



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

JUN 22 2016

Mr. Kerry Bauman
Manager
Base Rock Minerals/Mineral Area Asphalt
6801 Votech Road
Bonne Terre, MO 63628

RE: New Source Review Permit Amendment - Permit Number: 092015-006A
Project Number: 2016-02-010; Installation Number: 187-0072

Dear Mr. Bauman:

After the issuance of Construction Permit 092015-006, it was discovered that a few emission sources associated with the recycled asphalt paving (RAP) crushing and screening processes were accidentally omitted in the permit's calculations. Table 1 summarizes the emission sources associated with the RAP crushing and screening processes.

Table 1: Summary of RAP Crushing and Screening Emission Sources

Emission Point Number	Description
EP-127	RAP Bins
EP-128	Bin Under conveyors
EP-129	RAP Conveyor #1
EP-130	RAP Crusher
EP-131	RAP Screen
EP-132	RAP Conveyor #2

The calculations of Construction Permit 092015-006 included emissions of the RAP crusher but did not include emissions of the remaining RAP emission sources. As a result, Construction Permit 092015-006 is being corrected to include the RAP emission sources that were omitted.

Construction Permit 092015-006 is also being amended to reflect the Air Pollution Control Program's updated construction industry policy for cessation of the use of nomographs to estimate the ambient impact of concrete, rock-crushing and asphalt plants. As a result, the ambient impact of this plant is being converted to a daily production limit.

This permit includes an updated project description for Construction Permit 092015-006 to account for the RAP equipment in Table 1 and the Air Pollution Control Program's new policy.

Construction Permit 092015-006 was issued for the installation of a new stationary asphalt plant at an existing quarry that has a stationary rock-crushing plant and a stationary asphalt plant. The new asphalt plant will be replacing the existing stationary asphalt plant at this site. The new asphalt plant will not be placed in the same physical location as the existing asphalt plant.

The existing rock-crushing plant at this site will supply the aggregate for the asphalt plant. Nothing with the rock-crushing plant is changing at this time. The rock-crushing plant and the asphalt plant are both plants considered one installation and operate under Installation ID Number 187-0072.

The new asphalt plant is a drum mix type plant with a MHDR of 325 tons of asphalt per hour. The plant was manufactured by ALmix circa 1993. Particulate emissions from the drum dryer are controlled by a fabric filter. The dryer is equipped with a 125 MMBtu/hr burner and a 2 MMBtu/hr asphaltic cement (AC) heater. The drum dryer and heater can both be fueled by diesel fuel oil #2 and natural gas. Base Rock Minerals/Mineral Area Asphalt (Base Rock) plans to use natural gas as the primary fuel source and diesel fuel oil #2 as a backup fuel during periods of curtailment or price spikes in natural gas. Since diesel fuel oil #2 has higher potential emissions, diesel fuel oil #2 with a sulfur content of 0.0015% by weight was assumed to be used during the review of this project to calculate the worst case emissions.

Raw materials for making asphalt will consist of limestone rock obtained from the onsite rock-crushing plant, sand, recovered asphalt product (RAP) and AC. There will be an unpaved haul road from the rock-crushing plant to the material storage pile area for the delivery of rock by truck. This haul road is considered a part of the asphalt plant and its emissions will be controlled by BMPs. Sand, RAP and AC will be delivered by truck via a paved haul road connecting the asphalt plant and Votech Road. RAP is typically an old asphalt paving mixture that has been removed from an existing roadway. Other materials that may be used to replace a portion of the aggregate in the paving mixture include shingles or crushed glass. The emission sources for the new asphalt plant (including RAP equipment) are listed below.

Table 2: Summary of Emission Sources

Permit Number	Description	Permit Number	Description
EP-115	Quarry rock haul road	EP-125	Silo loading
EP-116	Sand/RAP/AC haul road	EP-126	Plant load out
EP-117	Rock storage area	EP-127	RAP bins
EP-118	Sand/RAP storage area	EP-128	Bin under conveyors
EP-119	Cold feed bins	EP-129	RAP conveyors #1
EP-120	Bin under conveyors	EP-130	RAP crusher
EP-121	Conveyor	EP-131	RAP screen
EP-122	Scalping screen	EP-132	RAP conveyor #2
EP-123	Conveyor	EP-133	AC tank heater
EP-124	Drum mix asphalt dryer	EP-134	Asphalt haul road

Base Rock plans to discontinue production at the existing stationary asphalt plant once the proposed plant is deemed functional and ready to take over production from the existing plant. Per the application, Base Rock has no intention of operating the new and existing asphalt plants at the same time and would like the existing plant to remain onsite on standby for up to 90 days



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

JUN 22 2016

Mr. Kerry Bauman
 Manager
 Base Rock Minerals/Mineral Area Asphalt
 6801 Votech Road
 Bonne Terre, MO 63628

RE: New Source Review Permit Amendment - Permit Number: 092015-006A
 Project Number: 2016-02-010; Installation Number: 187-0072

Dear Mr. Bauman:

After the issuance of Construction Permit 092015-006, it was discovered that a few emission sources associated with the recycled asphalt paving (RAP) crushing and screening processes were accidentally omitted in the permit's calculations. Table 1 summarizes the emission sources associated with the RAP crushing and screening processes.

Table 1: Summary of RAP Crushing and Screening Emission Sources

Emission Point Number	Description
EP-127	RAP Bins
EP-128	Bin Under conveyors
EP-129	RAP Conveyor #1
EP-130	RAP Crusher
EP-131	RAP Screen
EP-132	RAP Conveyor #2

The calculations of Construction Permit 092015-006 included emissions of the RAP crusher but did not include emissions of the remaining RAP emission sources. As a result, Construction Permit 092015-006 is being corrected to include the RAP emission sources that were omitted.

Construction Permit 092015-006 is also being amended to reflect the Air Pollution Control Program's updated construction industry policy for cessation of the use of nomographs to estimate the ambient impact of concrete, rock-crushing and asphalt plants. As a result, the ambient impact of this plant is being converted to a daily production limit.

This permit includes an updated project description for Construction Permit 092015-006 to account for the RAP equipment in Table 1 and the Air Pollution Control Program's new policy.

Construction Permit 092015-006 was issued for the installation of a new stationary asphalt plant at an existing quarry that has a stationary rock-crushing plant and a stationary asphalt plant. The new asphalt plant will be replacing the existing stationary asphalt plant at this site. The new asphalt plant will not be placed in the same physical location as the existing asphalt plant.

The existing rock-crushing plant at this site will supply the aggregate for the asphalt plant. Nothing with the rock-crushing plant is changing at this time. The rock-crushing plant and the asphalt plant are both plants considered one installation and operate under Installation ID Number 187-0072.

The new asphalt plant is a drum mix type plant with a MHDR of 325 tons of asphalt per hour. The plant was manufactured by ALmix circa 1993. Particulate emissions from the drum dryer are controlled by a fabric filter. The dryer is equipped with a 125 MMBtu/hr burner and a 2 MMBtu/hr asphaltic cement (AC) heater. The drum dryer and heater can both be fueled by diesel fuel oil #2 and natural gas. Base Rock Minerals/Mineral Area Asphalt (Base Rock) plans to use natural gas as the primary fuel source and diesel fuel oil #2 as a backup fuel during periods of curtailment or price spikes in natural gas. Since diesel fuel oil #2 has higher potential emissions, diesel fuel oil #2 with a sulfur content of 0.0015% by weight was assumed to be used during the review of this project to calculate the worst case emissions.

Raw materials for making asphalt will consist of limestone rock obtained from the onsite rock-crushing plant, sand, recovered asphalt product (RAP) and AC. There will be an unpaved haul road from the rock-crushing plant to the material storage pile area for the delivery of rock by truck. This haul road is considered a part of the asphalt plant and its emissions will be controlled by BMPs. Sand, RAP and AC will be delivered by truck via a paved haul road connecting the asphalt plant and Votech Road. RAP is typically an old asphalt paving mixture that has been removed from an existing roadway. Other materials that may be used to replace a portion of the aggregate in the paving mixture include shingles or crushed glass. The emission sources for the new asphalt plant (including RAP equipment) are listed below.

Table 2: Summary of Emission Sources

Permit Number	Description	Permit Number	Description
EP-115	Quarry rock haul road	EP-125	Silo loading
EP-116	Sand/RAP/AC haul road	EP-126	Plant load out
EP-117	Rock storage area	EP-127	RAP bins
EP-118	Sand/RAP storage area	EP-128	Bin under conveyors
EP-119	Cold feed bins	EP-129	RAP conveyors #1
EP-120	Bin under conveyors	EP-130	RAP crusher
EP-121	Conveyor	EP-131	RAP screen
EP-122	Scalping screen	EP-132	RAP conveyor #2
EP-123	Conveyor	EP-133	AC tank heater
EP-124	Drum mix asphalt dryer	EP-134	Asphalt haul road

Base Rock plans to discontinue production at the existing stationary asphalt plant once the proposed plant is deemed functional and ready to take over production from the existing plant. Per the application, Base Rock has no intention of operating the new and existing asphalt plants at the same time and would like the existing plant to remain onsite on standby for up to 90 days

in case of operational difficulties with the proposed plant. This request is hereby granted as long as Base Rock only operates one asphalt plant at a time.

This installation is located in St. Francois County, attainment status. This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. Hot mix asphalt plants fall under Category 27. Fugitive emissions are counted toward major source applicability. However, Category 27 does not apply to the 100 tons per year major source level thresholds for construction permits. Therefore, the major source threshold for this asphalt plant is 250 tons per year.

The table below summarizes the updated emissions of the new asphalt plant with the RAP equipment. The potential emissions of the process equipment exclude emissions from haul roads and wind erosion. The existing actual emissions were taken from the previous year's EIQ and include emissions from the existing asphalt and rock-crushing plants. The potential emissions of the asphalt plant represent the emissions of all equipment and activities assuming continuous operation (8760 hours per year). The conditioned potential emissions of the asphalt plant are based on a voluntary 10.0 ton PM_{2.5} limit to avoid modeling requirements.

Table 3: Emissions Summary (tons per year)

Air Pollutant	De Minimis Level/ SMAL	^a Potential Emissions of the Process Equipment for Asphalt Plant	Existing Actual Emissions (2015 EIQ)	^b Potential Emissions of the Asphalt Plant	Conditioned Potential Emissions of Asphalt Plant
PM	25.0	52.49	N/D	122.95	28.39
PM ₁₀	15.0	35.71	6.62	60.60	13.99
PM _{2.5}	10.0	33.13	1.10	43.32	< 10.00
SO _x	40.0	0.95	0.16	0.95	0.22
NO _x	40.0	96.49	0.33	96.49	22.28
VOC	40.0	68.49	0.33	68.49	15.81
CO	100.0	23.75	1.35	23.75	5.48
Formaldehyde	10.0/2.0 ^c	4.54	N/D	4.54	1.05
2-methylnaphthalene _d	10.0/0.01 ^c	0.24	N/D	0.24	0.06
Lead Compounds	10.0/0.01 ^c	0.02	N/D	0.02	0.005
Total HAPs	25.0	12.78	N/D	12.78	2.95

N/A = Not Applicable; N/D = Not Determined

^a Excludes emissions from haul roads and storage pile emissions

^b Includes haul road and storage pile emissions

^c SMAL

^d 2-methylnaphthalene is a member of the Polycyclic Organic Matter (POM) HAP group.

Emissions for the project were calculated using emission factors found in the United States EPA document AP-42 *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition (AP-42).

Emissions from the drum mix asphalt plant were calculated using emission factors from AP-42 Section 11.1 "Hot Mix Asphalt Plants," April 2004. SO_x emissions were calculated using the SO₂ and SO₃ emission factors from AP-42 Section 1.3 "Fuel Oil Combustion," September 1998 and assuming half of the sulfur up to 0.1 pound per ton of product is absorbed into the product. The asphalt plant is controlled by a baghouse, so the fabric filter controlled emission factor was used to calculate PM₁₀ emissions. Emissions from plant load-out were calculated using predictive equations found in AP-42 Table 11.1-14. Default values were used for asphalt volatility and mix temperature. Emissions from the asphalt heater were calculated using emission factors from AP-42 Section 1.3. Emissions from aggregate handling were calculated using emission factors from AP-42 Section 11.19.2 "Crushed Stone Processing and Pulverized Mineral Processing," August 2004. The controlled emission factors were used because the inherent moisture content of the crushed rock is equal to or greater than 1.5% by weight.

Emissions from the RAP equipment were calculated using emission factors from AP-42 Section 11.19.2 "Crushed Stone Processing and Pulverized Mineral Processing," August 2004. The controlled emission factors were used because the oil in the RAP will have similar benefits as a dust suppressant.

Emissions from haul roads and vehicular activity areas for the asphalt plant were calculated using the predictive equation from AP-42 Section 13.2.2 "Unpaved Roads," November 2006. A 90% control efficiency for PM and PM₁₀ and a 40% control efficiency for PM_{2.5} were applied to the emission calculations for the use of BMPs. Emissions from load-in and load-out of storage piles were calculated using the predictive equation from AP-42 Section 13.2.4. The moisture content of the aggregate is 1.5% by weight. Emissions from wind erosion of storage piles were calculated using an equation found in the Air Pollution Control Program's Emissions Inventory Questionnaire Form 2.8 "Storage Pile Worksheet."

Base Rock is permitted to operate with other plants located at the site as long as the following scenarios are maintained. These scenarios are also summarized in the table below.

- During solitary and concurrent operations, the asphalt plant will track PM_{2.5} emissions using Attachment A. As a result, a daily production limit is not required for the asphalt plant.
- When the rock-crushing plant operates by itself (referred to as solitary operation), it may produce up to 9,157 tons of rock per day. When the rock-crushing plant operates with the stationary asphalt owned by Base Rock (referred to as same owner operation), it may produce up to 7,531 tons of rock per day. When the rock-crushing plant operates with a plant not owned by Base Rock (referred to as separate owner operation), it may produce up to 5,064 tons of rock per day.

Table 4: Summary of Daily Production Limits

Type of Operation	Daily Production Limit	
	Asphalt Plant	Rock-crushing Plant
^a Solitary	N/A	9,157 tons per day
^b Same	N/A	7,531 tons per day
^c Separate	N/A	5,064 tons per day

^a Operation without other plants

^b Operation with other plants that are owned by Base Rock Minerals/Mineral Area Asphalt

^c Operation with plants that are not owned by Base Rock Minerals/Mineral Area Asphalt

Because the 2-methylnaphthalene conditioned emissions exceed the SMAL of 0.01 tons per year, these emissions were modeled and compared to the RAL. The maximum ambient impact of 2-methylnaphthalene was less than the 0.23 $\mu\text{g}/\text{m}^3$ 24-hour RAL and the 2.3 $\mu\text{g}/\text{m}^3$ annual RAL. This ambient air quality impact analysis is summarized below.

Table 5: Ambient Air Quality Impact Analysis

Pollutant	RAL ($\mu\text{g}/\text{m}^3$)	Averaging Time	Maximum Ambient Impact ($\mu\text{g}/\text{m}^3$)
2-methylnaphthalene	23.0	24-hour	0.13
2-methylnaphthalene	2.3	Annual	0.021

The plant's drum dryer (EP-124) was modeled using the AERSCREEN screen modeling software. The stack characteristic entered into the modeled are listed below.

Table 6: AERSCREEN Input Parameters

Equipment Description	Stack Height (m)	Stack Inside Diameter (m)	Stack Gas Exit Velocity (m/s)	Stack Gas Exit Temperature (K)	Dispersion Coefficient
Drum Dryer	12.8	1.2	19.6	393.7	Rural

Enclosed with this letter are special conditions for the rock-crushing plant and asphalt plant. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified

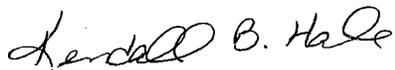
Mr. Kenny Bauman
Page Six

mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.aa.mo.gov/ahc.

If you have any questions regarding this permit, please do not hesitate to contact Daronn A. Williams, at the department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



Kendall B. Hale
Permits Section Chief

KBH:dwj

Enclosures

c: Southeast Regional Office
PAMS File: 2016-02-010

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

1. Superseding Condition

The conditions of this permit supersede special conditions 2, 3 and 6 found in the previously issued construction permit, Construction Permit 092015-006, which was issued by the Air Pollution Control Program.

2. Annual Emission Limit For Asphalt Plant

- A. Base Rock Minerals/Mineral Area Asphalt shall emit less than 10.0 tons of PM_{2.5} in any 12-month period from the stationary asphalt plant and its associated equipment and haul roads.
- B. Base Rock Minerals/Mineral Area Asphalt shall demonstrate compliance with Special Condition 2.A using Attachment A or another equivalent form that has been approved by the Air Pollution Control Program, including an electronic form.

3. Daily Production Limit For Rock-Crushing Plant

- A. Base Rock's stationary rock-crushing plant shall limit its daily production based on the table below using Attachment B, or another equivalent form, that has been approved by the Air Pollution Control Program, including electronic forms.

Table 7: Summary of Daily Production Limits For Rock-Crushing Plant

Type of Operation	Daily Production Limit
^a Solitary	9,157 tons per day
^b Same	7,531 tons per day
^c Separate	5,064 tons per day

^a Operation without other plants

^b Operation with other plants that are owned by Base Rock Minerals/Mineral Area Asphalt

^c Operation with plants that are not owned by Base Rock Minerals/Mineral Area Asphalt

4. Record Keeping Requirement

Base Rock Minerals/Mineral Area Asphalt shall maintain all records required by this permit for not less than five years and make them available to any Missouri Department of Natural Resources' personnel upon request.

Page No.	8
Permit No.	092015-006A
Project No.	2016-02-010

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

5. Reporting Requirement

Base Rock Minerals/Mineral Area Asphalt shall report to the Air Pollution Control Program, Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 days after any exceedances of the limitations imposed by this permit.

APPENDIX A

Abbreviations and Acronyms

%	percent	Mgal	1,000 gallons
°F	degrees Fahrenheit	MW	megawatt
acfm	actual cubic feet per minute	MHDR	maximum hourly design rate
BACT	Best Available Control Technology	MMBtu	Million British thermal units
BMPs	Best Management Practices	MMCF	million cubic feet
Btu	British thermal unit	MSDS	Material Safety Data Sheet
CAM	Compliance Assurance Monitoring	NAAQS	National Ambient Air Quality Standards
CAS	Chemical Abstracts Service	NESHAPs ...	National Emissions Standards for Hazardous Air Pollutants
CEMS	Continuous Emission Monitor System	NO_x	nitrogen oxides
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	carbon monoxide	NSR	New Source Review
CO₂	carbon dioxide	PM	particulate matter
CO₂e	carbon dioxide equivalent	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
COMS	Continuous Opacity Monitoring System	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
CSR	Code of State Regulations	ppm	parts per million
dscf	dry standard cubic feet	PSD	Prevention of Significant Deterioration
EIQ	Emission Inventory Questionnaire	PTE	potential to emit
EP	Emission Point	RACT	Reasonable Available Control Technology
EPA	Environmental Protection Agency	RAL	Risk Assessment Level
EU	Emission Unit	SCC	Source Classification Code
fps	feet per second	scfm	standard cubic feet per minute
ft	feet	SDS	Safety Data Sheet
GACT	Generally Available Control Technology	SIC	Standard Industrial Classification
GHG	Greenhouse Gas	SIP	State Implementation Plan
gpm	gallons per minute	SMAL	Screening Model Action Levels
gr	grains	SO_x	sulfur oxides
GWP	Global Warming Potential	SO₂	sulfur dioxide
HAP	Hazardous Air Pollutant	tph	tons per hour
hr	hour	tpy	tons per year
hp	horsepower	VMT	vehicle miles traveled
lb	pound	VOC	Volatile Organic Compound
lbs/hr	pounds per hour		
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		
m/s	meters per second		