

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
1520 East Sixth Avenue
P.O. Box 200901
Helena, Montana 59620-0901
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued For: Granite Concrete Company, Inc.

Permit Number: #3020-01

Preliminary Determination Issued: 04/05/06

Department Decision Issued: 04/21/06

Permit Final:

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LEGISLATIVE ENVIRONMENTAL
POLICY OFFICE

1. *Legal Description of Site:* Granite operates a portable truck mix concrete batch plant and a portable crushing/screening facility. However, Permit #3020-01 would apply while operating at any location in Montana, except within those areas having a Department-approved permitting program or those areas considered tribal lands. *A Missoula County air quality permit will be required for locations within Missoula County, Montana.* Addendum #2 applies to the Granite facility while operating at any location in or within 10 km of certain PM₁₀ nonattainment areas during the summer months (April 1 – September 30) and at sites approved by the Department during the winter months (October 1 – March 31), including the initial site location, the E ½ of the SW ¼ of Section 14, Township 30 North, Range 31 West, in Lincoln County, Montana.
2. *Description of Project:* Granite owns and operates a portable truck mix concrete batch plant, which includes an electric powered 2006 Erie Strayer Silo and Batcher (maximum capacity of 150 cubic yards per hour (yd³/hr)), an electric powered 2006 Erie Strayer Tilt Mixer, an electric powered 2006 Erie Strayer Bin and Batcher, and associated equipment. A fabric filter dust collector controls particulate emissions from the cement silo. A rubber boot load-out spout controls particulate emissions from the cement batcher.

Granite also owns and operates a portable crushing/screening facility, which includes a 1945 Cedar Rapids Jaw Crusher (up to 71 tons per hour (TPH)), a 1958 Cone Crusher (up to 71 TPH), a 1996 2-deck screen (up to 71 TPH), and associated equipment.

3. *Objectives of Project:* Granite, in an effort to increase business and revenue for the company through the construction of the proposed truck mix concrete batch plant and associated equipment, submitted a complete permit application for the proposed equipment. The concrete batch plant would be used to supply wet mix concrete for sale and use in various construction operations. In addition to operating a concrete batch plant, the object of the project would be to produce business and revenue for the company through the sale and use of aggregate.
4. *Additional Project Site Information:* In many cases, this truck mix concrete batch plant operation and crushing/screening operation may move to a general site location or open cut pit, which has been previously permitted through the Industrial and Energy Minerals Bureau (IEMB). If this were the case, additional information for the site would be found in the Mined Land Reclamation Permit for that specific site.

5. *Alternatives Considered:* In addition to the proposed action, the Department considered the "no-action" alternative. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because Granite demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.
6. *A Listing of Mitigation, Stipulations, and Other Controls:* A listing of the enforceable permit conditions and a permit analysis, including a BACT analysis, would be contained in Permit #3020-01.
7. *Regulatory Effects on Private Property Rights:* The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined the permit conditions would be reasonably necessary to ensure compliance with applicable requirements and to demonstrate compliance with those requirements and would not unduly restrict private property rights.
8. *The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no action alternative" was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A.	Terrestrial and Aquatic Life and Habitats			X			yes
B.	Water Quality, Quantity, and Distribution			X			yes
C.	Geology and Soil Quality, Stability, and Moisture			X			yes
D.	Vegetation Cover, Quantity, and Quality			X			yes
E.	Aesthetics			X			yes
F.	Air Quality			X			yes
G.	Unique Endangered, Fragile, or Limited Environmental Resource			X			yes
H.	Demands on Environmental Resource of Water, Air, and Energy			X			yes
I.	Historical and Archaeological Sites				X		yes
J.	Cumulative and Secondary Impacts			X			yes

Summary of Comments on Potential Physical and Biological Effects: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

Terrestrials would use the same area as the truck mix concrete batch plant operation and aggregate crushing/screening operations. Impacts on terrestrial and aquatic life could result from storm water runoff and pollutant deposition, but such impacts would be minor, because the crushing/screening operations would be considered a minor source of emissions and would have intermittent and seasonal operations. Furthermore, the air emissions would have only minor effects on terrestrial and aquatic life because facility emissions would be well dispersed in the area of operations (see Section 8.F of this EA). Also, the Flathead River is approximately one mile away from the proposed operational site and, at such a distance, only minor and temporary effects to terrestrial and aquatic life and habitat would be expected from the proposed crushing/screening

operation because only minor amounts of pollutants would reach the water body. Therefore, only minor and temporary effects to terrestrial and aquatic life and habitat would be expected from the proposed truck mix concrete batch plant operation and crushing/screening operation.

B. Water Quality, Quantity, and Distribution

Water would be required for dust suppression on the surrounding roadways and areas of operation and for pollution control for equipment operations. Water use would cause only minor, if any, impacts to water resources in these areas because the facility has readily available water resources and would be far enough away from those resources that any pollutant deposition would be dispersed before reaching the surface water resources. The facility would only require a relatively small amount of water for pollution control and would only have minor amounts of pollutant deposition (see Section 8.F of this EA). Therefore, at most, only minor surface and groundwater quality impacts would be expected.

C. Geology and Soil Quality, Stability, and Moisture

The truck mix concrete batch plant operation and crushing/screening operations would have only minor impacts on geology and soil quality, stability, and moisture because deposition of air pollutants on soils would be minor (see Section 8.F of this EA), only minor amounts of water would be required to be used for pollution control, and only minor amounts of pollution would be generated. Also, this facility does not mine material at the current site. In addition, the pollutants would be widely dispersed before settling upon vegetation and surrounding soils (see Section 8.D of this EA). Therefore, any effects upon geology and soil quality, stability, and moisture at this proposed operational site would be minor.

D. Vegetation Cover, Quantity, and Quality

Minor impacts would occur on vegetative cover, quality, and quantity because the facility does not mine material at the current site. Pollutants would be greatly dispersed and corresponding deposition on vegetation from the proposed project would be minor (see Section 8.F of this EA). Also, water would be used for pollution control, as necessary.

E. Aesthetics

The truck mix concrete batch plant operation and crushing/screening operation would be visible and would create additional noise while operating at the initially proposed site. However, Permit #3020-01 would include conditions to control emissions, including visible emissions, from the plant. Also, permit limitations and conditions from Addendum #2 would apply when the facility is operating in nonattainment areas. Since the truck mix concrete batch plant operation and crushing/screening operation would be portable and would operate on an intermittent and seasonal basis, any visual aesthetic impacts would be minor and short-lived.

F. Air Quality

Air quality impacts from the proposed project would be minor because the facility would operate on an intermittent and temporary basis, and would originally locate at a previously disturbed site. Permit #3020-01 would include conditions limiting the facility's opacity and the facility's truck mix concrete batch plant operation and crushing/screening production. Permit #3020-01 would also require water and water spray bars be available on site and used to control emissions. Permit #3020-01 would also limit total emissions from the truck mix concrete batch plant operation and crushing/screening facility and any additional Granite equipment operated at the site to 250 tons/year or less, excluding fugitive emissions. Additionally, Addendum #2 would apply while the facility is operating in or within 10 km of a certain PM₁₀ nonattainment areas and would impose more stringent requirements for operations within those areas.

Further, the Department determined that the truck mix concrete batch plant operation and crushing/screening facility would be a minor source of emissions as defined under the Title V Operating Permit Program because the source's PTE was limited below the major source threshold level of 100 tons per year for any regulated pollutant. Pollutant deposition from the facility would be minimal because the pollutants emitted would be widely dispersed (from factors such as wind speed and wind direction) and would have minimal deposition on the surrounding area (due to site topography of the area and minimal vegetative cover in the area). Therefore, air quality impacts from operating the truck mix concrete batch plant operation and crushing/screening equipment in this area would be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

The truck mix concrete batch plant operation and crushing/screening operation will have only minor impacts to unique, endangered, fragile, or limited environmental resources because this facility does not mine material at the current site, is small by industry standards, and operates on relatively small portions of land.

H. Demands on Environmental Resources of Water, Air, and Energy

Due to the relatively small size of the facility, the truck mix concrete batch plant operation and crushing/screening operation would only require small quantities of water, air, and energy for proper operation. Only small quantities of water would be required for dust suppression of emissions being generated at the site. In addition, impacts to air resources would be minor because the source is a minor industrial source of emissions, with intermittent and seasonal operations, and because air pollutants generated by the facility would be widely dispersed (see Section 8.F of this EA). Energy requirements would be provided by electrical power. Overall, any impacts to water, air, and energy resources would be minor.

I. Historical and Archaeological Sites

The Department previously contacted the Montana Historical Society - State Historical Preservation Office (SHPO) in an effort to identify any historical and/or archaeological sites that may be present in the proposed area of construction/operation. Search results concluded that there are no previously recorded historical or archaeological resources of concern within the area proposed for initial operations. According to past correspondence from the Montana State Historic Preservation Office, there would be a low likelihood of adverse disturbance to any known archaeological or historic site given previous industrial disturbance to an area. Therefore, no impacts upon historical or archaeological sites would be expected as a result of operating the proposed truck mix concrete batch plant operation and crushing/screening operation.

J. Cumulative and Secondary Impacts

The truck mix concrete batch plant operation and crushing/screening operation would cause minor cumulative and secondary impacts to the physical and biological aspects of the human environment because the facility would be limited in the amount of PM, PM₁₀, NO_x, VOC, CO, and SO_x emissions to be generated. Emissions and noise generated from the equipment would, at most, result in only minor impacts to the area of operations because of the proposed equipment location for the crushing/screening plant and because it would be seasonal and temporary in nature. The proposed operational site is estimated to be 150 yards away from any home or structure and is 1.5 miles from the city of Libby. Additionally, this facility, in combination with other emissions from equipment operations would not be permitted to exceed 250 tons per year of non-fugitive emissions. Overall, cumulative and secondary impacts to the physical and biological aspects of the human environment would be minor.

9. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no action alternative" was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A.	Social Structures and Mores				X		yes
B.	Cultural Uniqueness and Diversity				X		yes
C.	Local and State Tax Base and Tax Revenue			X			yes
D.	Agricultural or Industrial Production			X			yes
E.	Human Health			X			yes
F.	Access to and Quality of Recreational and Wilderness Activities			X			yes
G.	Quantity and Distribution of Employment				X		yes
H.	Distribution of Population				X		yes
I.	Demands for Government Services			X			yes
J.	Industrial and Commercial Activity			X			yes
K.	Locally Adopted Environmental Plans and Goals			X			yes
L.	Cumulative and Secondary Impacts			X			yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores

The truck mix concrete batch plant operation and crushing/screening operation would cause no disruption to the social structures and mores in the area because the source would be a minor industrial source of emissions, would be separated from the general population, and would only have temporary and intermittent operations. Further, the facility would be required to operate according to the conditions that would be placed in Permit #3020-01 and Addendum #2, which would limit the effects to social structures and mores.

B. Cultural Uniqueness and Diversity

The cultural uniqueness and diversity of this area would not be impacted by the proposed truck mix concrete batch plant operation and crushing/screening operation because the proposed site is separated from the general population, and the facility would be a portable source, with seasonal and intermittent operations. The predominant use of the surrounding area is rural and would not change as a result of this truck mix concrete batch plant operation and crushing/screening operation. Therefore, the cultural uniqueness and diversity of the area would not be affected.

C. Local and State Tax Base and Tax Revenue

The truck mix concrete batch plant operation and crushing/screening operations would have little, if any, impact on the local and state tax base and tax revenue because the facility would be a minor industrial source of emissions and would have seasonal and intermittent operations. The facility would require the use of 13 employees. Thus, only minor impacts to the local and state tax base and revenue could be expected from the employees and facility production. Furthermore, the impacts to local tax base and revenue would be minor because the source would be portable and the money generated for taxes would be widespread.

D. Agricultural or Industrial Production

The truck mix concrete batch plant operation and crushing/screening operations would have only a minor impact on local industrial production since the facility would be a minor source of concrete and aggregate production and air emissions. Also, the facility would locate in a rural area. Therefore, because minimal deposition of air pollutants would occur on the surrounding land (see Section 8.F of this EA), only minor and temporary effects on the surrounding vegetation (i.e. agricultural production) would occur. In addition, the facility operations would be temporary in nature and would be permitted with operational conditions and limitations that would minimize impacts upon surrounding vegetation (see Section 8.D of this EA).

E. Human Health

Permit #3020-01 would incorporate conditions to ensure that the truck mix concrete batch plant operation and crushing/screening operations would be operated in compliance with all applicable air quality rules and standards. These rules and standards are designed to be protective of human health. As described in Section 8.F. of this EA, the air emissions from this facility would be minimized by the use of water spray and other process limits that would be required by Permit #3020-01. Also, the facility would be operating on a temporary basis and pollutants would be dispersed (see Section 8.F of this EA). Therefore, only minor impacts would be expected on human health from the proposed truck mix concrete batch plant operation and crushing/screening operations.

F. Access to and Quality of Recreational and Wilderness Activities

Noise from the facility would be minor because the facility would be small and would operate in an area removed from the general population. As a result, the amount of noise generated from the truck mix concrete batch plant operation and crushing/screening operations would be minimal. Also, the facility would operate on a seasonal and intermittent basis on private land and would be a relatively minor industrial source of emissions. Therefore, any changes in the quality of recreational and wilderness activities created by operating the equipment at this site would be expected to be minor and intermittent.

G. Quantity and Distribution of Employment

The truck mix concrete batch plant operation and crushing/screening operations would require 13 employees to operate and would have seasonal and intermittent operations. No individuals would be expected to permanently relocate to this area of operation as a result of operating the truck mix concrete batch plant operation and crushing/screening operations. Therefore, no effects upon the quantity and distribution of employment in this area would be expected.

H. Distribution of Population

The portable truck mix concrete batch plant operation and crushing/screening operation is a portable industrial facility that would only require 13 existing employees to operate. No individuals would be expected to permanently relocate to this area of operation as a result of operating the truck mix concrete batch plant operation and crushing/screening operations. Therefore, the truck mix concrete batch plant operation and crushing/screening operations would not impact the normal population distribution in the initial area of operation or any future operating site.

I. Demands of Government Services

Minor increases would be seen in traffic on existing roadways in the area while the truck mix concrete batch plant operation and crushing/screening operation is in progress. In addition, government services would be required for acquiring the appropriate permits for the proposed project and to verify compliance with the permits that would be issued. Demands for government services would be minor.

J. Industrial and Commercial Activity

The truck mix concrete batch plant operation and crushing/screening operation would represent only a minor increase in the industrial activity in the proposed area of operation because the source would be a relatively small industrial source that would be portable and temporary in nature. No additional industrial or commercial activity would be expected as a result of the proposed operation.

K. Locally Adopted Environmental Plans and Goals

Granite would be allowed, by Permit #3020-01 to operate in areas designated by EPA as attainment or unclassified for ambient air quality. Addendum #2 to Permit #3020-01 would allow for summertime operations (April 1- September 30) in or within 10 km of certain PM₁₀ nonattainment areas. Permit #3020-01 would contain limits for protecting air quality and to keep facility emissions in compliance with any applicable ambient air quality standards, as a locally adopted environmental plan or goal for operating at this proposed site. Because the facility would be a portable source and would have intermittent and seasonal operations, any impacts from the facility would be minor and short-lived.

L. Cumulative and Secondary Impacts

The truck mix concrete batch plant operation and crushing/screening operations would cause minor cumulative and secondary impacts to the social and economic aspects of the human environment in the immediate area of operation because the source would be a portable and temporary source. Further, no other industrial operations are expected to result from the permitting of this facility. Minor increases in traffic would have minor effects on local traffic in the immediate area. Because the source is relatively small and temporary, only minor economic impacts to the local economy would be expected from operating the facility. Further, this facility may be operated in conjunction with other equipment owned and operated by Granite, but any cumulative impacts upon the social and economic aspects of the human environment would be minor and short-lived. Thus, only minor and temporary cumulative effects would result to the local economy.

Recommendation: An EIS is not required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: All potential effects resulting from construction and operation of the proposed facility are minor; therefore, an EIS is not required.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Department of Environmental Quality - Permitting and Compliance Division (Industrial and Energy Minerals Bureau); Montana Natural Heritage Program; and the State Historic Preservation Office (Montana Historical Society).

Individuals or groups contributing to this EA: Montana Department of Environmental Quality (Air Resources Management Bureau and Industrial and Energy Minerals Bureau), Montana State Historic Preservation Office (Montana Historical Society).

EA prepared by: Eric Thunstrom

Date: March 28, 2006

Source	Tons/Year					
	PM	PM-10	NOx	VOC	CO	SOx
Aggregate Delivery to Ground Storage	2.11	1.01				
Sand Delivery to Ground Storage	0.49	0.16				
Aggregate Transfer to Conveyor	2.11	1.01				
Sand Transfer to Conveyor	0.49	0.16				
Aggregate Transfer to Elevated Storage	2.11	1.01				
Sand Transfer to Elevated Storage	0.49	0.16				
Cement Unloading to Elevated Storage Silo	0.02	0.01				
Cement Supplement Unloading to Elevated Storage Silo	0.01	0.00				
Weigh Hopper Loading of Sand/Aggregate	2.76	1.30				
Central Mix Loading of Cement/Supplement/Sand/Aggregate	19.53	6.92				
Haul Roads	2.74	1.23				
Total	32.87	13.00				

Aggregate Delivery to Ground Storage

Maximum Production Rate: 150 yd³/hr
 Aggregate in Mix: 0.9325 ton/yd³ (AP-42, page 11.12-7, 10/01)
 Maximum Aggregate Handled: 150 yd³/hr * 0.9325 ton/yd³ = 139.88 ton/hr
 Control Technology: Water
 Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 0.0069 lbs/ton (AP-42, table 11.12-2, 10/01)
 Control Efficiency: 50.0%
 Calculations: 0.0069 lbs/ton * 139.88 ton/hr = 0.97 lbs/hr
 0.97 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 4.23 tons/yr
 4.23 tons/yr * (1.00 - 0.500) = 2.114 tons/yr

PM-10 Emissions:

Emission Factor: 0.0033 lbs/ton (AP-42, table 11.12-2, 10/01)
 Control Efficiency: 50.0%
 Calculations: 0.0033 lbs/ton * 139.88 ton/hr = 0.46 lbs/hr
 0.46 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 2.022 tons/yr
 2.022 tons/yr * (1.00 - 0.500) = 1.01 tons/yr

Sand Delivery to Ground Storage

Maximum Production Rate: 150 yd³/hr
 Sand in Mix: 0.714 ton/yd³ (AP-42, page 11.12-7, 10/01)
 Maximum Sand Handled: 150 yd³/hr * 0.7140 ton/yd³ = 107.10 ton/hr
 Control Technology: Water
 Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 0.0021 lbs/ton (AP-42, page 11.12-2, 10/01)
 Control Efficiency: 50.0%
 Calculations: 0.0021 lbs/ton * 107.10 ton/hr = 0.22 lbs/hr
 0.22 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 0.99 tons/yr
 0.99 tons/yr * (1.00 - 0.500) = 0.493 tons/yr

PM-10 Emissions:

Emission Factor: 0.0007 lbs/ton (AP-42, page 11.12-2, 10/01)
 Control Efficiency: 50.0%
 Calculations: 0.0007 lbs/ton * 107.10 ton/hr = 0.07 lbs/hr
 0.07 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 0.328 tons/yr
 0.328 tons/yr * (1.00 - 0.500) = 0.16 tons/yr

Aggregate Transfer to Conveyor

Maximum Production Rate: 150 yd³/hr
Aggregate in Mix: 0.9325 ton/yd³ (AP-42, page 11.12-7, 10/01)
Maximum Aggregate Handled: 150 yd³/hr * 0.9325 ton/yd³ = 139.88 ton/hr
Control Technology: Water
Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 0.0069 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 50.0%
Calculations: 0.0069 lbs/ton * 139.88 ton/hr = 0.97 lbs/hr
0.97 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 4.23 tons/yr
4.23 tons/yr * (1.00 - 0.500) = 2.114 tons/yr

PM-10 Emissions:

Emission Factor: 0.0033 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 50.0%
Calculations: 0.0033 lbs/ton * 139.88 ton/hr = 0.46 lbs/hr
0.46 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 2.022 tons/yr
2.022 tons/yr * (1.00 - 0.500) = 1.01 tons/yr

Sand Transfer to Conveyor

Maximum Production Rate: 150 yd³/hr
Sand in Mix: 0.714 ton/yd³ (AP-42, page 11.12-7, 10/01)
Maximum Sand Handled: 150 yd³/hr * 0.7140 ton/yd³ = 107.10 ton/hr
Control Technology: Water
Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 0.0021 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 50.0%
Calculations: 0.0021 lbs/ton * 107.10 ton/hr = 0.22 lbs/hr
0.22 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 0.99 tons/yr
0.99 tons/yr * (1.00 - 0.500) = 0.493 tons/yr

PM-10 Emissions:

Emission Factor: 0.0007 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 50.0%
Calculations: 0.0007 lbs/ton * 107.10 ton/hr = 0.07 lbs/hr
0.07 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 0.328 tons/yr
0.328 tons/yr * (1.00 - 0.500) = 0.16 tons/yr

Aggregate Transfer to Elevated Storage

Maximum Production Rate: 150 yd³/hr
Aggregate in Mix: 0.9325 ton/yd³ (AP-42, page 11.12-7, 10/01)
Maximum Aggregate Handled: 150 yd³/hr * 0.9325 ton/yd³ = 139.88 ton/hr
Control Technology: Water
Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 0.0069 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 50.0%
Calculations: 0.0069 lbs/ton * 139.88 ton/hr = 0.97 lbs/hr
0.97 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 4.23 tons/yr
4.23 tons/yr * (1.00 - 0.500) = 2.114 tons/yr

PM-10 Emissions:

Emission Factor: 0.0033 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 50.0%
Calculations: 0.0033 lbs/ton * 139.88 ton/hr = 0.46 lbs/hr
0.46 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 2.022 tons/yr
2.022 tons/yr * (1.00 - 0.500) = 1.01 tons/yr

Sand Transfer to Elevated Storage

Maximum Production Rate: 150 yd³/hr
Sand in Mix: 0.714 ton/yd³ (AP-42, page 11.12-7, 10/01)
Maximum Sand Handled: 150 yd³/hr * 0.7140 ton/yd³ = 107.10 ton/hr
Control Technology: Water
Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 0.0021 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 50.0%
Calculations: 0.0021 lbs/ton * 107.10 ton/hr = 0.22 lbs/hr
0.22 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 0.99 tons/yr
0.99 tons/yr * (1.00 - 0.500) = 0.493 tons/yr

PM-10 Emissions:

Emission Factor: 0.0007 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 50.0%
Calculations: 0.001 lbs/ton * 107.10 ton/hr = 0.07 lbs/hr
0.07 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 0.328 tons/yr
0.328 tons/yr * (1.00 - 0.500) = 0.16 tons/yr

Cement Unloading to Elevated Storage Silo

Maximum Production Rate: 21 yd³/hr
Cement in Mix: 0.2455 ton/yd³ (AP-42, page 11.12-7, 10/01)
Maximum Cement Handled: 21 yd³/hr * 0.2455 ton/yd³ = 5.16 ton/hr
Control Technology: Bag Filter Vent
Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 0.72 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 99.9%
Calculations: 0.7200 lbs/ton * 5.16 ton/hr = 3.71 lbs/hr
3.71 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 16.26 tons/yr
16.26 tons/yr * (1.00 - 0.999) = 0.016 tons/yr

PM-10 Emissions:

Emission Factor: 0.46 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 99.9%
Calculations: 0.460 lbs/ton * 5.16 ton/hr = 2.37 lbs/hr
2.37 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 10.387 tons/yr
10.387 tons/yr * (1.00 - 0.999) = 0.010 tons/yr

Cement Supplement Unloading to Elevated Storage Silo

Maximum Production Rate: 21 yd³/hr
Cement Supplement in Mix: 0.0365 ton/yd³ (AP-42, page 11.12-7, 10/01)
Maximum Supplement Handled: 21 yd³/hr * 0.0365 ton/yd³ = 0.77 ton/hr
Control Technology: Bag Filter Vent
Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 3.14 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 99.9%
Calculations: 3.1400 lbs/ton * 0.77 ton/hr = 2.4068 lbs/hr
2.41 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 10.542 tons/yr
10.542 tons/yr * (1.00 - 0.999) = 0.011 tons/yr

PM-10 Emissions:

Emission Factor: 1.1 lbs/ton (AP-42, table 11.12-2, 10/01)
Control Efficiency: 99.9%
Calculations: 1.1000 lbs/ton * 0.77 ton/hr = 0.8432 lbs/hr
0.8432 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 3.693 tons/yr
3.693 tons/yr * (1.00 - 0.999) = 0.004 tons/yr

Weigh Hopper Loading of Sand/Aggregate

Maximum Production Rate: 150 yd³/hr
 Sand/Aggregate in Mix: 1.65 ton/yd³ (AP-42, page 11.12-7, 10/01)
 Control Technology: Watering
 Maximum Sand/Aggregate Handled: 150 yd³/hr * 1.6500 ton/yd³ = 247.50 ton/hr
 Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 0.0051 lbs/ton (AP-42, table 11.12-2, 10/01)
 Control Efficiency: 50%
 Calculations: 0.0051 lbs/ton * 247.50 ton/hr = 1.26 lbs/hr
 1.26 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 5.53 tons/yr
 5.53 tons/yr * (1.00 - 0.50) = 2.76 tons/yr

PM-10 Emissions:

Emission Factor: 0.0024 lbs/ton (AP-42, table 11.12-2, 10/01)
 Control Efficiency: 50%
 Calculations: 0.0024 lbs/ton * 247.50 ton/hr = 0.59 lbs/hr
 0.59 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 2.60 tons/yr
 2.60 tons/yr * (1.00 - 0.50) = 1.30 tons/yr

Central Mix Loading of Cement/Supplement/Sand/Aggregate

Maximum Production Rate: 21 yd³/hr
 Cement/Supp./Sand/Agg. in Mix: 1.93 ton/yd³ (AP-42, page 11.12-7, 10/01)
 Max. Cement/Supp./Sand/Agg. Handled: 21 yd³/hr * 1.9300 ton/yd³ = 40.53 ton/hr
 Control Technology: Water
 Hours of operation: 8760 hr/yr

TSP Emissions:

Emission Factor: 0.22 lbs/ton (AP-42, table 11.12-2, 10/01)
 Control Efficiency: 50%
 Calculations: 0.22 lbs/ton * 40.53 ton/hr = 8.92 lbs/hr
 8.92 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 39.05 tons/yr
 39.05 tons/yr * (1.00 - 0.50) = 19.53 tons/yr

PM-10 Emissions:

Emission Factor: 0.078 lbs/ton (AP-42, table 11.12-2, 10/01)
 Control Efficiency: 50%
 Calculations: 0.078 lbs/ton * 40.53 ton/hr = 3.16 lbs/hr
 3.16 lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 13.85 tons/yr
 13.85 tons/yr * (1.00 - 0.50) = 6.92 tons/yr

Haul Roads

Vehicle miles travelled: 5 VMT/day {Estimated}
 Control Efficiency: 50% {Watering}

TSP Emission Factor is based on AP-42, Section 11.2.1

TSP Emissions

TSP Emission Factor (Rated Load Capacity <50 tons): 6 Lbs/VMT
 E(TSP)= (5 VMT/day)(6.00 Lbs/VMT)(0.5)
 E(TSP)= 15.00 Lbs/day
 or 2.74 tons/yr

PM-10 Emission Factor is based on AP-42, Section 11.2.1

PM10 Emissions:

PM10 Emission Factor (Rated Load Capacity <50 tons): 2.70 Lbs/VMT
 E(PM10)= (5 VMT/day)(2.70 Lbs/VMT)(0.5)
 E(PM10)= 6.75 Lbs/day
 or 1.23 tons/yr

Source	Lbs/Day					
	PM	PM-10	NOx	VOC	CO	SOx
Crusher (up to 71 TPH)	4.26	2.04				
Crusher (up to 71 TPH)	4.26	2.04				
2-Deck Screen (up to 71 TPH)	26.84	12.78				
Material Transfer (7 Material Transfers, 71 TPH)	17.30	8.35				
Pile Forming (4 Pile Forming, 71 TPH)	28.63	13.63				
Bulk Loading (3 Bulk Loading, 71 TPH)	21.47	10.22				
Haul Roads	15.00	6.75				
	117.75	55.83				

Source	Tons/Year					
	PM	PM-10	NOx	VOC	CO	SOx
Crusher (up to 71 TPH)	0.78	0.37				
Crusher (up to 71 TPH)	0.78	0.37				
2-Deck Screen (up to 71 TPH)	4.90	2.33				
Material Transfer (7 Material Transfers, 71 TPH)	3.16	1.52				
Pile Forming (4 Pile Forming, 71 TPH)	5.22	2.49				
Bulk Loading (3 Bulk Loading, 71 TPH)	3.92	1.87				
Haul Roads	2.74	1.23				
Total	21.49	10.19				

Crusher (up to 71 TPH)

Maximum Process Rate:: 71 ton/hr
Adjusted Process Rate: 71 ton/hr
Hours of operation: 24 hr/day or 8760 hr/yr

PM Emissions:

Emission Factor: 0.005 lb/ton (AP-42, Table 11.19.2-2, 1/95)
Control Efficiency: 50% wet material
Hourly Calculations: $0.005 \text{ lb/ton} * 71 \text{ ton/hr} * (1-0.5) = 0.18 \text{ lb/hr}$
Daily Calculations: $0.1775 \text{ lb/hr} * 24 \text{ hr/day} = 4.26 \text{ lb/day}$
Annual Calculations: $0.1775 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.78 \text{ ton/yr}$

PM-10 Emissions:

Emission Factor: 0.0024 lb/ton (AP-42, Table 11.19.2-2, 1/95)
Control Efficiency: 50% wet material
Hourly Calculations: $0.0024 \text{ lb/ton} * 71 \text{ ton/hr} * (1-0.5) = 0.09 \text{ lb/hr}$
Daily Calculations: $0.0852 \text{ lb/hr} * 24 \text{ hr/day} = 2.04 \text{ lb/day}$
Annual Calculations: $0.0852 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.37 \text{ ton/yr}$

Crusher (up to 71 TPH)

Maximum Process Rate: 71 ton/hr
 Adjusted Process Rate: 71 ton/hr
 Hours of operation: 24 hr/day or 8760 hr/yr

PM Emissions:

Emission Factor: 0.005 lb/ton (AP-42, Table 11.19.2-2, 1/95)
 Control Efficiency: 50% wet material
 Hourly Calculations: $0.005 \text{ lb/ton} * 71 \text{ ton/hr} * (1-0.5) = 0.18 \text{ lb/hr}$
 Daily Calculations: $0.1775 \text{ lb/hr} * 24 \text{ hr/day} = 4.26 \text{ lb/day}$
 Annual Calculations: $0.1775 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.78 \text{ ton/yr}$

PM-10 Emissions:

Emission Factor: 0.0024 lb/ton (AP-42, Table 11.19.2-2, 1/95)
 Control Efficiency: 50% wet material
 Hourly Calculations: $0.0024 \text{ lb/ton} * 71 \text{ ton/hr} * (1-0.5) = 0.09 \text{ lb/hr}$
 Daily Calculations: $0.0852 \text{ lb/hr} * 24 \text{ hr/day} = 2.04 \text{ lb/day}$
 Annual Calculations: $0.0852 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.37 \text{ ton/yr}$

2-Deck Screen (up to 71 TPH)

Maximum Process Rate: 71 ton/hr
 Adjusted Process Rate: 71 ton/hr
 Hours of operation: 24 hr/day or 8760 hr/yr

PM Emissions:

Emission Factor: 0.0315 lb/ton (AP-42, Table 11.19.2-2, 1/95)
 Control Efficiency: 50% wet material
 Hourly Calculations: $0.0315 \text{ lb/ton} * 71 \text{ ton/hr} * (1-0.5) = 1.12 \text{ lb/hr}$
 Daily Calculations: $1.11825 \text{ lb/hr} * 24 \text{ hr/day} = 26.84 \text{ lb/day}$
 Annual Calculations: $1.11825 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 4.90 \text{ ton/yr}$

PM-10 Emissions:

Emission Factor: 0.015 lb/ton (AP-42, Table 11.19.2-2, 1/95)
 Control Efficiency: 50% wet material
 Hourly Calculations: $0.015 \text{ lb/ton} * 71 \text{ ton/hr} * (1-0.5) = 0.53 \text{ lb/hr}$
 Daily Calculations: $0.5325 \text{ lb/hr} * 24 \text{ hr/day} = 12.78 \text{ lb/day}$
 Annual Calculations: $0.5325 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 2.33 \text{ ton/yr}$

Material Transfer (7 Material Transfers, 71 TPH)

Maximum Process Rate: 71 ton/hr
 Adjusted Process Rate: 71 ton/hr
 Number of Material Transfer: 7 number of Transfers
 Hours of operation: 8760 hr/yr or 24 hr/day

PM Emissions:

Emission Factor: 0.0029 lb/ton (AP-42, Table 8.23-4, moisture content >4% by weight, pg. 8.23-4, 8/82)
 Control Efficiency: 50% wet material
 Hourly Calculations: $0.0029 \text{ lb/ton} * 71 \text{ ton/hr} * 7 \text{ number of Transfers} * (1-0.5) = 0.72 \text{ lb/hr}$
 Daily Calculations: $0.72065 \text{ lb/hr} * 24 \text{ hr/day} = 17.30 \text{ lb/day}$
 Annual Calculations: $0.72065 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 3.16 \text{ ton/yr}$

PM-10 Emissions:

Emission Factor: 0.0014 lb/ton (AP-42, Table 8.23-4, moisture content >4% by weight, pg. 8.23-4, 8/82)
 Control Efficiency: 50% wet material
 Hourly Calculations: $0.0014 \text{ lb/ton} * 71 \text{ ton/hr} * 7 \text{ number of Transfers} * (1-0.5) = 0.35 \text{ lb/hr}$
 Daily Calculations: $0.3479 \text{ lb/hr} * 24 \text{ hr/day} = 8.35 \text{ lb/day}$
 Annual Calculations: $0.3479 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 1.52 \text{ ton/yr}$

Pile Forming (4 Pile Forming, 71 TPH)

Maximum Process Rate: 71 ton/hr
Adjusted Process Rate: 71 ton/hr
Number of Piles: 4 Piles
Hours of operation: 8760 hr/yr or 24 hr/day

PM Emissions:

Emission Factor: 0.0084 lb/ton (AP-42, Table 8.23-4, moisture content >4% by weight, pg. 8.23-4, 8/82)
Control Efficiency: 50% wet material
Hourly Calculations: $0.0084 \text{ lb/ton} * 71 \text{ ton/hr} * 4 \text{ Piles} * (1-0.5) = 1.19 \text{ lb/hr}$
Daily Calculations: $1.1928 \text{ lb/hr} * 24 \text{ hr/day} = 28.63 \text{ lb/day}$
Annual Calculations: $1.1928 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 5.22 \text{ ton/yr}$

PM-10 Emissions:

Emission Factor: 0.004 lb/ton (AP-42, Table 8.23-4, moisture content >4% by weight, pg. 8.23-4, 8/82)
Control Efficiency: 50% wet material
Hourly Calculations: $0.004 \text{ lb/ton} * 71 \text{ ton/hr} * 4 \text{ Piles} * (1-0.5) = 0.57 \text{ lb/hr}$
Daily Calculations: $0.568 \text{ lb/hr} * 24 \text{ hr/day} = 13.63 \text{ lb/day}$
Annual Calculations: $0.568 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 2.49 \text{ ton/yr}$

Bulk Loading (3 Bulk Loading, 71 TPH)

Maximum Process Rate: 71 ton/hr
Adjusted Process Rate: 71 ton/hr
Number of Loads: 3 Load
Hours of operation: 8760 hr/yr or 24 hr/day

PM Emissions:

Emission Factor: 0.0084 lb/ton (AP-42, Table 8.23-4, moisture content >4% by weight, pg. 8.23-4, 8/82)
Control Efficiency: 50% wet material
Hourly Calculations: $0.0084 \text{ lb/ton} * 71 \text{ ton/hr} * 3 \text{ Load} * (1-0.5) = 0.89 \text{ lb/hr}$
Daily Calculations: $0.8946 \text{ lb/hr} * 24 \text{ hr/day} = 21.47 \text{ lb/day}$
Annual Calculations: $0.8946 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 3.92 \text{ ton/yr}$

PM-10 Emissions:

Emission Factor: 0.004 lb/ton (AP-42, Table 8.23-4, moisture content >4% by weight, pg. 8.23-4, 8/82)
Control Efficiency: 50% wet material
Hourly Calculations: $0.004 \text{ lb/ton} * 71 \text{ ton/hr} * 3 \text{ Load} * (1-0.5) = 0.43 \text{ lb/hr}$
Daily Calculations: $0.426 \text{ lb/hr} * 24 \text{ hr/day} = 10.22 \text{ lb/day}$
Annual Calculations: $0.426 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ tons/lb} = 1.87 \text{ ton/yr}$