Hayes, Alyson

From: Singleton, Mareesa
Sent: Friday, October 6, 2017 4:05 PM
To: Hayes, Alyson
Subject: FW: Revision Construction Permit Application Documents (October 2017 Revision 1)
Attachments: rdai00117.october2017revision1.pdf

From: Matthew Wike [mailto:matthew.wike@gel.com]
Sent: Friday, October 06, 2017 9:43 AM
To: Singleton, Mareesa <singlemj@dhec.sc.gov>
Cc: Clark Wooten <cwooten@buysod.com>; Craig Kennedy <craigkennedy.kcs@gmail.com>; Rich Moses <Rich.Moses@americanmaterialsco.com>; Price, Tracy <priceto@dhec.sc.gov>
Subject: Revision Construction Permit Application Documents (October 2017 Revision 1)

Mareesa
Per our discussions, please find enclosed revisions to the June 2017 Construction Permit Application for the RDA Facility. The October 2017 revisions were needed for the following reasons:

- RDA relocated the proposed primary crusher (CR1) and Conveyor #1 (C1) to the north;
- RDA is proposing to split Conveyor #1 (C1) into two conveyors (C1a and C1b); and
- RDA has voluntarily ($PM_{2.5}$ emissions are below de minimis modeling levels) agreed to conduct air dispersion modeling for $PM_{2.5}$ with this submittal.

The enclosed October 2017 revision sections (changes from the June 2017 Construction Permit Application are highlighted in yellow) are as follows:

- Revised Summary of Emissions Table 1;
- Revised DHEC BAQ Emissions Form D-2569;
- Revised EA&C I (Crushed Stone Mine and Processing) Text;
- Revised EA&C I (Crushed Stone Mine and Processing) Tables 1, 2, and 3;
- Revised Air Dispersion Modeling Results Text;
- Revised Air Dispersion Modeling Tables 1 and 2; and
- Revised Figure 3 Process Flow Diagram (Material Handling and Storage).

The air dispersion modeling files will be emailed to DHEC BAQ in a separate email. We appreciate your assistance with the construction permit application and the October 2017 revisions. Please call me with any questions.

Thanks,
Matt

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Matthew W. Wike, P.E.
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Table 1
Facility Summary of Emissions
RDA, LLC
Andrews, South Carolina

Emissions Source Description	Uncontrolled PM		Controlled PM[1]		Uncontrolled PM-10		Controlled PM-10[1]		Uncontrolled PM-2.5		Controlled PM-2.5[1]	
	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)
Mining and Material Handling	149.33	654.06	6.81	29.82	43.66	191.25	**2.75**	12.02	6.61	28.96	0.40	1.77
Material Storage	0.63	2.77	0.63	2.77	0.32	1.39	0.32	1.39	0.05	0.20	0.05	0.20
Haul Roads	36.52	159.94	3.65	15.99	10.38	45.48	1.04	4.55	1.04	4.55	0.10	0.45
Customer Roads	19.62	85.92	1.96	8.59	5.79	25.36	0.58	2.54	0.58	2.54	0.06	0.25
Totals	206.09	902.69	13.06	57.18	60.15	263.47	4.68	20.50	8.27	36.24	0.61	2.68

Note:

1. PM emissions do not require modeling. Controlled emissions requiring modeling due to PM-10 emissions over 1.14 lbs/hr are highlighted in bold. All PM-2.5 emissions are below 1.14 lbs/hr and do not require modeling.

Bureau of Air Quality
Construction Permit Application
Emissions

APPLICATION IDENTIFICATION *(Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)*		
Facility Name *(This should be the name used to identify the facility)* RDA, LLC	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)* -	Application Date June 2017 Original Oct. 2017 Revision 1

ATTACHMENTS *(Check all the appropriate checkboxes if included as an attachment)*	
☒ Sample Calculations, Emission Factors Used, etc.	☒ Detailed Explanation of Assumptions, Bottlenecks, etc.
☒ Supporting Information: Manufacturer's Data, etc.	☐ Source Test Information
☒ Details on Limits Being Taken for Limited Emissions	☐ NSR Analysis

SUMMARY OF PROJECTED CHANGE IN FACILITY WIDE POTENTIAL EMISSIONS
(Calculated at maximum design capacity.)

Pollutants	**Emission Rates Prior to Construction / Modification (tons/year)**			**Emission Rates After Construction / Modification (tons/year)**		
	Uncontrolled	**Controlled**	**Limited**	**Uncontrolled**	**Controlled**	**Limited**
Particulate Matter (PM)	Not Applicable			902.69	57.18	<100 tpy
Particulate Matter <10 Microns (PM_{10})				263.47	20.50	<100 tpy
Particulate Matter <2.5 Microns ($PM_{2.5}$)				36.24	2.68	NA
Sulfur Dioxide (SO_2)				Not Applicable		
Nitrogen Oxides (NO_x)						
Carbon Monoxide (CO)						
Volatile Organic Compounds (VOC)						
Lead (Pb)						
Highest HAP Prior to Construction (CAS #: NA)						
Highest HAP After Construction (CAS #: NA)						
Total HAP Emissions*						

Include emissions from exempt equipment and emission increases from process changes that were exempt from construction permits.
(*All HAP emitted from the various equipment or processes must be listed in the appropriate "Potential Emission Rates at Maximum Design Capacity" Table)

POTENTIAL EMISSION RATES AT MAXIMUM DESIGN CAPACITY								
Equipment ID / Process ID	**Emission Point ID**	**Pollutants** (Include CAS #)	**Calculation Methods / Limits Taken / Other Comments**	**Uncontrolled**		**Controlled**		**Limited**	
				lbs/hr	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
See EA&C									

EMISSIONS ASSUMPTIONS AND CALCULATIONS I
CRUSHED STONE MINE AND PROCESSING

RDA, LLC
Andrews, South Carolina

The following emissions assumptions and calculations are presented for emissions from the mining and material handling, transportation, and material storage operations associated with RDA, LLC's (RDA) proposed crushed stone mine and processing facility near Andrews, South Carolina. In addition, emissions from the wind erosion of storage piles are presented in this emission assumptions and calculations. Emission calculations are presented for particulate matter (PM), particulates with an aerodynamic diameter of less than or equal to 10 microns (PM_{10}), and particulates with an aerodynamic diameter of less than or equal to 2.5 microns ($PM_{2.5}$).

1.0 Emission Assumptions

- The facility requests federally enforceable permit conditions limiting the potential to emit of PM to below 100 tons per year.
- Emission sources at the facility can be broken into the following categories:
  - Mining and Material Handling – includes wet drilling and truck loading operations;
  - Material Storage; and
  - Transportation
    - Haul Roads
    - Customer Roads

Mining

- PM, PM_{10}, and $PM_{2.5}$ are the only criteria pollutants emitted from the emission sources of wet drilling (Drill) and truck loading (HaulLoad) of materials in the mine.
- Emissions were calculated assuming 8,760 hours per year.
- Uncontrolled and controlled PM, PM_{10}, and $PM_{2.5}$ emissions from wet drilling and truck loading at the mine are calculated based on the U.S. Environmental Protection Agency (EPA) Compilation of Air Pollutant Emission Factors, AP-42, Section 11.19.2, Table 11.19.2-2, dated August 2004.
- AP-42, Table 11.19.2-2 only provides truck loading emission factors for PM_{10} emissions. PM emissions for the truck loading within the quarry were conservatively assumed to be three times PM_{10} emissions.
- AP-42 Section 11.19.2 does not provide $PM_{2.5}$ emission factors for wet drilling or truck loading. In cases where $PM_{2.5}$ emission factors were not determined, the PM_{10} emission factor was used and adjusted based on the particle size multiplier (0.053 - $PM_{2.5}$/0.35 - PM_{10}) contained in AP-42 Section 13.2.4 for Aggregate Handling and Storage Piles.

Material Handling

- A summary of the material handling and storage related equipment to be installed at RDA is shown below:

Figure 2 ID	Equip ID	Description
1	CR1	Crusher #1 (Primary)
2a	C1a	Conveyor #1a (CR1 to C1b)
2b	C1b	Conveyor #1b (C1a to S1)
3	S1	Screen #1 (Scalping)
4	C2	Conveyor #2 (S1 to C3)
5	C3	Conveyor #3 (C2 to STP1)
6	STP1	Storage Pile #1
7	C4	Conveyor #4 (S1 to STP2)
8	STP2	Storage Pile #2
9	C5	Conveyor #5 (Tunnel, STP2 to C6)
10	C6	Conveyor #6 (C6 to S2)
11	S2	Screen #2 (Secondary)
12	C7	Conveyor #7 (S2 to C8)
13	C8	Conveyor #8 (C7 to STP3)
14	STP3	Storage Pile #3
15	C9	Conveyor #9 (S2 to C10)
16	C10	Conveyor #10 (C9 to STP4)
17	STP4	Storage Pile #4
18	CR2	Crusher #2 (Secondary)
19	C11	Conveyor #11 (CR2 to C12)
20	C12	Conveyor #12 (C11 to S3)
21	S3	Screen #3 (Tertiary)
22	C13	Conveyor #13 (S3 to C14)
23	C14	Conveyor #14 (C13 to STP5)
24	STP5	Storage Pile #5
25	C15	Conveyor #15 (S3 to C16)
26	C16	Conveyor #16 (C15 to STP6)
27	STP6	Storage Pile #6
28	CR3	Crusher #3 (Tertiary)
29	C17	Conveyor #17 (CR3 to C18)
30	C18	Conveyor #18 (C17 to S4)
31	S4	Screen #4 (Fines)
32	C19	Conveyor #19 (S4 to C20)
33	C20	Conveyor #20 (C20 to STP7)
34	STP7	Storage Pile #7

Figure 2 ID	Equip ID	Description
35	C21	Conveyor #21 (S4 to C22)
36	C22	Conveyor #22 (C21 to STP8)
37	STP8	Storage Pile #8
38	C23	Conveyor #23 (S4 to C24)
39	C24	Conveyor #24 (C24 to STP9)
40	STP9	Storage Pile #9

- PM, PM_{10}, and $PM_{2.5}$ are the only criteria pollutants emitted.
- The hourly production rates were provided by RDA. Annual emissions were calculated assuming 8,760 hours per year.
- Uncontrolled and controlled PM, PM_{10}, and $PM_{2.5}$ emissions from material handling are calculated based on the EPA Compilation of Air Pollutant Emission Factors, AP-42, Section 11.19.2, Table 11.19.2-2, dated August 2004. Controlled emissions are based on wet suppression.
- AP-42, Table 11.19.2-2 only provides truck loading emission factors for PM_{10} emissions. PM emissions for the final product truck loading were conservatively assumed to be three times PM_{10} emissions.
- AP-42 Section 11.19.2 only provides $PM_{2.5}$ emission factors for some operations. For other operations, $PM_{2.5}$ emission factors were not determined. In cases where $PM_{2.5}$ emission factors were not determined, the PM_{10} emission factor was used and adjusted based on the particle size multiplier (0.053- $PM_{2.5}$ /0.35- PM_{10}) contained in AP-42 Section 13.2.4 for Aggregate Handling and Storage Piles.
- No PM emissions data was provided in AP-42 for primary or secondary crushing. It was conservatively assumed that primary and secondary crushing emissions were equal to tertiary crushing.

Material Storage

- There will be nine storage piles that will storage various of materials that have been mined, crushed, and screened.
- Emission factors of 3.2 lbs PM per day per acre, 1.6 lbs PM_{10} per day per acre, and 0.23 lbs $PM_{2.5}$ per day per acre were used for storage pile wind erosion calculations. The PM emission factor is based on an equation in the EPA Document 450/2-92-004 “Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures," Equation 2-12. Based on the referenced document, the fraction of PM which is PM_{10} is estimated at 0.5. To obtain the $PM_{2.5}$ emission factors, the PM emission factor

was used and adjusted based on the particle size multiplier (0.053 $PM_{2.5}$ /0.74-PM) contained in AP-42 Section 13.2.4 for Aggregate Handling and Storage Piles.

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

  E = 1.7 x (s/1.5) x [(365-p)/235)] x (f/15)
  Where,
  E = lbs PM per day per acre
  s = 3.9 silt content % (from AP-42 5th Edition Table 13.2.4-1 for various limestone products)
  p = 110 number of days with ≥ 0.01 inches of precipitation per year (from AP-42 Figure 13.2.2-1)
  f = 10 percentage of time that the unobstructed wind speed exceeds 5.4 m/s at the mean pile height (engineering estimate)

- Annual PM, PM_{10}, and $PM_{2.5}$ emissions are calculated assuming 8,760 hours of operation per year.

- Hourly emissions were calculated using 24 hours per day. Annual emissions were calculated using 365 days per year.

<u>Transportation (Haul and Customer Roads)</u>

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

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

  Where:

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

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

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

  W = average weight of vehicles (tons)

  P = number of hours with at least 0.01 inches of precipitation during the averaging period. (Used 2012 Charleston, SC data from weatherunderground.com - Number of days with 0.01 inches of rain: P = 107 days/yr)

- Controlled emissions from the haul roads and customer roads assume a control efficiency of 90% for keeping the roads wet suppressed during transportation activities.

2.0 Emission Calculations

Using the above assumptions and the following equations, PM, PM_{10}, and $PM_{2.5}$ emissions from the mining and material handling equipment are calculated and shown in Tables 1, 2, and 3, respectively. PM, PM_{10}, and $PM_{2.5}$ emissions from wind erosion on the storage piles are calculated and shown in Table 4. PM, PM_{10}, and $PM_{2.5}$ emissions from unpaved roads are calculated and shown in Table 5. The boxed alpha codes in the equations refer to the appropriate columns in the tables.

Tables 1-3 – Material Handling - PM, PM_{10}, and $PM_{2.5}$ Emissions

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

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

$$= \boxed{D}\ \frac{\text{tons uncontrolled emissions}}{\text{year}}$$

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

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

$$= \boxed{G}\ \frac{\text{tons controlled emissions}}{\text{year}}$$

Table 4 – Storage Piles - PM, PM_{10}, and $PM_{2.5}$ Emissions

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

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

Table 5 – Unpaved Roads - PM, PM_{10}, and $PM_{2.5}$ Emissions

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

$Eext = E(365 - P/365)$

Where,

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

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

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

P = hours with 0.01 inches of rain

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

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

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

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

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

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

Table 1
Emission Assumptions and Calculation I: PM Emissions from Drilling and Material Handling
RDA, LLC
Andrews, South Carolina

Emission Source ID	Emissions Source Description	Transfer From	Transfer To	A Design Capacity (tons/hr)	B Uncontrolled PM Emission Factor (lbs/ton)	C Uncontrolled PM Hourly Emissions (lbs/hr)	D Uncontrolled PM Annual Emissions (tpy)	E Controlled PM Emission Factor (lbs/ton)	F Controlled PM Hourly Emissions (lbs/hr)	G Controlled PM Annual Emissions (tpy)
CR1	Crusher No. 1 (Primary)	-	-	500	0.0054	2.70	11.83	0.0012	0.600	2.63
TP1a	Transfer Point No. 1a	CR1 (Figure ID 1)	C1a (Figure ID 2a)	500	0.003	1.50	6.57	0.00014	0.070	0.31
TP1b	Transfer Point No. 1b	C1a (Figure ID 2a)	C1b (Figure ID 2b)	500	0.003	1.50	6.57	0.00014	0.070	0.31
TP2	Transfer Point No. 2	C1b (Figure ID 2b)	S1 (Figure ID 3)	500	0.003	1.50	6.57	0.00014	0.070	0.31
S1	Screening Station #1 (Scalping)	-	-	500	0.025	12.50	54.75	0.0022	1.100	4.82
TP3	Transfer Point No. 3	S1 (Figure ID 3)	C2 (Figure ID 4)	150	0.003	0.45	1.97	0.00014	0.021	0.09
TP4	Transfer Point No. 4	C2 (Figure ID 4)	C3 (Figure ID 5	150	0.003	0.45	1.97	0.00014	0.021	0.09
TP5	Transfer Point No. 5	C3 (Figure ID 5)	STP1 (Figure ID 6)	150	0.003	0.45	1.97	0.00014	0.021	0.09
TP6	Transfer Point No. 6	S1 (Figure ID 3)	C4 (Figure ID 7)	400	0.003	1.20	5.26	0.00014	0.056	0.25
TP7	Transfer Point No. 7	C4 (Figure ID 7)	STP2 (Figure ID 8)	400	0.003	1.20	5.26	0.00014	0.056	0.25
TP8	Transfer Point No. 8	STP2 (Figure 8)	C5 (Figure ID 9)	400	0.003	1.20	5.26	0.00014	0.056	0.25
TP9	Transfer Point No. 9	C5 (Figure ID 9)	C6 (Figure ID 10)	400	0.003	1.20	5.26	0.00014	0.056	0.25
TP10	Transfer Point No. 10	C6 (Figure ID 10)	S2 (Figure ID 11)	400	0.003	1.20	5.26	0.00014	0.056	0.25
S2	Screening Station #2 (Secondary)	-	-	400	0.025	10.00	43.80	0.0022	0.880	3.85
TP11	Transfer Point No. 11	S2 (Figure ID 11)	C7 (Figure ID 12)	50	0.003	0.15	0.66	0.00014	0.007	0.03
TP12	Transfer Point No. 12	C7 (Figure ID 12)	C8 (Figure ID 13)	50	0.003	0.15	0.66	0.00014	0.007	0.03
TP13	Transfer Point No. 13	C8 (Figure ID 13)	STP3 (Figure ID 14)	50	0.003	0.15	0.66	0.00014	0.007	0.03
TP14	Transfer Point No. 14	S2 (Figure ID 11)	C9 (Figure ID 15)	50	0.003	0.15	0.66	0.00014	0.007	0.03
TP15	Transfer Point No. 15	C9 (Figure ID 15)	C10 (Figure ID 16)	50	0.003	0.15	0.66	0.00014	0.007	0.03
TP16	Transfer Point No. 16	C10 (Figure ID 16)	STP4 (Figure ID 17)	50	0.003	0.15	0.66	0.00014	0.007	0.03
CR2	Crusher No. 2 (Secondary)	-	-	400	0.0054	2.16	9.46	0.0012	0.480	2.10
TP17	Transfer Point No. 17	CR2 (Figure ID 18)	C11 (Figure ID 19)	400	0.003	1.20	5.26	0.00014	0.056	0.25
TP18	Transfer Point No. 18	C11 (Figure ID 19)	C12 (Figure ID 20)	400	0.003	1.20	5.26	0.00014	0.056	0.25
TP19	Transfer Point No. 19	C12 (Figure ID 20)	S3 (Figure ID 21)	400	0.003	1.20	5.26	0.00014	0.056	0.25
S3	Screening Station #3 (Tertiary)	-	-	400	0.025	10.00	43.80	0.0022	0.880	3.85
TP20	Transfer Point No. 20	S3 (Figure ID 21)	C13 (Figure ID 22)	75	0.003	0.23	0.99	0.00014	0.011	0.05
TP21	Transfer Point No. 21	C13 (Figure ID 22)	C14 (Figure ID 23)	75	0.003	0.23	0.99	0.00014	0.011	0.05
TP22	Transfer Point No. 22	C14 (Figure ID 23)	STP5 (Figure ID 24)	75	0.003	0.23	0.99	0.00014	0.011	0.05
TP23	Transfer Point No. 23	S3 (Figure ID 21)	C15 (Figure ID 25)	75	0.003	0.23	0.99	0.00014	0.011	0.05
TP24	Transfer Point No. 24	C15 (Figure ID 25)	C16 (Figure ID 26)	75	0.003	0.23	0.99	0.00014	0.011	0.05
TP25	Transfer Point No. 25	C16 (Figure ID 26)	STP6 (Figure 27)	75	0.003	0.23	0.99	0.00014	0.011	0.05
CR3	Crusher No. 3 (Tertiary)	-	-	400	0.0054	2.16	9.46	0.0012	0.480	2.10
TP26	Transfer Point No. 26	CR3 (Figure ID 28)	C17 (Figure ID 29)	290	0.003	0.87	3.81	0.00014	0.041	0.18
TP27	Transfer Point No. 27	C17 (Figure ID 29)	C18 (Figure ID 30)	290	0.003	0.87	3.81	0.00014	0.041	0.18
TP28	Transfer Point No. 28	C18 (Figure ID 30)	S4 (Figure ID 31)	290	0.003	0.87	3.81	0.00014	0.041	0.18
S4	Screening Station #4 (Fines)	-	-	290	0.3	87.00	381.06	0.0036	1.044	4.57
TP29	Transfer Point No. 29	S4 (Figure ID 31)	C19 (Figure ID 32)	90	0.003	0.27	1.18	0.00014	0.013	0.06
TP30	Transfer Point No. 30	C19 (Figure ID 32)	C20 (Figure ID 33)	90	0.003	0.27	1.18	0.00014	0.013	0.06
TP31	Transfer Point No. 31	C20 (Figure ID 33)	STP7 (Figure ID 34)	90	0.003	0.27	1.18	0.00014	0.013	0.06
TP32	Transfer Point No. 32	S4 (Figure ID 31)	C21 (Figure ID 35)	80	0.003	0.24	1.05	0.00014	0.011	0.05
TP33	Transfer Point No. 33	C21 (Figure ID 35)	C22 (Figure ID 35)	80	0.003	0.24	1.05	0.00014	0.011	0.05
TP34	Transfer Point No. 34	C22 (Figure ID 35)	STP8 (Figure ID 36)	80	0.003	0.24	1.05	0.00014	0.011	0.05
TP35	Transfer Point No. 35	S4 (Figure ID 31)	C23 (Figure ID 38)	75	0.003	0.23	0.99	0.00014	0.011	0.05
TP36	Transfer Point No. 36	C23 (Figure ID 38)	C24 (Figure ID 39)	75	0.003	0.23	0.99	0.00014	0.011	0.05
TP37	Transfer Point No. 37	C24 (Figure ID 39)	STP9 (Figure ID 40)	75	0.003	0.23	0.99	0.00014	0.011	0.05
Tload	Final Product Truck Loading	-	-	500	0.0003	0.15	0.66	0.0003	0.150	0.66
Drill	Drilling inside the Quarry	-	-	500	0.0002	0.12	0.53	0.0002	0.120	0.53
HaulLoad	Truck Loading at the Quarry	-	-	500	0.00005	0.02	0.11	0.00005	0.024	0.11
Total	-	-	-	-		**149.33**	**654.06**		**6.81**	**29.82**

Table 2
Emission Assumptions and Calculation: PM-10 Emissions from Drilling and Material Handling
RDA, LLC
Andrews, South Carolina

Emission Source ID	Emissions Source Description	Transfer From	Transfer To	**A** Design Capacity (tons/hr)	**B** Uncontrolled PM_{10} Emission Factor (lbs/ton)	**C** Uncontrolled PM_{10} Hourly Emissions (lbs/hr)	**D** Uncontrolled PM_{10} Annual Emissions (tpy)	**E** Controlled PM_{10} Emission Factor (lbs/ton)	**F** Controlled PM_{10} Hourly Emissions (lbs/hr)	**G** Controlled PM_{10} Annual Emissions (tpy)
CR1	Crusher No. 1 (Primary)	-	-	500	0.0024	1.20	5.26	0.00054	0.270	1.18
TP1a	Transfer Point No. 1a	CR1 (Figure ID 1)	C1a (Figure ID 2a)	500	0.0011	0.55	2.41	0.000046	0.023	0.10
TP1b	Transfer Point No. 1b	C1a (Figure ID 2a)	C1b (Figure ID 2b)	500	0.0011	0.55	2.41	0.000046	0.023	0.10
TP2	Transfer Point No. 2	C1b (Figure ID 2b)	S1 (Figure ID 3)	500	0.0011	0.55	2.41	0.000046	0.023	0.10
S1	Screening Station #1 (Scalping)	-	-	500	0.0087	4.35	19.05	0.00074	0.370	1.62
TP3	Transfer Point No. 3	S1 (Figure ID 3)	C2 (Figure ID 4)	150	0.0011	0.17	0.72	0.000046	0.007	0.03
TP4	Transfer Point No. 4	C2 (Figure ID 4)	C3 (Figure ID 5	150	0.0011	0.17	0.72	0.000046	0.007	0.03
TP5	Transfer Point No. 5	C3 (Figure ID 5)	STP1 (Figure ID 6)	150	0.0011	0.17	0.72	0.000046	0.007	0.03
TP6	Transfer Point No. 6	S1 (Figure ID 3)	C4 (Figure ID 7)	400	0.0011	0.44	1.93	0.000046	0.018	0.08
TP7	Transfer Point No. 7	C4 (Figure ID 7)	STP2 (Figure ID 8)	400	0.0011	0.44	1.93	0.000046	0.018	0.08
TP8	Transfer Point No. 8	STP2 (Figure 8)	C5 (Figure ID 9)	400	0.0011	0.44	1.93	0.000046	0.018	0.08
TP9	Transfer Point No. 9	C5 (Figure ID 9)	C6 (Figure ID 10)	400	0.0011	0.44	1.93	0.000046	0.018	0.08
TP10	Transfer Point No. 10	C6 (Figure ID 10)	S2 (Figure ID 11)	400	0.0011	0.44	1.93	0.000046	0.018	0.08
S2	Screening Station #2 (Secondary)	-	-	400	0.0087	3.48	15.24	0.00074	0.296	1.30
TP11	Transfer Point No. 11	S2 (Figure ID 11)	C7 (Figure ID 12)	50	0.0011	0.06	0.24	0.000046	0.002	0.01
TP12	Transfer Point No. 12	C7 (Figure ID 12)	C8 (Figure ID 13)	50	0.0011	0.06	0.24	0.000046	0.002	0.01
TP13	Transfer Point No. 13	C8 (Figure ID 13)	STP3 (Figure ID 14)	50	0.0011	0.06	0.24	0.000046	0.002	0.01
TP14	Transfer Point No. 14	S2 (Figure ID 11)	C9 (Figure ID 15)	50	0.0011	0.06	0.24	0.000046	0.002	0.01
TP15	Transfer Point No. 15	C9 (Figure ID 15)	C10 (Figure ID 16)	50	0.0011	0.06	0.24	0.000046	0.002	0.01
TP16	Transfer Point No. 16	C10 (Figure ID 16)	STP4 (Figure ID 17)	50	0.0011	0.06	0.24	0.000046	0.002	0.01
CR2	Crusher No. 2 (Secondary)	-	-	400	0.0024	0.96	4.20	0.00054	0.216	0.95
TP17	Transfer Point No. 17	CR2 (Figure ID 18)	C11 (Figure ID 19)	400	0.0011	0.44	1.93	0.000046	0.018	0.08
TP18	Transfer Point No. 18	C11 (Figure ID 19)	C12 (Figure ID 20)	400	0.0011	0.44	1.93	0.000046	0.018	0.08
TP19	Transfer Point No. 19	C12 (Figure ID 20)	S3 (Figure ID 21)	400	0.0011	0.44	1.93	0.000046	0.018	0.08
S3	Screening Station #3 (Tertiary)	-	-	400	0.0087	3.48	15.24	0.00074	0.296	1.30
TP20	Transfer Point No. 20	S3 (Figure ID 21)	C13 (Figure ID 22)	75	0.0011	0.08	0.36	0.000046	0.003	0.02
TP21	Transfer Point No. 21	C13 (Figure ID 22)	C14 (Figure ID 23)	75	0.0011	0.08	0.36	0.000046	0.003	0.02
TP22	Transfer Point No. 22	C14 (Figure ID 23)	STP5 (Figure ID 24)	75	0.0011	0.08	0.36	0.000046	0.003	0.02
TP23	Transfer Point No. 23	S3 (Figure ID 21)	C15 (Figure ID 25)	75	0.0011	0.08	0.36	0.000046	0.003	0.02
TP24	Transfer Point No. 24	C15 (Figure ID 25)	C16 (Figure ID 26)	75	0.0011	0.08	0.36	0.000046	0.003	0.02
TP25	Transfer Point No. 25	C16 (Figure ID 26)	STP6 (Figure 27)	75	0.0011	0.08	0.36	0.000046	0.003	0.02
CR3	Crusher No. 3 (Tertiary)	-	-	400	0.0024	0.96	4.20	0.00054	0.216	0.95
TP26	Transfer Point No. 26	CR3 (Figure ID 28)	C17 (Figure ID 29)	290	0.0011	0.32	1.40	0.000046	0.013	0.06
TP27	Transfer Point No. 27	C17 (Figure ID 29)	C18 (Figure ID 30)	290	0.0011	0.32	1.40	0.000046	0.013	0.06
TP28	Transfer Point No. 28	C18 (Figure ID 30)	S4 (Figure ID 31)	290	0.0011	0.32	1.40	0.000046	0.013	0.06
S4	Screening Station #4 (Fines)	-	-	290	0.072	20.88	91.45	0.0022	0.638	2.79
TP29	Transfer Point No. 29	S4 (Figure ID 31)	C19 (Figure ID 32)	90	0.0011	0.10	0.43	0.000046	0.004	0.02
TP30	Transfer Point No. 30	C19 (Figure ID 32)	C20 (Figure ID 33)	90	0.0011	0.10	0.43	0.000046	0.004	0.02
TP31	Transfer Point No. 31	C20 (Figure ID 33)	STP7 (Figure ID 34)	90	0.0011	0.10	0.43	0.000046	0.004	0.02
TP32	Transfer Point No. 32	S4 (Figure ID 31)	C21 (Figure ID 35)	80	0.0011	0.09	0.39	0.000046	0.004	0.02
TP33	Transfer Point No. 33	C21 (Figure ID 35)	C22 (Figure ID 35)	80	0.0011	0.09	0.39	0.000046	0.004	0.02
TP34	Transfer Point No. 34	C22 (Figure ID 35)	STP8 (Figure ID 36)	80	0.0011	0.09	0.39	0.000046	0.004	0.02
TP35	Transfer Point No. 35	S4 (Figure ID 31)	C23 (Figure ID 38)	75	0.0011	0.08	0.36	0.000046	0.003	0.02
TP36	Transfer Point No. 36	C23 (Figure ID 38)	C24 (Figure ID 39)	75	0.0011	0.08	0.36	0.000046	0.003	0.02
TP37	Transfer Point No. 37	C24 (Figure ID 39)	STP9 (Figure ID 40)	75	0.0011	0.08	0.36	0.000046	0.003	0.02
Tload	Final Product Truck Loading	-	-	500	0.0001	0.05	0.22	0.0001	0.050	0.22
Drill	Drilling inside the Quarry	-	-	500	0.00008	0.04	0.18	0.00008	0.040	0.18
HaulLoad	Truck Loading at the Quarry	-	-	500	0.000016	0.01	0.04	0.000016	0.008	0.04
Total	**-**	**-**	**-**	**-**		**43.66**	**191.25**		**2.75**	**12.02**

Table 3
Emission Assumptions and Calculation I: PM2.5 Emissions from Drilling and Material Handling
RDA, LLC
Andrews, South Carolina

Emission Source ID	Emissions Source Description	Transfer From Equipment ID	Transfer To Equipment ID	A Design Capacity (tons/hr)	B Uncontrolled $PM_{2.5}$ Emission Factor (lbs/ton)	C Uncontrolled $PM_{2.5}$ Hourly Emissions (lbs/hr)	D Uncontrolled $PM_{2.5}$ Annual Emissions (tpy)	E Controlled $PM_{2.5}$ Emission Factor (lbs/ton)	F Controlled $PM_{2.5}$ Hourly Emissions (lbs/hr)	G Controlled $PM_{2.5}$ Annual Emissions (tpy)
CR1	Crusher No. 1 (Primary)	-	-	500	0.00036	0.18	0.80	0.0001	0.050	0.22
TP1a	Transfer Point No. 1a	CR1 (Figure ID 1)	C1a (Figure ID 2a)	500	0.00017	0.08	0.36	0.000013	0.007	0.03
TP1b	Transfer Point No. 1b	C1a (Figure ID 2a)	C1b (Figure ID 2b)	500	0.00017	0.08	0.36	0.000013	0.007	0.03
TP2	Transfer Point No. 2	C1b (Figure ID 2b)	S1 (Figure ID 3)	500	0.00017	0.08	0.36	0.000013	0.007	0.03
S1	Screening Station #1 (Scalping)	-	-	500	0.0013	0.66	2.89	0.00005	0.025	0.11
TP3	Transfer Point No. 3	S1 (Figure ID 3)	C2 (Figure ID 4)	150	0.00017	0.02	0.11	0.000013	0.002	0.01
TP4	Transfer Point No. 4	C2 (Figure ID 4)	C3 (Figure ID 5	150	0.00017	0.02	0.11	0.000013	0.002	0.01
TP5	Transfer Point No. 5	C3 (Figure ID 5)	STP1 (Figure ID 6)	150	0.00017	0.02	0.11	0.000013	0.002	0.01
TP6	Transfer Point No. 6	S1 (Figure ID 3)	C4 (Figure ID 7)	400	0.00017	0.07	0.29	0.000013	0.005	0.02
TP7	Transfer Point No. 7	C4 (Figure ID 7)	STP2 (Figure ID 8)	400	0.00017	0.07	0.29	0.000013	0.005	0.02
TP8	Transfer Point No. 8	STP2 (Figure 8)	C5 (Figure ID 9)	400	0.00017	0.07	0.29	0.000013	0.005	0.02
TP9	Transfer Point No. 9	C5 (Figure ID 9)	C6 (Figure ID 10)	400	0.00017	0.07	0.29	0.000013	0.005	0.02
TP10	Transfer Point No. 10	C6 (Figure ID 10)	S2 (Figure ID 11)	400	0.00017	0.07	0.29	0.000013	0.005	0.02
S2	Screening Station #2 (Secondary)	-	-	400	0.0013	0.53	2.31	0.00005	0.020	0.09
TP11	Transfer Point No. 11	S2 (Figure ID 11)	C7 (Figure ID 12)	50	0.00017	0.01	0.04	0.000013	0.001	0.003
TP12	Transfer Point No. 12	C7 (Figure ID 12)	C8 (Figure ID 13)	50	0.00017	0.01	0.04	0.000013	0.001	0.003
TP13	Transfer Point No. 13	C8 (Figure ID 13)	STP3 (Figure ID 14)	50	0.00017	0.01	0.04	0.000013	0.001	0.003
TP14	Transfer Point No. 14	S2 (Figure ID 11)	C9 (Figure ID 15)	50	0.00017	0.01	0.04	0.000013	0.001	0.003
TP15	Transfer Point No. 15	C9 (Figure ID 15)	C10 (Figure ID 16)	50	0.00017	0.008	0.04	0.000013	0.0007	0.0028
TP16	Transfer Point No. 16	C10 (Figure ID 16)	STP4 (Figure ID 17)	50	0.00017	0.008	0.04	0.000013	0.0007	0.0028
CR2	Crusher No. 2 (Secondary)	-	-	400	0.00036	0.15	0.64	0.0001	0.040	0.18
TP17	Transfer Point No. 17	CR2 (Figure ID 18)	C11 (Figure ID 19)	400	0.00017	0.07	0.29	0.000013	0.005	0.02
TP18	Transfer Point No. 18	C11 (Figure ID 19)	C12 (Figure ID 20)	400	0.00017	0.07	0.29	0.000013	0.005	0.02
TP19	Transfer Point No. 19	C12 (Figure ID 20)	S3 (Figure ID 21)	400	0.00017	0.07	0.29	0.000013	0.005	0.02
S3	Screening Station #3 (Tertiary)	-	-	400	0.00132	0.53	2.31	0.00005	0.020	0.09
TP20	Transfer Point No. 20	S3 (Figure ID 21)	C13 (Figure ID 22)	75	0.00017	0.01	0.05	0.000013	0.001	0.004
TP21	Transfer Point No. 21	C13 (Figure ID 22)	C14 (Figure ID 23)	75	0.00017	0.01	0.05	0.000013	0.001	0.004
TP22	Transfer Point No. 22	C14 (Figure ID 23)	STP5 (Figure ID 24)	75	0.00017	0.012	0.05	0.000013	0.0010	0.0043
TP23	Transfer Point No. 23	S3 (Figure ID 21)	C15 (Figure ID 25)	75	0.00017	0.01	0.05	0.000013	0.001	0.004
TP24	Transfer Point No. 24	C15 (Figure ID 25)	C16 (Figure ID 26)	75	0.00017	0.01	0.05	0.000013	0.001	0.004
TP25	Transfer Point No. 25	C16 (Figure ID 26)	STP6 (Figure 27)	75	0.00017	0.012	0.05	0.000013	0.0010	0.0043
CR3	Crusher No. 3 (Tertiary)	-	-	400	0.00036	0.15	0.64	0.0001	0.040	0.18
TP26	Transfer Point No. 26	CR3 (Figure ID 28)	C17 (Figure ID 29)	290	0.00017	0.048	0.21	0.000013	0.0038	0.0165
TP27	Transfer Point No. 27	C17 (Figure ID 29)	C18 (Figure ID 30)	290	0.00017	0.048	0.21	0.000013	0.0038	0.0165
TP28	Transfer Point No. 28	C18 (Figure ID 30)	S4 (Figure ID 31)	290	0.00017	0.048	0.21	0.000013	0.0038	0.0165
S4	Screening Station #4 (Fines)	-	-	290	0.011	3.16	13.85	0.00033	0.097	0.42
TP29	Transfer Point No. 29	S4 (Figure ID 31)	C19 (Figure ID 32)	90	0.00017	0.01	0.07	0.000013	0.001	0.01
TP30	Transfer Point No. 30	C19 (Figure ID 32)	C20 (Figure ID 33)	90	0.00017	0.01	0.07	0.000013	0.001	0.005
TP31	Transfer Point No. 31	C20 (Figure ID 33)	STP7 (Figure ID 34)	90	0.00017	0.015	0.07	0.000013	0.0012	0.0051
TP32	Transfer Point No. 32	S4 (Figure ID 31)	C21 (Figure ID 35)	80	0.00017	0.01	0.06	0.000013	0.001	0.005
TP33	Transfer Point No. 33	C21 (Figure ID 35)	C22 (Figure ID 35)	80	0.00017	0.01	0.06	0.000013	0.001	0.005
TP34	Transfer Point No. 34	C22 (Figure ID 35)	STP8 (Figure ID 36)	80	0.00017	0.013	0.06	0.000013	0.0010	0.0046
TP35	Transfer Point No. 35	S4 (Figure ID 31)	C23 (Figure ID 38)	75	0.00017	0.01	0.05	0.000013	0.001	0.004
TP36	Transfer Point No. 36	C23 (Figure ID 38)	C24 (Figure ID 39)	75	0.00017	0.01	0.05	0.000013	0.001	0.004
TP37	Transfer Point No. 37	C24 (Figure ID 39)	STP9 (Figure ID 40)	75	0.00017	0.012	0.05	0.000013	0.0010	0.0043
Tload	Final Product Truck Loading	-	-	500	0.000015	0.01	0.03	0.000015	0.008	0.03
Drill	Drilling inside the Quarry	-	-	500	0.000012	0.01	0.03	0.000012	0.006	0.03
HaulLoad	Truck Loading at the Quarry	-	-	500	0.000002	0.00	0.01	0.000002	0.001	0.01
Total	**-**	**-**	**-**	**-**		**6.61**	**28.96**		**0.40**	**1.77**

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

AIR DISPERSION MODELING RESULTS

RDA, LLC
ANDREWS, SOUTH CAROLINA

1.0 INTRODUCTION

RDA, LLC (RDA) proposes to operate a crushed stone mine and processing facility near Andrews, South Carolina. RDA currently has no permit issued by the South Carolina Department of Health and Environmental Control (DHEC) Bureau of Air Quality (BAQ).

An air dispersion modeling demonstration is required for particulates with aerodynamic diameter less or equal to 10 microns (PM_{10}). This air dispersion modeling demonstration was required because PM_{10} emissions from the mining and material handling emission sources are greater than 1.14 pound per hour (lb/hr). Emissions of particulates with aerodynamic diameter less or equal to 2.5 microns ($PM_{2.5}$) from the mining and material handling operations are less than 1.14 lb/hr, and therefore, no modeling is required for $PM_{2.5}$ emissions from the mining and material handling operations. Additionally, modeling for PM_{10} or $PM_{2.5}$ emissions from the material storage, the haul road process, or customer road process is not required since emissions from those processes are less than 1.14 lb/hr. The 1.14 lb/hr PM_{10} and $PM_{2.5}$ de minimis levels are established in the DHEC BAQ Guidance document "Facilities/Sources Exempt or Deferred from Modeling - Standard No. 2 and Standard No. 7." While no modeling is required for $PM_{2.5}$, RDA has voluntarily agreed to conduct air dispersion modeling for $PM_{2.5}$ with this submittal.

This modeling analysis was performed to determine compliance with the South Carolina Ambient Air Quality Standards (R.61-62.5, Standard No. 2). A South Carolina Prevention of Significant Deterioration (PSD) Minor Source Baseline Standard (R.61-62.5, Standard No. 7) modeling demonstration is not required since Williamsburg County does not have a minor source baseline date for PM_{10} or $PM_{2.5}$. Additionally, DHEC BAQ no longer requires a Standard No. 7 modeling demonstration for applications that have not triggered PSD. Lastly, the facility is not expected to emit toxic air pollutants and thus a South Carolina Toxic Air Pollutants Standard (R.61-62.5, Standard No. 8) modeling demonstration is not required.

2.0 AIR DISPERSION MODELING DATA

Modeling was performed using the U.S. Environmental Protection Agency's AERMOD air dispersion model and Florence meteorological data from 2002 through 2006. Cavity concentrations are incorporated into the AERMOD model. All model options were chosen in accordance with the DHEC BAQ document entitled "Air Quality Modeling Guidelines," dated July 2001 and AERMOD guidance from the DHEC BAQ website.

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

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

3.0 AIR DISPERSION MODELING RESULTS

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

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

The South Carolina Ambient Air Quality Standards (SCAAQS - R.61-62.5, Standard No. 2) establish ambient air quality standards for criteria pollutants, including PM_{10}, $PM_{2.5}$, carbon dioxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone, gaseous fluorides as hydrogen fluoride, and lead.

As stated in Section 1.0, PM_{10} was the only criteria pollutant requiring a modeling demonstration to comply with Standard No. 2. While no modeling is required for $PM_{2.5}$, RDA has voluntarily agreed to conduct air dispersion modeling for $PM_{2.5}$ with this submittal. To determine compliance with the SCAAQS, the estimated maximum potential ground-level concentrations of criteria pollutants resulting from site emissions were added to corresponding background concentrations for the criteria pollutants. The resultant total concentrations were then compared to the SCAAQS, as shown in Table 2. The modeling results demonstrate that PM_{10} and $PM_{2.5}$ emissions from RDA will be in compliance with the applicable ambient air quality standards.

The three-year average background concentration data for the criteria pollutants was obtained from the most recent monitoring data provided on the DHEC BAQ website.

Table 1

Summary of Modeled Emission Rates and Volume Source Parameters

RDA, LLC

Andrews, South Carolina

Volume Source ID	Equip ID	Source Description	PM_{10}[1] (lbs/hr)	PM2.5[1] (lbs/hr)	Source Release Height (ft)	Elevated Source Height (ft)	Horizontal Dimension (ft)	Vertical Dimension (ft)	Horizontal Modeling Parameter[2] - σy (ft)	Vertical Modeling Parameter[3] - σz (ft)
V1	CR1	Crusher No. 1 (Primary)	0.270	0.050	12	8	5.98	8	1.39	1.86
V2a	TP1a	Transfer Point No. 1	0.023	0.007	12.5	5	3	15	0.81	3.49
V2b	TP1b	Transfer Point No. 2	0.023	0.007	12.5	5	3	15	0.70	3.49
V3	TP2	Transfer Point No. 2	0.023	0.007	17	15	3	4	0.70	0.93
V4	S1	Screening Station #1 (Scalping)	0.370	0.025	12.5	10	10.4	5	2.42	1.16
V5	TP3	Transfer Point No. 3	0.007	0.002	12.5	10	3	5	0.70	1.16
V6	TP4	Transfer Point No. 4	0.007	0.002	8	6	4	4	0.93	0.93
V7	TP5	Transfer Point No. 5	0.007	0.002	22.5	15	3	15	0.70	3.49
V8	TP6	Transfer Point No. 6	0.018	0.005	6	4	3.5	4	0.81	0.93
V9	TP7	Transfer Point No. 7	0.018	0.005	22.5	15	3.5	15	0.81	3.49
V10	TP8	Transfer Point No. 8	0.018	0.005	6	4	3.5	4	0.81	0.93
V11	TP9	Transfer Point No. 9	0.018	0.005	6	4	3.5	4	0.81	0.93
V12	TP10	Transfer Point No. 10	0.018	0.005	19.25	16.5	3	5.5	0.70	1.28
V13	S2	Screening Station #2 (Secondary)	0.296	0.020	13.25	10	13.6	6.5	3.17	1.51
V14	TP11	Transfer Point No. 11	0.002	0.001	8	6	3	4	0.70	0.93
V15	TP12	Transfer Point No. 12	0.002	0.001	8	6	3	4	0.70	0.93
V16	TP13	Transfer Point No. 13	0.002	0.001	22.5	15	3	15	0.70	3.49
V17	TP14	Transfer Point No. 14	0.002	0.001	6	4	3	4	0.70	0.93
V18	TP15	Transfer Point No. 15	0.002	0.0007	6	4	3.5	4	0.81	0.93
V19	TP16	Transfer Point No. 16	0.002	0.0007	22.5	15	3	15	0.70	3.49
V20	CR2	Crusher No. 2 (Secondary)	0.216	0.040	13	10	5.5	6	1.28	1.40
V21	TP17	Transfer Point No. 17	0.018	0.005	7.5	5	3.5	5	0.81	1.16
V22	TP18	Transfer Point No. 18	0.018	0.005	6	4	3.5	4	0.81	0.93
V23	TP19	Transfer Point No. 19	0.018	0.005	19	16	3	6	0.70	1.40
V24	S3	Screening Station #3 (Tertiary)	0.296	0.020	12.5	10	10.4	5	2.42	1.16
V25	TP20	Transfer Point No. 20	0.003	0.001	8	6	3	4	0.70	0.93
V26	TP21	Transfer Point No. 21	0.003	0.001	6	4	5	4	1.16	0.93
V27	TP22	Transfer Point No. 22	0.003	0.0010	22.5	15	2.5	15	0.58	3.49
V28	TP23	Transfer Point No. 23	0.003	0.001	8	6	5	4	1.16	0.93
V29	TP24	Transfer Point No. 24	0.003	0.001	6	4	5	4	1.16	0.93
V30	TP25	Transfer Point No. 25	0.003	0.0010	22.5	15	2.5	15	0.58	3.49
V31	CR3	Crusher No. 3 (Tertiary)	0.216	0.040	8.5	6	5.5	5	1.28	1.16
V32	TP26	Transfer Point No. 26	0.013	0.0038	7.5	5	3	5	0.70	1.16
V33	TP27	Transfer Point No. 27	0.013	0.0038	6	4	3	4	0.70	0.93
V34	TP28	Transfer Point No. 28	0.013	0.0038	19	16	3	6	0.70	1.40
V35	S4	Screening Station #4 (Fines)	0.638	0.097	12.5	10	11.5	5	2.67	1.16
V36	TP29	Transfer Point No. 29	0.004	0.001	8	6	4	4	0.93	0.93
V37	TP30	Transfer Point No. 30	0.004	0.001	6	4	4	4	0.93	0.93
V38	TP31	Transfer Point No. 31	0.004	0.0012	22.5	15	2.5	15	0.58	3.49
V39	TP32	Transfer Point No. 32	0.004	0.001	6	4	4	4	0.93	0.93
V40	TP33	Transfer Point No. 33	0.004	0.001	6	4	4	4	0.93	0.93
V41	TP34	Transfer Point No. 34	0.004	0.0010	22.5	15	2.5	15	0.58	3.49
V42	TP35	Transfer Point No. 35	0.003	0.001	8	6	4	4	0.93	0.93
V43	TP36	Transfer Point No. 36	0.003	0.001	6	4	4	4	0.93	0.93
V44	TP37	Transfer Point No. 37	0.003	0.0010	22.5	15	2.5	15	0.58	3.49
V45	Tload	Final Product Truck Loading	0.050	0.008	5	0	8	10	1.86	2.33
V46	Drill	Drilling inside the Quarry	0.040	0.006	1.5	0	8	3	1.86	0.70
V47	HaulLoad	Truck Loading at the Quarry	0.008	0.001	5	0	8	10	1.86	2.33

Notes:

1) Facility is not required to model $PM_{2.5}$ emissions since stone processing emissions are below 1.14 lb/hr.

2) Horizontal Modeling Parameter - σy = Horizontal dimension divided by 4.3 for a single volume source.

3) Vertical Modeling Parameter - σz = Vertical dimension divided by 4.3 for all elevated sources at height greater than 0 ft and divided by 2.15 for all sources at ground level.

Table 2

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

RDA, LLC
Andrews, South Carolina

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)[1]	Total Concentration ($\mu g/m^3$)	Allowable Concentration ($\mu g/m^3$)	Site in Compliance
$PM_{2.5}$	24 hour	14.27	18	32.3	35	Yes
	Annual	2.04	8.4	10.4	12	Yes
PM_{10}	24 hour	85.22	49	134.2	150	Yes

Notes:

Background concentrations taken from the DHEC 2011-2013 average monitoring data (PM_{10}) and 2012-2014 average monitoring data for $PM_{2.5}$, gathered from the following sites for each pollutant:

PM_{10} = Jenkins Ave. Fire Station

$PM_{2.5}$ = Charleston FAA Beacon

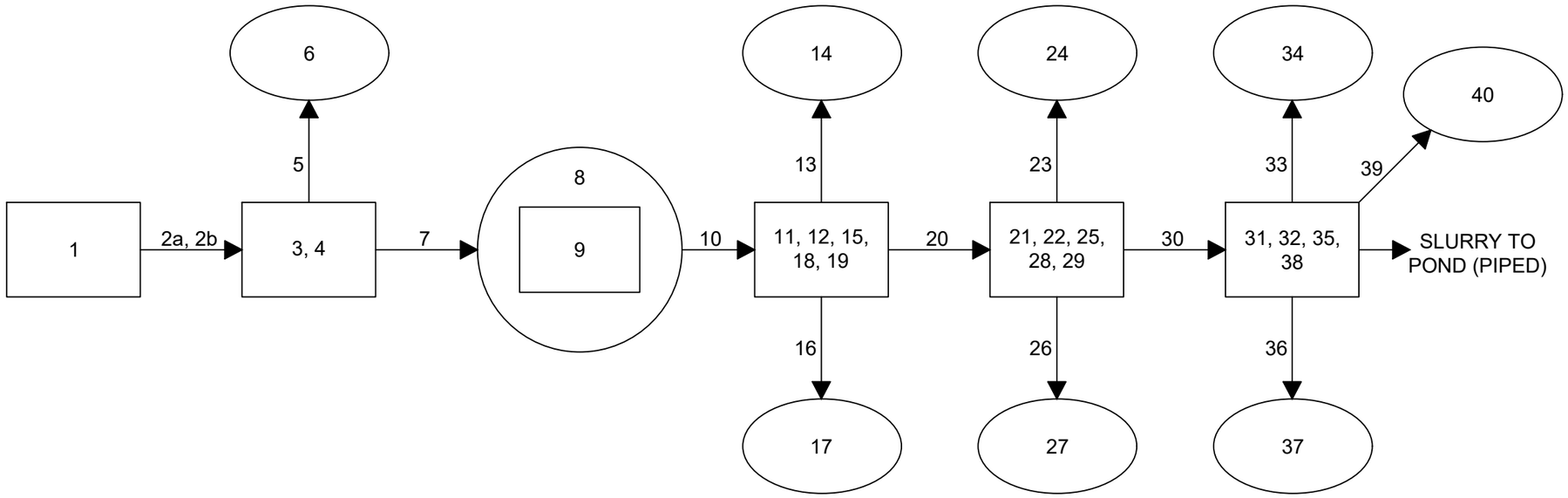

Figure	Equip ID	Description
1	CR1	Crusher #1 (Primary)
2a	C1a	Conveyor #1a (CR1 to C1b)
2b	C1b	Conveyor #1b (C1a to S1)
3	S1	Screen #1 (Scalping)
4	C2	Conveyor #2 (S1 to C3)
5	C3	Conveyor #3 (C2 to STP1)
6	STP1	Storage Pile #1
7	C4	Conveyor #4 (S1 to STP2)
8	STP2	Storage Pile #2
9	C5	Conveyor #5 (Tunnel, STP2 to C6)
10	C6	Conveyor #6 (C6 to S2)
11	S2	Screen #2 (Secondary)
12	C7	Conveyor #7 (S2 to C8)
13	C8	Conveyor #8 (C7 to STP3)
14	STP3	Storage Pile #3
15	C9	Conveyor #9 (S2 to C10)
16	C10	Conveyor #10 (C9 to STP4)
17	STP4	Storage Pile #4
18	CR2	Crusher #2 (Secondary)
19	C11	Conveyor #11 (CR2 to C12)
20	C12	Conveyor #12 (C11 to S3)
21	S3	Screen #3 (Tertiary)
22	C13	Conveyor #13 (S3 to C14)
23	C14	Conveyor #14 (C13 to STP5)
24	STP5	Storage Pile #5
25	C15	Conveyor #15 (S3 to C16)
26	C16	Conveyor #16 (C15 to STP6)
27	STP6	Storage Pile #6
28	CR3	Crusher #3 (Tertiary)
29	C17	Conveyor #17 (CR3 to C18)
30	C18	Conveyor #18 (C17 to S4)
31	S4	Screen #4 (Quaternary)
32	C19	Conveyor #19 (S4 to C20)
33	C20	Conveyor #20 (C20 to STP7)
34	STP7	Storage Pile #7
35	C21	Conveyor #21 (S4 to C22)
36	C22	Conveyor #22 (C21 to STP8)
37	STP8	Storage Pile #8
38	C23	Conveyor #23 (S4 to C24)
39	C24	Conveyor #24 (C24 to STP9)
40	STP9	Storage Pile #9

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RDA, LLC
ANDREWS, SOUTH CAROLINA

PROCESS FLOW DIAGRAM
MATERIAL HANDLING AND STORAGE

FIGURE
3

DATE: October 2017 (revision 1)

DRAWN BY: TJP

APPRV. BY: MWW