field Receptor Grid Employed in the Martin Marietta Analysis

AERMET

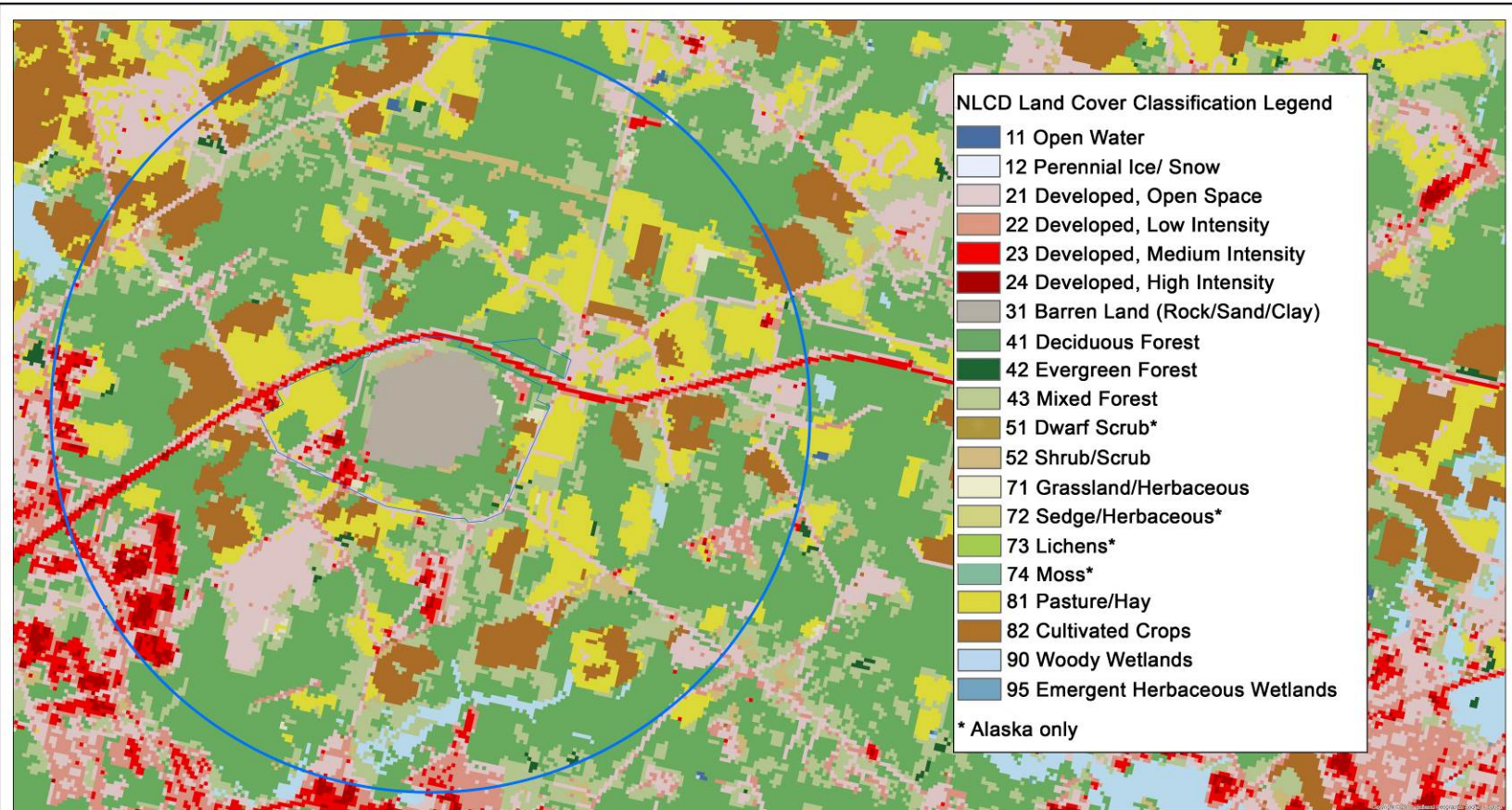
The meteorological data pre-processor AERMET was used to develop meteorological data for the AERMOD modeling system. The AERMET software processes surface meteorological data and twice-daily upper air sounding data into the proper format using a three-stage process. The first stage extracts the data and administers several data quality checks. The second stage merges the data, and the third stage estimates the required boundary layer parameters and writes the data in a format readable by AERMOD.

Five years (2015-2019) of meteorological data were processed using AERMET (Version 19191) for use in the analysis. Sequential hourly surface data from the National Weather Service (NWS) station at the Dover Air Force Base in Dover, MD (WBAN No. 13707) and upper air data from the NWS station at the Washington Dulles International Airport (WBAN No. 93734) in Sterling, VA were used.

AERMOD

AERMOD was run in the regulatory default mode using the rural land use dispersion option. The land use typing scheme of Auer was used to determine the proper land use classification of the site.³ Specifically, the USGS land use coverages were obtained for the area. The land use classification codes were then categorized as either urban or rural, based on the USGS land use classification codes. It was determined that the land use within the 3km radius of the area is rural as defined by Auer. Figure 4 shows the results of the landuse analysis. Only areas designated as red and dark red are considered "urban" under the Auer landuse classification.

³ Auer, Jr., A.H. "Correlation of Land Use and Cover with Meteorological Anomalies." Journal of Applied Meteorology, 17:636-643, 1978.



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0 375 750 1,500 2,250 3,000 Meters



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Figure 4. Land Use Analysis Results (3km Radius Circle Shown)

2.3 Source Input Parameters and Modeled Emissions

The modeled stack parameter and emission data are provided in Appendix A. All sources, with the exception of the quarry and the material stockpile areas, were modeled as volume sources. The quarry was modeled as an open pit source. Emissions from the quarry truck loading which is located in the pit were included in the modeled pit source. The stockpile areas were modeled as "area poly" sources. The release height for the piles was assumed to be 1/2 the pile height.

The remaining process equipment (i.e., conveyors, screens, crushers, and bins) were modeled as volume sources. The initial dispersion parameters (sigma y and sigma z) were calculated based upon the procedures of Table 3-1 in the EPA's AERMOD User's Guide using the area of release with an assumed horizontal and vertical dimension of 5 ft. More specifically, the sigma y values were calculated as the square root of the total area (25ft²) over which the emissions occur (or the average length of a side) divided by 4.3. The sigma z values were calculated as the initial vertical dimension of the release (assumed for all sources to be 5ft) divided by 4.3.

The emissions for each source were calculated by Martin Marietta pursuant to the MDE's Guidance⁴. The modeled PM₁₀ (and therefore silica) emissions included the proposed primary crusher replacement (and corresponding anticipated overall plant throughput following the proposed modification). In addition, Martin Marietta is permitted to operate a Portable Plant (ARMA Registration Number 015-0005-6-0299). The portable plant was included in the model by conservatively assuming all emissions occur from a single volume source located east of the existing fixed plant with the additional conservative assumption that both plants operate simultaneously at maximum capacity. All calculations can be found in Appendix B.

⁴ Maryland Department of the Environment, Procedures for Estimating PM-10 Emissions and Demonstrating Compliance with the Air Toxics Ambient Impact Requirement for Crystalline Silica Emissions from Crushing and Screening Operations, undated.

2.4 Good Engineering Practice (GEP) Stack Height

A good engineering practice (GEP) stack height evaluation was not required for this analysis as no point sources were modeled.

3.0 RESULTS

The AERMOD results are presented in Table 1. The maximum 8-hour concentration as modeled over the five year meteorological dataset is presented. As shown, the ambient silica concentration is below the MDE screening level. The maximum impact occurs along the eastern facility property boundary as shown in Figure 5.

Appendix C provides the model summary output. Actual model input and output files are included electronically.

Table 1. AERMOD Results

Pollutant	Modeled Averaging Period	Modeled Impact ($\mu\text{g}/\text{m}^3$)	Screening Level ($\mu\text{g}/\text{m}^3$)
Crystalline Silica	8-hour	0.18	0.25

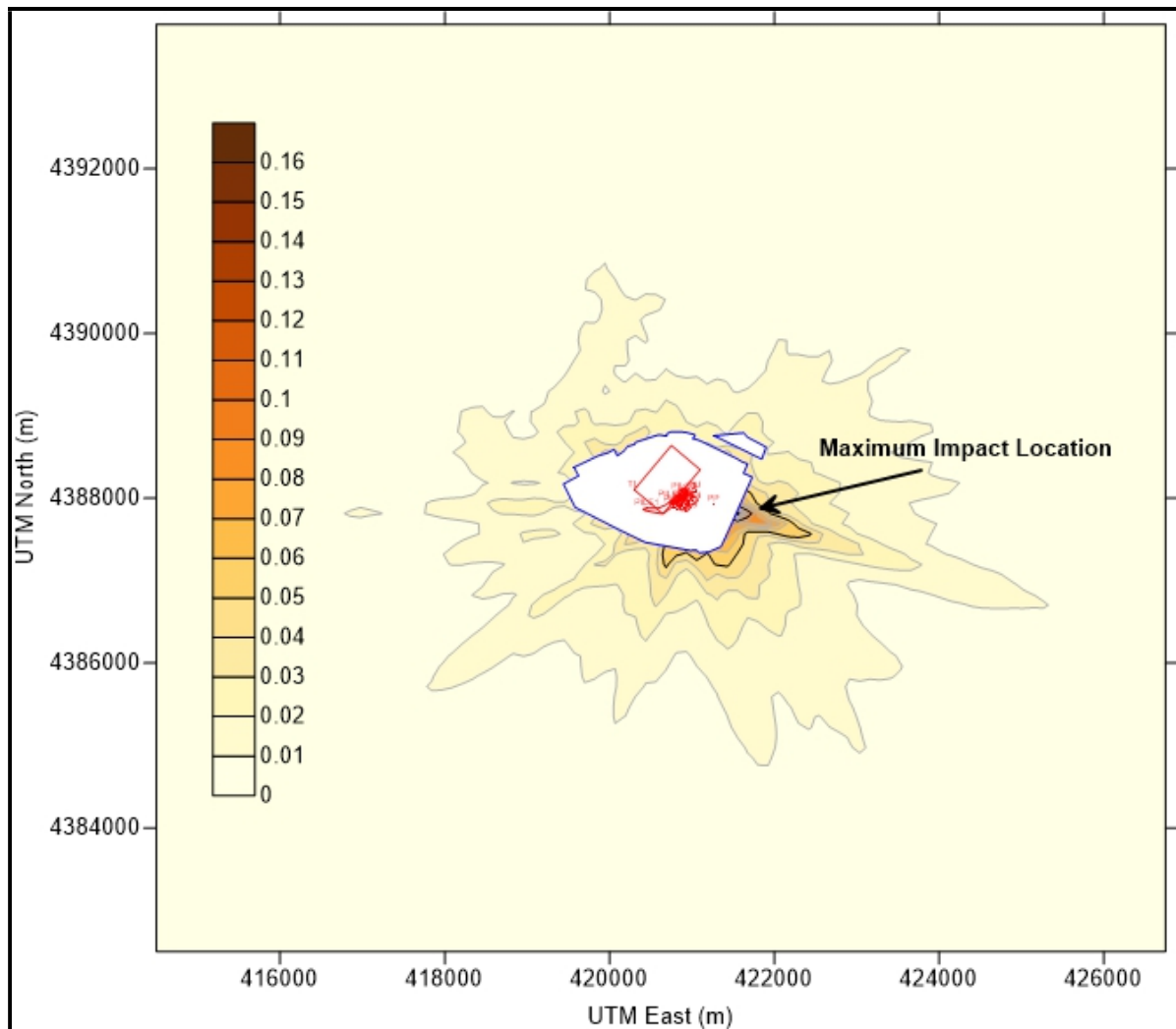


Figure 5. Location of Maximum 8-hour Crystalline Silica Impact ($\mu\text{g}/\text{m}^3$)

APPENDIX A

Model Input Data

Martin Marietta Cecil Co MD Model Input (NAD 83, Zone 18)

Last update: 3/22/21

Volume Sources

Model Source No.	Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Horizontal Dimension (ft) ^a	Vertical Dimension (ft) ^b	PM ₁₀ (lb/hr)	Silica (lb/hr)	Volume Source Dimensions (ft) (Width & Length)	
1	2	CR01 METSO C160 JAW CRUSHER	421040.7	4388077.5	160.4	25.00	1.16	1.16	6.05E-01	6.69E-04	5	5
2	13	CR02 Metso Nordberg HP 500 S/M	420918.7	4388006.2	154.0	15.00	1.16	1.16	4.73E-01	5.23E-04	5	5
3	26	CR03 Metso Nordberg HP 400 SH/M	420914.0	4387997.4	154.0	15.00	1.16	1.16	3.12E-01	3.45E-04	5	5
4	27	CR04 Teismith T-400 Crusher	420912.1	4387994.0	154.0	15.00	1.16	1.16	2.55E-01	2.82E-04	5	5
5	9	S1 Metso 7x16 Triple Deck	420921.2	4388012.4	154.0	40.00	1.16	1.16	1.04E+00	1.15E-03	5	5
6	15	S2 Diester BHM-31020-O3T	420889.1	4387947.5	153.6	30.00	1.16	1.16	1.55E+00	1.72E-03	5	5
8	3	C-1 CONV 48X60	421034.0	4388067.7	159.5	19.00	1.16	1.16	6.44E-02	7.13E-05	5	5
9	4	C-2 CONV 48X323	421012.6	4387976.4	223.8	0.00	1.16	1.16	6.44E-02	7.13E-05	5	5
10	8	C-3 CONV 48X360	420925.1	4388016.6	154.0	55.00	1.16	1.16	6.44E-02	7.13E-05	5	5
11	10	C-4 CONV 36X27 (reversible)	420927.0	4388021.1	154.0	24.00	1.16	1.16	1.61E-02	1.78E-05	5	5
12	14	C-5 CONV 48X360	420886.5	4387944.6	153.4	45.00	1.16	1.16	9.66E-02	1.07E-04	5	5
13	17	C-6 CONV 30X164	420887.9	4387992.6	180.0	30.00	1.16	1.16	6.28E-03	6.95E-06	5	5
14	16	C-6A CONV 30X40	420878.7	4387948.6	153.6	10.00	1.16	1.16	6.28E-03	6.95E-06	5	5
15	18	C-7 CONV 36X190	420898.8	4387975.8	154.0	12.00	1.16	1.16	4.83E-02	5.35E-05	5	5
16	19	C-8 CONV 36X283	420973.0	4387940.1	222.0	0.00	1.16	1.16	4.83E-02	5.35E-05	5	5
17	22	C-9 CONV 36X283	420917.7	4387994.8	154.0	46.00	1.16	1.16	4.83E-02	5.35E-05	5	5
18	28	C-10 CONV 36x145	420874.8	4387915.4	152.1	45.00	1.16	1.16	4.20E-02	4.65E-05	5	5
19	12	C-11 CONV, 36X85	420899.6	4388019.0	174.0	30.00	1.16	1.16	4.51E-03	4.99E-06	5	5
25	11	C-18 CONV 36X150	420943.6	4388055.2	196.9	55.00	1.16	1.16	1.16E-02	1.28E-05	5	5
32	1	FDR-1 METSO 58X24 VL-14 Vibrating	421044.7	4388083.9	161.7	22.00	1.16	1.16	2.24E-02	2.48E-05	5	5
35	7	FDR 4 SYNTRON MF200-C 48X84	420998.6	4387980.6	193.8	0.00	1.16	1.16	2.15E-02	2.38E-05	5	5
38	24	FDR 7 SYNTRON MF400-2 48X118	420914.8	4387997.1	154.0	20.00	1.16	1.16	2.42E-02	2.67E-05	5	5
39	25	BF-1 99 SYNTRON F480A Belt Feeder	420912.7	4387993.7	154.0	20.00	1.16	1.16	2.42E-02	2.67E-05	5	5
48	TU	Truck Unloading (at primary)	421050.0	4388090.0	160.4	15.00	2.33	1.16	2.24E-02	2.48E-05	10	10
49	PP	Portable Plant	421270.5	4387924.1	225.0	15.00	5.81	1.16	2.09E+00	2.31E-03	25	25

^aLength of side (assumed to be square root of area of release) divided by 4.3. Conveyor transfer points, crushers and screens were assumed to occur over a 5' x 5' area.

^bVertical dimension (assumed to be 5') divided by 4.3 for all sources.

Open Pit Sources

Model Source No.	Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Easterly Length (ft)	Northerly Length (ft)	Pit Volume (ft) ³ ^c	Angle from North	PM ₁₀ (lb/hr)	Silica (lb/hr)
50	TL	Operations in Pit (Truck Loading)	420299.4	4388103.8	250.00	0.00	1500	2300	1,207,500,000	40	1.40E-01	1.55E-04

^cAverage pit depth is 350'.

Area Polysources

Model Source No.	Source ID	Source Description	Base Elevation (ft)	Release Height (ft)	Number of Vertices	Vertical Dimension (ft)	Vertices (m)					
							PM ₁₀ (lb/hr)	Silica (lb/hr)	Easting (X1)	Northing (Y1)	Easting (X2)	Northing (Y2)
51	PILE1	Plant Pile 1	155.9	15	15	14.0	3.71E-01	4.11E-04	420466.67	4387880.62	420599.28	4387882.8
52	PILE2	Plant Pile 2	151.3	15	11	14.0	3.71E-01	4.11E-04	420755.26	4387978.09	420810.7	4388017.22
53	PILE3	Plant Pile 3	161.4	15	7	14.0	3.71E-01	4.11E-04	420915.05	4388074.83	420933.52	4388078.09
54	PILE4	Plant Pile 4	150.5	15	14	14.0	3.71E-01	4.11E-04	420971.57	4387966.13	420984.61	4387990.05
55	PILE5	Plant Pile 5	147.1	15	10	14.0	3.71E-01	4.11E-04	420925.92	4387849.83	420928.09	4387872.65
56	PILE6	Plant Pile 6	149.2	15	14	14.0	3.71E-01	4.11E-04	420817.41	4387914.61	420822.24	4387947.87

SP

Pile Total 2.23E+00 2.46E-03

APPENDIX B

Emission Calculations

Bluegrass Materials Company, LLC (C/o Martin Marietta Materials, Inc.)

North East, Permit to Operate 015-0005

Permit to Construct Application

Form 5T & Crystalline Silica Emissions Calculations

Date: 03/16/2021

Total Stage Throughputs - Current:

Primary 900 tph
Secondary 750 tph
Tertiary 700 tph

Proposed:

Primary 1400 tph
Secondary 1400 tph
Tertiary 1050 tph

ID No.	DESCRIPTION	PM-10 Emission Factor (lb/Ton)	Current Equipment				Proposed Equipment			
			Equip. Capacity (stph)	Projected Operating Rate (stph)	PM-10 Emissions @ Proj. Operating Rate (lbs/hr)	Crystalline Silica Emissions (lbs/hr)	Equip. Capacity (stph)	Projected Operating Rate (stph)	PM-10 Emissions @ Proj. Operating Rate (lbs/hr)	Crystalline Silica Emissions (lbs/hr)
2	CR01 METSO C140 JAW CRUSHER	0.00054	925	765	0.41	0.00046				
2	CR01 METSO C160 JAW CRUSHER	0.00054					1,260	1,120	0.60	0.00067
13	CR02 Metso Nordberg HP 500 S/M	0.00054	880	469	0.25	0.00028	880	875	0.47	0.00052
26	CR03 Metso Nordberg HP 400 SH/M	0.00054	700	385	0.21	0.00023	700	578	0.31	0.00035
27	CR04 Telsmith T-400 Crusher	0.00054	585	315	0.17	0.00019	585	473	0.26	0.00028
9	S1 Metso 7x16 Triple Deck	0.00074	1500	750	0.56	0.00061	1500	1,400	1.04	0.00115
15	S2 Diester BHM-31020-O3T	0.00074	2281	1,400	1.04	0.00115	2281	2,100	1.55	0.00172
29	S3 Diester BHM-3820-OT	WMPO	1750	609	0.00	0.00000	1750	914	0.00	0.00000
3	C-1 CONV 48X60	0.00046	-	900	0.04	0.00005	-	1,400	0.06	0.00007
4	C-2 CONV 48X323	0.00046	-	900	0.04	0.00005	-	1,400	0.06	0.00007
8	C-3 CONV 48X360	0.00046	-	750	0.03	0.00004	-	1,400	0.06	0.00007
10	C-4 CONV 36X27 (reversible)	0.00046	-	188	0.01	0.00001	-	350	0.02	0.00002
14	C-5 CONV 48X360	0.00046	-	1,400	0.06	0.00007	-	2,100	0.10	0.00011
17	C-6 CONV 30X164	0.00046	-	91	0.00	0.00000	-	137	0.01	0.00001
16	C-6A CONV 30X40	0.00046	-	91	0.00	0.00000	-	137	0.01	0.00001
18	C-7 CONV 36X190	0.00046	-	700	0.03	0.00004	-	1,050	0.05	0.00005
19	C-8 CONV 36X283	0.00046	-	700	0.03	0.00004	-	1,050	0.05	0.00005
22	C-9 CONV 36X283	0.00046	-	700	0.03	0.00004	-	1,050	0.05	0.00005
28	C-10 CONV 36x145	0.00046	-	609	0.03	0.00003	-	914	0.04	0.00005
12	C-11 CONV, 36X85	0.00046	-	53	0.00	0.00000	-	98	0.00	0.00000
30	C-12 CONV 36X50	WMPO	-	21	0.00	0.00000	-	32	0.00	0.00000
32	C-13 CONV 30X43 (reversible)	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
34	C-14 CONV 30X65	WMPO	-	245	0.00	0.00000	-	368	0.00	0.00000
36	C-15 CONV 30X85	WMPO	-	189	0.00	0.00000	-	284	0.00	0.00000
39	C-16 CONV 30X55	WMPO	-	119	0.00	0.00000	-	179	0.00	0.00000
11	C-18 CONV 36X150	0.00046	-	135	0.01	0.00001	-	252	0.01	0.00001
31	C-20 CONV 30X120	WMPO	-	21	0.00	0.00000	-	32	0.00	0.00000
33	C-21 CONV 30X123	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
35	C-22 CONV 30X123	WMPO	-	245	0.00	0.00000	-	368	0.00	0.00000
37	C-23 CONV 30X123	WMPO	-	189	0.00	0.00000	-	284	0.00	0.00000
40	C-24 CONV 30X123	WMPO	-	119	0.00	0.00000	-	179	0.00	0.00000
42	C-25 CONV 24X63	WMPO	-	7	0.00	0.00000	-	11	0.00	0.00000
1	FDR-1 METSO 58X24 VL-14 Vibrating Grizzly Feeder	0.000016	-	900	0.01	0.00002	-	1,400	0.02	0.00002
5	FDR 2 SYNTRON MF200-C 48X84	*(8)	-	250	0.00	0.00000	-	467	0.00	0.00000
6	FDR 3 SYNTRON MF200-C 48X84	*(8)	-	250	0.00	0.00000	-	467	0.00	0.00000
7	FDR 4 SYNTRON MF200-C 48X84	0.000046	-	250	0.01	0.00001	-	467	0.02	0.00002
21	FDR 5 SYNTRON 36X72 MF200-C	*(8)	-	700	0.00	0.00000	-	1,050	0.00	0.00000
20	FDR 6 SYNTRON MF200-C 36X72	*(8)	-	350	0.00	0.00000	-	525	0.00	0.00000
24	FDR 7 SYNTRON MF400-2 48X118	0.000046	-	350	0.02	0.00002	-	525	0.02	0.00003
25	BF-1 99 SYNTRON F480A Belt Feeder	0.000046	-	350	0.02	0.00002	-	525	0.02	0.00003
38	WASHER 44X33 DFMSW	WMPO	-	126	0.00	0.00000	-	189	0.00	0.00000
23	99 HOPPER (FOR BF-1)	N/A	-	700	0.00	0.00000	-	1,050	0.00	0.00000
41	WASH ULTRA FINES RECOVERY	WMPO	-	21	0.00	0.00000	-	32	0.00	0.00000
43	TC01 THICKENER / CLARIFIER	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
44	BP01 BDP BELT PRESS	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
45	BP02 BDP BELT PRESS	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
46	C-26 CONV 30x80	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
47	C-27 CONV 30x80	WMPO	-	28	0.00	0.00000	-	42	0.00	0.00000
TU	Truck Unloading	0.000016	N/A	765	0.01	0.00001	N/A	1,400	0.02	0.00002
TL	Truck Loading	0.0001	N/A	765	0.08	0.00008	N/A	1,400	0.14	0.00015
SP	Storage Piles	0.00159	N/A	765	1.22	0.00135	N/A	1,400	2.23	0.00246
PM-10 TOTAL:					4.33				7.24	
CRYSTALLINE SILICA TOTAL:						0.0048				0.0080
PM-10 TOTAL (MODIFICATION EQUIPMENT ONLY):									0.06	
CRYSTALLINE SILICA (MODIFICATION EQUIPMENT ONLY):									0.0007	

PP	Portable Plant, Fugitive Emis. From Processing	VARIOUS	600	600	2.09	0.00231	600	600	2.09	0.00231
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NOTE: Portable Plant PM-10 emissions from 2017 Air Permit to Construct Application

TOTAL (PROPOSED FIXED EQUIPMENT + PORTABLE PLANT):

									PM-10	9.33
									CRSYTALINE SILICA	0.0103

Comments:

- (1) Crushed Stone Processing equipment emissions factors from AP-42 11.19.2, Table 11.19.1-2 (English Units) revised 08/04.
- (2) Storage Pile emissions factors from AP-42, Section 13.2.4 - Assuming a moisture content of 2.1%, a mean wind speed of 6.9 miles per hour, < 10 micrometer particule size multiplier, and the number of tons processed (max design capacity) is equal to the number of tons handled.
- (3) WMPO = Wet Material Processing Operation.
- (4) Equipment associated with PTC modification is highlighted yellow.
- (5) "Equip. Capacity" is based on vendor or manufacturer provided information, or educated estimates where information is not available.
- (6) "Projected Operations" represent high-range estimates based on computer flow modeling, equipment configuration, past operational records, and interviews with knowledgeable personnel. Actual throughput may vary based on plant configuration and other factors.
- (7) Equipment associated with rail yard facility (A-1 thru A-5) operates only intermittently, and is located approximately 4000 feet from fixed facility. This equipment only conveys finished product into rail cars (no crushing or screening at facility). Therefore, emissions from this equipment was assumed to be negligible for the purposes of this evaluation.
- (8) Vibrating feeders, located underneath of surge piles (in surge tunnels).

APPENDIX C

Model Results

3-22-21 Martin Marietta Cecil Co MD Crystalline Silca Modeling

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 19191	MM Cecil Co_2018_Silica_1.SUM	SILICA	8-HR	ALL	1ST	0.17975	421546.3	4387837	68.27	90.01	0	18122524	DOVER_DULLES-18.SFC	32	1	5058
AERMOD 19191	MM Cecil Co_2016_Silica_1.SUM	SILICA	8-HR	ALL	1ST	0.16277	421546.3	4387837	68.27	90.01	0	16092424	DOVER_DULLES-16.SFC	32	1	5058
AERMOD 19191	MM Cecil Co_2015_Silica_1.SUM	SILICA	8-HR	ALL	1ST	0.14189	421605.3	4387970	68.61	90.01	0	15120608	DOVER_DULLES-15.SFC	32	1	5058
AERMOD 19191	MM Cecil Co_2019_Silica_1.SUM	SILICA	8-HR	ALL	1ST	0.1228	421536.5	4387815	66.4	90.01	0	19092408	DOVER_DULLES-19.SFC	32	1	5058
AERMOD 19191	MM Cecil Co_2017_Silica_1.SUM	SILICA	8-HR	ALL	1ST	0.119	421536.5	4387815	66.4	90.01	0	17011908	DOVER_DULLES-17.SFC	32	1	5058

3-22-21 Martin Marietta Cecil Co MD Crystalline Silca Modeling

Pollutant	Average	Group	Rank	Conc (ug/m3)	Screening Level (ug/m3)	% Screening Level
SILICA	8-HR	ALL	1ST	0.18	0.25	72%



Safety Data Sheet (SDS)





SAFETY DATA SHEET (SDS): GRANITE

SECTION I – IDENTIFICATION

PRODUCT IDENTIFIER	TRADE NAME	OTHER SYNONYMS
Granite	Granite, Diorite, Noveculite, Rhyolite	Aggregate, Base, Crushed Stone, Manufactured Sand, Ballast Screenings
RECOMMENDED USE AND RESTRICTION ON USE Used for construction purposes This product is not intended or designed for and should not be used as an abrasive blasting medium or for foundry applications.		
MANUFACTURER/SUPPLIER INFORMATION Martin Marietta Materials 2710 Wycliff Road Raleigh, North Carolina 27607 Phone: 919-781-4550 For additional health, safety or regulatory information and other emergency situations, call 919-781-4550		

SECTION II – HAZARD(S) IDENTIFICATION

HAZARD CLASSIFICATION: Category 1A Carcinogen Category 1 Specific Target Organ Toxicity (STOT) following repeated exposures Category 1 Eye Damage Category 1 Skin Corrosive	 
SIGNAL WORD: DANGER	
HAZARD STATEMENTS: May cause cancer by inhalation. Causes damage to lungs, kidneys and autoimmune system through prolonged or repeated exposure by inhalation. Causes severe skin burns and serious eye damage.	
PRECAUTIONARY STATEMENTS Do not handle until the safety information presented in this SDS has been read and understood. Do not breathe dusts or mists. Do not eat, drink or smoke while manually handling this product. Wash skin thoroughly after manually handling. If swallowed: Rinse mouth and do not induce vomiting. If on skin (or hair): Rinse skin after manually handling and wash contaminated clothing if there is potential for direct skin contact before reuse. If inhaled excessively: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do, and continue rinsing. If exposed, concerned, unwell or irritation of the eyes, skin, mouth or throat/nasal passage persist: Get medical attention. Wear eye protection and respiratory protection following this SDS, NIOSH guidelines and other applicable regulations. Use protective gloves if manually handling the product. Avoid creating dust when handling, using or storing. Use with adequate ventilation to keep exposure below recommended exposure limits. Dispose of product in accordance with local, regional, national or international regulations. Please refer to Section XI for details of specific health effects of the components.	

SECTION III – COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT(S) CHEMICAL NAME	CAS REGISTRY NO	% by weight (approx)
Silicon Dioxide, SiO ₂ ⁽¹⁾	7631-86-9	70-72
Aluminum Oxide, Al ₂ O ₃	1344-28-1	13-15
Ferrous Oxide, FeO	1345-25-1	1-2
Ferric Oxide, Fe ₂ O ₃	1309-37-1	1-2
Magnesium Oxide, MgO	1309-48-4	<1
Calcium Oxide, CaO	1305-78-8	1-2
Sodium Oxide, Na ₂ O	1313-59-3	3-4
Potassium Oxide, K ₂ O	12136-45-7	4-5

(1): The composition of SiO₂ may be up to 100% crystalline silica

SECTION IV – FIRST-AID MEASURES

INHALATION: If excessive inhalation occurs, remove to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or develops later.

EYES: Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Remove contact lenses, if present and easy to do, and continue rinsing. Beyond flushing, do not attempt to remove material from the eye(s). Contact a physician if irritation persists or develops later.

SKIN: Rinse skin with soap and water after manually handling and wash contaminated clothing if there is potential for direct skin contact. Contact a physician if irritation persists or develops later.

INGESTION: If swallowed, rinse mouth and do not induce vomiting. If gastrointestinal discomfort occurs, persists or develops later, get medical attention.

SIGNS AND SYMPTOMS OF EXPOSURE: There are generally no signs or symptoms of exposure to respirable crystalline silica. Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis which can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months, are the same as those associated with chronic silicosis; additionally, weight loss and fever may also occur. The symptoms of scleroderma, an autoimmune disease, include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

Direct skin and eye contact with dust may cause irritation by mechanical abrasion. Some components of the product are also known to cause corrosive effects to skin, eyes and mucous membranes. Ingestion of large amounts may cause gastrointestinal irritation and blockage. Inhalation of dust may irritate nose, throat, mucous membranes and respiratory tract by mechanical abrasion or corrosive action. Coughing, sneezing, chest pain, shortness of breath, inflammation of mucous membrane, and flu-like fever may occur following exposures in excess of appropriate exposure limits. Repeated excessive exposure may cause pneumoconiosis, such as silicosis and other respiratory effects.

SECTION V – FIRE-FIGHTING MEASURES**EXTINGUISHING AGENT**

Not flammable; use extinguishing media compatible with surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARD

Contact with powerful oxidizing agents may cause fire and/or explosions (see Section X of this SDS). While individual components are known to react vigorously with water to produce heat, this is not expected from the granite.

SPECIAL FIRE FIGHTING PROCEDURES

None known

HAZARDOUS COMBUSTION PRODUCTS

None known

SECTION VI – ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Persons involved in cleaning should first follow the precautions defined in Section VII of the SDS. Spilled materials, where dust can be generated, may overexpose cleanup personnel to respirable crystalline silica-containing dust and other components that may pose inhalation hazards. Do not dry sweep spilled material. Collect the material using a method that does not produce dust such as a High-Efficiency Particulate Air (HEPA) vacuum or thoroughly wetting down the dust before cleaning up. Wear appropriate personal protective equipment as specified in Section VIII including appropriate respirators during and following clean up or whenever airborne dust is present to ensure worker exposures remain below occupational exposure limits (OELs - Refer to Section VIII).

Place the dust in a covered container appropriate for disposal. Dispose of the dust according to federal, state and local regulations.

This product is not subject to the reporting requirements of SARA Title III Section 313, and 40 CFR 372.

SECTION VII – HANDLING AND STORAGE

This product is not intended or designed for and should not be used as an abrasive blasting medium or for foundry applications. Follow protective controls set forth in Section VIII of this SDS when handling this product. Dust containing respirable crystalline silica and other components that may be corrosive/irritant may be generated during processing, handling and storage. Use good housekeeping procedures to prevent the accumulation of dust in the workplace.

Do not breathe dust. Avoid contact with skin and eyes. Do not store near food or beverages or smoking materials. Do not stand on piles of materials; it may be unstable.

Use adequate ventilation and dust collection equipment and ensure that the dust collection system is adequate to reduce airborne dust levels to below the appropriate OELs. If the airborne dust levels are above the appropriate OELs, use respiratory protection during the establishment of engineering controls. Refer to Section VIII - Exposure Controls/Personal Protection for further information.

In accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, 1928.21), state, and/or local right-to-know laws and regulations, familiarize your employees with this SDS and the information contained herein. Warn your employees, your customers and other third parties (in case of resale or distribution to others) of the potential health risks associated with the use of this product and train them in the appropriate use of personal protective equipment and engineering controls, which will reduce their risks of exposure.

See also ASTM International standard practice E 1132-06, "Standard Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica."

For safe handling and use of this product for Hydraulic Fracturing, please see the OSHA/NIOSH Hazard Alert Worker Exposure to Silica during Hydraulic Fracturing DHHS (NIOSH) Publication No. 2012-166 (2012).
http://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.pdf

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne OELs for Components of Granite:

COMPONENT(S) CHEMICAL NAME	MSHA/OSHA PEL	ACGIH TLV-TWA	NIOSH REL
Silicon Dioxide, SiO ₂ §	(R) 0.05 mg/m ³ (R) 0.025 mg/m ³ (AL)	(R) 0.025 mg/m ³ #	(R) 0.05 mg/m ³ #
Aluminum Oxide, Al ₂ O ₃	(T) 15 mg/m ³ , (R) 5 mg/m ³	(¹) (R) 1 mg/m ³	-
Ferrous Oxide, FeO	-	-	-
Ferric Oxide, Fe ₂ O ₃	(²) 10 mg/m ³	(R) 5 mg/m ³	(³) 5 mg/m ³
Magnesium Oxide, MgO	(⁴) 15 mg/m ³	(I) 10 mg/m ³	-
Calcium Oxide, CaO	5 mg/m ³	2 mg/m ³	2 mg/m ³
Sodium Oxide, Na ₂ O (⁵)	2 mg/m ³	(C) 2 mg/m ³	(C) 2 mg/m ³
Potassium Oxide, K ₂ O	-	(⁶) (C) 2 mg/m ³	(⁶) (C) 2 mg/m ³

§ The OSHA OELs for respirable crystalline silica are listed in the table. As of June 28, 2018, the MSHA standard for respirable crystalline silica has not been changed but may be revised in the future. The MSHA PEL for dust containing crystalline silica (quartz) is based on the silica content of the respirable dust sample and is calculated as: 10 mg/m³ / (% SiO₂ + 2). The MSHA PEL for crystalline silica as tridymite and cristobalite is one-half the PEL for crystalline silica (quartz). # The ACGIH and NIOSH limits are for crystalline silica (quartz), independent of the dust concentration. The ACGIH TLV for crystalline silica as cristobalite is equal to the TLV for crystalline silica as quartz. In 2005, ACGIH withdrew the TLV for crystalline silica as tridymite. The NIOSH REL for crystalline silica as cristobalite and tridymite is the same as for quartz. Refer to Section X for thermal stability information for crystalline silica (quartz).

AL: Action Level

(1): Limits based on Aluminum Metal and Insoluble Compounds.

(2): As Iron Oxide Fume.

(3): Dust and fume, as Iron

(4): As Magnesium Oxide Fume Total Particulate.

(5): Based on Sodium Hydroxide.

(6): Based on Potassium Hydroxide.

(R): Respirable Fraction.

(T): Total Dust.

(I): Inhalable Fraction.

(C): Ceiling Limit

Airborne OELs for Inert/Nuisance Dust:

Standard	Respirable Dust	Total Dust
MSHA/OSHA PEL (as Inert or Nuisance Dust)	5 mg/m ³	15 mg/m ³
ACGIH TLV (as Particles Not Otherwise Specified)	3 mg/m ³	*10 mg/m ³
NIOSH REL (Particulates Not Otherwise Regulated)	-	-

Note: The limits for Inert Dust are provided as guidelines. Nuisance dust is limited to particulates not known to cause systemic injury or illness.

* The TLV provided is for inhalable particles not otherwise specified.

ENGINEERING CONTROLS

Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below appropriate exposure limits.

Other control measures: Respirable dust and crystalline silica levels should be monitored regularly. Dust and crystalline silica levels in excess of appropriate exposure limits should be reduced by implementing feasible engineering controls, including (but not limited to) dust suppression (wetting), ventilation, process enclosure and enclosed employee work stations.

EYE/FACE PROTECTION

Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated. If irritation persists, get medical attention immediately. There is potential for severe eye irritation if exposed to excessive concentrations of dust for those using contact lenses.

SKIN PROTECTION

Use appropriate protective gloves if manually handling the product.

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION, CONTD.**RESPIRATORY PROTECTION**

Respirator Recommendations:

For respirable crystalline silica levels that exceed or are likely to exceed appropriate exposure limits, a NIOSH-approved particulate filter respirator must be worn. Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements. For additional information contact NIOSH at 1-800-356-4674 or visit website: <http://www.cdc.gov/niosh/npg> (search for crystalline silica). See also ANSI standard Z88.2 (latest revision) "American National Standard for Respiratory Protection," 29 CFR 1910.134 and 1926.103, and 42 CFR 84.

NIOSH recommendations for respiratory protection include:

Up to 0.5 mg/m³:

(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100.

Up to 1.25 mg/m³:

(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate (100-series) filter.

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

Up to 2.5 mg/m³:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter

Up to 25 mg/m³:

(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions (50 mg/m³ for crystalline silica-quartz): A self-contained breathing apparatus (SCBA) that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode or any supplied-air respirator that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape from unknown or IDLH conditions: An air-purifying, full-face piece respirator with a high-efficiency particulate (100-series) filter or any appropriate escape-type, self-contained breathing apparatus.

If the workplace airborne crystalline silica concentration is unknown for a given task, conduct air monitoring to determine the appropriate level of respiratory protection to be worn. Consult with a certified industrial hygienist, your insurance risk manager or the OSHA Consultative Services group for detailed information. Ensure appropriate respirators are worn, as needed, during and following the task, including clean up or whenever airborne dust is present, to ensure worker exposures remain below OELs.

GENERAL HYGIENE CONSIDERATIONS

There are no known hazards associated with this material when used as recommended. Following the guidelines in this SDS are recognized as good industrial hygiene practices. Avoid breathing dust. Avoid skin and eye contact. Wash dust-exposed skin with soap and water before eating, drinking, smoking and using toilet facilities. Wash work clothes after each use.

SECTION IX— PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE Granite is a mixture of angular particles, color can range from white to red to black and colors in between, ranging in size from pebbles to boulders.	ODOR AND ODOR THRESHOLD Odorless and not applicable
pH AND VISCOSITY Not applicable	MELTING POINT/FREEZING POINT Not applicable
BOILING POINT AND RANGE Not applicable	FLASH POINT AND FLAMMABILITY Not applicable
FLAMMABILITY/EXPLOSIVE LIMITS AND AUTOIGNITION TEMPERATURE Not applicable	EVAPORATION RATE AND DECOMPOSITION TEMPERATURE Not applicable
VAPOR PRESSURE AND VAPOR DENSITY IN AIR Not applicable	SPECIFIC GRAVITY. 2.6-2.8
SOLUBILITY IN WATER Insoluble	PARTITION COEFFICIENT: N-OCTANOL/WATER Not applicable

SECTION X – STABILITY AND REACTIVITY

STABILITY Stable	CONDITIONS TO AVOID Contact with incompatible materials (see below).
THERMAL STABILITY If crystalline silica (quartz) is heated to more than 870°C (1598°F), it can change to a form of crystalline silica known as tridymite, and if crystalline silica (quartz) is heated to more than 1470°C (2678°F), it can change to a form of crystalline silica known as cristobalite.	
INCOMPATIBILITY (Materials to avoid) Contact with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride may cause fire and/or explosions. Some components of granite may react vigorously with water.	
HAZARDOUS DECOMPOSITION PRODUCTS Silica dissolves in hydrofluoric acid producing a corrosive gas - silicon tetrafluoride.	
HAZARDOUS POLYMERIZATION Not known to polymerize	

SECTION XI – TOXICOLOGICAL INFORMATION

<p>Health Effects: The information below represents an overview of health effects caused by overexposure to one or more components in granite.</p> <p>Primary routes(s) of exposure: <input checked="" type="checkbox"/> Inhalation <input type="checkbox"/> Skin <input checked="" type="checkbox"/> Ingestion</p> <p>EYE CONTACT: Direct contact with dust may cause irritation by mechanical abrasion or corrosive action. Conjunctivitis may occur.</p> <p>SKIN CONTACT: Direct contact may cause irritation by mechanical abrasion. Some components of material are also known to cause corrosive effects to skin and mucous membranes.</p> <p>SKIN ABSORPTION: Not expected to be a significant route of exposure.</p> <p>INGESTION: Small amounts (a tablespoonful) swallowed during normal handling operations are not likely to cause injury. Ingestion of large amounts may cause gastrointestinal irritation and blockage.</p>
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SECTION XI – TOXICOLOGICAL INFORMATION, CONTD.

INHALATION: Dust may irritate nose, throat, mucous membranes and respiratory tract by mechanical abrasion or corrosive action. Coughing, sneezing, chest pain, shortness of breath, inflammation of mucous membrane, and flu-like fever may occur following exposures in excess of appropriate exposure limits.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions. Smoking and obstructive/restrictive lung diseases may also exacerbate the effects of excessive exposure to this product.

This product is a mixture of components. The composition percentages are listed in Section III. Toxicological information for each component is listed below:

Silicon Dioxide: It is comprised of amorphous and crystalline forms of silica. In some batches, crystalline silica may represent up to 100% of silicon dioxide.

Exposure route: Eyes, respiratory system.

Target organs: Eyes, skin, respiratory system.

ACGIH, MSHA, and OSHA have determined that adverse effects are not likely to occur in the workplace provided exposure levels do not exceed the appropriate exposure limits. Lower exposure limits may be appropriate for some individuals including persons with pre-existing medical conditions as described under medical conditions aggravated by exposure.

A. SILICOSIS

The major concern is silicosis (lung disease), caused by the inhalation and retention of respirable crystalline silica dust. Silicosis leads to conditions such as lung fibrosis and reduced pulmonary function. The form and severity in which silicosis manifests itself, depends in part on the type and extent of exposure to silica dusts: chronic, accelerated and acute forms are recognized. In later stages the critical condition may become disabling and potentially fatal. Restrictive and/or obstructive changes in lung function may occur due to exposure. A risk associated with silicosis is development of pulmonary tuberculosis (silico-tuberculosis). Respiratory insufficiencies due to massive fibrosis and reduced pulmonary function, possibly with accompanying heart failure, are other potential causes of death due to silicosis.

Chronic or Ordinary Silicosis is the most common form of silicosis and can occur after many years of exposure to levels above the OELs for airborne respirable crystalline silica dust. Not all individuals with silicosis will exhibit symptoms (signs) of the disease. Symptoms of silicosis may include (but are not limited to): Shortness of breath; difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; heart enlargement and/or failure. It is further defined as either simple or complicated silicosis.

Simple Silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF).

Complicated Silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease (cor pulmonale) secondary to the lung disease.

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is a rapidly progressive, incurable lung disease and is typically fatal.

SECTION XI – TOXICOLOGICAL INFORMATION, CONTD.

B. CANCER

IARC - The International Agency for Research on Cancer ("IARC") concluded that there is “*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the form of quartz or cristobalite”, there is “*sufficient evidence* in experimental animals for the carcinogenicity of quartz dust” and that there is “*limited evidence* in experimental animals for the carcinogenicity of tridymite dust and cristobalite dust.” The overall IARC evaluation was that “crystalline silica inhaled in the form of quartz or cristobalite dust is *carcinogenic to humans (Group 1)*.” The IARC evaluation noted that not all industrial circumstances studied evidenced carcinogenicity. The monograph also stated that “Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs.” For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C, “Silica Dust, Crystalline, in the Form of Quartz or Cristobalite” (2012).

NTP - In its Eleventh Annual Report on Carcinogens, concluded that respirable crystalline silica is known to be a human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust.

OSHA - Crystalline silica is not on the OSHA carcinogen list.

CALIFORNIA PROPOSITION 65 - Crystalline silica in October 1996 was listed on the Safe Drinking Water and Toxic Enforcement ACT of 1986 as a chemical known to the state to cause cancer or reproductive toxicity.

There have been many articles published on the carcinogenicity of crystalline silica, which the reader should consult for additional information; the following are examples of recently published articles: (1) “Dose-Response Meta-Analysis of Silica and Lung Cancer”, *Cancer Causes Control*, (20):925-33 (2009); (2) “Occupational Silica Exposure and Lung Cancer Risk: A Review of Epidemiological Studies 1996-2005”, *Ann Oncol*, (17) 1039-50 (2006); (3) “Lung Cancer Among Industrial Sand Workers Exposed to Crystalline Silica”, *Am J Epidemiol*, (153) 695-703 (2001); (4) “Crystalline Silica and The Risk of Lung Cancer in The Potteries”, *Occup Environ Med*, (55) 779-785 (1998); (5) “Is Silicosis Required for Silica-Associated Lung Cancer?”, *American Journal of Industrial Medicine*, (37) 252- 259 (2000); (6) “Silica, Silicosis, and Lung Cancer: A Risk Assessment”, *American Journal of Industrial Medicine*, (38) 8-18 (2000); (7) “Silica, Silicosis, and Lung Cancer: A Response to a Recent Working Group Report”, *Journal of Occupational and Environmental Medicine*, (42) 704-720 (2000).

C. AUTOIMMUNE DISEASES

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders, -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. For a review of the subject, the following may be consulted: (1) “Antinuclear Antibody and Rheumatoid Factor in Silica-Exposed Workers”, *Arh Hig Rada Toksikol*, (60) 185-90 (2009); (2) “Occupational Exposure to Crystalline Silica and Autoimmune Disease”, *Environmental Health Perspectives*, (107) Supplement 5, 793-802 (1999); (3) “Occupational Scleroderma”, *Current Opinion in Rheumatology*, (11) 490-494 (1999); (4) “Connective Tissue Disease and Silicosis”, *Am J Ind Med*, (35), 375-381 (1999).

D. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: (1) “Tuberculosis and Silicosis: Epidemiology, Diagnosis and Chemoprophylaxis”, *J Bras Pneumol*, (34) 959-66 (2008); (2) *Occupational Lung Disorders*, Third Edition, Chapter 12, entitled “Silicosis and Related Diseases”, Parkes, W. Raymond (1994); (3) “Risk of Pulmonary Tuberculosis Relative to Silicosis and Exposure to Silica Dust in South African Gold Miners,” *Occup Environ Med*, (55) 496-502 (1998); (4) “Occupational Risk Factors for Developing Tuberculosis”, *Am J Ind Med*, (30) 148-154 (1996).

E. KIDNEY DISEASE

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney diseases, including end stage renal disease. For additional information on the subject, the following may be consulted: (1) “Mortality from Lung and Kidney Disease in a Cohort of North American Industrial Sand Workers: An Update”, *Ann Occup Hyg*, (49) 367-73 (2005); (2) “Kidney Disease and Silicosis”, *Nephron*, (85) 14-19 (2000); (3) “End Stage Renal Disease Among Ceramic Workers Exposed to Silica”, *Occup Environ Med*, (56) 559-561 (1999); (4) “Kidney Disease and Arthritis in a Cohort Study of Workers Exposed to Silica”, *Epidemiology*, (12) 405-412 (2001).

SECTION XI – TOXICOLOGICAL INFORMATION, CONTD.**F. NON-MALIGNANT RESPIRATORY DISEASES**

NIOSH has cited the results of studies that report an association between dusts found in various mining operations and non-malignant respiratory disease, particularly among smokers, including bronchitis, emphysema, and small airways disease. *NIOSH Hazard Review – Health Effects of Occupational Exposure to Respirable Crystalline Silica*, published in April 2002, available from NIOSH, 4676 Columbia Parkway, Cincinnati, OH 45226, or at <https://www.cdc.gov/niosh/docs/2002-129/default.html>.

Respirable dust containing newly broken particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size. Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken pieces of silica.

Aluminum Oxide:

Exposure route: Inhalation, ingestion, eye/skin contact.

Target organs: Respiratory system, gastrointestinal system, eyes, skin.

Acute effect: Inhalation or ingestion of high concentrations of this substance may cause gastrointestinal and/or upper respiratory tract irritation. Eye and skin irritant.

Chronic effect/carcinogenicity: Aluminum oxide is not classifiable as a human carcinogen. On occasion workers chronically exposed to aluminum-containing dusts or fumes have developed severe pulmonary reactions including fibrosis, emphysema and pneumothorax. Long-term exposure may have effects on the central nervous system.

Sodium Oxide:

Exposure route: Inhalation, ingestion, eye/skin contact.

Target organs: Respiratory system, gastrointestinal system, eyes, skin.

Acute effect: Corrosive – Sodium oxide reacts violently with water to form sodium hydroxide. Causes burns of skin, eyes, respiratory and gastrointestinal tracts, extremely destructive to mucous membranes.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

Iron Oxide: (Ferrous and Ferric Oxides)

Exposure route: Inhalation, ingestion, skin

Target organs: Respiratory system, skin, eyes, neurological system

Acute effect: Major findings: stupor, shock, acidosis, hematemesis, bloody diarrhea or coma. Minor findings: vomiting, diarrhea, mild lethargy. Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis. Experimental work in animals exposed by intratracheal injection or by inhalation to iron oxide mixed with less than 5% silica has shown no evidence of fibrosis produced in lung tissue.

Chronic effect/carcinogenicity: Irritability, nausea or vomiting, and normocytic anemia. When exposed to levels greater than 50 to 100 milligram per day, it can result in pathological deposition of iron in the body tissues causing fibrosis of the pancreas, diabetes mellitus, and liver cirrhosis. Workers exposed to iron oxide fume and silica may develop a “mixed dust pneumoconiosis.” Not classifiable as human carcinogen.

Potassium Oxide:

Exposure route: Inhalation, ingestion, eye/skin contact.

Target organs: Respiratory system, gastrointestinal system, eyes, skin.

Acute effect: Corrosive – Potassium oxide reacts violently with water to produce potassium hydroxide. If inhaled, causes sore throat, cough, burning sensation and shortness of breath. Contact with skin produces pain and blisters. Severe deep burns, redness and pain occur with eye contact. Ingestion results in burning sensations, abdominal pain, shock or collapse.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

SECTION XI – TOXICOLOGICAL INFORMATION, CONTD.**Calcium Oxide:**

Exposure route: Inhalation, ingestion, skin/eye contact.

Target organs: Eyes, skin, respiratory system.

Acute effect: Direct contact with tissues, can result in burns and severe irritation because of its high reactivity and alkalinity. Major complaints of workers exposed to lime consist of irritation of the skin and eyes, although inflammation of the respiratory passages, ulceration and perforation of the nasal septum, and even pneumonia has been attributed to inhalation of the dust.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

Magnesium Oxide:

Exposure route: Inhalation, eye/skin contact.

Target organs: Eyes, respiratory system.

Acute effect: Magnesium oxide dust caused slight irritation of the eyes and nose, conjunctivitis, inflammation of the mucous membrane, and coughing up discolored sputum after industrial exposures amongst workers exposed to an unspecified concentration of MgO.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

Acute Toxicity Estimates for Granite – Not Available

SECTION XII – ECOLOGICAL INFORMATION

No data available for this product.

SECTION XIII – DISPOSAL CONSIDERATIONS**WASTE DISPOSAL METHOD**

Collect and reuse clean materials. Dispose of waste materials only in accordance with applicable federal, state, and local laws and regulations.

The above information applies to Martin Marietta Materials product only as sold. The product may be contaminated during use and it is the responsibility of the user to assess the appropriate disposal method in that situation.

SECTION XIV – TRANSPORT INFORMATION**DOT HAZARD CLASSIFICATION**

None

PLACARD REQUIRED

None

LABEL REQUIRED

Label as required by the OSHA Hazard Communication standard {29 CFR 1910.1200(f)}, and applicable state and local regulations.

SECTION XV – REGULATORY INFORMATION

OSHA: Crystalline Silica is not listed as a carcinogen.

SARA Title III: Section 311 and 312: Immediate health hazard and delayed health hazard.

TSCA: All components of the product appear on the EPA TSCA chemical substance inventory.

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 40 CFR §302.4

EPCRA (Emergency Planning and Community Right to Know Act): Crystalline silica (quartz) is not an extremely hazardous substance under regulations of the Emergency Planning and Community Right to Know Act, 40 CFR Part 355, Appendices A and B and is not a toxic chemical subject to the requirements of Section 313.

Clean Air Act: Crystalline silica (quartz) mined and processed by Martin Marietta Materials was not processed with or does not contain any Class I or Class II ozone depleting substances.

FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3). (The FDA standard primarily applies to products containing silica used in the coatings of food contact surfaces).

California Proposition 65: Respirable crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.

Massachusetts Toxic Use Reduction Act: Respirable crystalline silica is considered toxic per the Massachusetts Toxic Use Reduction Act when used in abrasive blasting and molding.

Pennsylvania Worker and Community Right to Know Act: Quartz is considered hazardous for purposes of the Act, but it is not a special hazardous substance or an environmental hazardous substance.

SECTION XVI – OTHER INFORMATION**DEFINITIONS OF ACRONYMS/ABBREVIATIONS**

ACGIH: American Conference of Governmental Industrial Hygienists

AL: Action Level

ANSI: American National Standards Institute

APF: Assigned Protection Factor

California REL: California Inhalation Reference Exposure Limit

CAS: Chemical Abstracts Service

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act

CFR: US Code of Federal Regulations

DHHS: Department of Health and Human Services

EPA: Environmental Protection Agency

EPCRA: Emergency Planning and Community Right to Know Act

FDA: Food and Drug Administration

GHS: Globally Harmonized System

HEPA: High-Efficiency Particulate Air

IARC: International Agency for Research on Cancer

IDLH: Immediately Dangerous to Life and Health

MSHA: Mine Safety and Health Administration

NIOSH: National Institute for Occupational Safety and Health, US Department of Health and Human Services

NIOSH REL: NIOSH Recommended Exposure Limit

NTP: National Toxicology Program

OEL: Occupational Exposure Limit

OSHA: Occupational Safety and Health Administration, US Department of Labor

PEL: Permissible Exposure Limit

PMF: Progressive Massive Fibrosis

RCRA: Resource Conservation and Recovery Act

SARA Title III: Title III of the Superfund Amendments and Reauthorization Act, 1986

SDS: Safety Data Sheet

STOT: Specific Target Organ Toxicity

TLV: Threshold Limit Value

TSCA: Toxic Substance Control Act

TWA: Time-Weighted Average

SECTION XVI – OTHER INFORMATION, CONTD.

User's Responsibility: The OSHA Hazard Communication Standard 29 CFR 1910.1200 requires that this SDS be made available to your employees who handle or may be exposed to this product. Educate and train your employees regarding applicable precautions. Instruct your employees to handle this product properly.

Disclaimer: The information contained in this document applies to this specific material as supplied and Martin Marietta Materials believes that the information contained in this SDS is accurate. The suggested precautions and recommendations are based on recognized good work practices and experience as of the date of publication. They are not necessarily all-inclusive or fully adequate in every circumstance as not all use circumstances can be anticipated. It may not be valid for this material if it is used in combination with other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for one's own particular use. Since the actual use of the product described herein is beyond our control, Martin Marietta Materials, assumes no liability arising out of the use of the product by others. Appropriate warnings and safe handling procedures should be provided to handlers and users. Also, the suggestions should not be confused with nor followed in violation of applicable laws, regulation, rules or insurance requirement. However, product must not be used in a manner which could result in harm.

An electronic version of this SDS is available at www.martinmarietta.com. More information on the effects of crystalline silica exposure may be obtained from OSHA (phone number: 1-800-321-OSHA; website: <http://www.osha.gov>) or from NIOSH (phone number: 1-800-35-NIOSH; website: <http://www.cdc.gov/niosh>).

DATE OF PREPARATION 6/2018

REPLACES 3/2015

NO WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE IS MADE





SAFETY DATA SHEET (SDS): BASALT

SECTION I – IDENTIFICATION

PRODUCT IDENTIFIER Basalt	TRADE NAME Crushed Stone, Traprock	OTHER SYNONYMS Aggregate, Ballast Screenings, Dolerite, Manufactured Sand, Gabbro, Volcanic Rock
RECOMMENDED USE AND RESTRICTION ON USE Used for construction purposes This product is not intended or designed for and should not be used as an abrasive blasting medium or for foundry applications.		
MANUFACTURER/SUPPLIER INFORMATION Martin Marietta Materials 2710 Wycliff Road Raleigh, North Carolina 27607 Phone: 919-781-4550 For additional health, safety or regulatory information and other emergency situations, call 919-781-4550		

SECTION II – HAZARD(S) IDENTIFICATION

HAZARD CLASSIFICATION: Category 1A Carcinogen Category 1 Specific Target Organ Toxicity (STOT) following repeated exposures Category 1 Eye Damage Category 1 Skin Corrosive	 
SIGNAL WORD: DANGER	
HAZARD STATEMENTS: May cause cancer by inhalation. Causes damage to lungs, kidneys and autoimmune system through prolonged or repeated exposure by inhalation. Causes severe skin burns and serious eye damage.	
PRECAUTIONARY STATEMENTS Do not handle until the safety information presented in this SDS has been read and understood. Do not breathe dusts or mists. Do not eat, drink or smoke while manually handling this product. Wash skin thoroughly after manually handling. If swallowed: Rinse mouth and do not induce vomiting. If on skin (or hair): Rinse skin after manually handling and wash contaminated clothing if there is potential for direct skin contact before reuse. If inhaled excessively: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do, and continue rinsing. If exposed, concerned, unwell or irritation of the eyes, skin, mouth or throat/nasal passage persist: Get medical attention. Wear eye protection and respiratory protection following this SDS, NIOSH guidelines and other applicable regulations. Use protective gloves if manually handling the product. Avoid creating dust when handling, using or storing. Use with adequate ventilation to keep exposure below recommended exposure limits. Dispose of product in accordance with local, regional, national or international regulations. Please refer to Section XI for details of specific health effects of the components.	

SECTION III – COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT(S) CHEMICAL NAME	CAS REGISTRY NO	% by weight (approx)
Silicon Dioxide, SiO ₂ ⁽¹⁾	7631-86-9	<1
Aluminum Oxide, Al ₂ O ₃	1344-28-1	10-20
Ferrous Oxide/Ferric Oxide, FeO/Fe ₂ O ₃	1345-25-1/1309-37-1	2-20
Magnesium Oxide, MgO	1309-48-4	1-15
Calcium Oxide, CaO	1305-78-8	5-15
Sodium Oxide, Na ₂ O	1313-59-3	2-15
Potassium Oxide, K ₂ O	12136-45-7	0-12
Titanium Oxide, TiO ₂	13463-67-7	0-3

(1): The composition of SiO₂ may be up to 100% crystalline silica

SECTION IV – FIRST-AID MEASURES

INHALATION: If excessive inhalation occurs, remove to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or develops later.

EYES: Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Remove contact lenses, if present and easy to do, and continue rinsing. Beyond flushing, do not attempt to remove material from the eye(s). Contact a physician if irritation persists or develops later.

SKIN: Rinse skin with soap and water after manually handling and wash contaminated clothing if there is potential for direct skin contact. Contact a physician if irritation persists or develops later.

INGESTION: If swallowed, rinse mouth and do not induce vomiting. If gastrointestinal discomfort occurs, persists or develops later, get medical attention.

SIGNS AND SYMPTOMS OF EXPOSURE: There are generally no signs or symptoms of exposure to respirable crystalline silica. Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis which can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months, are the same as those associated with chronic silicosis; additionally, weight loss and fever may also occur. The symptoms of scleroderma, an autoimmune disease, include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

Direct skin and eye contact with dust may cause irritation by mechanical abrasion. Some components of the product are also known to cause corrosive effects to skin, eyes and mucous membranes. Ingestion of large amounts may cause gastrointestinal irritation and blockage. Inhalation of dust may irritate nose, throat, mucous membranes and respiratory tract by mechanical abrasion. Coughing, sneezing, chest pain, shortness of breath, inflammation of mucous membrane, and flu-like fever may occur following exposures in excess of appropriate exposure limits. Repeated excessive exposure may cause pneumoconiosis, such as silicosis and other respiratory effects.

SECTION V – FIRE-FIGHTING MEASURES**EXTINGUISHING AGENT**

Not flammable; use extinguishing media compatible with surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARD

Contact with powerful oxidizing agents may cause fire and/or explosions (see Section X of this SDS). While individual components are known to react vigorously with water to produce heat, this is not expected from the basalt.

SPECIAL FIRE FIGHTING PROCEDURES

None known

HAZARDOUS COMBUSTION PRODUCTS

None known

SECTION VI – ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Persons involved in cleaning should first follow the precautions defined in Section VII of the SDS. Spilled materials, where dust can be generated, may overexpose cleanup personnel to respirable crystalline silica-containing dust and other components that may pose inhalation hazards. Do not dry sweep spilled material. Collect the material using a method that does not produce dust such as a High-Efficiency Particulate Air (HEPA) vacuum or thoroughly wetting down the dust before cleaning up. Wear appropriate personal protective equipment as specified in Section VIII including appropriate respirators during and following clean up or whenever airborne dust is present to ensure worker exposures remain below occupational exposure limits (OELs - Refer to Section VIII).

Place the dust in a covered container appropriate for disposal. Dispose of the dust according to federal, state and local regulations.

This product is not subject to the reporting requirements of SARA Title III Section 313, and 40 CFR 372.

SECTION VII – HANDLING AND STORAGE

This product is not intended or designed for and should not be used as an abrasive blasting medium or for foundry applications. Follow protective controls set forth in Section VIII of this SDS when handling this product. Dust containing respirable crystalline silica and other components that may be corrosive/irritant may be generated during processing, handling and storage. Use good housekeeping procedures to prevent the accumulation of dust in the workplace.

Do not breathe dust. Avoid contact with skin and eyes. Do not store near food or beverages or smoking materials. Do not stand on piles of materials; it may be unstable.

Use adequate ventilation and dust collection equipment and ensure that the dust collection system is adequate to reduce airborne dust levels to below the appropriate OELs. If the airborne dust levels are above the appropriate OELs, use respiratory protection during the establishment of engineering controls. Refer to Section VIII - Exposure Controls/Personal Protection for further information.

In accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, 1928.21), state, and/or local right-to-know laws and regulations, familiarize your employees with this SDS and the information contained herein. Warn your employees, your customers and other third parties (in case of resale or distribution to others) of the potential health risks associated with the use of this product and train them in the appropriate use of personal protective equipment and engineering controls, which will reduce their risks of exposure.

See also ASTM International standard practice E 1132-06, "Standard Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica."

For safe handling and use of this product for Hydraulic Fracturing, please see the OSHA/NIOSH Hazard Alert Worker Exposure to Silica during Hydraulic Fracturing DHHS (NIOSH) Publication No. 2012-166 (2012).
http://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.pdf

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne OELs for Components of Basalt:

COMPONENT(S) CHEMICAL NAME	MSHA/OSHA PEL	ACGIH TLV-TWA	NIOSH REL
Silicon Dioxide, SiO ₂ §	(R) 0.05 mg/m ³ (R) 0.025 mg/m ³ (AL)	(R) 0.025 mg/m ³ #	(R) 0.05 mg/m ³ #
Aluminum Oxide, Al ₂ O ₃	(T) 15 mg/m ³ , (R) 5 mg/m ³	(¹) (R) 1 mg/m ³	-
Ferrous Oxide, FeO	-	-	-
Ferric Oxide, Fe ₂ O ₃	(²) 10 mg/m ³	(R) 5 mg/m ³	(³) 5 mg/m ³
Magnesium Oxide, MgO	(⁴) 15 mg/m ³	(I) 10 mg/m ³	-
Calcium Oxide, CaO	5 mg/m ³	2 mg/m ³	2 mg/m ³
Sodium Oxide, Na ₂ O (⁵)	2 mg/m ³	(C) 2 mg/m ³	(C) 2 mg/m ³
Potassium Oxide, K ₂ O	-	(⁶) (C) 2 mg/m ³	(⁶) (C) 2 mg/m ³
Titanium Oxide, TiO ₂	15 mg/m ³	10 mg/m ³	-

§ The OSHA OELs for respirable crystalline silica are listed in the table. As of June 28, 2018, the MSHA standard for respirable crystalline silica has not been changed but may be revised in the future. The MSHA PEL for dust containing crystalline silica (quartz) is based on the silica content of the respirable dust sample and is calculated as: 10 mg/m³ / (% SiO₂ + 2). The MSHA PEL for crystalline silica as tridymite and cristobalite is one-half the PEL for crystalline silica (quartz). # The ACGIH and NIOSH limits are for crystalline silica (quartz), independent of the dust concentration. The ACGIH TLV for crystalline silica as cristobalite is equal to the TLV for crystalline silica as quartz. In 2005, ACGIH withdrew the TLV for crystalline silica as tridymite. The NIOSH REL for crystalline silica as cristobalite and tridymite is the same as for quartz. Refer to Section X for thermal stability information for crystalline silica (quartz).

AL: Action Level

(1): Limits based on Aluminum Metal and Insoluble Compounds.

(2): As Iron Oxide Fume.

(3): Dust and fume, as Iron

(4): As Magnesium Oxide Fume Total Particulate.

(5): Based on Sodium Hydroxide.

(6): Based on Potassium Hydroxide.

(R): Respirable Fraction.

(T): Total Dust.

(I): Inhalable Fraction.

(C): Ceiling Limit

Airborne OELs for Inert/Nuisance Dust:

Standard	Respirable Dust	Total Dust
MSHA/OSHA PEL (as Inert or Nuisance Dust)	5 mg/m ³	15 mg/m ³
ACGIH TLV (as Particles Not Otherwise Specified)	3 mg/m ³	*10 mg/m ³
NIOSH REL (Particulates Not Otherwise Regulated)	-	-

Note: The limits for Inert Dust are provided as guidelines. Nuisance dust is limited to particulates not known to cause systemic injury or illness.

* The TLV provided is for inhalable particles not otherwise specified.

ENGINEERING CONTROLS

Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below appropriate exposure limits.

Other control measures: Respirable dust and crystalline silica levels should be monitored regularly. Dust and crystalline silica levels in excess of appropriate exposure limits should be reduced by implementing feasible engineering controls, including (but not limited to) dust suppression (wetting), ventilation, process enclosure and enclosed employee work stations.

EYE/FACE PROTECTION

Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated. If irritation persists, get medical attention immediately. There is potential for severe eye irritation if exposed to excessive concentrations of dust for those using contact lenses.

SKIN PROTECTION

Use appropriate protective gloves if manually handling the product.

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION, CONTD.**RESPIRATORY PROTECTION**

Respirator Recommendations:

For respirable crystalline silica levels that exceed or are likely to exceed appropriate exposure limits, a NIOSH-approved particulate filter respirator must be worn. Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements. For additional information contact NIOSH at 1-800-356-4674 or visit website: <http://www.cdc.gov/niosh/npg> (search for crystalline silica). See also ANSI standard Z88.2 (latest revision) "American National Standard for Respiratory Protection," 29 CFR 1910.134 and 1926.103, and 42 CFR 84.

NIOSH recommendations for respiratory protection include:

Up to 0.5 mg/m³:

(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100.

Up to 1.25 mg/m³:

(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate (100-series) filter.

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

Up to 2.5 mg/m³:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter

Up to 25 mg/m³:

(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions (50 mg/m³ for crystalline silica-quartz): A self-contained breathing apparatus (SCBA) that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode or any supplied-air respirator that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape from unknown or IDLH conditions: An air-purifying, full-face piece respirator with a high-efficiency particulate (100-series) filter or any appropriate escape-type, self-contained breathing apparatus.

If the workplace airborne crystalline silica concentration is unknown for a given task, conduct air monitoring to determine the appropriate level of respiratory protection to be worn. Consult with a certified industrial hygienist, your insurance risk manager or the OSHA Consultative Services group for detailed information. Ensure appropriate respirators are worn, as needed, during and following the task, including clean up or whenever airborne dust is present, to ensure worker exposures remain below OELs.

GENERAL HYGIENE CONSIDERATIONS

There are no known hazards associated with this material when used as recommended. Following the guidelines in this SDS are recognized as good industrial hygiene practices. Avoid breathing dust. Avoid skin and eye contact. Wash dust-exposed skin with soap and water before eating, drinking, smoking and using toilet facilities. Wash work clothes after each use.

SECTION IX— PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE Basalt is a mixture of smooth and rounded to angular particles. Its color can range from white to green to gray to black. The size may range from dust to pebbles to boulders.	ODOR AND ODOR THRESHOLD Odorless and not applicable
pH AND VISCOSITY Not applicable	MELTING POINT/FREEZING POINT Not applicable
BOILING POINT AND RANGE Not applicable	FLASH POINT AND FLAMMABILITY Not applicable
FLAMMABILITY/EXPLOSIVE LIMITS AND AUTOIGNITION TEMPERATURE Not applicable	EVAPORATION RATE AND DECOMPOSITION TEMPERATURE Not applicable
VAPOR PRESSURE AND VAPOR DENSITY IN AIR Not applicable	SPECIFIC GRAVITY. 2.6-2.81
SOLUBILITY IN WATER Insoluble	PARTITION COEFFICIENT: N-OCTANOL/WATER Not applicable

SECTION X – STABILITY AND REACTIVITY

STABILITY Stable	CONDITIONS TO AVOID Contact with incompatible materials (see below).
THERMAL STABILITY If crystalline silica (quartz) is heated to more than 870°C (1598°F), it can change to a form of crystalline silica known as tridymite, and if crystalline silica (quartz) is heated to more than 1470°C (2678°F), it can change to a form of crystalline silica known as cristobalite.	
INCOMPATIBILITY (Materials to avoid) Contact with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride may cause fire and/or explosions. Some components of basalt may react vigorously with water.	
HAZARDOUS DECOMPOSITION PRODUCTS Silica dissolves in hydrofluoric acid producing a corrosive gas - silicon tetrafluoride.	
HAZARDOUS POLYMERIZATION Not known to polymerize	

SECTION XI – TOXICOLOGICAL INFORMATION

<p>Health Effects: The information below represents an overview of health effects caused by overexposure to one or more components in basalt.</p> <p>Primary routes(s) of exposure: <input checked="" type="checkbox"/> Inhalation <input type="checkbox"/> Skin <input checked="" type="checkbox"/> Ingestion</p> <p>EYE CONTACT: Direct contact with dust may cause irritation by mechanical abrasion or corrosive action. Conjunctivitis may occur.</p> <p>SKIN CONTACT: Direct contact may cause irritation by mechanical abrasion. Some components of material are also known to cause corrosive effects to skin and mucous membranes.</p> <p>SKIN ABSORPTION: Not expected to be a significant route of exposure.</p> <p>INGESTION: Small amounts (a tablespoonful) swallowed during normal handling operations are not likely to cause injury. Ingestion of large amounts may cause gastrointestinal irritation and blockage.</p>

SECTION XI – TOXICOLOGICAL INFORMATION, CONTD.

INHALATION: Dust may irritate nose, throat, mucous membranes and respiratory tract by mechanical abrasion. Coughing, sneezing, chest pain, shortness of breath, inflammation of mucous membrane, and flu-like fever may occur following exposures in excess of appropriate exposure limits.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions. Smoking and obstructive/restrictive lung diseases may also exacerbate the effects of excessive exposure to this product.

This product is a mixture of components. The composition percentages are listed in Section III. Toxicological information for each component is listed below:

Silicon Dioxide: It is comprised of amorphous and crystalline forms of silica. In some batches, crystalline silica may represent up to 100% of silicon dioxide.

Exposure route: Eyes, respiratory system.

Target organs: Eyes, skin, respiratory system.

ACGIH, MSHA, and OSHA have determined that adverse effects are not likely to occur in the workplace provided exposure levels do not exceed the appropriate exposure limits. Lower exposure limits may be appropriate for some individuals including persons with pre-existing medical conditions as described under medical conditions aggravated by exposure.

A. SILICOSIS

The major concern is silicosis (lung disease), caused by the inhalation and retention of respirable crystalline silica dust. Silicosis leads to conditions such as lung fibrosis and reduced pulmonary function. The form and severity in which silicosis manifests itself, depends in part on the type and extent of exposure to silica dusts: chronic, accelerated and acute forms are recognized. In later stages the critical condition may become disabling and potentially fatal. Restrictive and/or obstructive changes in lung function may occur due to exposure. A risk associated with silicosis is development of pulmonary tuberculosis (silico-tuberculosis). Respiratory insufficiencies due to massive fibrosis and reduced pulmonary function, possibly with accompanying heart failure, are other potential causes of death due to silicosis.

Chronic or Ordinary Silicosis is the most common form of silicosis and can occur after many years of exposure to levels above the OELs for airborne respirable crystalline silica dust. Not all individuals with silicosis will exhibit symptoms (signs) of the disease. Symptoms of silicosis may include (but are not limited to): Shortness of breath; difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; heart enlargement and/or failure. It is further defined as either simple or complicated silicosis.

Simple Silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF).

Complicated Silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease (cor pulmonale) secondary to the lung disease.

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is a rapidly progressive, incurable lung disease and is typically fatal.

SECTION XI – TOXICOLOGICAL INFORMATION, CONTD.

B. CANCER

IARC - The International Agency for Research on Cancer ("IARC") concluded that there is “*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the form of quartz or cristobalite”, there is “*sufficient evidence* in experimental animals for the carcinogenicity of quartz dust” and that there is “*limited evidence* in experimental animals for the carcinogenicity of tridymite dust and cristobalite dust.” The overall IARC evaluation was that “crystalline silica inhaled in the form of quartz or cristobalite dust is *carcinogenic to humans (Group 1)*.” The IARC evaluation noted that not all industrial circumstances studied evidenced carcinogenicity. The monograph also stated that “Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs.” For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C, “Silica Dust, Crystalline, in the Form of Quartz or Cristobalite” (2012).

NTP - In its Eleventh Annual Report on Carcinogens, concluded that respirable crystalline silica is known to be a human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust.

OSHA - Crystalline silica is not on the OSHA carcinogen list.

CALIFORNIA PROPOSITION 65 - Crystalline silica in October 1996 was listed on the Safe Drinking Water and Toxic Enforcement ACT of 1986 as a chemical known to the state to cause cancer or reproductive toxicity.

There have been many articles published on the carcinogenicity of crystalline silica, which the reader should consult for additional information; the following are examples of recently published articles: (1) “Dose-Response Meta-Analysis of Silica and Lung Cancer”, *Cancer Causes Control*, (20):925-33 (2009); (2) “Occupational Silica Exposure and Lung Cancer Risk: A Review of Epidemiological Studies 1996-2005”, *Ann Oncol*, (17) 1039-50 (2006); (3) “Lung Cancer Among Industrial Sand Workers Exposed to Crystalline Silica”, *Am J Epidemiol*, (153) 695-703 (2001); (4) “Crystalline Silica and The Risk of Lung Cancer in The Potteries”, *Occup Environ Med*, (55) 779-785 (1998); (5) “Is Silicosis Required for Silica-Associated Lung Cancer?”, *American Journal of Industrial Medicine*, (37) 252- 259 (2000); (6) “Silica, Silicosis, and Lung Cancer: A Risk Assessment”, *American Journal of Industrial Medicine*, (38) 8-18 (2000); (7) “Silica, Silicosis, and Lung Cancer: A Response to a Recent Working Group Report”, *Journal of Occupational and Environmental Medicine*, (42) 704-720 (2000).

C. AUTOIMMUNE DISEASES

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders, -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. For a review of the subject, the following may be consulted: (1) “Antinuclear Antibody and Rheumatoid Factor in Silica-Exposed Workers”, *Arh Hig Rada Toksikol*, (60) 185-90 (2009); (2) “Occupational Exposure to Crystalline Silica and Autoimmune Disease”, *Environmental Health Perspectives*, (107) Supplement 5, 793-802 (1999); (3) “Occupational Scleroderma”, *Current Opinion in Rheumatology*, (11) 490-494 (1999); (4) “Connective Tissue Disease and Silicosis”, *Am J Ind Med*, (35), 375-381 (1999).

D. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: (1) “Tuberculosis and Silicosis: Epidemiology, Diagnosis and Chemoprophylaxis”, *J Bras Pneumol*, (34) 959-66 (2008); (2) *Occupational Lung Disorders*, Third Edition, Chapter 12, entitled “Silicosis and Related Diseases”, Parkes, W. Raymond (1994); (3) “Risk of Pulmonary Tuberculosis Relative to Silicosis and Exposure to Silica Dust in South African Gold Miners,” *Occup Environ Med*, (55) 496-502 (1998); (4) “Occupational Risk Factors for Developing Tuberculosis”, *Am J Ind Med*, (30) 148-154 (1996).

E. KIDNEY DISEASE

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney diseases, including end stage renal disease. For additional information on the subject, the following may be consulted: (1) “Mortality from Lung and Kidney Disease in a Cohort of North American Industrial Sand Workers: An Update”, *Ann Occup Hyg*, (49) 367-73 (2005); (2) “Kidney Disease and Silicosis”, *Nephron*, (85) 14-19 (2000); (3) “End Stage Renal Disease Among Ceramic Workers Exposed to Silica”, *Occup Environ Med*, (56) 559-561 (1999); (4) “Kidney Disease and Arthritis in a Cohort Study of Workers Exposed to Silica”, *Epidemiology*, (12) 405-412 (2001).

SECTION XI – TOXICOLOGICAL INFORMATION, CONTD.**F. NON-MALIGNANT RESPIRATORY DISEASES**

NIOSH has cited the results of studies that report an association between dusts found in various mining operations and non-malignant respiratory disease, particularly among smokers, including bronchitis, emphysema, and small airways disease. *NIOSH Hazard Review – Health Effects of Occupational Exposure to Respirable Crystalline Silica*, published in April 2002, available from NIOSH, 4676 Columbia Parkway, Cincinnati, OH 45226, or at <https://www.cdc.gov/niosh/docs/2002-129/default.html>.

Respirable dust containing newly broken particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size. Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken pieces of silica.

Aluminum Oxide:

Exposure route: Inhalation, ingestion, eye/skin contact.

Target organs: Respiratory system, gastrointestinal system, eyes, skin.

Acute effect: Inhalation or ingestion of high concentrations of this substance may cause gastrointestinal and/or upper respiratory tract irritation. Eye and skin irritant.

Chronic effect/carcinogenicity: Aluminum oxide is not classifiable as a human carcinogen. On occasion workers chronically exposed to aluminum-containing dusts or fumes have developed severe pulmonary reactions including fibrosis, emphysema and pneumothorax. Long-term exposure may have effects on the central nervous system.

Sodium Oxide:

Exposure route: Inhalation, ingestion, eye/skin contact.

Target organs: Respiratory system, gastrointestinal system, eyes, skin.

Acute effect: Corrosive – Sodium oxide reacts violently with water to form sodium hydroxide. Causes burns of skin, eyes, respiratory and gastrointestinal tracts, extremely destructive to mucous membranes.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

Iron Oxide: (Ferrous and Ferric Oxides)

Exposure route: Inhalation, ingestion, skin

Target organs: Respiratory system, skin, eyes, neurological system

Acute effect: Major findings: stupor, shock, acidosis, hematemesis, bloody diarrhea or coma. Minor findings: vomiting, diarrhea, mild lethargy. Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis. Experimental work in animals exposed by intratracheal injection or by inhalation to iron oxide mixed with less than 5% silica has shown no evidence of fibrosis produced in lung tissue.

Chronic effect/carcinogenicity: Irritability, nausea or vomiting, and normocytic anemia. When exposed to levels greater than 50 to 100 milligram per day, it can result in pathological deposition of iron in the body tissues causing fibrosis of the pancreas, diabetes mellitus, and liver cirrhosis. Workers exposed to iron oxide fume and silica may develop a “mixed dust pneumoconiosis.” Not classifiable as human carcinogen.

Potassium Oxide:

Exposure route: Inhalation, ingestion, eye/skin contact.

Target organs: Respiratory system, gastrointestinal system, eyes, skin.

Acute effect: Corrosive – Potassium oxide reacts violently with water to produce potassium hydroxide. If inhaled, causes sore throat, cough, burning sensation and shortness of breath. Contact with skin produces pain and blisters. Severe deep burns, redness and pain occur with eye contact. Ingestion results in burning sensations, abdominal pain, shock or collapse.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

SECTION XI – TOXICOLOGICAL INFORMATION, CONTD.**Calcium Oxide:**

Exposure route: Inhalation, ingestion, skin/eye contact.

Target organs: Eyes, skin, respiratory system.

Acute effect: Direct contact with tissues, can result in burns and severe irritation because of its high reactivity and alkalinity. Major complaints of workers exposed to lime consist of irritation of the skin and eyes, although inflammation of the respiratory passages, ulceration and perforation of the nasal septum, and even pneumonia has been attributed to inhalation of the dust.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

Magnesium Oxide:

Exposure route: Inhalation, eye/skin contact.

Target organs: Eyes, respiratory system.

Acute effect: Magnesium oxide dust caused slight irritation of the eyes and nose, conjunctivitis, inflammation of the mucous membrane, and coughing up discolored sputum after industrial exposures amongst workers exposed to an unspecified concentration of MgO.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

Titanium Oxide:

Exposure route: inhalation.

Target organs: respiratory system.

Acute effect: Toxicological studies have concluded that titanium oxide is inert, not absorbed by the body, and exerts no toxic effect.

Chronic effect/carcinogenicity: Classified as Group 2B-possibly carcinogenic to humans by IARC.

Acute Toxicity Estimates for Basalt– Not Available

SECTION XII – ECOLOGICAL INFORMATION

No data available for this product.

SECTION XIII – DISPOSAL CONSIDERATIONS**WASTE DISPOSAL METHOD**

Collect and reuse clean materials. Dispose of waste materials only in accordance with applicable federal, state, and local laws and regulations.

The above information applies to Martin Marietta Materials product only as sold. The product may be contaminated during use and it is the responsibility of the user to assess the appropriate disposal method in that situation.

SECTION XIV – TRANSPORT INFORMATION**DOT HAZARD CLASSIFICATION**

None

PLACARD REQUIRED

None

LABEL REQUIRED

Label as required by the OSHA Hazard Communication standard {29 CFR 1910.1200(f)}, and applicable state and local regulations.

SECTION XV – REGULATORY INFORMATION

OSHA: Crystalline Silica is not listed as a carcinogen.

SARA Title III: Section 311 and 312: Immediate health hazard and delayed health hazard.

TSCA: All components of the product appear on the EPA TSCA chemical substance inventory.

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 40 CFR §302.4

EPCRA (Emergency Planning and Community Right to Know Act): Crystalline silica (quartz) is not an extremely hazardous substance under regulations of the Emergency Planning and Community Right to Know Act, 40 CFR Part 355, Appendices A and B and is not a toxic chemical subject to the requirements of Section 313.

Clean Air Act: Crystalline silica (quartz) mined and processed by Martin Marietta Materials was not processed with or does not contain any Class I or Class II ozone depleting substances.

FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3). (The FDA standard primarily applies to products containing silica used in the coatings of food contact surfaces).

California Proposition 65: Respirable crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.

Massachusetts Toxic Use Reduction Act: Respirable crystalline silica is considered toxic per the Massachusetts Toxic Use Reduction Act when used in abrasive blasting and molding.

Pennsylvania Worker and Community Right to Know Act: Quartz is considered hazardous for purposes of the Act, but it is not a special hazardous substance or an environmental hazardous substance.

SECTION XVI – OTHER INFORMATION**DEFINITIONS OF ACRONYMS/ABBREVIATIONS**

ACGIH: American Conference of Governmental Industrial Hygienists

AL: Action Level

ANSI: American National Standards Institute

APF: Assigned Protection Factor

California REL: California Inhalation Reference Exposure Limit

CAS: Chemical Abstracts Service

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act

CFR: US Code of Federal Regulations

DHHS: Department of Health and Human Services

EPA: Environmental Protection Agency

EPCRA: Emergency Planning and Community Right to Know Act

FDA: Food and Drug Administration

GHS: Globally Harmonized System

HEPA: High-Efficiency Particulate Air

IARC: International Agency for Research on Cancer

IDLH: Immediately Dangerous to Life and Health

MSHA: Mine Safety and Health Administration

NIOSH: National Institute for Occupational Safety and Health, US Department of Health and Human Services

NIOSH REL: NIOSH Recommended Exposure Limit

NTP: National Toxicology Program

OEL: Occupational Exposure Limit

OSHA: Occupational Safety and Health Administration, US Department of Labor

PEL: Permissible Exposure Limit

PMF: Progressive Massive Fibrosis

RCRA: Resource Conservation and Recovery Act

SARA Title III: Title III of the Superfund Amendments and Reauthorization Act, 1986

SDS: Safety Data Sheet

STOT: Specific Target Organ Toxicity

TLV: Threshold Limit Value

TSCA: Toxic Substance Control Act

TWA: Time-Weighted Average

SECTION XVI – OTHER INFORMATION, CONTD.

User's Responsibility: The OSHA Hazard Communication Standard 29 CFR 1910.1200 requires that this SDS be made available to your employees who handle or may be exposed to this product. Educate and train your employees regarding applicable precautions. Instruct your employees to handle this product properly.

Disclaimer: The information contained in this document applies to this specific material as supplied and Martin Marietta Materials believes that the information contained in this SDS is accurate. The suggested precautions and recommendations are based on recognized good work practices and experience as of the date of publication. They are not necessarily all-inclusive or fully adequate in every circumstance as not all use circumstances can be anticipated. It may not be valid for this material if it is used in combination with other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for one's own particular use. Since the actual use of the product described herein is beyond our control, Martin Marietta Materials, assumes no liability arising out of the use of the product by others. Appropriate warnings and safe handling procedures should be provided to handlers and users. Also, the suggestions should not be confused with nor followed in violation of applicable laws, regulation, rules or insurance requirement. However, product must not be used in a manner which could result in harm.

An electronic version of this SDS is available at www.martinmarietta.com. More information on the effects of crystalline silica exposure may be obtained from OSHA (phone number: 1-800-321-OSHA; website: <http://www.osha.gov>) or from NIOSH (phone number: 1-800-35-NIOSH; website: <http://www.cdc.gov/niosh>).

DATE OF PREPARATION 6/2018

REPLACES 3/2015

NO WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE IS MADE



Zoning Documentation

Office of the County Executive

Alan McCarthy
County Executive

Alfred C. Wein, Jr.
Director of Administration

Office: 410.996.5202
Fax: 800.863.0947

Department of Land Use & Development Services

Eric Sennstrom, AICP, Director
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County Information
410.996.5200
410.658.4041



CECIL COUNTY, MARYLAND

Division of Planning and Zoning
200 Chesapeake Boulevard, Suite 2300, Elkton, MD 21921

July 17, 2017

Gustaf Buttar
Environmental, Health & Safety Manager - Maryland Division
Bluegrass Materials
10000 Beaver Dam Road
Cockeysville, MD 21030

RE: Letter of Zoning - North East Land & Materials Co. Inc. / Maryland Materials, Inc. (Multiple Parcels)

Dear Mr. Buttar:

This letter of zoning verification is for the multiple properties located in North East, MD 21901. Please refer to the table below regarding the zoning of each requested parcel. A written description of each zoning district follows the table.

Tax Account ID	Tax Map	Parcel	Zoning District	Overlay District
0803020568	19	34	MEA	
0803067661	25	662	MEA	
0803077012	19	517	MEA	
0803019837	19	36	MEA	
0803015459	25	228	LDR	MEB
0803067653	25	663	MEA	
0805038537	25	23	M2	MEB
0805038545	25	22	M2	MEB
0805056144	25	21	LDR	
0805038634	25	364	M2	MEB
0805018196	25	150	LDR	MEB
0805038626	25	51	M2	MEB

The purpose of the **Mineral Extraction A (MEA)** zone is to protect economically important mineral resources of the County for current and future use; to prevent incompatible development that may directly or indirectly preclude access to the mineral resources until such time that the resource can be removed; and to protect existing land uses adjacent to the potential mineral lands from undue harm that may result from mineral extraction activity.

The purpose of the **Heavy Industrial (M2)** zone is to provide for industrial uses of a larger scale and more intensive usage, with areas of uncovered storage. It is also to provide for a wide range of business/professional, research and development, manufacturing and processing, and industrial uses, activities and establishments which are compatible with adjacent uses to the extent that any adverse effects on health, safety, welfare, or the environment are avoided.

The purpose of the **Mineral Extraction 'B' (MEB)** overlay district is to identify areas of the County where mineral extraction may occur by special exception. This overlay designation shall only apply to areas designated as Mineral Extraction District on the Land Use Plan of the 2010 Cecil County Comprehensive Plan. It is intended that this overlay designation apply to those portion of the Mineral Extraction District where there is a potential for conflict between adjacent current and future land uses and mineral extraction activity. Permitted uses in the MEB District shall be those for the underlying zone, which in this case is M2.

The purpose of the **Low Density Residential (LDR)** zone is to provide an appropriate development area for low to medium density residential development and to act as a transitional zone between rural and more densely developed areas.

These properties do not have any open zoning violations. You may review the Cecil County Zoning Ordinance on the County's website at <http://www.ccgov.org/home/showdocument?id=1288> Please contact Mr. Patrick Conway, Chief of the Division of Permits & Inspections at 410-996-5235 for any requests regarding Certificate(s) of Use and/or Occupancy.

If you have any questions feel free to call or email me at soconnor@ccgov.org.

Sincerely,



Stephen J. O'Connor, AICP
Zoning Administrator
Cecil County MALPF Program Administrator

cc:



Certification of Insurance (COI)



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
09/29/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Marsh USA Inc. 100 North Tryon Street, Suite 3600 Charlotte, NC 28202 Attn: CA NON-RESIDENT NO. OB22889 CN102458548-1.MMM-GAWX-20-21	CONTACT NAME: PHONE (A/C. No. Ext):	FAX (A/C. No):	
	E-MAIL ADDRESS:		
INSURED Bluegrass Materials Company, LLC 2710 Wycliff Road PO Box 30013 Raleigh, NC 27622	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A : ACE American Insurance Company		22667
	INSURER B : Indemnity Ins Co Of North America		43575
	INSURER C : ACE Property And Casualty Ins Co		20699
	INSURER D :		
	INSURER E :		
INSURER F :			

COVERAGES	CERTIFICATE NUMBER: ATL-004935732-11	REVISION NUMBER:
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THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			HDOG71450430	09/30/2020	09/30/2021	EACH OCCURRENCE	\$ 3,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 50,000
							MED EXP (Any one person)	\$
							PERSONAL & ADV INJURY	\$ 3,000,000
							GENERAL AGGREGATE	\$ 6,000,000
							PRODUCTS - COMP/OP AGG	\$ 6,000,000
								\$
A	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY			ISAH25308475	09/30/2020	09/30/2021	COMBINED SINGLE LIMIT (Ea accident)	\$ 5,000,000
							BODILY INJURY (Per person)	\$
							BODILY INJURY (Per accident)	\$
							PROPERTY DAMAGE (Per accident)	\$
								\$
C	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED RETENTION \$			XEUG28167581005	09/30/2020	09/30/2021	EACH OCCURRENCE	\$ 1,000,000
							AGGREGATE	\$ 1,000,000
								\$
B A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N N	N/A	WLRC67464126 (AOS) WLRC67464163 (CA)	09/30/2020 09/30/2020	09/30/2021 09/30/2021	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER E.L. EACH ACCIDENT	\$ 2,000,000
							E.L. DISEASE - EA EMPLOYEE	\$ 2,000,000
							E.L. DISEASE - POLICY LIMIT	\$ 2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Certificate holder is additional insured under General Liability and Automobile Liability as their interest may appear, if required by written contract with the named insured, subject to the terms and conditions of the policies. A waiver of subrogation applies under General Liability, Automobile Liability, and Workers Compensation in favor of the certificate holder, if required by written contract with the named insured, subject to the terms and conditions of the policies. General liability and auto liability insurance apply on a primary and non-contributory basis, if required by written contract, and subject to policy terms and conditions.

CERTIFICATE HOLDER **CANCELLATION**Maryland Department of the Environment
1800 Washington Blvd
Baltimore, MD 21230**SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.**AUTHORIZED REPRESENTATIVE
of Marsh USA Inc.

Annette Stefani

Annette Stefani

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