COUNTY OF ALLEGHENY
RICH FITZGERALD
COUNTY EXECUTIVE

Air Quality Program

301 39th Street, Clack Health Center Building 7, Pittsburgh, PA 15201-1811
ph: 412.578.8103 • 24-hr: 412.687.ACHD (2243) • ***www.alleghenycounty.us/healthdepartment***

SUBMISSION FORM – AIR POLLUTION MITIGATION PLAN

APPLICANT INFORMATION

The Air Pollution Mitigation Plan is submitted by affected facilities to meet the requirements of Allegheny County regulations found in §2106.06 (Mon Valley Air Pollution Episode) of Article XXI.

01 Facility Information

Name of Facility	**Redland Quarries NY Inc. – Duquesne Plant**		
Address	**4810 Buttermilk Hollow Road**		
City State Zip+4	**West Mifflin, PA 15122**		
Permit #	**0171**	Phone	**(412) 462-4427**

02 Environmental Contact Information (Person to contact regarding technical details of this mitigation plan)

Name/Title	**James R. Carroll, Director, Environmental and Land – Mid-Atlantic Region**		
Address	**6401 Golden Triangle Drive, Suite 400**		
City State Zip+4	**Greenbelt, Maryland 20770**		
Email	**James.Carroll@lafargeholcim.com**	Phone	**(240) 564-3877**

03 Responsible Official Information

Name/Title	**Cedric Barthelemy, General Manager**		
Address	**6401 Golden Triangle Drive, Suite 400**		
City State Zip+4	**Greenbelt, Maryland 20770**		
Email		Phone	

DEBRA L. BOGEN, MD, DIRECTOR
ALLEGHENY COUNTY HEALTH DEPARTMENT
542 FOURTH AVENUE • PITTSBURGH, PA 15219
PHONE (412) 687.2243 • FAX (412) 578-8325 • WWW.ALLEGHENYCOUNTY.US

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04	**AFFIDAVIT**

I certify that, subject to the penalties of Title 18Pa. C.S.A. Section 4904 and 35 P.S. Section 4009(b)(2), I am the responsible official having primary responsibility for the operation of the facilities to which this air pollution mitigation plan applies and that the information provided in this mitigation plan is true, accurate and complete to the best of my knowledge, information and belief formed after reasonable inquiry.

Signature: **Date** 12/17/2021

Typed/Printed Name:

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SUBMISSION FORM – AIR POLLUTION MITIGATION PLAN

05 List all equipment or processes at your facility that emit PM_{10} and/or $PM_{2.5}$

See Section 3 of attached plan document.

WATCH PHASE OF MITIGATION PLAN

06 How will your facility ensure that equipment which produces particulate emissions is operating in a manner consistent with optimal engineering practices?

See Section 4.1 of plan document.

07 How will your facility ensure that air pollution control equipment is maintained in optimal working condition?

No add-on air pollution equipment is utilized at the site. See Section 4.1 for facility inspections performed during Watch.

08 How will your facility ensure that actions taken in blocks 05 and 06 are properly monitored, recorded, and reported to the Health Department?

See communication outlined in Section 4.1 and records outlined in Section 4.2 of the plan document.

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WARNING PHASE OF MITIGATION PLAN

09 How will your facility ensure that procedures are in place so enough staff and resources are available to implement the Mon Valley Air Pollution Warning Phase within 24 hours of the notification from ACHD?

Additional personnel does not impact ability of the site to mitigate air emissions. Staff training regarding this plan will be implemented to ensure consistent understanding of the plan and its requirements.

10 For every process and piece of equipment, list all available methods to reduce $PM_{2.5}/PM_{10}$ emissions from your four-year hourly average. During an actual warning phase, the actions to reduce emissions must last the length of the episode.

See Section 5.3 for available methods for emission reduction. See Section 5.2 for more details about the practices to be employed during a Warning.

11 For each piece of equipment and process, determine which emission reduction methods are feasible. List whether each method is feasible or infeasible and provide a justification for your determination.

See Section 5.3 of the plan document.

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SUBMISSION FORM – AIR POLLUTION MITIGATION PLAN

12 How will your facility ensure that actions taken in block 10 are properly monitored, recorded, and reported to the Health Department?

See communication outlined in Section 5.1 and records outlined in Section 5.2 of the plan document.

13 Provide an active spreadsheet containing the following:

- Calculations of your facility's $PM_{2.5}$ and PM_{10} emissions for each of the past four years (2017-2020) in tons/year for every piece of equipment and process;
- Calculation of average four year emissions of $PM_{2.5}$ and PM_{10} in lbs/hr for each piece of equipment and process;
- Feasible $PM_{2.5}$ and PM_{10} emission reductions in lbs/hr that will occur during a warning phase for every piece of equipment and process as well as the facility total; and
- Feasible $PM_{2.5}$ and PM_{10} emission reductions in percent reduced from the hourly four year average for every piece of equipment and process as well as the facility total percent reduction.

This spreadsheet will be used to calculate actual emission reductions that will be reported to the Health Department after warning phases have ended.

Spreadsheet provided via email and printouts are included as Appendix A (past actual emissions) and Appendix B (emissions reductions calculations).

14 How much time will be required for your facility to implement the emission reductions in block 10?

For the feasible control practices, implementation will occur the same day as notification is received from the Department of a Warning.

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SUBMISSION FORM – AIR POLLUTION MITIGATION PLAN

INSTRUCTIONS Submission Form for the Air Pollution Mitigation Plan	
Block 01 Facility Information	The facility name for the operation at that particular address should be used and not the name of the larger corporation. Use the address for the actual facility and not the company headquarters, if different. The most recent permit number should be included. If it is not known, it can be left blank.
Block 02 Environmental Contact Information	Fill in the contact information of the individual (e.g. employee or consultant) who will be contacted to provide environmental technical information for the Air Pollution Mitigation Plan
Block 03 Responsible Official Information	This address and phone number are for the office where the responsible official works the majority of the time. See block 04 instructions for information regarding the responsible official.
Block 04 Affidavit	This affidavit must be signed by the responsible official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of a Board of Directors, or Owner, depending on business structure. CORPORATION – President, Vice President, Secretary, Treasurer, or duly authorized person BUSINESS – Sole Proprietor or General Partner GOVERNMENT ENTITY – Ranking elected official or principal executive officer

Blocks 05–08
Watch Phase of Mitigation Plan
	The responses that you provide in blocks 05 through 08 will be specific to your equipment and facility. Below are some general ideas that may help you in how to approach these requirements.
	• Staff related
	  • Review procedures with employees to ensure all equipment is properly operating in a way to minimize air emissions.
	  • Schedule additional or on-call employees for upcoming shifts to ensure facility is fully staffed for a warning phase.
	  • Conduct a shift meeting(s) to remind employees to prioritize the environmental impact of their operations to reduce emissions.
	  • Share any other procedures which would help ensure sufficient staff levels and available resources to implement a warning phase.
	• Equipment related

SUBMISSION FORM – AIR POLLUTION MITIGATION PLAN

	• Inspect any equipment or processes which may have a potential to increase emissions to ensure proper operation and maintenance. • Implement improved operation and maintenance practices beyond standard operating procedures. • Ensure the facility is following the idling requirements under Act 124 of the PA Department of Environmental Protection regulations. • Conduct maintenance on all pollution control equipment. • Share any other procedures which help ensure the facility is operating in a manner consistent with good engineering practices. • Share any other procedures which help ensure the air pollution control equipment is maintained in good working condition.
Block 09 Warning Phase of Mitigation Plan	A good starting point in completing this block is to refer to the table found in section II of your facility's air quality permit titled "Emission Unit Identification" and identify which units emit particulate matter. There may be other equipment, not listed in the section II table, that can be included in the block 09 list.
Block 10 Warning Phase of Mitigation Plan	Block 10 should explain what actions the facility could possible take to ensure that hourly emissions are reduced. Possible methods include: • Reduction in material throughput • Reduction in operating time • Increased use of controls or suppression equipment • Changes in raw materials Examples of possible actions include: • Reduce production by a certain percentage or rate from normal operating conditions. A reduction from a potential maximum production rate will not be accepted if it is too high compared to normal operating rates for the relevant time period, thereby not resulting in an actual reduction in pollution. • Reduce usage of diesel fuel or other $PM_{2.5}$ or PM_{10} creating fuel types or switch fuel types to lower $PM_{2.5}$ or PM_{10} as allowed by the relevant permits. • Bring in additional employees to allow the facility to operate in the best environmentally responsible manner. • Delay production to a future day when a mitigation plan is not needed. • Delay any non-essential activities to a future day when a mitigation plan is not needed.

SUBMISSION FORM – AIR POLLUTION MITIGATION PLAN

	• Fully or partially enclose material movement and other work activities which produce dust and other particulate matter ($PM_{2.5}$ or PM_{10} emissions).
	• Modify work practices to decrease $PM_{2.5}$ or PM_{10} emissions such as:
	  ○ Slowing material handling
	  ○ Fully or partially enclose material movement and other work activities which produce dust and other particulate matter ($PM_{2.5}$ or PM_{10} emissions).
	• Stop or decrease unnecessary transportation activities and reduce travel speed on necessary transportation.
	• Employ additional roadway wetting or other activities to minimize road dust creation.
	• Add any other measures which reduce $PM_{2.5}$ or PM_{10} emissions.

Block 11 Warning Phase of Mitigation Plan	Emission reduction methods that are feasible can be eliminated from consideration for other reasons as long as adequate justification is given.
Block 12 Warning Phase of Mitigation Plan	The Health Department will require a report, submitted after the warning phase has ended, itemizing what actions were taken to meet the requirements of the warning phase.
Block 13 Warning Phase of Mitigation Plan	The spreadsheet must include actual plant emissions of $PM_{2.5\ and}$ PM_{10} for all equipment listed in block 09 for each of the past four years (2017-2020) in tons/year. These calculations can be copied directly from the spreadsheets submitted to the Health Department for emissions inventories. For each piece of equipment and process, emissions from the last four years must be provided in tons/year. For each piece of equipment and process, proposed feasible emission reductions must be provided in lbs/hr. The hourly average will be calculated for each unit and process by adding yearly emissions together and dividing by the total number of hours that the unit emitted over four years. In the case of a batch process, calculations will need to take into account the number of hours in each batch and the number of batches in a year.

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Block 14 Warning Phase of Mitigation Plan	Section 2106.06 of county air quality regulations requires that an affected facility is able to implement the requirements of the warning phase within 24 hours.

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SUBMISSION FORM – AIR POLLUTION MITIGATION PLAN

Mitigation Plan Checklist

The following checklist is provided as a list of items required for a complete mitigation plan submission. If at any time you have questions about your application, please call JoAnn Truchan 412-578-7981 or Jayme Graham 412-578-8129.

□ Has the responsible official signed and dated the first page (block 04)?

□ Have you provided an active spreadsheet showing actual emissions for every piece of equipment and process of $PM_{2.5}$ and PM_{10} for the past four years in tons per year?

□ Does the spreadsheet include the average actual $PM_{2.5}$ and PM_{10} emissions from every piece of equipment and process for the past four years in lbs/hr?

□ Does the spreadsheet include the PM_{10} and $PM_{2.5}$ reduction that will be achieved from every piece of equipment and process in lbs/hr and % from the four year hourly average during the warning phase?

□ Have you provided a complete response for each of the fourteen blocks?

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AIR POLLUTION MITIGATION PLAN

Redland Quarries NY Inc. / Duquesne Plant

Prepared By:

TRINITY CONSULTANTS
4500 Brooktree Road
Suite 310
Wexford, PA 15090
724.935.2611

December 2021

TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

Redland Quarries NY Inc. (Redland Quarries) owns and operates the Duquesne Plant in West Mifflin, Allegheny County. On October 1, 2021, Redland Quarries received notice from Allegheny County Health Department (ACHD or the Department) that the Duquesne Plant is subject to the new section in ACHD's Rules and Regulations, Article XXI §2106.06 (Mon Valley Air Pollution Episode). The new rule was added in response to weather-related inversions that occur in the Mon Valley that result in high levels of particulate matter measuring 2.5 micro-meters or less ($PM_{2.5}$). During an inversion, the air becomes stagnant with little to no dispersion, resulting in the accumulation of emissions. The emissions can originate from industrial sources in and around the valley as well as from traffic from regional (i.e., more distant) larger sources. While $PM_{2.5}$ is the primary pollutant of concern, it is worth noting that precursors to $PM_{2.5}$ include nitrogen oxides (NO_x) and sulfur dioxide (SO_2). To comply with the rule, the Duquesne Plant is required to develop and submit an air pollution mitigation plan (i.e., this document) explaining how the facility will reduce its $PM_{2.5}$ emissions when an episode occurs in the Mon Valley. As will be discussed, this plan addresses both Mon Valley Air Pollution Watches as well as Mon Valley Air Pollution Warnings as defined in Section 2.

If any changes at the site occur that affect the technical content or the implementation of this plan, then Redland Quarries will provide the Department notification in writing no more than 30 days following the change.

1.1 Facility Description

Redland Quarries' Duquesne Plant is currently authorized via Minor Source Operating Permit (MSOP) No. 0171. The Duquesne Plant is a blast furnace slag processing facility. The raw material known as moist granular slag is received from U. S. Steel Edgar Thomson Plant via truck. Once at the site, the granular slag is crushed, screened, sized and shipped offsite. In addition to the material handling and sizing equipment, the site's emissions sources include paved roadways, unpaved roadways and material storage piles. Section 3 provides a more detailed identification of $PM_{2.5}$ emissions sources.

The Duquesne Plant is considered a minor source of $PM_{2.5}$ (and all other criteria and hazardous air pollutants) as defined in Section 2101.20 of Article XXI. However, since the allowable emissions from the plant are greater than 6.5 tons per year (tpy) of $PM_{2.5}$ and 10 tpy of PM_{10}, and based on its location, Redland Quarries is subject to the ACHD Mon Valley Air Pollution Episode regulation.

1.2 Air Pollution Mitigation Plan Organization

This plan is organized as follows:

- Section 1 – Introduction & Facility Description;
- Section 2 – Air Pollution Mitigation Plan Requirements and Definitions;
- Section 3 – Identification of PM_{10} and $PM_{2.5}$ Emissions Sources;
- Section 4 – Watch Phase Procedures;
- Section 5 – Warning Phase Procedures;
- Appendix A – Past Actual Emissions Inventories;
- Appendix B – Emission Reduction Calculations; and
- Appendix C – Copy of Mon Valley Air Pollution Episode Regulation

2. AIR POLLUTION PLAN REQUIREMENTS AND DEFINITIONS

This section of the plan provides a summary of key definitions as well as a summary of the procedures by which a Mon Valley Air Pollution Watch or Mon Valley Air Pollution Warning is identified by the Department, communicated to the regulated community, and ultimately resolved.

2.1 Key Definitions

This section contains critical definitions relative to this air pollution mitigation plan. The full regulation is included as Appendix C to this plan.

Mon Valley $PM_{2.}5$ Threshold Level. The value of the threshold level is equal to the value of the primary 24-hour $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS). The current, primary 24-hour $PM_{2.5}$ NAAQS is 35 micrograms per cubic meter ($\mu g/m^3$).

Mon Valley Air Pollution Watch. The Department shall issue a Mon Valley Air Pollution Watch if the Department has determined from an air quality forecast that for at least the next 24-hour period atmospheric conditions will exist which indicate that the 24-hour average ambient concentration of $PM_{2.5}$ in one or more of the municipalities identified in Subsection d is forecasted to exceed the Mon Valley $PM_{2.5}$ threshold level.

Mon Valley Air Pollution Warning. The Department shall issue a Mon Valley Air Pollution Warning if during a rolling 24-hour averaging period, the Mon Valley $PM_{2.5}$ threshold level is exceeded at an official monitoring station in the municipalities identified in Subsection d of the regulation and the Department has determined atmospheric conditions will continue as described in Paragraph c.1 of the regulation.

Mon Valley Air Pollution Episode Area. This Section shall apply to the following municipalities: City of Clairton, City of Duquesne, City of McKeesport, Borough of Braddock, Borough of Braddock Hills, Borough of Chalfant, Borough of Dravosburg, Borough of East McKeesport, Borough of East Pittsburgh, Borough of Elizabeth, Borough of Forest Hills, Borough of Glassport, Borough of Jefferson Hills, Borough of Liberty, Borough of Lincoln, Borough of Munhall, Borough of North Braddock, Borough of Port Vue, Borough of Rankin, Borough of Swissvale, Borough of Turtle Creek, Borough of Versailles, Borough of Wall, Borough of West Elizabeth, Borough of West Mifflin, Borough of White Oak, Borough of Wilmerding, Borough of Whitaker, Elizabeth Township, Forward Township, North Versailles Township, and Wilkins Township.

2.2 Procedures for Establishing Mon Valley Air Pollution Episodes

The Department will determine if a Mon Valley Air Pollution Watch is necessary based on air quality forecast. The Department shall rely on the air quality forecast provided by the Pennsylvania Department of Environmental Protection (PADEP) for determining Mon Valley Air Pollution Episodes. The Director of the Allegheny County Health Department may approve a change in the air quality forecast provider or methodology. The Department shall post on its Air Quality Program website[1] any changes to the air quality forecast provider or methodology.

A Mon Valley Air Pollution Warning, when necessary, will be established based on actual ambient air monitoring stations within the Mon Valley Air Pollution Episode Area as well as Department review of

[1] https://www.alleghenycounty.us/Health-Department/Programs/Air-Quality/Air-Quality.aspx

atmospheric conditions (i.e., persistence of temperature inversion and/or generally poor atmospheric dispersion conditions).

2.3 Procedures for Notifications during Mon Valley Air Pollution Episodes

When a Mon Valley Air Pollution Watch or Warning is issued, the Department shall notify Redland Quarries (and all other sources) that they are required to implement the procedures and measures identified in either the Mon Valley Air Pollution Watch or Warning Phase.

Upon termination of a Mon Valley Air Pollution Watch or Warning, the Department will issue a notification to all affected sources that the watch or warning is no longer in effect.

3. IDENTIFICATION OF PM_{10} AND $PM_{2.5}$ EMISSION SOURCES

The characteristics of $PM_{2.5}$ air emissions from the emission units at the Duquesne Plant are briefly described in this section of the application. $PM_{2.5}$ emissions from the plant can be classified as fugitive in nature and generated from the following main mechanisms: (1) generation of particulate matter during materials handling operations; (2) fugitive roadway emissions; and (3) storage pile activities and wind erosion emissions. Detailed emissions calculations (and specific methodology references) from 2017 through 2020 are presented in Appendix A. Calculations include average pound per hour (lb/hr) and tpy estimates.

3.1 Emissions from Material Handling Operations

Fugitive particulate emissions occur from material handling activities including crushers, screens, conveyor transfers and other material transfers. These operations are collectively identified as P004 in the air permit. The following is a complete list of the material handling system at the Duquesne Plant (not all equipment is used concurrently):

- Truck Load and Dump (batch dump);
- Twenty-six (26) conveyors or stackers;
- Three (3) screens;
- Two (2) crushers; and
- Three (3) feeders.

In general, emissions from material handling operations are based on U.S. EPA AP-42, 5th Edition, Section 11.19.2 ("Crushed Stone Processing and Pulverized Mineral Processing") for crushers, conveyor transfers and screens and Section 13.2.4 ("Aggregate Handling and Storage Piles") for material transfers (other than conveyor transfer). Emissions per ton of throughput are taken, or derived, from these sections and multiplied by actual throughput at the Duquesne Plant. Emissions from material handling operations are currently controlled via natural moisture content of the slag received.

3.2 Emissions from Plant Roadways

Roadway emissions at the Duquesne Plant are generated by vehicle traffic on paved and unpaved roads at the facility. As shown in Appendix A, emissions are estimated based on emissions factors, in terms of pounds of pollutant per mile traveled, in accordance with procedures outlined in:

1. U.S. EPA AP-42, 5th Edition, Section 13.2.1 for Paved Roads; and
2. U.S. EPA AP-42, 5th Edition, Section 13.2.2 for Unpaved Roads.

The Duquesne Plant maintains onsite a water truck that can be used to reduce fugitive PM emissions resulting from roadway traffic.

3.3 Emissions from Storage Piles

Emissions from storage piles include those associated with transfers to/from piles as well as wind erosion. Pile transfer emissions are accounted for with other material handling operations. Wind erosion emissions are computed using an equation from EPA's *Control of Open Fugitive Dust Source* (September 1988)(EPA 450/3-88-008). Emissions from storage piles are currently minimized via inherent material moisture.

4. WATCH PHASE PROCEDURES

This section of the plan outlines the procedures to be undertaken by Duquesne Plant personnel during a Mon Valley Air Pollution Watch.

4.1 Communication and Inspections

Upon being notified of a Mon Valley Air Pollution Watch by the Department, Redland Quarries will notify Duquesne Plant personnel either during a shift meeting or email communication. Since all PM emissions from the plant are fugitive in nature, additional or on-call employees are not required as they would not mitigate PM_{10} and $PM_{2.5}$ emissions.

The Duquesne Plant does not operate any add-on air pollution control devices. However, the inherent moisture of the slag processed at the site and ability to employ a water truck are key to limiting PM_{10} and $PM_{2.5}$ emissions from material handling operations, storage piles and roadways. As such, **for any day during which the Department implements a Mon Valley Air Pollution Watch**, Redland Quarries shall undertake the following inspections:

- A daily visual inspection of the site conditions and water truck:
  - Manager/supervisor will conduct a daily site-wide visual inspection to determine if vehicles or weather conditions (e.g., wind) are creating excess fugitive dust.
  - Availability of the site's water truck and its contents will be confirmed.

- A daily inspection of incoming slag (assuming there is incoming material):
  - Incoming material form U. S. Steel is frequently quenched with water from the steel mill prior to arriving to the Duquesne Plant.
  - Incoming material will be inspected to determine if there are any issues with quality or other issues.
  - If issues are identified, the personnel conducting the inspection shall contact U. S. Steel and request they cease sending material until the issue is resolved.

4.2 Recordkeeping and Reporting

Redland Quarries will maintain the following records associated with the implementation of a Watch Phase:

- During a Watch Phase, the manager/supervisor shall perform a site-wide visual inspection and record observations on an inspection form.
- The manager/supervisor shall record the quantity and quality of "Incoming Materials" on the inspection form described above and note when slag material does not meet quality standards and that U. S. Steel is notified.

The records associated with a specific Mon Valley Air Pollution Watch will be provided to the Department upon request.

5. WARNING PHASE PROCEDURES

This section of the plan outlines the procedures to be undertaken by Duquesne Plant personnel during a Mon Valley Air Pollution Warning. Procedures outlined below are to be implemented within 24 hours of notification from ACHD. Plant personnel will receive a briefing of these procedures, and the plan in general upon its implementation.

5.1 Communication, Inspections and Controls

Upon being notified of a Mon Valley Air Pollution Warning by the Department, Redland Quarries will notify Duquesne Plant personnel either during a shift meeting or email communication. Since all PM emissions from the plant are fugitive in nature, additional or on-call employees are not required as they would not mitigate PM_{10} and $PM_{2.5}$ emissions.

The Duquesne Plant does not operate any add-on air pollution control devices. However, the inherent moisture of the slag processed at the site and ability to employ a water truck are key to limiting PM_{10} and $PM_{2.5}$ emissions from material handling operations, storage piles and roadways. As such, **for any day during which the Department implements a Mon Valley Air Pollution Warning**, Redland Quarries shall undertake the following inspections (except for where such inspections have already occurred due to a Watch being issued earlier in the same day):

- A daily visual inspection of the site conditions and water truck:
  - Manager/supervisor will conduct a daily site-wide visual inspection to determine if vehicles or weather conditions (e.g., wind) are creating excess fugitive dust.
  - Availability of the site's water truck and its contents will be confirmed.
  - Additional roadway wetting will be employed as necessary, assuming feasible (i.e., not during freeze or potential freeze conditions) to minimize road dust emissions. If wetting application is not feasible vehicle speeds, additional emphasis will be placed on the vehicle speed limit of ten (10) miles per hour (mph).

- A daily inspection of incoming slag (assuming there is incoming material):
  - Incoming material form U. S. Steel is frequently quenched with water from the steel mill prior to arriving to the Duquesne Plant.
  - Incoming material will be inspected to determine if there are any issues with quality or other issues.
  - If issues are identified, the personnel conducting the inspection shall contact U. S. Steel and request they cease sending material until the issue is resolved.
  - If any material in the surge pile or other piles are dusty, plant personnel will use the water truck to wet it down before it goes through the plant.

- Inspections, and resulting actions, triggered by a Mon Valley Air Pollution Warning will last the length of the episode.

5.2 Recordkeeping and Reporting

Redland Quarries will maintain the following records associated with the implementation of a Warning Phase:

- During a Warning Phase, the manager/supervisor shall perform a site-wide visual inspection and record observations on an inspection form.
- The manager/supervisor shall record the quantity and quality of "Incoming Materials" on the inspection form described above and note when slag material does not meet quality standards and that U. S. Steel is notified.
- The daily gallons of material used by the water truck will be recorded on the inspection form. The volume of water additive (e.g., Chemstream's Polyakylene Glycol – DC-104) used by the site to enhance the sprayed water's effectiveness in reducing fugitive dust will also be recorded.

Following conclusion of a Mon Valley Air Pollution Warning, a brief summary report of the itemized actions taken to meet the requirements of the warning phase will be provided to the Department. Redland Quarries will work with the Department on establishing the timeframe for submittal of the report (e.g., within 30 days following the conclusion of the episode, semiannually, etc.).

5.3 Documentation of Available Control Methods

Redland Quarries reviewed current control practices as well as those potentially available to fully document opportunities to obtain further reductions in PM_{10} and $PM_{2.5}$ emissions. The benefit of selected practices is quantified, as required by the Department, in Appendix B.

Table 5-1. List of All Controls Options Considered in the Analysis

Source	Control Option	Description	Feasibility Summary	Justification
Roadways	Water Truck / Wetting	Use of a water truck (including small quantities chemical additive as needed) reduces potential for roadway fugitives.	Feasible - Employed	N/A – Already Employed. Will utilize additional wetting when necessary and practical.
	Vehicle Speed Restrictions	Vehicle speed restriction of 10 mph minimizes roadway surface disturbance and thus fugitive emissions.	Feasible - Employed	N/A – Already Employed
	Road Sweeping	Roadway sweeping helps remove loose sediment buildup on roadways, thus reducing potential for fugitive emissions.	Feasible - Not Employed	The site has already employed the most effective control option. In addition, fugitive emissions are more likely to be driven due to increased wind speeds. During an inversion, the condition expected to drive most episodes, winds tend to be calm or at least not gusting. Therefore, potential for additional reduction with this measure are limited at best.
Storage Piles	Material Moisture	Inherent moisture limits loose particles susceptible to becoming fugitive emissions.	Feasible - Employed	N/A – Already Employed
	Enclosure	Enclosure reduces wind erosion emissions by limiting the ability of winds to disturb loose sediment.	Not Feasible for Plan	The storage piles at the plant are large and spread out over the site footprint. Nonetheless due to inherent moisture of the material, emissions are expected to be minimal (e.g., estimated to be 0.1 tpy PM_{10} and 0.02 tpy of $PM_{2.5}$ in 2020). During an inversion, winds tend to be calm or at least not gusting. Therefore, potential for additional reduction with this measure are limited, especially given the existing emissions quantities.

Source	Control Option	Description	Feasibility Summary	Justification
Material Handling Operations	Material Moisture	Inherent moisture limits loose particles susceptible to becoming fugitive emissions.	Feasible - Employed	N/A – Already Employed. Additional practices outlined in Section 5.1 depending on moisture content of incoming material.
	Enclosure	Enclosure helps fugitive emissions by limiting the ability of.	Not Feasible for Plan	The material handling operations are spread out (spider-like network) in the site's slag processing area and are not necessarily all used concurrently. Therefore, no single enclosure for the entire area is feasible. Nonetheless due to inherent moisture of the material, emissions are expected to be minimal (e.g., estimated to be 2 tpy PM_{10} and 0.3 tpy of $PM_{2.5}$ in 2020) and therefore potential for additional reduction is limited.
	Dust Collector	Installation of a dust collector in order to capture fugitive emissions and pass the air through filters/bags to reduce PM emissions.	Not Feasible for Plan	The material handling operations are spread out (spider-like network) in the site's slag processing area and are not necessarily all used concurrently. Based on the layout, a very large dust collector with extensive dust work, or multiple small collectors would be required to apply dust collection to the system. However, potential for reduced emissions is limited based on historical emissions (e.g., estimated to be 2 tpy PM_{10} and 0.3 tpy of $PM_{2.5}$ in 2020) from all material handling operations combined. The implementation of dust collection is not an option to respond to near immediate episode declaration (e.g., it would take roughly a year or longer to design and then seek authorization for the control) all for extremely limited benefit.

*Control options listed for material handling operations are for all equipment listed in Section 3.1 of this plan.

APPENDIX A. PAST ACTUAL EMISSIONS SUMMARIES

Calendar Years 2017 through 2020

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2017**

TABLE 1. Annual Inputs

Source Information:

Average Pile Surface Area (ft2)	90,000
Annual tonnage moved to/from storage piles	487,453
Average Moisture Content (%)	6.36
Annual tonnage moved on roads	487,453
Annual tonnage moved through system	487,453
Average Operating Schedule: hrs/day	10
Average Operating Schedule: hrs/week	50
Average Operating Schedule: hrs/month	210
Average Operating Schedule: hrs/yr	1890

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2017**

TABLE 2. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	487,453
Operating Schedule (hrs/yr):	1,890
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2017

TABLE 3. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.05	0.21	0.02	0.11	0.00	0.02

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	80	
Controlled Emissions (CE)	lb/acre-day	0.567	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	1.171	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.07	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.214	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.04	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.11	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.01	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.02	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations CY2017**

TABLE 4. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	487453	[Site Data]
Hours per year	hr	1890	[Site Data]
Trucks per year	truck/yr	24373	[Site Data]
Miles per year	miles/yr	24373	[Site Data]
Miles driven per hour	mph	13	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.40	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.39	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.04	Calculated
Uncontrolled PM Emissions	lb/hr	67.89	Calculated
Controlled PM Emissions	lb/hr	13.58	Calculated
Uncontrolled PM Emissions	tpy	64.16	Calculated
Controlled PM Emissions	tpy	12.83	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	18.66	Calculated
Controlled PM_{10} Emissions	lb/hr	3.73	Calculated
Uncontrolled PM_{10} Emissions	tpy	17.63	Calculated
Controlled PM_{10} Emissions	tpy	3.53	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.87	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.37	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.76	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.35	Calculated

Notes:

1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365

* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.33	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.27	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		0.00054	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.07	Calculated
Average control efficiency, 69-(0.231xV)	%	63.23	Calculated (prior application)
Number of vehicle passes since last application of water (V)		25	
Uncontrolled PM Emissions	lb/hr	11.67	Calculated
Controlled PM Emissions	lb/hr	4.29	Calculated
Uncontrolled PM Emissions	tpy	11.03	Calculated
Controlled PM Emissions	tpy	4.06	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.33	Calculated
Controlled PM_{10} Emissions	lb/hr	0.86	Calculated
Uncontrolled PM_{10} Emissions	tpy	2.21	Calculated
Controlled PM_{10} Emissions	tpy	0.81	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.57	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.21	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.54	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.20	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	67.89	64.16	18.66	17.63	1.87	1.76
Controlled	13.58	12.83	3.73	3.53	0.37	0.35
Paved						
Uncontrolled	11.67	11.03	2.33	2.21	0.57	0.54
Controlled	4.29	4.06	0.86	0.81	0.21	0.20
Total						
Uncontrolled	79.57	75.19	20.99	19.84	2.44	2.30
Controlled	17.87	16.89	4.59	4.34	0.58	0.55

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2017

TABLE 5. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Process	P004	5.46	2.34	0.34	5.16	2.22	0.32
Storage Pile Emissions	--	0.05	0.02	0.004	0.21	0.11	0.02
Roads Emissions	--	17.87	4.59	0.58	16.89	4.34	0.55
Total Facility (Actuals)		23.38	6.96	0.92	22.26	6.66	0.88

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2018**

TABLE 1. Annual Inputs

Source Information:

Average Pile Surface Area (ft2)	90,000
Annual tonnage moved to/from storage piles	539,521
Average Moisture Content (%)	6.44
Annual tonnage moved on roads	539,521
Annual tonnage moved through system	539,521
Average Operating Schedule: hrs/day	10
Average Operating Schedule: hrs/week	50
Average Operating Schedule: hrs/month	210
Average Operating Schedule: hrs/yr	2100

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2018**

TABLE 2. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	539,521
Operating Schedule (hrs/yr):	2,100
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2018

TABLE 3. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.05	0.21	0.02	0.11	0.00	0.02

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	80	
Controlled Emissions (CE)	lb/acre-day	0.567	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	1.171	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.07	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.214	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.04	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.11	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.01	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.02	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations CY2018**

TABLE 4. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	539521	[Site Data]
Hours per year	hr	2100	[Site Data]
Trucks per year	truck/yr	26976	[Site Data]
Miles per year	miles/yr	26976	[Site Data]
Miles driven per hour	mph	13	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.40	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.39	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.04	Calculated
Uncontrolled PM Emissions	lb/hr	67.63	Calculated
Controlled PM Emissions	lb/hr	13.53	Calculated
Uncontrolled PM Emissions	tpy	71.01	Calculated
Controlled PM Emissions	tpy	14.20	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	18.59	Calculated
Controlled PM_{10} Emissions	lb/hr	3.72	Calculated
Uncontrolled PM_{10} Emissions	tpy	19.52	Calculated
Controlled PM_{10} Emissions	tpy	3.90	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.86	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.37	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.95	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.39	Calculated

Notes:

1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365

* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.33	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.27	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		0.00054	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.07	Calculated
Average control efficiency, 69-(0.231xV)	%	63.23	Calculated (prior application)
Number of vehicle passes since last application of water (V)		25	
Uncontrolled PM Emissions	lb/hr	11.63	Calculated
Controlled PM Emissions	lb/hr	4.28	Calculated
Uncontrolled PM Emissions	tpy	12.21	Calculated
Controlled PM Emissions	tpy	4.49	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.33	Calculated
Controlled PM_{10} Emissions	lb/hr	0.86	Calculated
Uncontrolled PM_{10} Emissions	tpy	2.44	Calculated
Controlled PM_{10} Emissions	tpy	0.90	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.57	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.21	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.60	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.22	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	67.63	71.01	18.59	19.52	1.86	1.95
Controlled	13.53	14.20	3.72	3.90	0.37	0.39
Paved						
Uncontrolled	11.63	12.21	2.33	2.44	0.57	0.60
Controlled	4.28	4.49	0.86	0.90	0.21	0.22
Total						
Uncontrolled	79.26	83.22	20.91	21.96	2.43	2.55
Controlled	17.80	18.69	4.57	4.80	0.58	0.61

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2018

TABLE 5. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Process	P004	5.39	2.31	0.33	5.66	2.43	0.35
Storage Pile Emissions	--	0.05	0.02	0.004	0.21	0.11	0.02
Roads Emissions	--	17.80	4.57	0.58	18.69	4.80	0.61
Total Facility (Actuals)		23.24	6.91	0.92	24.56	7.34	0.97

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2019**

TABLE 1. Annual Inputs

Source Information:

Average Pile Surface Area (ft2)	90,000
Annual tonnage moved to/from storage piles	503,706
Average Moisture Content (%)	5.65
Annual tonnage moved on roads	503,706
Annual tonnage moved through system	503,706
Average Operating Schedule: hrs/day	10
Average Operating Schedule: hrs/week	50
Average Operating Schedule: hrs/month	210
Average Operating Schedule: hrs/yr	2100

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2019**

TABLE 2. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	503,706
Operating Schedule (hrs/yr):	2,100
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2019

TABLE 3. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.05	0.21	0.02	0.11	0.00	0.02

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	80	
Controlled Emissions (CE)	lb/acre-day	0.567	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	1.171	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.07	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.214	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.04	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.11	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.01	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.02	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations CY2019**

TABLE 4. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	503706	[Site Data]
Hours per year	hr	2100	[Site Data]
Trucks per year	truck/yr	25185	[Site Data]
Miles per year	miles/yr	25185	[Site Data]
Miles driven per hour	mph	12	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.40	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.39	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.04	Calculated
Uncontrolled PM Emissions	lb/hr	63.14	Calculated
Controlled PM Emissions	lb/hr	12.63	Calculated
Uncontrolled PM Emissions	tpy	66.30	Calculated
Controlled PM Emissions	tpy	13.26	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	17.35	Calculated
Controlled PM_{10} Emissions	lb/hr	3.47	Calculated
Uncontrolled PM_{10} Emissions	tpy	18.22	Calculated
Controlled PM_{10} Emissions	tpy	3.64	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.74	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.35	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.82	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.36	Calculated

Notes:

1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365

* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.33	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.27	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		0.00054	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.07	Calculated
Average control efficiency, 69-(0.231xV)	%	63.23	Calculated (prior application)
Number of vehicle passes since last application of water (V)		25	
Uncontrolled PM Emissions	lb/hr	10.86	Calculated
Controlled PM Emissions	lb/hr	3.99	Calculated
Uncontrolled PM Emissions	tpy	11.40	Calculated
Controlled PM Emissions	tpy	4.19	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.17	Calculated
Controlled PM_{10} Emissions	lb/hr	0.80	Calculated
Uncontrolled PM_{10} Emissions	tpy	2.28	Calculated
Controlled PM_{10} Emissions	tpy	0.84	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.53	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.20	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.56	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.21	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	63.14	66.30	17.35	18.22	1.74	1.82
Controlled	12.63	13.26	3.47	3.64	0.35	0.36
Paved						
Uncontrolled	10.86	11.40	2.17	2.28	0.53	0.56
Controlled	3.99	4.19	0.80	0.84	0.20	0.21
Total						
Uncontrolled	74.00	77.70	19.52	20.50	2.27	2.38
Controlled	16.62	17.45	4.27	4.48	0.54	0.57

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2019

TABLE 5. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Process	P004	5.55	2.41	0.35	5.83	2.53	0.36
Storage Pile Emissions	--	0.05	0.02	0.004	0.21	0.11	0.02
Roads Emissions	--	16.62	4.27	0.54	17.45	4.48	0.57
Total Facility (Actuals)		22.22	6.70	0.89	23.50	7.12	0.95

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2020**

TABLE 1. Annual Inputs

Source Information:

Average Pile Surface Area (ft2)	90,000
Annual tonnage moved to/from storage piles	367,697
Average Moisture Content (%)	5.32
Annual tonnage moved on roads	367,697
Annual tonnage moved through system	367,697
Average Operating Schedule: hrs/day	10
Average Operating Schedule: hrs/week	50
Average Operating Schedule: hrs/month	210
Average Operating Schedule: hrs/yr	1470

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2020**

TABLE 2. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	367,697
Operating Schedule (hrs/yr):	1,470
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2020

TABLE 3. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.05	0.21	0.02	0.11	0.00	0.02

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	80	
Controlled Emissions (CE)	lb/acre-day	0.567	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	1.171	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.07	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.214	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.04	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.11	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.01	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.02	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations CY2020**

TABLE 4. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	367697	[Site Data]
Hours per year	hr	1470	[Site Data]
Trucks per year	truck/yr	18385	[Site Data]
Miles per year	miles/yr	18385	[Site Data]
Miles driven per hour	mph	13	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.40	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.39	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.04	Calculated
Uncontrolled PM Emissions	lb/hr	65.84	Calculated
Controlled PM Emissions	lb/hr	13.17	Calculated
Uncontrolled PM Emissions	tpy	48.40	Calculated
Controlled PM Emissions	tpy	9.68	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	18.10	Calculated
Controlled PM_{10} Emissions	lb/hr	3.62	Calculated
Uncontrolled PM_{10} Emissions	tpy	13.30	Calculated
Controlled PM_{10} Emissions	tpy	2.66	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.81	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.36	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.33	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.27	Calculated

Notes:

1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365

* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.33	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.27	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		0.00054	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.07	Calculated
Average control efficiency, 69-(0.231xV)	%	63.23	Calculated (prior application)
Number of vehicle passes since last application of water (V)		25	
Uncontrolled PM Emissions	lb/hr	11.32	Calculated
Controlled PM Emissions	lb/hr	4.16	Calculated
Uncontrolled PM Emissions	tpy	8.32	Calculated
Controlled PM Emissions	tpy	3.06	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.26	Calculated
Controlled PM_{10} Emissions	lb/hr	0.83	Calculated
Uncontrolled PM_{10} Emissions	tpy	1.66	Calculated
Controlled PM_{10} Emissions	tpy	0.61	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.56	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.20	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.41	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.15	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	65.84	48.40	18.10	13.30	1.81	1.33
Controlled	13.17	9.68	3.62	2.66	0.36	0.27
Paved						
Uncontrolled	11.32	8.32	2.26	1.66	0.56	0.41
Controlled	4.16	3.06	0.83	0.61	0.20	0.15
Total						
Uncontrolled	77.17	56.72	20.36	14.97	2.37	1.74
Controlled	17.33	12.74	4.45	3.27	0.57	0.42

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2020

TABLE 5. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Process	P004	6.08	2.65	0.38	4.47	1.94	0.28
Storage Pile Emissions	--	0.05	0.02	0.004	0.21	0.11	0.02
Roads Emissions	--	17.33	4.45	0.57	12.74	3.27	0.42
Total Facility (Actuals)		23.46	7.12	0.95	17.42	5.32	0.71

APPENDIX B. EMISSION REDUCTION CALCULATIONS

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations

Summary of Mitigation Plan Benefits

Source Name	Source ID	2020		2019		2018		2017		Average		Mitigation Plan Rates		Reduction		Mitigation Plan	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	Reduction (%)	Reduction (%)
Process	P004	2.65	0.38	2.41	0.35	2.31	0.33	2.34	0.34	2.43	0.35	2.38	0.34	0.0	0.0	2%	2%
Storage Pile Emissions	--	0.02	0.004	0.02	0.004	0.02	0.004	0.02	0.004	0.02	0.004	0.02	0.003	0.01	0.001	25%	25%
Roads Emissions	--	4.45	0.57	4.27	0.54	4.57	0.58	4.59	0.58	4.47	0.57	2.59	0.37	1.88	0.20	42%	35%
Total Facility (Estimated Future Average Actuals)		7.12	0.95	6.70	0.89	6.91	0.92	6.96	0.92	6.92	0.92	4.98	0.71	1.94	0.21	28%	22%

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations**

Annual Inputs **Future - Average**

Source Information:

Average Pile Surface Area (ft2)	90,000
Annual tonnage moved to/from storage piles	474,594
Average Moisture Content (%)	6.05
Annual tonnage moved on roads	474,594
Annual tonnage moved through system	474,594
Average Operating Schedule: hrs/day	10
Average Operating Schedule: hrs/week	50
Average Operating Schedule: hrs/month	210
Average Operating Schedule: hrs/yr	1,890

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **Future - Average**

TABLE 1. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	474,594
Operating Schedule (hrs/yr):	1,890
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations Future - Average

TABLE 2. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.04	0.16	0.02	0.08	0.00	0.01

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	85	*Increased efficiency for short-term if additonal wetting is applied
Controlled Emissions (CE)	lb/acre-day	0.425	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	0.878	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.05	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.160	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.03	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.08	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.00	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.01	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations Future - Average

TABLE 3. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	474594	[Site Data]
Hours per year	hr	1890	[Site Data]
Trucks per year	truck/yr	23730	[Site Data]
Miles per year	miles/yr	23730	[Site Data]
Miles driven per hour	mph	13	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	90	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.70	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	90	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.19	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	90	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.02	Calculated
Uncontrolled PM Emissions	lb/hr	66.10	Calculated
Controlled PM Emissions	lb/hr	6.61	Calculated
Uncontrolled PM Emissions	tpy	62.47	Calculated
Controlled PM Emissions	tpy	6.25	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	18.17	Calculated
Controlled PM_{10} Emissions	lb/hr	1.82	Calculated
Uncontrolled PM_{10} Emissions	tpy	17.17	Calculated
Controlled PM_{10} Emissions	tpy	1.72	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.82	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.18	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.72	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.17	Calculated

Notes:

1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365

* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month. Short-term control efficiency of increased wetting application estimated by Duquesne Plant to be 90 percent (level of control assumed by other sites and listed in EPA-450/3-88-008.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.23	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.25	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		######	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.06	Calculated
Average control efficiency, 69-(0.231xV)	%	66.11	Calculated (prior application)
Number of vehicle passes since last application of water (V)		13	* increased frequency during plan
Uncontrolled PM Emissions	lb/hr	11.37	Calculated
Controlled PM Emissions	lb/hr	3.85	Calculated
Uncontrolled PM Emissions	tpy	10.74	Calculated
Controlled PM Emissions	tpy	3.64	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.27	Calculated
Controlled PM_{10} Emissions	lb/hr	0.77	Calculated
Uncontrolled PM_{10} Emissions	tpy	2.15	Calculated
Controlled PM_{10} Emissions	tpy	0.73	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.56	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.19	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.53	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.18	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	66.10	62.47	18.17	17.17	1.82	1.72
Controlled	6.61	6.25	1.82	1.72	0.18	0.17
Paved						
Uncontrolled	11.37	10.74	2.27	2.15	0.56	0.53
Controlled	3.85	3.64	0.77	0.73	0.19	0.18
Total						
Uncontrolled	77.47	73.21	20.44	19.32	2.37	2.24
Controlled	10.46	9.89	2.59	2.44	0.37	0.35

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations Future - Average

TABLE 4. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	Future			Future		
		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
		(lb/hr)	(lb/hr)	(lb/hr)	(tpy)	(tpy)	(tpy)
Process	P004	5.51	2.38	0.34	5.21	2.25	0.32
Storage Pile Emissions	--	0.04	0.02	0.003	0.16	0.08	0.01
Roads Emissions	--	10.46	2.59	0.37	9.89	2.44	0.35
Total Facility (Estimated Future Average Actuals)		16.01	4.98	0.71	15.26	4.77	0.68

APPENDIX C. COPY OF MON VALLEY AIR POLLUTION EPISODE REGULATION

Allegheny County Health Department
Article XXI Revision – Mon Valley Air Pollution Episode Regulation

§2106.06 MON VALLEY AIR POLLUTION EPISODE {effective }

a. **Applicability.** This section applies to the following sources located in one or more of the municipalities identified in Subsection d:

1. All major and synthetic minor sources of $PM_{2.5}$;

2. All sources that have combined allowable emissions from all emission units of 6.5 tons or more per year of $PM_{2.5}$; and

3. All sources that have combined allowable emissions from all emission units of 10 tons or more per year of PM_{10}.

b. **Air Quality Forecast.** For purposes of this Section, the Department shall rely on the air quality forecast provided by the Pennsylvania Department of Environmental Protection for determining Mon Valley Air Pollution Episodes. The Director of the Allegheny County Health Department may approve a change in the air quality forecast provider or methodology. The Department shall post on its Air Quality Program website any changes to the air quality forecast provider or methodology.

c. **Mon Valley Air Pollution Episodes.** For purposes of this Section, the "Mon Valley $PM_{2.5}$ threshold level" shall be the value of the primary 24-hour $PM_{2.5}$ NAAQS.

1. **Mon Valley Air Pollution Watch.** The Department shall issue a Mon Valley Air Pollution Watch if the Department has determined from an air quality forecast that for at least the next 24-hour period atmospheric conditions will exist which indicate that the 24-hour average ambient concentration of $PM_{2.5}$ in one or more of the municipalities identified in Subsection d is forecasted to exceed the Mon Valley $PM_{2.5}$ threshold level.

2. **Mon Valley Air Pollution Warning.** The Department shall issue a Mon Valley Air Pollution Warning if during a rolling 24-hour averaging period, the Mon Valley $PM_{2.5}$ threshold level is exceeded at an official monitoring station in the municipalities identified in Subsection d and the Department has determined atmospheric conditions will continue as described in Paragraph c.1.

d. **Mon Valley Air Pollution Episode Area.** This Section shall apply to the following municipalities: City of Clairton, City of Duquesne, City of McKeesport, Borough of Braddock, Borough of Braddock Hills, Borough of Chalfant, Borough of Dravosburg, Borough of East McKeesport, Borough of East Pittsburgh, Borough of Elizabeth, Borough of Forest Hills, Borough of Glassport, Borough of Jefferson Hills, Borough of Liberty, Borough of Lincoln, Borough of Munhall, Borough of North Braddock, Borough of Port Vue, Borough of Rankin, Borough of Swissvale, Borough of Turtle Creek, Borough of Versailles, Borough of Wall, Borough of West Elizabeth, Borough of West Mifflin, Borough of White Oak, Borough of Wilmerding, Borough of Whitaker, Elizabeth Township, Forward Township, North Versailles Township, and Wilkins Township.

e. **Mon Valley Air Pollution Mitigation Plan.** In addition to any applicable plan requirements under Sections 2106.02 and 2106.05, all sources subject to this Section shall submit to the Department according to the schedule provided in Subsection f, a Mon Valley Air Pollution Mitigation Plan (referred to in this Section as "Plan") with the following two phases:

1. **Mon Valley Air Pollution Watch Phase:** A Mon Valley Air Pollution Watch Phase shall include procedures to ensure the source is operating in a manner consistent with good engineering practice and all air pollution control equipment is maintained in good working condition. The Mon Valley Air Pollution Watch Phase shall include procedures for record keeping and reporting to the Department the actions taken during the Mon Valley Air Pollution Watch period. The Mon Valley Air Pollution Watch Phase shall also include procedures to ensure that the source has sufficient staff and resources available to implement the Mon Valley Air Pollution Warning Phase within 24 hours of the Department's notification to the source of a Mon Valley Air Pollution Watch.

2. **Mon Valley Air Pollution Warning Phase:** A Mon Valley Air Pollution Warning Phase shall include measures to reduce $PM_{2.5}$ and PM_{10} emissions to minimize the impact on public health, safety, or welfare, the timeframe for implementing each measure, and an estimate of the $PM_{2.5}$ and PM_{10} emissions reductions during a 24-hour period for each measure. The Mon Valley Air Pollution Warning Phase shall include the procedures identified in the Mon Valley Air Pollution Watch Phase and procedures for record keeping and reporting to the Department the actions taken during the Mon Valley Air Pollution Warning period. The measures to reduce $PM_{2.5}$ and PM_{10} emissions may include, but are not limited to, the following:

A. Reduce transportation activity;

B. Switch or decrease fuel use as allowed by the facility's permit issued under this Article;

C. Delay nonessential activities that may cause emissions;

D. Modify work or other practices; and

E. Reduce, modify, cease, curtail, defer or postpone production and allied operations.

f. **Dates for Submission of Mon Valley Air Pollution Mitigation Plan.** Sources subject to this Section shall submit the Mon Valley Air Pollution Mitigation Plan according to the following schedule:

1. Existing sources shall submit to the Department the Plan within 90 days after the effective date of this Section.

2. Sources that startup after the effective date of this Section shall submit to the Department the Plan within 90 days after initial startup of the source.

3. Existing sources that become subject to this Section after the effective date of this Section shall submit to the Department the Plan within 90 days after the source becomes subject to this Section.

4. Any person responsible for operation of the source shall advise the Department in writing of any change affecting the technical content or the implementation of the Plan no more than 30 days following the change. Such submittals shall be reviewed and implemented according to the procedures described in Subsection g below.

g. **Procedure for Review and Effective Date of the Mon Valley Air Pollution Mitigation Plans.**

1. The Mon Valley Air Pollution Mitigation Plan shall be effective upon submission to the Department.

2. If the Mon Valley Air Pollution Mitigation Plan is not acceptable to the Department, the Department shall issue an order directing the responsible person to modify and resubmit the Plan within thirty (30) days after receiving notice. The order shall specify the reason or reasons for disapproval and shall specify the changes or additions necessary to make the Plan acceptable to the Department. The Plan submitted for review to the Department under Paragraph g.1 shall continue to be effective until a modified Plan has been submitted. The modified Plan shall be effective upon submission to the Department.

3. When determining whether the Mon Valley Air Pollution Mitigation Plan is acceptable, the Department may consider the following factors:

   a. The feasibility of implementing the Mon Valley Air Pollution Warning Phase within 24 hours of the Department's notification to the source of a Mon Valley Air Pollution Watch;

   b. Whether the measures to decrease $PM_{2.5}$ and PM_{10} emissions can reasonably improve public health, safety, or welfare; and

   c. Whether the estimated reduction in $PM_{2.5}$ and PM_{10} emissions is proportionate to the source's contribution to emissions in any of the municipalities identified in Subsection d.

4. In the event that a source fails to submit the Mon Valley Air Pollution Mitigation Plan according to the schedule provided in Subsection f, fails to resubmit the Plan, or fails to resubmit the Plan in accordance with the changes or additions specified by the Department, the Department, in addition to any other remedies available to it under this Article, shall have the authority to issue an order to that person detailing the procedures for a Mon Valley Air Pollution Watch or Warning Phase.

h. **Notification of Mon Valley Air Pollution Episodes.** When a Mon Valley Air Pollution Watch or Warning is issued, the Department shall make the following notifications:

1. The Department shall notify all sources subject to this Section that they are required to implement the procedures and measures identified in either the Mon Valley Air Pollution Watch or Warning Phase.

2. The Department shall notify all municipalities identified in Subsection d, and any other municipality that requests to be notified, that a Mon Valley Air Pollution Watch or Warning is in effect.

3. The Department shall issue an advisory on its Air Quality Program website and notify various media that a Mon Valley Air Pollution Watch or Warning is in effect.

i. **Termination of Mon Valley Air Pollution Episodes**.

1. The Department shall terminate any Mon Valley Air Pollution Watch or Warning when the conditions in Paragraphs c.1 and c.2 no longer exist.

2. The Department shall issue a notification to all person(s) identified under Subsection h when the ACHD has determined that a Mon Valley Air Pollution Watch or Warning is no longer in effect.

j. **Other powers unaffected.** Nothing contained in this Section shall affect the power of the Department to issue an Emergency Order pursuant to §2109.05 of this Article, whether or not such emergency occurs during a Mon Valley Air Pollution episode.

For the following section:
Additions are shown in **larger font, bolded, and underlined.**

§2105.50 OPEN BURNING

a. **General**.

. . .

3. Wood burning activities shall not be conducted on Air Quality Action Days **or in the municipalities identified in Subsection 2106.06.d when a Mon Valley Air Pollution Watch or Warning under Section 2106.06 has been issued**, with the exception of conducting such burning for the commercial preparation of food.

End of Regulation Changes

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2017**

TABLE 1. Annual Inputs

Source Information:

Average Pile Surface Area (ft2)	90,000
Annual tonnage moved to/from storage piles	487,453
Average Moisture Content (%)	6.36
Annual tonnage moved on roads	487,453
Annual tonnage moved through system	487,453
Average Operating Schedule: hrs/day	10
Average Operating Schedule: hrs/week	50
Average Operating Schedule: hrs/month	210
Average Operating Schedule: hrs/yr	1890

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2017

TABLE 2. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	487,453
Operating Schedule (hrs/yr):	1,890
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

					PM					PM_{10}					$PM_{2.5}$				
Source	**Emission Type**	**Basis (AP-42 Section)**	**Control**	**Throughput Per Year**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**
					(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy
Loader/Truck to 60 T Feed Hopper	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
60 T Feed Hopper to Feeder (3158320)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Feeder (3158320) to Oversize pile	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Feeder (3158320) to Conveyor (3121021)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3121021) to Conveyor (3121022)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Conveyor (3121022) to Screen (3120601)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Screen (3120601)	Screen	11.19.2-2	Inherent Moisture	487,453	0.025	6.09	0.0020	0.516	0.49	0.0087	2.12	0.0007	0.191	0.18	0.0087	2.12	0.00005	0.013	0.01
Screen (3120601) to CR-1 crusher (4120203)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
CR-1, Symons crusher (3120203)	Crusher	11.19.2-2	Inherent Moisture	487,453	0.0054	1.32	0.0012	0.309	0.29	0.0024	0.58	0.0005	0.139	0.13	0.0024	0.58	0.0001	0.026	0.02
CR-1 crusher (4120203) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Screen (3120601) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3158121)/ Secondary Conveyor (3991306) to Conveyor (3158122)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Conveyor (3158122) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Conveyor (3120106) to Screen (3251302)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Screen (3251302)	Screen	11.19.2-2	Inherent Moisture	487,453	0.025	6.09	0.0020	0.516	0.49	0.0087	2.12	0.0007	0.191	0.18	0.0087	2.12	0.00005	0.013	0.01
Screen (3251302) to Conveyor (3210107)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120108)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120108) to Conveyor (3120115)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120115) to Stacker Conveyor (3120114)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120114) to Pile #2A (Dense Grade Product)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120116) or Conveyor (3700398)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120116) to Stacker Conveyor (3120117)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120117) to Pile #1A Fines	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251302) to Conveyor (3120110)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120110) to Conveyor (3120111)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120111) to Stacker Conveyor (3120113)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120113) to Pile #1	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120110) to Conveyor (3120112)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Conveyor (3120112) to 40 Ton Bin (3120305)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
40 Ton Bin (3120305) to Feeder (3120304)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Feeder (3120304) to CR-2, crusher (3156206)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
CR-2, crusher (3156206)	Crusher	11.19.2-2	Inherent Moisture	487,453	0.0054	1.32	0.0012	0.309	0.29	0.0024	0.58	0.0005	0.139	0.13	0.0024	0.58	0.0001	0.026	0.02
CR-2, crusher (3156206) to Conveyor (3120105)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120105) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Screen (3251302) to Conveyor (3120109)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120109) to 50 T Bin (3080003)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
50 T Bin (3080003) to Feeder (3120303)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Feeder (3120303) to Conveyor (3120118)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120118) to Screen (3251207)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Screen (3251207)	Screen	11.19.2-2	Inherent Moisture	487,453	0.025	6.09	0.0020	0.516	0.49	0.0087	2.12	0.0007	0.191	0.18	0.0087	2.12	0.00005	0.013	0.01
Screen (3251207) to Conveyor (3120120)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120120) to Conveyor (3120123)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120123) to Stack Conveyor (3120130)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stack Conveyor (3120130) to Pile #57	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251207) to Conveyor (3120121)	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120121) to Conveyor (3120126)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Conveyor (3120126) to Stack Conveyor (32800001)	Transfer	11.19.2-2	Inherent Moisture	487,453	0.0030	0.73	0.0001	0.036	0.03	0.0011	0.27	0.0000	0.012	0.01	0.0011	0.27	0.0000	0.003	0.00
Stack Conveyor (32800001) to Pile #8	Transfer	13.2.4	Inherent Moisture	487,453	0.0008	0.19	0.0008	0.204	0.19	0.0004	0.09	0.0004	0.097	0.09	0.0001	0.01	0.0001	0.015	0.01
Screen (3251207) to Conveyor (3281207)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3281207) to Stacker Conveyor (3120129)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120129) to Fines Pile	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
				Total		**32.39**		**5.457**	**5.16**		**12.03**		**2.345**	**2.22**		**10.94**		**0.335**	**0.32**
				Permit Limits					**25.00**					**6.00**	`				**N/A**

1. Bolded items represent worst-case path and conservative assumption for annual emissions.
2. Emission factors are based on drop equation (AP-42 Section 13.2.4) for material transfers (other than conveyor transfers) or AP-42 Section 11.19.2-2 for crushers, conveyor transfers and screens. Material is controlled via natural moisture content (consistent with prior application assumptions).

Material Transfer Fugitive Emissions Calculations Data[1,3]	**Value**
k (particle size multiplier, PM)	0.74
k (particle size multiplier, PM-10)	0.35
k (particle size multiplier, PM-2.5)	0.053
Mean Wind Speed (mph) KAGC[2]	7.48
Material Moisture Content (%)	6.36

1. Parameters from AP-42, Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006
2. PA State Meterologist data; http://climate.met.psu.edu/
3. Emission factors calculated using Equation 1 from AP-42 Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006: E= k(0.0032)[(U/5)^1.3]/[(M/2)^1.4]

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2017**

TABLE 3. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.05	0.21	0.02	0.11	0.00	0.02

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	80	
Controlled Emissions (CE)	lb/acre-day	0.567	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	1.171	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.07	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.214	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.04	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.11	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.01	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.02	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2017

TABLE 4. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	487453	[Site Data]
Hours per year	hr	1890	[Site Data]
Trucks per year	truck/yr	24373	[Site Data]
Miles per year	miles/yr	24373	[Site Data]
Miles driven per hour	mph	13	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.40	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.39	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.04	Calculated
Uncontrolled PM Emissions	lb/hr	67.89	Calculated
Controlled PM Emissions	lb/hr	13.58	Calculated
Uncontrolled PM Emissions	tpy	64.16	Calculated
Controlled PM Emissions	tpy	12.83	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	18.66	Calculated
Controlled PM_{10} Emissions	lb/hr	3.73	Calculated
Uncontrolled PM_{10} Emissions	tpy	17.63	Calculated
Controlled PM_{10} Emissions	tpy	3.53	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.87	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.37	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.76	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.35	Calculated

Notes:
1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365

* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.33	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.27	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		0.00054	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.07	Calculated
Average control efficiency, 69-(0.231xV)	%	63.23	Calculated (prior application)
Number of vehicle passes since last application of water (V)		25	
Uncontrolled PM Emissions	lb/hr	11.67	Calculated
Controlled PM Emissions	lb/hr	4.29	Calculated
Uncontrolled PM Emissions	tpy	11.03	Calculated
Controlled PM Emissions	tpy	4.06	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.33	Calculated
Controlled PM_{10} Emissions	lb/hr	0.86	Calculated
Uncontrolled PM_{10} Emissions	tpy	2.21	Calculated
Controlled PM_{10} Emissions	tpy	0.81	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.57	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.21	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.54	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.20	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	67.89	64.16	18.66	17.63	1.87	1.76
Controlled	13.58	12.83	3.73	3.53	0.37	0.35
Paved						
Uncontrolled	11.67	11.03	2.33	2.21	0.57	0.54
Controlled	4.29	4.06	0.86	0.81	0.21	0.20
Total						
Uncontrolled	79.57	75.19	20.99	19.84	2.44	2.30
Controlled	17.87	16.89	4.59	4.34	0.58	0.55

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2017

TABLE 5. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Process	P004	5.46	2.34	0.34	5.16	2.22	0.32
Storage Pile Emissions	--	0.05	0.02	0.004	0.21	0.11	0.02
Roads Emissions	--	17.87	4.59	0.58	16.89	4.34	0.55
Total Facility (Actuals)		23.38	6.96	0.92	22.26	6.66	0.88

METADATA:

Database:	FAA_DAILY		Average:	7.479 m/s
Id:	KAGC	Count Hours above 12 mph:		30
Name:	PITTSBURGH AGC	Count Hours:		366
County:	ALLEGHENY	% above 12:		8%
State:	PA			
Lat:	40.355			
Lon:	-79.922			
Elev (ft):	1248			
Start_date:	12/31/1972			
End_date:	2/1/2021			

Start Date:	2020-01-01	
End Date:	2020-12-31	
Variables Requested:	date	wspd_avg

Date (EST)	Average Wind Speed (mph)
1/1/2020	11.59
1/2/2020	10.54
1/3/2020	4.75
1/4/2020	8
1/5/2020	9.94
1/6/2020	12.49
1/7/2020	7.11
1/8/2020	10.83
1/9/2020	6.3
1/10/2020	8.61
1/11/2020	14.2
1/12/2020	12.05
1/13/2020	6.48
1/14/2020	7.95
1/15/2020	6.36
1/16/2020	12.32
1/17/2020	7.12
1/18/2020	10.57
1/19/2020	13.08
1/20/2020	6.77
1/21/2020	3.78
1/22/2020	4.52
1/23/2020	3.18
1/24/2020	8.04
1/25/2020	9.51
1/26/2020	11.81
1/27/2020	8.14
1/28/2020	7.23
1/29/2020	4.8
1/30/2020	1.75
1/31/2020	2.09
2/1/2020	4.96
2/2/2020	13.23
2/3/2020	8.35
2/4/2020	12.47
2/5/2020	7.24
2/6/2020	4.12
2/7/2020	10.78
2/8/2020	7.87
2/9/2020	7.33
2/10/2020	9.77
2/11/2020	7.06
2/12/2020	5.47
2/13/2020	8.1
2/14/2020	8.61
2/15/2020	7.69
2/16/2020	6.39
2/17/2020	4.39
2/18/2020	11.03
2/19/2020	7.22
2/20/2020	5.93
2/21/2020	6.77
2/22/2020	10.63
2/23/2020	10.29
2/24/2020	5.67
2/25/2020	3.59
2/26/2020	7.29
2/27/2020	16.01
2/28/2020	11.93

2/29/2020	11.87
3/1/2020	8.55
3/2/2020	11.67
3/3/2020	10.18
3/4/2020	11.62
3/5/2020	4.39
3/6/2020	9.88
3/7/2020	8.9
3/8/2020	8.87
3/9/2020	9.94
3/10/2020	12.6
3/11/2020	2.59
3/12/2020	5.29
3/13/2020	12.98
3/14/2020	4.13
3/15/2020	5.24
3/16/2020	7.77
3/17/2020	6.41
3/18/2020	7.56
3/19/2020	7.44
3/20/2020	14.58
3/21/2020	7.4
3/22/2020	7.73
3/23/2020	10.16
3/24/2020	4.36
3/25/2020	5.26
3/26/2020	7.69
3/27/2020	3.52
3/28/2020	6.07
3/29/2020	16.63
3/30/2020	13.89
3/31/2020	3.87
4/1/2020	6.27
4/2/2020	10.95
4/3/2020	10.42
4/4/2020	4.42
4/5/2020	6.32
4/6/2020	4.38
4/7/2020	6.55
4/8/2020	8.74
4/9/2020	13.3
4/10/2020	13.2
4/11/2020	9.18
4/12/2020	8.19
4/13/2020	13.46
4/14/2020	8.93
4/15/2020	10.22
4/16/2020	10.87
4/17/2020	6.88
4/18/2020	9.27
4/19/2020	10.38
4/20/2020	8.06
4/21/2020	12.96
4/22/2020	8.51
4/23/2020	5.79
4/24/2020	5.57
4/25/2020	6.49
4/26/2020	9.2
4/27/2020	8.9
4/28/2020	6.93
4/29/2020	11.19
4/30/2020	10.3
5/1/2020	6.94
5/2/2020	8.89
5/3/2020	7.5
5/4/2020	8.57
5/5/2020	5.36
5/6/2020	6.69
5/7/2020	10.04
5/8/2020	6.12
5/9/2020	10.54
5/10/2020	11.74
5/11/2020	10.88
5/12/2020	9.86
5/13/2020	5.35
5/14/2020	7.96

5/15/2020	11.32
5/16/2020	4.08
5/17/2020	8.93
5/18/2020	10.9
5/19/2020	15.22
5/20/2020	12.34
5/21/2020	11.21
5/22/2020	3.85
5/23/2020	1.91
5/24/2020	7.3
5/25/2020	5.58
5/26/2020	6.82
5/27/2020	8.89
5/28/2020	8.1
5/29/2020	10.26
5/30/2020	6.07
5/31/2020	7.32
6/1/2020	4.87
6/2/2020	10.56
6/3/2020	13.32
6/4/2020	6.87
6/5/2020	4.28
6/6/2020	7.32
6/7/2020	6.28
6/8/2020	2.9
6/9/2020	5.47
6/10/2020	10.61
6/11/2020	9.88
6/12/2020	7.83
6/13/2020	3.32
6/14/2020	7.83
6/15/2020	5.13
6/16/2020	4.69
6/17/2020	6.59
6/18/2020	6.78
6/19/2020	3.87
6/20/2020	2.87
6/21/2020	5
6/22/2020	7.05
6/23/2020	9.39
6/24/2020	9.72
6/25/2020	7.75
6/26/2020	9.56
6/27/2020	11.83
6/28/2020	6.74
6/29/2020	2.37
6/30/2020	4.1
7/1/2020	5.58
7/2/2020	4.29
7/3/2020	4.38
7/4/2020	3.79
7/5/2020	2.65
7/6/2020	5.38
7/7/2020	5.77
7/8/2020	3.17
7/9/2020	3.5
7/10/2020	6.49
7/11/2020	10.34
7/12/2020	6.02
7/13/2020	3.35
7/14/2020	3.42
7/15/2020	4.19
7/16/2020	9.7
7/17/2020	4.99
7/18/2020	5.72
7/19/2020	11
7/20/2020	7.54
7/21/2020	4.58
7/22/2020	8.15
7/23/2020	7.69
7/24/2020	4.02
7/25/2020	2.62
7/26/2020	5.42
7/27/2020	9.74
7/28/2020	8.57
7/29/2020	7.31

7/30/2020	4.78
7/31/2020	3.29
8/1/2020	4.36
8/2/2020	12.76
8/3/2020	6.06
8/4/2020	4.72
8/5/2020	4.48
8/6/2020	3.38
8/7/2020	3.33
8/8/2020	3.69
8/9/2020	4.89
8/10/2020	6.14
8/11/2020	7.5
8/12/2020	3.23
8/13/2020	3.96
8/14/2020	5.48
8/15/2020	6.67
8/16/2020	6
8/17/2020	4.6
8/18/2020	4.61
8/19/2020	6.63
8/20/2020	3.83
8/21/2020	3.17
8/22/2020	4.73
8/23/2020	4.43
8/24/2020	7.85
8/25/2020	8.6
8/26/2020	7.26
8/27/2020	10.77
8/28/2020	6.11
8/29/2020	9.71
8/30/2020	3.97
8/31/2020	5.94
9/1/2020	5.76
9/2/2020	8.18
9/3/2020	3.86
9/4/2020	7.12
9/5/2020	7.17
9/6/2020	6.82
9/7/2020	8.32
9/8/2020	4.34
9/9/2020	4.72
9/10/2020	3.87
9/11/2020	4.07
9/12/2020	7.31
9/13/2020	7.79
9/14/2020	6.25
9/15/2020	3.1
9/16/2020	5.05
9/17/2020	4.26
9/18/2020	7.76
9/19/2020	4.37
9/20/2020	4.93
9/21/2020	5.2
9/22/2020	3.67
9/23/2020	6.64
9/24/2020	5.3
9/25/2020	4.32
9/26/2020	5.44
9/27/2020	7.7
9/28/2020	9.51
9/29/2020	4.87
9/30/2020	13.02
10/1/2020	9.46
10/2/2020	7.07
10/3/2020	4.14
10/4/2020	4.16
10/5/2020	4.58
10/6/2020	8.25
10/7/2020	11.42
10/8/2020	5.67
10/9/2020	7.97
10/10/2020	9.33
10/11/2020	4.35
10/12/2020	9.16
10/13/2020	7.42

10/14/2020	7.47
10/15/2020	12.09
10/16/2020	5.43
10/17/2020	6.24
10/18/2020	7.22
10/19/2020	5.28
10/20/2020	4.19
10/21/2020	7.58
10/22/2020	4.33
10/23/2020	8.94
10/24/2020	7.69
10/25/2020	5.83
10/26/2020	3.99
10/27/2020	2.63
10/28/2020	3.96
10/29/2020	6.92
10/30/2020	7.21
10/31/2020	5.19
11/1/2020	14.39
11/2/2020	14.24
11/3/2020	11.95
11/4/2020	8.89
11/5/2020	9.07
11/6/2020	7.36
11/7/2020	3.69
11/8/2020	2.06
11/9/2020	4.9
11/10/2020	9.13
11/11/2020	6.16
11/12/2020	5.66
11/13/2020	7.16
11/14/2020	4.78
11/15/2020	16.83
11/16/2020	14.35
11/17/2020	10.59
11/18/2020	6.92
11/19/2020	11.94
11/20/2020	11.29
11/21/2020	5.26
11/22/2020	8.31
11/23/2020	8.59
11/24/2020	4.53
11/25/2020	7.3
11/26/2020	9.75
11/27/2020	4.7
11/28/2020	6.87
11/29/2020	6.05
11/30/2020	7.14
12/1/2020	15.56
12/2/2020	14.61
12/3/2020	10.62
12/4/2020	8.69
12/5/2020	7.62
12/6/2020	6.4
12/7/2020	6.16
12/8/2020	9.45
12/9/2020	9.32
12/10/2020	3.81
12/11/2020	8.99
12/12/2020	10.92
12/13/2020	7.96
12/14/2020	6.54
12/15/2020	4.43
12/16/2020	7.91
12/17/2020	2.71
12/18/2020	5.22
12/19/2020	6.85
12/20/2020	7.11
12/21/2020	9
12/22/2020	9.9
12/23/2020	8.42
12/24/2020	11.2
12/25/2020	13.69
12/26/2020	11.8
12/27/2020	8.24
12/28/2020	11.51

12/29/2020	6.49
12/30/2020	10.89
12/31/2020	4.84

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2018**

TABLE 1. Annual Inputs

Source Information:

Average Pile Surface Area (ft2)	90,000
Annual tonnage moved to/from storage piles	539,521
Average Moisture Content (%)	6.44
Annual tonnage moved on roads	539,521
Annual tonnage moved through system	539,521
Average Operating Schedule: hrs/day	10
Average Operating Schedule: hrs/week	50
Average Operating Schedule: hrs/month	210
Average Operating Schedule: hrs/yr	2100

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2018

TABLE 2. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	539,521
Operating Schedule (hrs/yr):	2,100
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

					PM					PM_{10}					$PM_{2.5}$				
Source	**Emission Type**	**Basis (AP-42 Section)**	**Control**	**Throughput Per Year**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**
					(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy
Loader/Truck to 60 T Feed Hopper	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
60 T Feed Hopper to Feeder (3158320)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Feeder (3158320) to Oversize pile	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Feeder (3158320) to Conveyor (3121021)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Conveyor (3121021) to Conveyor (3121022)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Conveyor (3121022) to Screen (3120601)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Screen (3120601)	Screen	11.19.2-2	Inherent Moisture	539,521	0.025	6.74	0.0020	0.514	0.54	0.0087	2.35	0.0007	0.190	0.20	0.0087	2.35	0.00005	0.013	0.01
Screen (3120601) to CR-1 crusher (4120203)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
CR-1, Symons crusher (3120203)	Crusher	11.19.2-2	Inherent Moisture	539,521	0.0054	1.46	0.0012	0.308	0.32	0.0024	0.65	0.0005	0.139	0.15	0.0024	0.65	0.0001	0.026	0.03
CR-1 crusher (4120203) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Screen (3120601) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3158121)/ Secondary Conveyor (3991306) to Conveyor (3158122)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Conveyor (3158122) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Conveyor (3120106) to Screen (3251302)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Screen (3251302)	Screen	11.19.2-2	Inherent Moisture	539,521	0.025	6.74	0.0020	0.514	0.54	0.0087	2.35	0.0007	0.190	0.20	0.0087	2.35	0.00005	0.013	0.01
Screen (3251302) to Conveyor (3210107)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120108)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120108) to Conveyor (3120115)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120115) to Stacker Conveyor (3120114)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120114) to Pile #2A (Dense Grade Product)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120116) or Conveyor (3700398)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120116) to Stacker Conveyor (3120117)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120117) to Pile #1A Fines	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251302) to Conveyor (3120110)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Conveyor (3120110) to Conveyor (3120111)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120111) to Stacker Conveyor (3120113)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120113) to Pile #1	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120110) to Conveyor (3120112)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Conveyor (3120112) to 40 Ton Bin (3120305)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
40 Ton Bin (3120305) to Feeder (3120304)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Feeder (3120304) to CR-2, crusher (3156206)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
CR-2, crusher (3156206)	Crusher	11.19.2-2	Inherent Moisture	539,521	0.0054	1.46	0.0012	0.308	0.32	0.0024	0.65	0.0005	0.139	0.15	0.0024	0.65	0.0001	0.026	0.03
CR-2, crusher (3156206) to Conveyor (3120105)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Conveyor (3120105) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Screen (3251302) to Conveyor (3120109)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Conveyor (3120109) to 50 T Bin (3080003)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
50 T Bin (3080003) to Feeder (3120303)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Feeder (3120303) to Conveyor (3120118)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Conveyor (3120118) to Screen (3251207)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Screen (3251207)	Screen	11.19.2-2	Inherent Moisture	539,521	0.025	6.74	0.0020	0.514	0.54	0.0087	2.35	0.0007	0.190	0.20	0.0087	2.35	0.00005	0.013	0.01
Screen (3251207) to Conveyor (3120120)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120120) to Conveyor (3120123)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120123) to Stack Conveyor (3120130)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stack Conveyor (3120130) to Pile #57	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251207) to Conveyor (3120121)	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Conveyor (3120121) to Conveyor (3120126)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Conveyor (3120126) to Stack Conveyor (32800001)	Transfer	11.19.2-2	Inherent Moisture	539,521	0.0030	0.81	0.0001	0.036	0.04	0.0011	0.30	0.0000	0.012	0.01	0.0011	0.30	0.0000	0.003	0.00
Stack Conveyor (32800001) to Pile #8	Transfer	13.2.4	Inherent Moisture	539,521	0.0008	0.21	0.0008	0.200	0.21	0.0004	0.10	0.0004	0.094	0.10	0.0001	0.02	0.0001	0.014	0.02
Screen (3251207) to Conveyor (3281207)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3281207) to Stacker Conveyor (3120129)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120129) to Fines Pile	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
				Total		**35.79**		**5.386**	**5.66**		**13.29**		**2.312**	**2.43**		**12.11**		**0.330**	**0.35**
				Permit Limits					**25.00**					**6.00**					**N/A**

1. Bolded items represent worst-case path and conservative assumption for annual emissions.
2. Emission factors are based on drop equation (AP-42 Section 13.2.4) for material transfers (other than conveyor transfers) or AP-42 Section 11.19.2-2 for crushers, conveyor transfers and screens. Material is controlled via natural moisture content (consistent with prior application assumptions).

Material Transfer Fugitive Emissions Calculations Data[1,3]	**Value**
k (particle size multiplier, PM)	0.74
k (particle size multiplier, PM-10)	0.35
k (particle size multiplier, PM-2.5)	0.053
Mean Wind Speed (mph) KAGC[2]	7.48
Material Moisture Content (%)	6.44

1. Parameters from AP-42, Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006
2. PA State Meterologist data; http://climate.met.psu.edu/
3. Emission factors calculated using Equation 1 from AP-42 Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006: E= k(0.0032)[(U/5)^1.3]/[(M/2)^1.4]

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2018

TABLE 3. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.05	0.21	0.02	0.11	0.00	0.02

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	80	
Controlled Emissions (CE)	lb/acre-day	0.567	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	1.171	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.07	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.214	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.04	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.11	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.01	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.02	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2018

TABLE 4. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	539521	[Site Data]
Hours per year	hr	2100	[Site Data]
Trucks per year	truck/yr	26976	[Site Data]
Miles per year	miles/yr	26976	[Site Data]
Miles driven per hour	mph	13	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.40	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.39	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.04	Calculated
Uncontrolled PM Emissions	lb/hr	67.63	Calculated
Controlled PM Emissions	lb/hr	13.53	Calculated
Uncontrolled PM Emissions	tpy	71.01	Calculated
Controlled PM Emissions	tpy	14.20	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	18.59	Calculated
Controlled PM_{10} Emissions	lb/hr	3.72	Calculated
Uncontrolled PM_{10} Emissions	tpy	19.52	Calculated
Controlled PM_{10} Emissions	tpy	3.90	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.86	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.37	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.95	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.39	Calculated

Notes:
1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365

* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.33	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.27	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		0.00054	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.07	Calculated
Average control efficiency, 69-(0.231xV)	%	63.23	Calculated (prior application)
Number of vehicle passes since last application of water (V)		25	
Uncontrolled PM Emissions	lb/hr	11.63	Calculated
Controlled PM Emissions	lb/hr	4.28	Calculated
Uncontrolled PM Emissions	tpy	12.21	Calculated
Controlled PM Emissions	tpy	4.49	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.33	Calculated
Controlled PM_{10} Emissions	lb/hr	0.86	Calculated
Uncontrolled PM_{10} Emissions	tpy	2.44	Calculated
Controlled PM_{10} Emissions	tpy	0.90	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.57	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.21	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.60	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.22	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	67.63	71.01	18.59	19.52	1.86	1.95
Controlled	13.53	14.20	3.72	3.90	0.37	0.39
Paved						
Uncontrolled	11.63	12.21	2.33	2.44	0.57	0.60
Controlled	4.28	4.49	0.86	0.90	0.21	0.22
Total						
Uncontrolled	79.26	83.22	20.91	21.96	2.43	2.55
Controlled	17.80	18.69	4.57	4.80	0.58	0.61

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2018

TABLE 5. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Process	P004	5.39	2.31	0.33	5.66	2.43	0.35
Storage Pile Emissions	--	0.05	0.02	0.004	0.21	0.11	0.02
Roads Emissions	--	17.80	4.57	0.58	18.69	4.80	0.61
Total Facility (Actuals)		23.24	6.91	0.92	24.56	7.34	0.97

METADATA:

Database:	FAA_DAILY		Average:	7.479 m/s
Id:	KAGC	Count Hours above 12 mph:		30
Name:	PITTSBURGH AGC	Count Hours:		366
County:	ALLEGHENY	% above 12:		8%
State:	PA			
Lat:	40.355			
Lon:	-79.922			
Elev (ft):	1248			
Start_date:	12/31/1972			
End_date:	2/1/2021			

Start Date:	2020-01-01	
End Date:	2020-12-31	
Variables Requested:	date	wspd_avg

Date (EST)	Average Wind Speed (mph)
1/1/2020	11.59
1/2/2020	10.54
1/3/2020	4.75
1/4/2020	8
1/5/2020	9.94
1/6/2020	12.49
1/7/2020	7.11
1/8/2020	10.83
1/9/2020	6.3
1/10/2020	8.61
1/11/2020	14.2
1/12/2020	12.05
1/13/2020	6.48
1/14/2020	7.95
1/15/2020	6.36
1/16/2020	12.32
1/17/2020	7.12
1/18/2020	10.57
1/19/2020	13.08
1/20/2020	6.77
1/21/2020	3.78
1/22/2020	4.52
1/23/2020	3.18
1/24/2020	8.04
1/25/2020	9.51
1/26/2020	11.81
1/27/2020	8.14
1/28/2020	7.23
1/29/2020	4.8
1/30/2020	1.75
1/31/2020	2.09
2/1/2020	4.96
2/2/2020	13.23
2/3/2020	8.35
2/4/2020	12.47
2/5/2020	7.24
2/6/2020	4.12
2/7/2020	10.78
2/8/2020	7.87
2/9/2020	7.33
2/10/2020	9.77
2/11/2020	7.06
2/12/2020	5.47
2/13/2020	8.1
2/14/2020	8.61
2/15/2020	7.69
2/16/2020	6.39
2/17/2020	4.39
2/18/2020	11.03
2/19/2020	7.22
2/20/2020	5.93
2/21/2020	6.77
2/22/2020	10.63
2/23/2020	10.29
2/24/2020	5.67
2/25/2020	3.59
2/26/2020	7.29
2/27/2020	16.01
2/28/2020	11.93

2/29/2020	11.87
3/1/2020	8.55
3/2/2020	11.67
3/3/2020	10.18
3/4/2020	11.62
3/5/2020	4.39
3/6/2020	9.88
3/7/2020	8.9
3/8/2020	8.87
3/9/2020	9.94
3/10/2020	12.6
3/11/2020	2.59
3/12/2020	5.29
3/13/2020	12.98
3/14/2020	4.13
3/15/2020	5.24
3/16/2020	7.77
3/17/2020	6.41
3/18/2020	7.56
3/19/2020	7.44
3/20/2020	14.58
3/21/2020	7.4
3/22/2020	7.73
3/23/2020	10.16
3/24/2020	4.36
3/25/2020	5.26
3/26/2020	7.69
3/27/2020	3.52
3/28/2020	6.07
3/29/2020	16.63
3/30/2020	13.89
3/31/2020	3.87
4/1/2020	6.27
4/2/2020	10.95
4/3/2020	10.42
4/4/2020	4.42
4/5/2020	6.32
4/6/2020	4.38
4/7/2020	6.55
4/8/2020	8.74
4/9/2020	13.3
4/10/2020	13.2
4/11/2020	9.18
4/12/2020	8.19
4/13/2020	13.46
4/14/2020	8.93
4/15/2020	10.22
4/16/2020	10.87
4/17/2020	6.88
4/18/2020	9.27
4/19/2020	10.38
4/20/2020	8.06
4/21/2020	12.96
4/22/2020	8.51
4/23/2020	5.79
4/24/2020	5.57
4/25/2020	6.49
4/26/2020	9.2
4/27/2020	8.9
4/28/2020	6.93
4/29/2020	11.19
4/30/2020	10.3
5/1/2020	6.94
5/2/2020	8.89
5/3/2020	7.5
5/4/2020	8.57
5/5/2020	5.36
5/6/2020	6.69
5/7/2020	10.04
5/8/2020	6.12
5/9/2020	10.54
5/10/2020	11.74
5/11/2020	10.88
5/12/2020	9.86
5/13/2020	5.35
5/14/2020	7.96

5/15/2020	11.32
5/16/2020	4.08
5/17/2020	8.93
5/18/2020	10.9
5/19/2020	15.22
5/20/2020	12.34
5/21/2020	11.21
5/22/2020	3.85
5/23/2020	1.91
5/24/2020	7.3
5/25/2020	5.58
5/26/2020	6.82
5/27/2020	8.89
5/28/2020	8.1
5/29/2020	10.26
5/30/2020	6.07
5/31/2020	7.32
6/1/2020	4.87
6/2/2020	10.56
6/3/2020	13.32
6/4/2020	6.87
6/5/2020	4.28
6/6/2020	7.32
6/7/2020	6.28
6/8/2020	2.9
6/9/2020	5.47
6/10/2020	10.61
6/11/2020	9.88
6/12/2020	7.83
6/13/2020	3.32
6/14/2020	7.83
6/15/2020	5.13
6/16/2020	4.69
6/17/2020	6.59
6/18/2020	6.78
6/19/2020	3.87
6/20/2020	2.87
6/21/2020	5
6/22/2020	7.05
6/23/2020	9.39
6/24/2020	9.72
6/25/2020	7.75
6/26/2020	9.56
6/27/2020	11.83
6/28/2020	6.74
6/29/2020	2.37
6/30/2020	4.1
7/1/2020	5.58
7/2/2020	4.29
7/3/2020	4.38
7/4/2020	3.79
7/5/2020	2.65
7/6/2020	5.38
7/7/2020	5.77
7/8/2020	3.17
7/9/2020	3.5
7/10/2020	6.49
7/11/2020	10.34
7/12/2020	6.02
7/13/2020	3.35
7/14/2020	3.42
7/15/2020	4.19
7/16/2020	9.7
7/17/2020	4.99
7/18/2020	5.72
7/19/2020	11
7/20/2020	7.54
7/21/2020	4.58
7/22/2020	8.15
7/23/2020	7.69
7/24/2020	4.02
7/25/2020	2.62
7/26/2020	5.42
7/27/2020	9.74
7/28/2020	8.57
7/29/2020	7.31

7/30/2020	4.78
7/31/2020	3.29
8/1/2020	4.36
8/2/2020	12.76
8/3/2020	6.06
8/4/2020	4.72
8/5/2020	4.48
8/6/2020	3.38
8/7/2020	3.33
8/8/2020	3.69
8/9/2020	4.89
8/10/2020	6.14
8/11/2020	7.5
8/12/2020	3.23
8/13/2020	3.96
8/14/2020	5.48
8/15/2020	6.67
8/16/2020	6
8/17/2020	4.6
8/18/2020	4.61
8/19/2020	6.63
8/20/2020	3.83
8/21/2020	3.17
8/22/2020	4.73
8/23/2020	4.43
8/24/2020	7.85
8/25/2020	8.6
8/26/2020	7.26
8/27/2020	10.77
8/28/2020	6.11
8/29/2020	9.71
8/30/2020	3.97
8/31/2020	5.94
9/1/2020	5.76
9/2/2020	8.18
9/3/2020	3.86
9/4/2020	7.12
9/5/2020	7.17
9/6/2020	6.82
9/7/2020	8.32
9/8/2020	4.34
9/9/2020	4.72
9/10/2020	3.87
9/11/2020	4.07
9/12/2020	7.31
9/13/2020	7.79
9/14/2020	6.25
9/15/2020	3.1
9/16/2020	5.05
9/17/2020	4.26
9/18/2020	7.76
9/19/2020	4.37
9/20/2020	4.93
9/21/2020	5.2
9/22/2020	3.67
9/23/2020	6.64
9/24/2020	5.3
9/25/2020	4.32
9/26/2020	5.44
9/27/2020	7.7
9/28/2020	9.51
9/29/2020	4.87
9/30/2020	13.02
10/1/2020	9.46
10/2/2020	7.07
10/3/2020	4.14
10/4/2020	4.16
10/5/2020	4.58
10/6/2020	8.25
10/7/2020	11.42
10/8/2020	5.67
10/9/2020	7.97
10/10/2020	9.33
10/11/2020	4.35
10/12/2020	9.16
10/13/2020	7.42

10/14/2020	7.47
10/15/2020	12.09
10/16/2020	5.43
10/17/2020	6.24
10/18/2020	7.22
10/19/2020	5.28
10/20/2020	4.19
10/21/2020	7.58
10/22/2020	4.33
10/23/2020	8.94
10/24/2020	7.69
10/25/2020	5.83
10/26/2020	3.99
10/27/2020	2.63
10/28/2020	3.96
10/29/2020	6.92
10/30/2020	7.21
10/31/2020	5.19
11/1/2020	14.39
11/2/2020	14.24
11/3/2020	11.95
11/4/2020	8.89
11/5/2020	9.07
11/6/2020	7.36
11/7/2020	3.69
11/8/2020	2.06
11/9/2020	4.9
11/10/2020	9.13
11/11/2020	6.16
11/12/2020	5.66
11/13/2020	7.16
11/14/2020	4.78
11/15/2020	16.83
11/16/2020	14.35
11/17/2020	10.59
11/18/2020	6.92
11/19/2020	11.94
11/20/2020	11.29
11/21/2020	5.26
11/22/2020	8.31
11/23/2020	8.59
11/24/2020	4.53
11/25/2020	7.3
11/26/2020	9.75
11/27/2020	4.7
11/28/2020	6.87
11/29/2020	6.05
11/30/2020	7.14
12/1/2020	15.56
12/2/2020	14.61
12/3/2020	10.62
12/4/2020	8.69
12/5/2020	7.62
12/6/2020	6.4
12/7/2020	6.16
12/8/2020	9.45
12/9/2020	9.32
12/10/2020	3.81
12/11/2020	8.99
12/12/2020	10.92
12/13/2020	7.96
12/14/2020	6.54
12/15/2020	4.43
12/16/2020	7.91
12/17/2020	2.71
12/18/2020	5.22
12/19/2020	6.85
12/20/2020	7.11
12/21/2020	9
12/22/2020	9.9
12/23/2020	8.42
12/24/2020	11.2
12/25/2020	13.69
12/26/2020	11.8
12/27/2020	8.24
12/28/2020	11.51

12/29/2020	6.49
12/30/2020	10.89
12/31/2020	4.84

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2019**

TABLE 1. Annual Inputs

Source Information:

Average Pile Surface Area (ft2)	90,000
Annual tonnage moved to/from storage piles	503,706
Average Moisture Content (%)	5.65
Annual tonnage moved on roads	503,706
Annual tonnage moved through system	503,706
Average Operating Schedule: hrs/day	10
Average Operating Schedule: hrs/week	50
Average Operating Schedule: hrs/month	210
Average Operating Schedule: hrs/yr	2100

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2019

TABLE 2. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	503,706
Operating Schedule (hrs/yr):	2,100
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

					PM					PM_{10}					$PM_{2.5}$				
Source	**Emission Type**	**Basis (AP-42 Section)**	**Control**	**Throughput Per Year**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**
					(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy
Loader/Truck to 60 T Feed Hopper	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
60 T Feed Hopper to Feeder (3158320)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Feeder (3158320) to Oversize pile	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Feeder (3158320) to Conveyor (3121021)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Conveyor (3121021) to Conveyor (3121022)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Conveyor (3121022) to Screen (3120601)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Screen (3120601)	Screen	11.19.2-2	Inherent Moisture	503,706	0.025	6.30	0.0020	0.480	0.50	0.0087	2.19	0.0007	0.177	0.19	0.0087	2.19	0.00005	0.012	0.01
Screen (3120601) to CR-1 crusher (4120203)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
CR-1, Symons crusher (3120203)	Crusher	11.19.2-2	Inherent Moisture	503,706	0.0054	1.36	0.0012	0.288	0.30	0.0024	0.60	0.0005	0.130	0.14	0.0024	0.60	0.0001	0.024	0.03
CR-1 crusher (4120203) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Screen (3120601) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3158121)/ Secondary Conveyor (3991306) to Conveyor (3158122)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Conveyor (3158122) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Conveyor (3120106) to Screen (3251302)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Screen (3251302)	Screen	11.19.2-2	Inherent Moisture	503,706	0.025	6.30	0.0020	0.480	0.50	0.0087	2.19	0.0007	0.177	0.19	0.0087	2.19	0.00005	0.012	0.01
Screen (3251302) to Conveyor (3210107)	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120108)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120108) to Conveyor (3120115)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120115) to Stacker Conveyor (3120114)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120114) to Pile #2A (Dense Grade Product)	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120116) or Conveyor (3700398)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120116) to Stacker Conveyor (3120117)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120117) to Pile #1A Fines	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251302) to Conveyor (3120110)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Conveyor (3120110) to Conveyor (3120111)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120111) to Stacker Conveyor (3120113)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120113) to Pile #1	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120110) to Conveyor (3120112)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Conveyor (3120112) to 40 Ton Bin (3120305)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
40 Ton Bin (3120305) to Feeder (3120304)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Feeder (3120304) to CR-2, crusher (3156206)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
CR-2, crusher (3156206)	Crusher	11.19.2-2	Inherent Moisture	503,706	0.0054	1.36	0.0012	0.288	0.30	0.0024	0.60	0.0005	0.130	0.14	0.0024	0.60	0.0001	0.024	0.03
CR-2, crusher (3156206) to Conveyor (3120105)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Conveyor (3120105) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Screen (3251302) to Conveyor (3120109)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Conveyor (3120109) to 50 T Bin (3080003)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
50 T Bin (3080003) to Feeder (3120303)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Feeder (3120303) to Conveyor (3120118)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Conveyor (3120118) to Screen (3251207)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Screen (3251207)	Screen	11.19.2-2	Inherent Moisture	503,706	0.025	6.30	0.0020	0.480	0.50	0.0087	2.19	0.0007	0.177	0.19	0.0087	2.19	0.00005	0.012	0.01
Screen (3251207) to Conveyor (3120120)	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120120) to Conveyor (3120123)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120123) to Stack Conveyor (3120130)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stack Conveyor (3120130) to Pile #57	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251207) to Conveyor (3120121)	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Conveyor (3120121) to Conveyor (3120126)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Conveyor (3120126) to Stack Conveyor (32800001)	Transfer	11.19.2-2	Inherent Moisture	503,706	0.0030	0.76	0.0001	0.034	0.04	0.0011	0.28	0.0000	0.011	0.01	0.0011	0.28	0.0000	0.003	0.00
Stack Conveyor (32800001) to Pile #8	Transfer	13.2.4	Inherent Moisture	503,706	0.0009	0.24	0.0009	0.224	0.24	0.0004	0.11	0.0004	0.106	0.11	0.0001	0.02	0.0001	0.016	0.02
Screen (3251207) to Conveyor (3281207)	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3281207) to Stacker Conveyor (3120129)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120129) to Fines Pile	Transfer	13.2.4	Inherent Moisture	0	0.0009	0.00	0.0009	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
				Total		**33.97**		**5.554**	**5.83**		**12.66**		**2.407**	**2.53**		**11.34**		**0.346**	**0.36**
				Permit Limits					**25.00**					**6.00**					**N/A**

1. Bolded items represent worst-case path and conservative assumption for annual emissions.
2. Emission factors are based on drop equation (AP-42 Section 13.2.4) for material transfers (other than conveyor transfers) or AP-42 Section 11.19.2-2 for crushers, conveyor transfers and screens. Material is controlled via natural moisture content (consistent with prior application assumptions).

Material Transfer Fugitive Emissions Calculations Data[1,3]	**Value**
k (particle size multiplier, PM)	0.74
k (particle size multiplier, PM-10)	0.35
k (particle size multiplier, PM-2.5)	0.053
Mean Wind Speed (mph) KAGC[2]	7.48
Material Moisture Content (%)	5.65

1. Parameters from AP-42, Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006
2. PA State Meterologist data; http://climate.met.psu.edu/
3. Emission factors calculated using Equation 1 from AP-42 Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006: E= k(0.0032)[(U/5)^1.3]/[(M/2)^1.4]

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2019

TABLE 3. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.05	0.21	0.02	0.11	0.00	0.02

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	80	
Controlled Emissions (CE)	lb/acre-day	0.567	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	1.171	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.07	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.214	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.04	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.11	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.01	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.02	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2019

TABLE 4. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	503706	[Site Data]
Hours per year	hr	2100	[Site Data]
Trucks per year	truck/yr	25185	[Site Data]
Miles per year	miles/yr	25185	[Site Data]
Miles driven per hour	mph	12	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.40	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.39	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.04	Calculated
Uncontrolled PM Emissions	lb/hr	63.14	Calculated
Controlled PM Emissions	lb/hr	12.63	Calculated
Uncontrolled PM Emissions	tpy	66.30	Calculated
Controlled PM Emissions	tpy	13.26	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	17.35	Calculated
Controlled PM_{10} Emissions	lb/hr	3.47	Calculated
Uncontrolled PM_{10} Emissions	tpy	18.22	Calculated
Controlled PM_{10} Emissions	tpy	3.64	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.74	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.35	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.82	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.36	Calculated

Notes:
1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365

* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.33	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.27	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		0.00054	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.07	Calculated
Average control efficiency, 69-(0.231xV)	%	63.23	Calculated (prior application)
Number of vehicle passes since last application of water (V)		25	
Uncontrolled PM Emissions	lb/hr	10.86	Calculated
Controlled PM Emissions	lb/hr	3.99	Calculated
Uncontrolled PM Emissions	tpy	11.40	Calculated
Controlled PM Emissions	tpy	4.19	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.17	Calculated
Controlled PM_{10} Emissions	lb/hr	0.80	Calculated
Uncontrolled PM_{10} Emissions	tpy	2.28	Calculated
Controlled PM_{10} Emissions	tpy	0.84	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.53	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.20	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.56	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.21	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	63.14	66.30	17.35	18.22	1.74	1.82
Controlled	12.63	13.26	3.47	3.64	0.35	0.36
Paved						
Uncontrolled	10.86	11.40	2.17	2.28	0.53	0.56
Controlled	3.99	4.19	0.80	0.84	0.20	0.21
Total						
Uncontrolled	74.00	77.70	19.52	20.50	2.27	2.38
Controlled	16.62	17.45	4.27	4.48	0.54	0.57

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2019

TABLE 5. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Process	P004	5.55	2.41	0.35	5.83	2.53	0.36
Storage Pile Emissions	--	0.05	0.02	0.004	0.21	0.11	0.02
Roads Emissions	--	16.62	4.27	0.54	17.45	4.48	0.57
Total Facility (Actuals)		22.22	6.70	0.89	23.50	7.12	0.95

METADATA:

Database:	FAA_DAILY	Average:	7.479 m/s
Id:	KAGC	Count Hours above 12 mph:	30
Name:	PITTSBURGH AGC	Count Hours:	366
County:	ALLEGHENY	% above 12:	8%
State:	PA		
Lat:	40.355		
Lon:	-79.922		
Elev (ft):	1248		
Start_date:	12/31/1972		
End_date:	2/1/2021		

Start Date:	2020-01-01	
End Date:	2020-12-31	
Variables Requested:	date	wspd_avg

Date (EST)	Average Wind Speed (mph)
1/1/2020	11.59
1/2/2020	10.54
1/3/2020	4.75
1/4/2020	8
1/5/2020	9.94
1/6/2020	12.49
1/7/2020	7.11
1/8/2020	10.83
1/9/2020	6.3
1/10/2020	8.61
1/11/2020	14.2
1/12/2020	12.05
1/13/2020	6.48
1/14/2020	7.95
1/15/2020	6.36
1/16/2020	12.32
1/17/2020	7.12
1/18/2020	10.57
1/19/2020	13.08
1/20/2020	6.77
1/21/2020	3.78
1/22/2020	4.52
1/23/2020	3.18
1/24/2020	8.04
1/25/2020	9.51
1/26/2020	11.81
1/27/2020	8.14
1/28/2020	7.23
1/29/2020	4.8
1/30/2020	1.75

1/31/2020	2.09
2/1/2020	4.96
2/2/2020	13.23
2/3/2020	8.35
2/4/2020	12.47
2/5/2020	7.24
2/6/2020	4.12
2/7/2020	10.78
2/8/2020	7.87
2/9/2020	7.33
2/10/2020	9.77
2/11/2020	7.06
2/12/2020	5.47
2/13/2020	8.1
2/14/2020	8.61
2/15/2020	7.69
2/16/2020	6.39
2/17/2020	4.39
2/18/2020	11.03
2/19/2020	7.22
2/20/2020	5.93
2/21/2020	6.77
2/22/2020	10.63
2/23/2020	10.29
2/24/2020	5.67
2/25/2020	3.59
2/26/2020	7.29
2/27/2020	16.01
2/28/2020	11.93
2/29/2020	11.87
3/1/2020	8.55
3/2/2020	11.67
3/3/2020	10.18
3/4/2020	11.62
3/5/2020	4.39
3/6/2020	9.88
3/7/2020	8.9
3/8/2020	8.87
3/9/2020	9.94
3/10/2020	12.6
3/11/2020	2.59
3/12/2020	5.29
3/13/2020	12.98
3/14/2020	4.13
3/15/2020	5.24
3/16/2020	7.77
3/17/2020	6.41

3/18/2020	7.56
3/19/2020	7.44
3/20/2020	14.58
3/21/2020	7.4
3/22/2020	7.73
3/23/2020	10.16
3/24/2020	4.36
3/25/2020	5.26
3/26/2020	7.69
3/27/2020	3.52
3/28/2020	6.07
3/29/2020	16.63
3/30/2020	13.89
3/31/2020	3.87
4/1/2020	6.27
4/2/2020	10.95
4/3/2020	10.42
4/4/2020	4.42
4/5/2020	6.32
4/6/2020	4.38
4/7/2020	6.55
4/8/2020	8.74
4/9/2020	13.3
4/10/2020	13.2
4/11/2020	9.18
4/12/2020	8.19
4/13/2020	13.46
4/14/2020	8.93
4/15/2020	10.22
4/16/2020	10.87
4/17/2020	6.88
4/18/2020	9.27
4/19/2020	10.38
4/20/2020	8.06
4/21/2020	12.96
4/22/2020	8.51
4/23/2020	5.79
4/24/2020	5.57
4/25/2020	6.49
4/26/2020	9.2
4/27/2020	8.9
4/28/2020	6.93
4/29/2020	11.19
4/30/2020	10.3
5/1/2020	6.94
5/2/2020	8.89
5/3/2020	7.5

5/4/2020	8.57
5/5/2020	5.36
5/6/2020	6.69
5/7/2020	10.04
5/8/2020	6.12
5/9/2020	10.54
5/10/2020	11.74
5/11/2020	10.88
5/12/2020	9.86
5/13/2020	5.35
5/14/2020	7.96
5/15/2020	11.32
5/16/2020	4.08
5/17/2020	8.93
5/18/2020	10.9
5/19/2020	15.22
5/20/2020	12.34
5/21/2020	11.21
5/22/2020	3.85
5/23/2020	1.91
5/24/2020	7.3
5/25/2020	5.58
5/26/2020	6.82
5/27/2020	8.89
5/28/2020	8.1
5/29/2020	10.26
5/30/2020	6.07
5/31/2020	7.32
6/1/2020	4.87
6/2/2020	10.56
6/3/2020	13.32
6/4/2020	6.87
6/5/2020	4.28
6/6/2020	7.32
6/7/2020	6.28
6/8/2020	2.9
6/9/2020	5.47
6/10/2020	10.61
6/11/2020	9.88
6/12/2020	7.83
6/13/2020	3.32
6/14/2020	7.83
6/15/2020	5.13
6/16/2020	4.69
6/17/2020	6.59
6/18/2020	6.78
6/19/2020	3.87

6/20/2020	2.87
6/21/2020	5
6/22/2020	7.05
6/23/2020	9.39
6/24/2020	9.72
6/25/2020	7.75
6/26/2020	9.56
6/27/2020	11.83
6/28/2020	6.74
6/29/2020	2.37
6/30/2020	4.1
7/1/2020	5.58
7/2/2020	4.29
7/3/2020	4.38
7/4/2020	3.79
7/5/2020	2.65
7/6/2020	5.38
7/7/2020	5.77
7/8/2020	3.17
7/9/2020	3.5
7/10/2020	6.49
7/11/2020	10.34
7/12/2020	6.02
7/13/2020	3.35
7/14/2020	3.42
7/15/2020	4.19
7/16/2020	9.7
7/17/2020	4.99
7/18/2020	5.72
7/19/2020	11
7/20/2020	7.54
7/21/2020	4.58
7/22/2020	8.15
7/23/2020	7.69
7/24/2020	4.02
7/25/2020	2.62
7/26/2020	5.42
7/27/2020	9.74
7/28/2020	8.57
7/29/2020	7.31
7/30/2020	4.78
7/31/2020	3.29
8/1/2020	4.36
8/2/2020	12.76
8/3/2020	6.06
8/4/2020	4.72
8/5/2020	4.48

8/6/2020	3.38
8/7/2020	3.33
8/8/2020	3.69
8/9/2020	4.89
8/10/2020	6.14
8/11/2020	7.5
8/12/2020	3.23
8/13/2020	3.96
8/14/2020	5.48
8/15/2020	6.67
8/16/2020	6
8/17/2020	4.6
8/18/2020	4.61
8/19/2020	6.63
8/20/2020	3.83
8/21/2020	3.17
8/22/2020	4.73
8/23/2020	4.43
8/24/2020	7.85
8/25/2020	8.6
8/26/2020	7.26
8/27/2020	10.77
8/28/2020	6.11
8/29/2020	9.71
8/30/2020	3.97
8/31/2020	5.94
9/1/2020	5.76
9/2/2020	8.18
9/3/2020	3.86
9/4/2020	7.12
9/5/2020	7.17
9/6/2020	6.82
9/7/2020	8.32
9/8/2020	4.34
9/9/2020	4.72
9/10/2020	3.87
9/11/2020	4.07
9/12/2020	7.31
9/13/2020	7.79
9/14/2020	6.25
9/15/2020	3.1
9/16/2020	5.05
9/17/2020	4.26
9/18/2020	7.76
9/19/2020	4.37
9/20/2020	4.93
9/21/2020	5.2

9/22/2020	3.67
9/23/2020	6.64
9/24/2020	5.3
9/25/2020	4.32
9/26/2020	5.44
9/27/2020	7.7
9/28/2020	9.51
9/29/2020	4.87
9/30/2020	13.02
10/1/2020	9.46
10/2/2020	7.07
10/3/2020	4.14
10/4/2020	4.16
10/5/2020	4.58
10/6/2020	8.25
10/7/2020	11.42
10/8/2020	5.67
10/9/2020	7.97
10/10/2020	9.33
10/11/2020	4.35
10/12/2020	9.16
10/13/2020	7.42
10/14/2020	7.47
10/15/2020	12.09
10/16/2020	5.43
10/17/2020	6.24
10/18/2020	7.22
10/19/2020	5.28
10/20/2020	4.19
10/21/2020	7.58
10/22/2020	4.33
10/23/2020	8.94
10/24/2020	7.69
10/25/2020	5.83
10/26/2020	3.99
10/27/2020	2.63
10/28/2020	3.96
10/29/2020	6.92
10/30/2020	7.21
10/31/2020	5.19
11/1/2020	14.39
11/2/2020	14.24
11/3/2020	11.95
11/4/2020	8.89
11/5/2020	9.07
11/6/2020	7.36
11/7/2020	3.69

11/8/2020	2.06
11/9/2020	4.9
11/10/2020	9.13
11/11/2020	6.16
11/12/2020	5.66
11/13/2020	7.16
11/14/2020	4.78
11/15/2020	16.83
11/16/2020	14.35
11/17/2020	10.59
11/18/2020	6.92
11/19/2020	11.94
11/20/2020	11.29
11/21/2020	5.26
11/22/2020	8.31
11/23/2020	8.59
11/24/2020	4.53
11/25/2020	7.3
11/26/2020	9.75
11/27/2020	4.7
11/28/2020	6.87
11/29/2020	6.05
11/30/2020	7.14
12/1/2020	15.56
12/2/2020	14.61
12/3/2020	10.62
12/4/2020	8.69
12/5/2020	7.62
12/6/2020	6.4
12/7/2020	6.16
12/8/2020	9.45
12/9/2020	9.32
12/10/2020	3.81
12/11/2020	8.99
12/12/2020	10.92
12/13/2020	7.96
12/14/2020	6.54
12/15/2020	4.43
12/16/2020	7.91
12/17/2020	2.71
12/18/2020	5.22
12/19/2020	6.85
12/20/2020	7.11
12/21/2020	9
12/22/2020	9.9
12/23/2020	8.42
12/24/2020	11.2

12/25/2020	13.69
12/26/2020	11.8
12/27/2020	8.24
12/28/2020	11.51
12/29/2020	6.49
12/30/2020	10.89
12/31/2020	4.84

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **CY2020**

TABLE 1. Annual Inputs

Source Information:

Average Pile Surface Area (ft2)	90,000
Annual tonnage moved to/from storage piles	367,697
Average Moisture Content (%)	5.32
Annual tonnage moved on roads	367,697
Annual tonnage moved through system	367,697
Average Operating Schedule: hrs/day	10
Average Operating Schedule: hrs/week	50
Average Operating Schedule: hrs/month	210
Average Operating Schedule: hrs/yr	1470

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2020

TABLE 2. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	367,697
Operating Schedule (hrs/yr):	1,470
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

					PM					PM_{10}					$PM_{2.5}$				
Source	**Emission Type**	**Basis (AP-42 Section)**	**Control**	**Throughput Per Year**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**
					(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy
Loader/Truck to 60 T Feed Hopper	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
60 T Feed Hopper to Feeder (3158320)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Feeder (3158320) to Oversize pile	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Feeder (3158320) to Conveyor (3121021)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Conveyor (3121021) to Conveyor (3121022)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Conveyor (3121022) to Screen (3120601)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Screen (3120601)	Screen	11.19.2-2	Inherent Moisture	367,697	0.025	4.60	0.0020	0.500	0.37	0.0087	1.60	0.0007	0.185	0.14	0.0087	1.60	0.00005	0.013	0.01
Screen (3120601) to CR-1 crusher (4120203)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
CR-1, Symons crusher (3120203)	Crusher	11.19.2-2	Inherent Moisture	367,697	0.0054	0.99	0.0012	0.300	0.22	0.0024	0.44	0.0005	0.135	0.10	0.0024	0.44	0.0001	0.025	0.02
CR-1 crusher (4120203) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Screen (3120601) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3158121)/ Secondary Conveyor (3991306) to Conveyor (3158122)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Conveyor (3158122) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Conveyor (3120106) to Screen (3251302)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Screen (3251302)	Screen	11.19.2-2	Inherent Moisture	367,697	0.025	4.60	0.0020	0.500	0.37	0.0087	1.60	0.0007	0.185	0.14	0.0087	1.60	0.00005	0.013	0.01
Screen (3251302) to Conveyor (3210107)	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120108)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120108) to Conveyor (3120115)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120115) to Stacker Conveyor (3120114)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120114) to Pile #2A (Dense Grade Product)	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120116) or Conveyor (3700398)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120116) to Stacker Conveyor (3120117)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120117) to Pile #1A Fines	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251302) to Conveyor (3120110)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Conveyor (3120110) to Conveyor (3120111)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120111) to Stacker Conveyor (3120113)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120113) to Pile #1	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120110) to Conveyor (3120112)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Conveyor (3120112) to 40 Ton Bin (3120305)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
40 Ton Bin (3120305) to Feeder (3120304)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Feeder (3120304) to CR-2, crusher (3156206)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
CR-2, crusher (3156206)	Crusher	11.19.2-2	Inherent Moisture	367,697	0.0054	0.99	0.0012	0.300	0.22	0.0024	0.44	0.0005	0.135	0.10	0.0024	0.44	0.0001	0.025	0.02
CR-2, crusher (3156206) to Conveyor (3120105)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Conveyor (3120105) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Screen (3251302) to Conveyor (3120109)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Conveyor (3120109) to 50 T Bin (3080003)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
50 T Bin (3080003) to Feeder (3120303)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Feeder (3120303) to Conveyor (3120118)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Conveyor (3120118) to Screen (3251207)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Screen (3251207)	Screen	11.19.2-2	Inherent Moisture	367,697	0.025	4.60	0.0020	0.500	0.37	0.0087	1.60	0.0007	0.185	0.14	0.0087	1.60	0.00005	0.013	0.01
Screen (3251207) to Conveyor (3120120)	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120120) to Conveyor (3120123)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120123) to Stack Conveyor (3120130)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stack Conveyor (3120130) to Pile #57	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251207) to Conveyor (3120121)	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Conveyor (3120121) to Conveyor (3120126)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Conveyor (3120126) to Stack Conveyor (32800001)	Transfer	11.19.2-2	Inherent Moisture	367,697	0.0030	0.55	0.0001	0.035	0.03	0.0011	0.20	0.0000	0.012	0.01	0.0011	0.20	0.0000	0.003	0.00
Stack Conveyor (32800001) to Pile #8	Transfer	13.2.4	Inherent Moisture	367,697	0.0010	0.19	0.0010	0.254	0.19	0.0005	0.09	0.0005	0.120	0.09	0.0001	0.01	0.0001	0.018	0.01
Screen (3251207) to Conveyor (3281207)	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3281207) to Stacker Conveyor (3120129)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120129) to Fines Pile	Transfer	13.2.4	Inherent Moisture	0	0.0010	0.00	0.0010	0.000	0.00	0.0005	0.00	0.0005	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
				Total		**25.01**		**6.079**	**4.47**		**9.34**		**2.646**	**1.94**		**8.29**		**0.381**	**0.28**
				Permit Limits					**25.00**					**6.00**	`				**N/A**

1. Bolded items represent worst-case path and conservative assumption for annual emissions.
2. Emission factors are based on drop equation (AP-42 Section 13.2.4) for material transfers (other than conveyor transfers) or AP-42 Section 11.19.2-2 for crushers, conveyor transfers and screens. Material is controlled via natural moisture content (consistent with prior application assumptions).

Material Transfer Fugitive Emissions Calculations Data[1,3]	**Value**
k (particle size multiplier, PM)	0.74
k (particle size multiplier, PM-10)	0.35
k (particle size multiplier, PM-2.5)	0.053
Mean Wind Speed (mph) KAGC[2]	7.48
Material Moisture Content (%)	5.32

1. Parameters from AP-42, Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006
2. PA State Meterologist data; http://climate.met.psu.edu/
3. Emission factors calculated using Equation 1 from AP-42 Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006: E= k(0.0032)[(U/5)^1.3]/[(M/2)^1.4]

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2020

TABLE 3. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.05	0.21	0.02	0.11	0.00	0.02

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	80	
Controlled Emissions (CE)	lb/acre-day	0.567	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	1.171	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.07	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.214	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.04	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.11	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.01	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.02	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2020

TABLE 4. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	367697	[Site Data]
Hours per year	hr	1470	[Site Data]
Trucks per year	truck/yr	18385	[Site Data]
Miles per year	miles/yr	18385	[Site Data]
Miles driven per hour	mph	13	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.40	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.39	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	80	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.04	Calculated
Uncontrolled PM Emissions	lb/hr	65.84	Calculated
Controlled PM Emissions	lb/hr	13.17	Calculated
Uncontrolled PM Emissions	tpy	48.40	Calculated
Controlled PM Emissions	tpy	9.68	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	18.10	Calculated
Controlled PM_{10} Emissions	lb/hr	3.62	Calculated
Uncontrolled PM_{10} Emissions	tpy	13.30	Calculated
Controlled PM_{10} Emissions	tpy	2.66	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.81	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.36	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.33	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.27	Calculated

Notes:
1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365

* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.33	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.27	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		0.00054	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.07	Calculated
Average control efficiency, 69-(0.231xV)	%	63.23	Calculated (prior application)
Number of vehicle passes since last application of water (V)		25	
Uncontrolled PM Emissions	lb/hr	11.32	Calculated
Controlled PM Emissions	lb/hr	4.16	Calculated
Uncontrolled PM Emissions	tpy	8.32	Calculated
Controlled PM Emissions	tpy	3.06	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.26	Calculated
Controlled PM_{10} Emissions	lb/hr	0.83	Calculated
Uncontrolled PM_{10} Emissions	tpy	1.66	Calculated
Controlled PM_{10} Emissions	tpy	0.61	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.56	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.20	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.41	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.15	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	65.84	48.40	18.10	13.30	1.81	1.33
Controlled	13.17	9.68	3.62	2.66	0.36	0.27
Paved						
Uncontrolled	11.32	8.32	2.26	1.66	0.56	0.41
Controlled	4.16	3.06	0.83	0.61	0.20	0.15
Total						
Uncontrolled	77.17	56.72	20.36	14.97	2.37	1.74
Controlled	17.33	12.74	4.45	3.27	0.57	0.42

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations CY2020

TABLE 5. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Process	P004	6.08	2.65	0.38	4.47	1.94	0.28
Storage Pile Emissions	--	0.05	0.02	0.004	0.21	0.11	0.02
Roads Emissions	--	17.33	4.45	0.57	12.74	3.27	0.42
Total Facility (Actuals)		23.46	7.12	0.95	17.42	5.32	0.71

METADATA:

Database:	FAA_DAILY	Average:	7.479 m/s
Id:	KAGC	Count Hours above 12 mph:	30
Name:	PITTSBURGH AGC	Count Hours:	366
County:	ALLEGHENY	% above 12:	8%
State:	PA		
Lat:	40.355		
Lon:	-79.922		
Elev (ft):	1248		
Start_date:	12/31/1972		
End_date:	2/1/2021		

Start Date:	2020-01-01	
End Date:	2020-12-31	
Variables Requested:	date	wspd_avg

Date (EST)	Average Wind Speed (mph)
1/1/2020	11.59
1/2/2020	10.54
1/3/2020	4.75
1/4/2020	8
1/5/2020	9.94
1/6/2020	12.49
1/7/2020	7.11
1/8/2020	10.83
1/9/2020	6.3
1/10/2020	8.61
1/11/2020	14.2
1/12/2020	12.05
1/13/2020	6.48
1/14/2020	7.95
1/15/2020	6.36
1/16/2020	12.32
1/17/2020	7.12
1/18/2020	10.57
1/19/2020	13.08
1/20/2020	6.77
1/21/2020	3.78
1/22/2020	4.52
1/23/2020	3.18
1/24/2020	8.04
1/25/2020	9.51
1/26/2020	11.81
1/27/2020	8.14
1/28/2020	7.23
1/29/2020	4.8
1/30/2020	1.75

1/31/2020	2.09
2/1/2020	4.96
2/2/2020	13.23
2/3/2020	8.35
2/4/2020	12.47
2/5/2020	7.24
2/6/2020	4.12
2/7/2020	10.78
2/8/2020	7.87
2/9/2020	7.33
2/10/2020	9.77
2/11/2020	7.06
2/12/2020	5.47
2/13/2020	8.1
2/14/2020	8.61
2/15/2020	7.69
2/16/2020	6.39
2/17/2020	4.39
2/18/2020	11.03
2/19/2020	7.22
2/20/2020	5.93
2/21/2020	6.77
2/22/2020	10.63
2/23/2020	10.29
2/24/2020	5.67
2/25/2020	3.59
2/26/2020	7.29
2/27/2020	16.01
2/28/2020	11.93
2/29/2020	11.87
3/1/2020	8.55
3/2/2020	11.67
3/3/2020	10.18
3/4/2020	11.62
3/5/2020	4.39
3/6/2020	9.88
3/7/2020	8.9
3/8/2020	8.87
3/9/2020	9.94
3/10/2020	12.6
3/11/2020	2.59
3/12/2020	5.29
3/13/2020	12.98
3/14/2020	4.13
3/15/2020	5.24
3/16/2020	7.77
3/17/2020	6.41

3/18/2020	7.56
3/19/2020	7.44
3/20/2020	14.58
3/21/2020	7.4
3/22/2020	7.73
3/23/2020	10.16
3/24/2020	4.36
3/25/2020	5.26
3/26/2020	7.69
3/27/2020	3.52
3/28/2020	6.07
3/29/2020	16.63
3/30/2020	13.89
3/31/2020	3.87
4/1/2020	6.27
4/2/2020	10.95
4/3/2020	10.42
4/4/2020	4.42
4/5/2020	6.32
4/6/2020	4.38
4/7/2020	6.55
4/8/2020	8.74
4/9/2020	13.3
4/10/2020	13.2
4/11/2020	9.18
4/12/2020	8.19
4/13/2020	13.46
4/14/2020	8.93
4/15/2020	10.22
4/16/2020	10.87
4/17/2020	6.88
4/18/2020	9.27
4/19/2020	10.38
4/20/2020	8.06
4/21/2020	12.96
4/22/2020	8.51
4/23/2020	5.79
4/24/2020	5.57
4/25/2020	6.49
4/26/2020	9.2
4/27/2020	8.9
4/28/2020	6.93
4/29/2020	11.19
4/30/2020	10.3
5/1/2020	6.94
5/2/2020	8.89
5/3/2020	7.5

5/4/2020	8.57
5/5/2020	5.36
5/6/2020	6.69
5/7/2020	10.04
5/8/2020	6.12
5/9/2020	10.54
5/10/2020	11.74
5/11/2020	10.88
5/12/2020	9.86
5/13/2020	5.35
5/14/2020	7.96
5/15/2020	11.32
5/16/2020	4.08
5/17/2020	8.93
5/18/2020	10.9
5/19/2020	15.22
5/20/2020	12.34
5/21/2020	11.21
5/22/2020	3.85
5/23/2020	1.91
5/24/2020	7.3
5/25/2020	5.58
5/26/2020	6.82
5/27/2020	8.89
5/28/2020	8.1
5/29/2020	10.26
5/30/2020	6.07
5/31/2020	7.32
6/1/2020	4.87
6/2/2020	10.56
6/3/2020	13.32
6/4/2020	6.87
6/5/2020	4.28
6/6/2020	7.32
6/7/2020	6.28
6/8/2020	2.9
6/9/2020	5.47
6/10/2020	10.61
6/11/2020	9.88
6/12/2020	7.83
6/13/2020	3.32
6/14/2020	7.83
6/15/2020	5.13
6/16/2020	4.69
6/17/2020	6.59
6/18/2020	6.78
6/19/2020	3.87

6/20/2020	2.87
6/21/2020	5
6/22/2020	7.05
6/23/2020	9.39
6/24/2020	9.72
6/25/2020	7.75
6/26/2020	9.56
6/27/2020	11.83
6/28/2020	6.74
6/29/2020	2.37
6/30/2020	4.1
7/1/2020	5.58
7/2/2020	4.29
7/3/2020	4.38
7/4/2020	3.79
7/5/2020	2.65
7/6/2020	5.38
7/7/2020	5.77
7/8/2020	3.17
7/9/2020	3.5
7/10/2020	6.49
7/11/2020	10.34
7/12/2020	6.02
7/13/2020	3.35
7/14/2020	3.42
7/15/2020	4.19
7/16/2020	9.7
7/17/2020	4.99
7/18/2020	5.72
7/19/2020	11
7/20/2020	7.54
7/21/2020	4.58
7/22/2020	8.15
7/23/2020	7.69
7/24/2020	4.02
7/25/2020	2.62
7/26/2020	5.42
7/27/2020	9.74
7/28/2020	8.57
7/29/2020	7.31
7/30/2020	4.78
7/31/2020	3.29
8/1/2020	4.36
8/2/2020	12.76
8/3/2020	6.06
8/4/2020	4.72
8/5/2020	4.48

8/6/2020	3.38
8/7/2020	3.33
8/8/2020	3.69
8/9/2020	4.89
8/10/2020	6.14
8/11/2020	7.5
8/12/2020	3.23
8/13/2020	3.96
8/14/2020	5.48
8/15/2020	6.67
8/16/2020	6
8/17/2020	4.6
8/18/2020	4.61
8/19/2020	6.63
8/20/2020	3.83
8/21/2020	3.17
8/22/2020	4.73
8/23/2020	4.43
8/24/2020	7.85
8/25/2020	8.6
8/26/2020	7.26
8/27/2020	10.77
8/28/2020	6.11
8/29/2020	9.71
8/30/2020	3.97
8/31/2020	5.94
9/1/2020	5.76
9/2/2020	8.18
9/3/2020	3.86
9/4/2020	7.12
9/5/2020	7.17
9/6/2020	6.82
9/7/2020	8.32
9/8/2020	4.34
9/9/2020	4.72
9/10/2020	3.87
9/11/2020	4.07
9/12/2020	7.31
9/13/2020	7.79
9/14/2020	6.25
9/15/2020	3.1
9/16/2020	5.05
9/17/2020	4.26
9/18/2020	7.76
9/19/2020	4.37
9/20/2020	4.93
9/21/2020	5.2

9/22/2020	3.67
9/23/2020	6.64
9/24/2020	5.3
9/25/2020	4.32
9/26/2020	5.44
9/27/2020	7.7
9/28/2020	9.51
9/29/2020	4.87
9/30/2020	13.02
10/1/2020	9.46
10/2/2020	7.07
10/3/2020	4.14
10/4/2020	4.16
10/5/2020	4.58
10/6/2020	8.25
10/7/2020	11.42
10/8/2020	5.67
10/9/2020	7.97
10/10/2020	9.33
10/11/2020	4.35
10/12/2020	9.16
10/13/2020	7.42
10/14/2020	7.47
10/15/2020	12.09
10/16/2020	5.43
10/17/2020	6.24
10/18/2020	7.22
10/19/2020	5.28
10/20/2020	4.19
10/21/2020	7.58
10/22/2020	4.33
10/23/2020	8.94
10/24/2020	7.69
10/25/2020	5.83
10/26/2020	3.99
10/27/2020	2.63
10/28/2020	3.96
10/29/2020	6.92
10/30/2020	7.21
10/31/2020	5.19
11/1/2020	14.39
11/2/2020	14.24
11/3/2020	11.95
11/4/2020	8.89
11/5/2020	9.07
11/6/2020	7.36
11/7/2020	3.69

11/8/2020	2.06
11/9/2020	4.9
11/10/2020	9.13
11/11/2020	6.16
11/12/2020	5.66
11/13/2020	7.16
11/14/2020	4.78
11/15/2020	16.83
11/16/2020	14.35
11/17/2020	10.59
11/18/2020	6.92
11/19/2020	11.94
11/20/2020	11.29
11/21/2020	5.26
11/22/2020	8.31
11/23/2020	8.59
11/24/2020	4.53
11/25/2020	7.3
11/26/2020	9.75
11/27/2020	4.7
11/28/2020	6.87
11/29/2020	6.05
11/30/2020	7.14
12/1/2020	15.56
12/2/2020	14.61
12/3/2020	10.62
12/4/2020	8.69
12/5/2020	7.62
12/6/2020	6.4
12/7/2020	6.16
12/8/2020	9.45
12/9/2020	9.32
12/10/2020	3.81
12/11/2020	8.99
12/12/2020	10.92
12/13/2020	7.96
12/14/2020	6.54
12/15/2020	4.43
12/16/2020	7.91
12/17/2020	2.71
12/18/2020	5.22
12/19/2020	6.85
12/20/2020	7.11
12/21/2020	9
12/22/2020	9.9
12/23/2020	8.42
12/24/2020	11.2

12/25/2020	13.69
12/26/2020	11.8
12/27/2020	8.24
12/28/2020	11.51
12/29/2020	6.49
12/30/2020	10.89
12/31/2020	4.84

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **Future - Average**

TABLE 1. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
Source ID:	P004
Production Rate (tons/hr):	400
Annual Capacity (tons/yr):	474,594
Operating Schedule (hrs/yr):	1,890
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations Future - Average

TABLE 1. Materials Processing Emission Limitations

Source Information:

Process Description:	Slag Crushing & Screening Plant (Electrically Driven)
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Operating Schedule (hrs/yr):	1,890
Fuel/Raw Material:	Slag
Emission Control:	Inherent moisture

					PM					PM_{10}					$PM_{2.5}$				
Source	**Emission Type**	**Basis (AP-42 Section)**	**Control**	**Throughput Per Year**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor[2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**	**Uncontrolled Emission Factor [2]**	**Uncontrolled Emissions**	**Controlled Emission Factor[2]**	**Controlled Emissions**	**Controlled Emissions**
					(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy	(lb/ton)	tpy	(lb/ton)	lb/hr	tpy
Loader/Truck to 60 T Feed Hopper	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
60 T Feed Hopper to Feeder (3158320)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Feeder (3158320) to Oversize pile	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Feeder (3158320) to Conveyor (3121021)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3121021) to Conveyor (3121022)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Conveyor (3121022) to Screen (3120601)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Screen (3120601)	Screen	11.19.2-2	Inherent Moisture	474,594	0.025	5.93	0.0020	0.502	0.47	0.0087	2.06	0.0007	0.186	0.18	0.0087	2.06	0.00005	0.013	0.01
Screen (3120601) to CR-1 crusher (4120203)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
CR-1, Symons crusher (3120203)	Crusher	11.19.2-2	Inherent Moisture	474,594	0.0054	1.28	0.0012	0.301	0.28	0.0024	0.57	0.0005	0.136	0.13	0.0024	0.57	0.0001	0.025	0.02
CR-1 crusher (4120203) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Screen (3120601) to Conveyor (3158121)/ Secondary Conveyor (3991306)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3158121)/ Secondary Conveyor (3991306) to Conveyor (3158122)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Conveyor (3158122) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Conveyor (3120106) to Screen (3251302)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Screen (3251302)	Screen	11.19.2-2	Inherent Moisture	474,594	0.025	5.93	0.0020	0.502	0.47	0.0087	2.06	0.0007	0.186	0.18	0.0087	2.06	0.00005	0.013	0.01
Screen (3251302) to Conveyor (3210107)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120108)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120108) to Conveyor (3120115)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120115) to Stacker Conveyor (3120114)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120114) to Pile #2A (Dense Grade Product)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3210107) to Conveyor (3120116) or Conveyor (3700398)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120116) to Stacker Conveyor (3120117)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120117) to Pile #1A Fines	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251302) to Conveyor (3120110)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120110) to Conveyor (3120111)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120111) to Stacker Conveyor (3120113)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120113) to Pile #1	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120110) to Conveyor (3120112)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Conveyor (3120112) to 40 Ton Bin (3120305)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
40 Ton Bin (3120305) to Feeder (3120304)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Feeder (3120304) to CR-2, crusher (3156206)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
CR-2, crusher (3156206)	Crusher	11.19.2-2	Inherent Moisture	474,594	0.0054	1.28	0.0012	0.301	0.28	0.0024	0.57	0.0005	0.136	0.13	0.0024	0.57	0.0001	0.025	0.02
CR-2, crusher (3156206) to Conveyor (3120105)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120105) to Conveyor (3120106)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Screen (3251302) to Conveyor (3120109)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120109) to 50 T Bin (3080003)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
50 T Bin (3080003) to Feeder (3120303)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Feeder (3120303) to Conveyor (3120118)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120118) to Screen (3251207)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Screen (3251207)	Screen	11.19.2-2	Inherent Moisture	474,594	0.025	5.93	0.0020	0.502	0.47	0.0087	2.06	0.0007	0.186	0.18	0.0087	2.06	0.00005	0.013	0.01
Screen (3251207) to Conveyor (3120120)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3120120) to Conveyor (3120123)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Conveyor (3120123) to Stack Conveyor (3120130)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stack Conveyor (3120130) to Pile #57	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Screen (3251207) to Conveyor (3120121)	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Conveyor (3120121) to Conveyor (3120126)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Conveyor (3120126) to Stack Conveyor (32800001)	Transfer	11.19.2-2	Inherent Moisture	474,594	0.0030	0.71	0.0001	0.035	0.03	0.0011	0.26	0.0000	0.012	0.01	0.0011	0.26	0.0000	0.003	0.00
Stack Conveyor (32800001) to Pile #8	Transfer	13.2.4	Inherent Moisture	474,594	0.0008	0.20	0.0008	0.213	0.20	0.0004	0.10	0.0004	0.101	0.10	0.0001	0.01	0.0001	0.015	0.01
Screen (3251207) to Conveyor (3281207)	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
Conveyor (3281207) to Stacker Conveyor (3120129)	Transfer	11.19.2-2	Inherent Moisture	0	0.0030	0.00	0.0001	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00	0.0011	0.00	0.0000	0.000	0.00
Stacker Conveyor (3120129) to Fines Pile	Transfer	13.2.4	Inherent Moisture	0	0.0008	0.00	0.0008	0.000	0.00	0.0004	0.00	0.0004	0.000	0.00	0.0001	0.00	0.0001	0.000	0.00
				Total		**31.72**		**5.514**	**5.21**		**11.80**		**2.378**	**2.25**		**10.67**		**0.341**	**0.32**
				Permit Limits					**25.00**					**6.00**	`				**N/A**

1. Bolded items represent worst-case path and conservative assumption for annual emissions.
2. Emission factors are based on drop equation (AP-42 Section 13.2.4) for material transfers (other than conveyor transfers) or AP-42 Section 11.19.2-2 for crushers, conveyor transfers and screens. Material is controlled via natural moisture content (consistent with prior application assumptions).

Material Transfer Fugitive Emissions Calculations Data[1,3]	**Value**
k (particle size multiplier, PM)	0.74
k (particle size multiplier, PM-10)	0.35
k (particle size multiplier, PM-2.5)	0.053
Mean Wind Speed (mph) KAGC[2]	7.48
Material Moisture Content (%)	6.05

1. Parameters from AP-42, Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006
2. PA State Meterologist data; http://climate.met.psu.edu/
3. Emission factors calculated using Equation 1 from AP-42 Section 13.2.4 *Aggregate Handling and Storage Piles* , 11/2006: E= k(0.0032)[(U/5)^1.3]/[(M/2)^1.4]

Company Name: **Redland Quarries NY Inc.**
Facility Name: **Duquesne Plant**
Project Description: **Annual Emissions Calculations** **Future - Average**

TABLE 2. Storage Pile Wind Erosion Emissions

Source Information:

Process Description:	Fugitive wind erosion emissions

	PM		PM_{10}		$PM_{2.5}$	
Actual Emission (total piles)	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Uncontrolled	0.24	1.07	0.12	0.53	0.02	0.08
Controlled	0.04	0.16	0.02	0.08	0.00	0.01

Wind Erosion:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Wind Erosion Factor (E)	lb/acre-day	2.833	Calculated using Equation 1
Silt Content of Aggregate (s)	%	5	[Table 4-1, EPA -450/3-88-008]
# of days with >or=0.01 inches of precipitation per year (p)	Days	150	[Table 4-2, EPA -450/3-88-008]
Percent of the time the unobstructed wind speed exceeds 12 mph at the mean pile height (f)	%	8	Met. data from KAGC
Control efficiency based on moisture in material	%	85	*Increased efficiency for short-term if additonal wetting is applied
Controlled Emissions (CE)	lb/acre-day	0.425	=(1 - Control Efficiency) * E
Total Surface Area	sq ft	90,000	Provided via email on 2/1/2021
Acres of Storage Piles (A)	acres	2.07	Square feet to acres conversion
Uncontrolled emissions per day	lb/day	5.853	= A *E
Controlled emissions per day	lb/day	0.878	=A * CE
Days per year	days	365	
Uncontrolled PM emissions per year per pile	tpy	0.36	Calculated
Controlled PM emissions per year per pile	tpy	0.05	Calculated
Uncontrolled PM emissions per year total	tpy	1.068	Calculated
Controlled PM emissions per year total	tpy	0.160	Calculated
Portion of PM that is PM_{10}	%	50.0	PM10/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled PM_{10} emissions per year per pile	tpy	0.18	Calculated
Controlled PM_{10} emissions per year per pile	tpy	0.03	Calculated
Uncontrolled PM_{10} emissions per year total	tpy	0.53	Calculated
Controlled PM_{10} emissions per year total	tpy	0.08	Calculated
Portion of PM that is $PM_{2.5}$	%	7.5	PM2.5/PM ratio based on ratio of particle size multipliers in AP-42 Section 13.2-5
Uncontrolled $PM_{2.5}$ emissions per year per pile	tpy	0.03	Calculated
Controlled $PM_{2.5}$ emissions per year per pile	tpy	0.00	Calculated
Uncontrolled $PM_{2.5}$ emissions per year total	tpy	0.08	Calculated
Controlled $PM_{2.5}$ emissions per year total	tpy	0.01	Calculated

Note:
1. Equation 1 (EQU. 4-9, EPA-450/3-88-008): E = 1.7(S/1.5)*((365-P)/235)*(F/15)

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations Future - Average

TABLE 3. Roads Emissions

Source Information:

Process Description:	Fugitive emissions from roads

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Distance Driven per Truck	miles	1.0	[Site Data]
Load per truck	tons	20	[Site Data]
Annual Tonnage Moved on Roads	tpy	474594	[Site Data]
Hours per year	hr	1890	[Site Data]
Trucks per year	truck/yr	23730	[Site Data]
Miles per year	miles/yr	23730	[Site Data]
Miles driven per hour	mph	13	[Site Data]
Percent of roads unpaved	%	75	[Site Data]
Percent of Roads paved	%	25	[Site Data]

Unpaved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	7.02	Equation 1
Constant (k)		4.9	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.7	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	90	*
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.70	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	1.93	Equation 1
Constant (k)		1.5	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	90	*
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.19	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.19	Equation 1
Constant (k)		0.15	[AP-42, Table 13.2.2-2]
Silt Content of road surface material (s)	Percent	7	
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA -450/3-88-008]
constant (a)		0.9	[AP-42, Table 13.2.2-2]
constant (b)		0.45	[AP-42, Table 13.2.2-2]
Average control efficiency	%	90	*
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.02	Calculated
Uncontrolled PM Emissions	lb/hr	66.10	Calculated
Controlled PM Emissions	lb/hr	6.61	Calculated
Uncontrolled PM Emissions	tpy	62.47	Calculated
Controlled PM Emissions	tpy	6.25	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	18.17	Calculated
Controlled PM_{10} Emissions	lb/hr	1.82	Calculated
Uncontrolled PM_{10} Emissions	tpy	17.17	Calculated
Controlled PM_{10} Emissions	tpy	1.72	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	1.82	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.18	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	1.72	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.17	Calculated

Notes:
1. Equation 1 [AP-42 Section 13.2.2.2, Equations 1a and 2]: E = K(S/12)^a*(W/3)^b*(365-p)/365
* From AP-42 :Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM_{10} control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month. Short-term control efficiency of increased wetting application estimated by Duquesne Plant to be 90 percent (level of control assumed by other sites and listed in EPA-450/3-88-008.

Paved Roads:

Parameter (parameter variable)	Units	Value	Estimation Basis / Emission Factor Source
Uncontrolled PM emission factor (E)	lb/mile	3.62	Equation 2
Constant (k)		0.011	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM emission factor (lb/vehicle mile traveled) (EC)	lb/mile	1.23	Calculated
Uncontrolled PM_{10} emission factor (E)	lb/mile	0.72	Equation 2
Constant (k)		0.0022	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled PM_{10} emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.25	Calculated
Uncontrolled $PM_{2.5}$ emission factor (E)	lb/mile	0.18	Equation 2
Constant (k)		######	[AP-42, Table 13.2.1-1]
Silt Content of road surface material (s)	Percent	8.2	[AP-42, Table 13.2.1-3, Quarry]
Mean vehicle weight (W)	ton	50	
# of days with >or=0.01 inches of precipitation per year (p)	days	150	[Figure 3-1, EPA-450/3-88-008]
Controlled $PM_{2.5}$ emission factor (lb/vehicle mile traveled) (EC)	lb/mile	0.06	Calculated
Average control efficiency, 69-(0.231xV)	%	66.11	Calculated (prior application)
Number of vehicle passes since last application of water (V)		13	* increased frequency during plan
Uncontrolled PM Emissions	lb/hr	11.37	Calculated
Controlled PM Emissions	lb/hr	3.85	Calculated
Uncontrolled PM Emissions	tpy	10.74	Calculated
Controlled PM Emissions	tpy	3.64	Calculated
Uncontrolled PM_{10} Emissions	lb/hr	2.27	Calculated
Controlled PM_{10} Emissions	lb/hr	0.77	Calculated
Uncontrolled PM_{10} Emissions	tpy	2.15	Calculated
Controlled PM_{10} Emissions	tpy	0.73	Calculated
Uncontrolled $PM_{2.5}$ Emissions	lb/hr	0.56	Calculated
Controlled $PM_{2.5}$ Emissions	lb/hr	0.19	Calculated
Uncontrolled $PM_{2.5}$ Emissions	tpy	0.53	Calculated
Controlled $PM_{2.5}$ Emissions	tpy	0.18	Calculated

1. Equation 2 [AP-42 Section 13.2.1.3, Equations 1]: E = K*s^0.91*W^1.02*(1-p/4/365)

Summary:

	PM		PM_{10}		$PM_{2.5}$	
Emissions at actual hours per year	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Unpaved						
Uncontrolled	66.10	62.47	18.17	17.17	1.82	1.72
Controlled	6.61	6.25	1.82	1.72	0.18	0.17
Paved						
Uncontrolled	11.37	10.74	2.27	2.15	0.56	0.53
Controlled	3.85	3.64	0.77	0.73	0.19	0.18
Total						
Uncontrolled	77.47	73.21	20.44	19.32	2.37	2.24
Controlled	10.46	9.89	2.59	2.44	0.37	0.35

Company Name: Redland Quarries NY Inc.
Facility Name: Duquesne Plant
Project Description: Annual Emissions Calculations Future - Average

TABLE 4. Atmospheric Emissions from Each Source at the facility

Source Name	Source ID	Future			Future		
		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
		(lb/hr)	(lb/hr)	(lb/hr)	(tpy)	(tpy)	(tpy)
Process	P004	5.51	2.38	0.34	5.21	2.25	0.32
Storage Pile Emissions	--	0.04	0.02	0.003	0.16	0.08	0.01
Roads Emissions	--	10.46	2.59	0.37	9.89	2.44	0.35
Total Facility (Estimated Future Average Actuals)		16.01	4.98	0.71	15.26	4.77	0.68

METADATA:

Database:	FAA_DAILY		Average:	7.479 m/s
Id:	KAGC	Count Hours above 12 mph:		30
Name:	PITTSBURGH AGC	Count Hours:		366
County:	ALLEGHENY	% above 12:		8%
State:	PA			
Lat:	40.355			
Lon:	-79.922			
Elev (ft):	1248			
Start_date:	12/31/1972			
End_date:	2/1/2021			

Start Date:	2020-01-01	
End Date:	2020-12-31	
Variables Requested:	date	wspd_avg

Date (EST)	Average Wind Speed (mph)
1/1/2020	11.59
1/2/2020	10.54
1/3/2020	4.75
1/4/2020	8
1/5/2020	9.94
1/6/2020	12.49
1/7/2020	7.11
1/8/2020	10.83
1/9/2020	6.3
1/10/2020	8.61
1/11/2020	14.2
1/12/2020	12.05
1/13/2020	6.48
1/14/2020	7.95
1/15/2020	6.36
1/16/2020	12.32
1/17/2020	7.12
1/18/2020	10.57
1/19/2020	13.08
1/20/2020	6.77
1/21/2020	3.78
1/22/2020	4.52
1/23/2020	3.18
1/24/2020	8.04
1/25/2020	9.51
1/26/2020	11.81
1/27/2020	8.14
1/28/2020	7.23
1/29/2020	4.8
1/30/2020	1.75
1/31/2020	2.09
2/1/2020	4.96
2/2/2020	13.23
2/3/2020	8.35
2/4/2020	12.47
2/5/2020	7.24
2/6/2020	4.12
2/7/2020	10.78
2/8/2020	7.87
2/9/2020	7.33
2/10/2020	9.77
2/11/2020	7.06
2/12/2020	5.47
2/13/2020	8.1
2/14/2020	8.61
2/15/2020	7.69
2/16/2020	6.39
2/17/2020	4.39
2/18/2020	11.03
2/19/2020	7.22
2/20/2020	5.93
2/21/2020	6.77
2/22/2020	10.63
2/23/2020	10.29
2/24/2020	5.67
2/25/2020	3.59
2/26/2020	7.29
2/27/2020	16.01
2/28/2020	11.93

2/29/2020	11.87
3/1/2020	8.55
3/2/2020	11.67
3/3/2020	10.18
3/4/2020	11.62
3/5/2020	4.39
3/6/2020	9.88
3/7/2020	8.9
3/8/2020	8.87
3/9/2020	9.94
3/10/2020	12.6
3/11/2020	2.59
3/12/2020	5.29
3/13/2020	12.98
3/14/2020	4.13
3/15/2020	5.24
3/16/2020	7.77
3/17/2020	6.41
3/18/2020	7.56
3/19/2020	7.44
3/20/2020	14.58
3/21/2020	7.4
3/22/2020	7.73
3/23/2020	10.16
3/24/2020	4.36
3/25/2020	5.26
3/26/2020	7.69
3/27/2020	3.52
3/28/2020	6.07
3/29/2020	16.63
3/30/2020	13.89
3/31/2020	3.87
4/1/2020	6.27
4/2/2020	10.95
4/3/2020	10.42
4/4/2020	4.42
4/5/2020	6.32
4/6/2020	4.38
4/7/2020	6.55
4/8/2020	8.74
4/9/2020	13.3
4/10/2020	13.2
4/11/2020	9.18
4/12/2020	8.19
4/13/2020	13.46
4/14/2020	8.93
4/15/2020	10.22
4/16/2020	10.87
4/17/2020	6.88
4/18/2020	9.27
4/19/2020	10.38
4/20/2020	8.06
4/21/2020	12.96
4/22/2020	8.51
4/23/2020	5.79
4/24/2020	5.57
4/25/2020	6.49
4/26/2020	9.2
4/27/2020	8.9
4/28/2020	6.93
4/29/2020	11.19
4/30/2020	10.3
5/1/2020	6.94
5/2/2020	8.89
5/3/2020	7.5
5/4/2020	8.57
5/5/2020	5.36
5/6/2020	6.69
5/7/2020	10.04
5/8/2020	6.12
5/9/2020	10.54
5/10/2020	11.74
5/11/2020	10.88
5/12/2020	9.86
5/13/2020	5.35
5/14/2020	7.96

5/15/2020	11.32
5/16/2020	4.08
5/17/2020	8.93
5/18/2020	10.9
5/19/2020	15.22
5/20/2020	12.34
5/21/2020	11.21
5/22/2020	3.85
5/23/2020	1.91
5/24/2020	7.3
5/25/2020	5.58
5/26/2020	6.82
5/27/2020	8.89
5/28/2020	8.1
5/29/2020	10.26
5/30/2020	6.07
5/31/2020	7.32
6/1/2020	4.87
6/2/2020	10.56
6/3/2020	13.32
6/4/2020	6.87
6/5/2020	4.28
6/6/2020	7.32
6/7/2020	6.28
6/8/2020	2.9
6/9/2020	5.47
6/10/2020	10.61
6/11/2020	9.88
6/12/2020	7.83
6/13/2020	3.32
6/14/2020	7.83
6/15/2020	5.13
6/16/2020	4.69
6/17/2020	6.59
6/18/2020	6.78
6/19/2020	3.87
6/20/2020	2.87
6/21/2020	5
6/22/2020	7.05
6/23/2020	9.39
6/24/2020	9.72
6/25/2020	7.75
6/26/2020	9.56
6/27/2020	11.83
6/28/2020	6.74
6/29/2020	2.37
6/30/2020	4.1
7/1/2020	5.58
7/2/2020	4.29
7/3/2020	4.38
7/4/2020	3.79
7/5/2020	2.65
7/6/2020	5.38
7/7/2020	5.77
7/8/2020	3.17
7/9/2020	3.5
7/10/2020	6.49
7/11/2020	10.34
7/12/2020	6.02
7/13/2020	3.35
7/14/2020	3.42
7/15/2020	4.19
7/16/2020	9.7
7/17/2020	4.99
7/18/2020	5.72
7/19/2020	11
7/20/2020	7.54
7/21/2020	4.58
7/22/2020	8.15
7/23/2020	7.69
7/24/2020	4.02
7/25/2020	2.62
7/26/2020	5.42
7/27/2020	9.74
7/28/2020	8.57
7/29/2020	7.31

7/30/2020	4.78
7/31/2020	3.29
8/1/2020	4.36
8/2/2020	12.76
8/3/2020	6.06
8/4/2020	4.72
8/5/2020	4.48
8/6/2020	3.38
8/7/2020	3.33
8/8/2020	3.69
8/9/2020	4.89
8/10/2020	6.14
8/11/2020	7.5
8/12/2020	3.23
8/13/2020	3.96
8/14/2020	5.48
8/15/2020	6.67
8/16/2020	6
8/17/2020	4.6
8/18/2020	4.61
8/19/2020	6.63
8/20/2020	3.83
8/21/2020	3.17
8/22/2020	4.73
8/23/2020	4.43
8/24/2020	7.85
8/25/2020	8.6
8/26/2020	7.26
8/27/2020	10.77
8/28/2020	6.11
8/29/2020	9.71
8/30/2020	3.97
8/31/2020	5.94
9/1/2020	5.76
9/2/2020	8.18
9/3/2020	3.86
9/4/2020	7.12
9/5/2020	7.17
9/6/2020	6.82
9/7/2020	8.32
9/8/2020	4.34
9/9/2020	4.72
9/10/2020	3.87
9/11/2020	4.07
9/12/2020	7.31
9/13/2020	7.79
9/14/2020	6.25
9/15/2020	3.1
9/16/2020	5.05
9/17/2020	4.26
9/18/2020	7.76
9/19/2020	4.37
9/20/2020	4.93
9/21/2020	5.2
9/22/2020	3.67
9/23/2020	6.64
9/24/2020	5.3
9/25/2020	4.32
9/26/2020	5.44
9/27/2020	7.7
9/28/2020	9.51
9/29/2020	4.87
9/30/2020	13.02
10/1/2020	9.46
10/2/2020	7.07
10/3/2020	4.14
10/4/2020	4.16
10/5/2020	4.58
10/6/2020	8.25
10/7/2020	11.42
10/8/2020	5.67
10/9/2020	7.97
10/10/2020	9.33
10/11/2020	4.35
10/12/2020	9.16
10/13/2020	7.42

10/14/2020	7.47
10/15/2020	12.09
10/16/2020	5.43
10/17/2020	6.24
10/18/2020	7.22
10/19/2020	5.28
10/20/2020	4.19
10/21/2020	7.58
10/22/2020	4.33
10/23/2020	8.94
10/24/2020	7.69
10/25/2020	5.83
10/26/2020	3.99
10/27/2020	2.63
10/28/2020	3.96
10/29/2020	6.92
10/30/2020	7.21
10/31/2020	5.19
11/1/2020	14.39
11/2/2020	14.24
11/3/2020	11.95
11/4/2020	8.89
11/5/2020	9.07
11/6/2020	7.36
11/7/2020	3.69
11/8/2020	2.06
11/9/2020	4.9
11/10/2020	9.13
11/11/2020	6.16
11/12/2020	5.66
11/13/2020	7.16
11/14/2020	4.78
11/15/2020	16.83
11/16/2020	14.35
11/17/2020	10.59
11/18/2020	6.92
11/19/2020	11.94
11/20/2020	11.29
11/21/2020	5.26
11/22/2020	8.31
11/23/2020	8.59
11/24/2020	4.53
11/25/2020	7.3
11/26/2020	9.75
11/27/2020	4.7
11/28/2020	6.87
11/29/2020	6.05
11/30/2020	7.14
12/1/2020	15.56
12/2/2020	14.61
12/3/2020	10.62
12/4/2020	8.69
12/5/2020	7.62
12/6/2020	6.4
12/7/2020	6.16
12/8/2020	9.45
12/9/2020	9.32
12/10/2020	3.81
12/11/2020	8.99
12/12/2020	10.92
12/13/2020	7.96
12/14/2020	6.54
12/15/2020	4.43
12/16/2020	7.91
12/17/2020	2.71
12/18/2020	5.22
12/19/2020	6.85
12/20/2020	7.11
12/21/2020	9
12/22/2020	9.9
12/23/2020	8.42
12/24/2020	11.2
12/25/2020	13.69
12/26/2020	11.8
12/27/2020	8.24
12/28/2020	11.51

12/29/2020	6.49
12/30/2020	10.89
12/31/2020	4.84