

# ASPHALT



## SPECIALTIES CO.

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March 1, 2021

Wyoming Department of Environmental Quality  
Air Quality Division  
200 West 17th Street, 3<sup>rd</sup> Floor  
Cheyenne, Wyoming 82002

**RE: Revised Permit Application No. A0006524  
ASCI - Lone Tree Creek Quarry (F028222)  
Laramie County, Wyoming**

Mr. Andrew Keyfauber:

Asphalt Specialties Company, Inc. (ASCI) has revised Air Quality Division (AQD) Application No. A0006524 to permit the Lone Tree Creek Quarry (F028222) located approximately two (2) miles southwest of Granite in Laramie County, Wyoming. As previously discussed, the proposed Lone Tree Creek Quarry is a Limited Mining Operation (LMO) 15-acre hard rock quarry. ASCI has provided documentation from Laramie County affirming ASCI is not required to go through the site plan process outlined in the Laramie County Land Use Regulation Section 2-2-133 and regulation of the site will be handled by Wyoming Department of Environmental Quality (DEQ).

Proposed activities at the quarry include topsoil and overburden stripping, stockpiling, blasting, crushing and screening activity, and haul truck activity. No concrete batch plants or hot mix asphalt plants will be located at the quarry. ASCI is committed to reducing fugitive particulate matter and will control particulate emissions from the quarry. The primary emission source at the quarry is the haul road. To control haul road particulate emissions, ASCI will pave the haul road. ASCI anticipates the haul road will be paved within 90 working days from the start of construction (not including shutdowns due to inclement weather). To reduce fugitive particulate emissions, ASCI will apply water as necessary during stripping, stockpiling, crushing/screening, and reclamation activities. In addition, topsoil and overburden stockpiles will be seeded and watered. The portable crushing/screening equipment is permitted separately from the quarry permit (P0024616).

In order to expedite the permitting process, ASCI respectfully requests a public hearing be preemptively scheduled to occur immediately after the 30-day public notice comment period.

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SPECIALTIES CO.

Mr. Andrew Keyfauber – Wyoming DEQ-AQD  
ASCI Lone Tree Creek Quarry

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If you should have questions regarding this permit application, please contact me at 303-289-8555.

Sincerely,



Greg Geras  
Land Resource Manager  
Asphalt Specialties Co., Inc.  
10100 Dallas Street  
Henderson, CO 80640  
Phone: 303-289-8555

## **Emission Calculation Details:**

Asphalt Specialties Company, Inc. plans to locate and operate crushing/screening equipment and conduct blasting operations at the Lone Tree Creek Quarry. Two permit applications are submitted: one for Lone Tree Creek Quarry and one for the portable crushing/screening equipment to be located at the quarry. No concrete batch plants or hot mix asphalt plants will be located at the Lone Tree Creek Quarry. The estimated emissions of the following sources are listed below.

### **Pit Emissions:**

The pollutant of main concern at the Lone Tree Creek Quarry will be fugitive particulate matter (TSP, PM<sub>10</sub> and PM<sub>2.5</sub>) emitted primarily from exposed acreage, stockpiling, blasting and haul truck activity. Estimated emissions were based on EPA document, AP-42, Compilation of Emission Factors, a maximum production rate of 500,000 tons per year (tpy) of mined material, 50,000 tpy of stockpiled material, 27,200 tpy of topsoil and 54,400 tpy of overburden. Per Air Quality Division (Division) guidance, application of water during stockpiling operations is credited for fifty percent (50%) control efficiency. Topsoil and overburden stockpiles will be seeded and watered as needed to reduce fugitive particulate matter. Exposed acreage is based on 18 acres, and the total haul road length of 2.0 miles (miles to and from the quarry). Uncontrolled haul road emissions were estimated using AP-42 13.2.2 Equation 1a for an unpaved road. Asphalt Specialties will pave the haul road to reduce fugitive particulate matter, and the controlled haul road emissions were estimated using AP-42 13.2.1.3 Equation 1 for a paved road. Blasting emissions were based on AP-42 Table 11.9-1, a horizontal blast area of 100 ft<sup>2</sup> and 42 blasts per year.

### **Crushing and Screening:**

The pollutant of main concern during crushing/screening operations will be fugitive particulate matter. Crushing and screening emissions were estimated using emission factors from AP-42 Table 11.19.2-2. AP-42 Table 11.19.2-2 does not have crushing/screening emission factors for uncontrolled PM<sub>2.5</sub>; therefore, uncontrolled crushing/screening emissions for PM<sub>2.5</sub> were based on a ratio of PM<sub>2.5</sub> to PM<sub>10</sub> emission factors for controlled tertiary crushing/screening in AP-42 Table 11.19.2-2. Per Air Quality Division guidance, application of water during portable crushing/screening operations is credited for fifty percent (50%) control efficiency. Water will be applied during crushing/screening activities as needed.

### **Generator Emissions:**

The power source for the quarry (scale, scale house, pumps) will be provided by a diesel fired portable generator. The major pollutants emitted from the generator include NO<sub>x</sub> with some CO from incomplete combustion. Emissions from the portable generator are based on the engines Tier 1 certification, horsepower and annual operating hours of 3,120.

In addition to the portable generator, the crushing and screening equipment will include generators on each unit. These generators will be diesel fired and emissions are based on *EPA Nonroad Compression-Ignition Engines: Exhaust Emission Standards*, the generators Tier III and IV certifications, horsepower and annual operating hours of 3,120.

### **Ambient Air Quality:**

The Division generally does not require modeling or monitoring for rock pits or multiple pits in an area. In previous permitting actions, the Division has modeled large surface coal

mines with production rates in the millions of tons per year and the results have demonstrated compliance with particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) and nitrogen dioxide (NO<sub>2</sub>) annual ambient standards, which are health based standards. Primary ambient air quality standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly.

Emission estimates for the Lone Tree Creek Quarry are 8.8 tpy PM<sub>10</sub>. In comparison, a coal mine that produces 40 million tpy (MM tpy) of coal annually has estimated particulate emissions in the range of 1,500 tpy. The large surface coal mines in the Powder River Basin (PRB) are adjacent and the emissions from all mines in the modeling domain are considered in the modeling analysis, which can total 7,000 tpy particulate matter and 5,000 tpy NO<sub>x</sub>. As discussed, large surface coal mines in the PRB have demonstrated compliance with Wyoming Air Quality Standards and Regulations health-based standards through modeling and/or monitoring.

To further reduce particulate emissions at the Lone Tree Creek Quarry, Asphalt Specialties will pave the haul road, reducing PM<sub>10</sub> emissions by 70%.

Based on the emissions reduction for paving the haul road and past experience with coal mines, the cumulative impact from properly controlled pits, as required through the application of BACT, will not result in an exceedance of air quality standards.

<b>Asphalt Specialties Company, Inc.</b>
Lone Tree Creek Quarry
<b>Pit Emissions</b>

**Inputs**

Production Rate	500,000 tons/yr	
Exposed Acreage	18 acres	
Stockpiled Material	50,000 tons/yr	
Topsoil	27,200 tons/yr	
Overburden	54,400 tons/yr	
Material Moisture Content	0.7 %	(mean value for stone quarrying and processing, AP-42 Table 13.2.4-1)
Average Wind Speed	12.4 mph	(avg. wind speed for Cheyenne, WY)
Haul Road Length	2 mile	
Control Efficiency	50 %	

Note: Application of water during portable crushing/screening, stockpiling, and haul road operations is credited for 50% control efficiency

**Crushing Emission Factors**

Pollutant	Emission Rate (lb/Ton)
TSP	0.0054
PM <sub>10</sub>	0.0024
PM <sub>2.5</sub>	0.00044

Note: Emission factors based on AP-42 Table 11.19.2-2. PM<sub>2.5</sub> emission factors for uncontrolled crushing are based on a ratio of PM<sub>2.5</sub> to PM<sub>10</sub> emissions as determined from emission factors for controlled tertiary crushing in AP-42 Table 11.19.2-2

**Crushing Emissions**

TSP tpy = (500,000 tpy) x (0.0054 lb/Ton) x (100%-50 %) / (2,000 lb/ton)	= <b>0.68</b>
PM <sub>10</sub> tpy = (500,000 tpy) x (0.0024 lb/Ton) x (100%-50 %) / (2,000 lb/ton)	= <b>0.30</b>
PM <sub>2.5</sub> tpy = (500,000 tpy) x (0.0004 lb/Ton) x (100%-50 %) / (2,000 lb/ton)	= <b>0.06</b>

**Screening Emission Factors**

Pollutant	Emission Rate (lb/Ton)
TSP	0.025
PM <sub>10</sub>	0.0087
PM <sub>2.5</sub>	0.00059

Note: Emission factors based on AP-42 Table 11.19.2-2. PM<sub>2.5</sub> emission factors for uncontrolled screening are based on a ratio of PM<sub>2.5</sub> to PM<sub>10</sub> emissions as determined from emission factors for controlled screening in AP-42 Table 11.19.2-2

**Screening Emissions**

TSP tpy = (500,000 tpy) x (0.0250 lb/Ton) x (100%-50 %) / (2,000 lb/ton)	= <b>3.13</b>
PM <sub>10</sub> tpy = (500,000 tpy) x (0.0087 lb/Ton) x (100%-50 %) / (2,000 lb/ton)	= <b>1.09</b>
PM <sub>2.5</sub> tpy = (500,000 tpy) x (0.0006 lb/Ton) x (100%-50 %) / (2,000 lb/ton)	= <b>0.07</b>

**Exposed Acreage Emission Factors**

Pollutant	Emission Rate (tons/acre/year)
TSP	0.38
PM <sub>10</sub>	0.114
PM <sub>2.5</sub>	0.0171

Note: Emission factors based on AP-42 Table 11.19-4, assume PM<sub>10</sub> = 30% total TSP, assume PM<sub>2.5</sub> = 15% total PM<sub>10</sub>

**Exposed Acreage Emissions**

TSP tpy = (18 acres) x (0.38 tons/acre/yr) x (100%-50 %)	= <b>3.42</b>
PM <sub>10</sub> tpy = (18 acres) x (0.11 tons/acre/yr) x (100%-50 %)	= <b>1.03</b>
PM <sub>2.5</sub> tpy = (18 acres) x (0.02 tons/acre/yr) x (100%-50 %)	= <b>0.15</b>

**Truck Loading and Stockpiling Emission Factors**

Based on production rates, total amount of stockpiled material and AP-42 13.2.4 Equation 1:

$$E = A(0.0032) \left( \frac{U}{5} \right)^k \left( \frac{M}{2} \right)^M$$

Where:  
 k=particle size multiplier  
 U=average wind speed, mph  
 M=material moisture content, %

k= 0.74 for TSP  
 k= 0.35 for PM<sub>10</sub>  
 k= 0.053 for PM<sub>2.5</sub>  
 U= 12.4 mph (avg. wind speed for Cheyenne, WY)  
 M= 0.7 % (mean value for stone quarrying and processing, AP-42 Table 13.2.4-1)

Pollutant	Emission Rate (lb/Ton)
TSP	0.0335
PM <sub>10</sub>	0.0159
PM <sub>2.5</sub>	0.0024

Note: Emission factors based on AP-42 13.2.4 Equation 1

**Truck Loading and Stockpiling Emissions**

TSP tpy = (631,600 tpy) x (0.0335 lb/Ton) x (100%-50 %) / (2,000 lb/ton)	= 5.29
x2 drop/trip = <b>10.59</b>	
PM <sub>10</sub> tpy = (631,600 tpy) x (0.0159 lb/Ton) x (100%-50 %) / (2,000 lb/ton)	= 2.50
x2 drop/trip = <b>5.01</b>	
PM <sub>2.5</sub> tpy = (631,600 tpy) x (0.0024 lb/Ton) x (100%-50 %) / (2,000 lb/ton)	= 0.38
x2 drop/trip = <b>0.76</b>	

### Hall Road Activity Emission Factors (Unpaved Road)

Fugitive TSP and PM10 emissions per Vehicle Mile Traveled associated with haul roads are estimated using AP-42 13.2.2 Equation 1a

$$E = k \left( \frac{s}{12} \right)^a \left( \frac{W}{3} \right)^b$$

Where:

k=empirical constant  
s=surface material silt content, %  
a=empirical constant  
W=mean vehicular weight  
b=empirical constant

	TSP	PM10	PM2.5
k=	4.9	1.5	0.15
s=	8.3 %	8.3 %	8.3 %
a=	0.7	0.9	0.9
W=	28 tons	28 tons	28 tons
b=	0.45	0.45	0.45

Pollutant	Emission Rate (lb/VMT)
TSP	10.34
PM <sub>10</sub>	2.94
PM <sub>2.5</sub>	0.29

Amount of trips per year = (500,000 tpy) x (1 trip/35 ton)  
= 14,286

### Haul Road Activity Emissions (Unpaved)

TSP tpy = (14,286 trips/yr) x (2 miles/trip) x (10.34 lb/VMT) x (100%-50 %) / (2,000 lb/ton) = <b>73.88</b>
PM <sub>10</sub> tpy = (14,286 trips/yr) x (2 miles/trip) x (2.94 lb/VMT) x (100%-50 %) / (2,000 lb/ton) = <b>21.01</b>
PM <sub>2.5</sub> tpy = (14,286 trips/yr) x (2 miles/trip) x (0.29 lb/VMT) x (100%-50 %) / (2,000 lb/ton) = <b>2.10</b>

### Hall Road Activity Emission Factors (Paved Road)

Fugitive TSP and PM10 emissions per Vehicle Mile Traveled associated with haul roads are estimated using AP-42 13.2.1.3 Equation 1

$$E = k (sL)^{0.91} \times (W)^{1.02} \quad (1)$$

where: E = particulate emission factor (having units matching the units of k).  
k = particle size multiplier for particle size range and units of interest (see below).  
sL = road surface silt loading (grams per square meter) (g/m<sup>2</sup>), and  
W = average weight (tons) of the vehicles traveling the road.

	TSP	PM10	PM2.5
k=	0.011	0.0022	0.0005
sL=	2.4 (g/m <sup>2</sup> )	2.4 (g/m <sup>2</sup> )	2.4 (g/m <sup>2</sup> )
W=	28 tons	28 tons	28 tons

sL = Ubiquitous Baseline for Average Daily Travel (ADT) < 500, with Winter Baseline Multiplier during months with frozen precipitation

Pollutant	Emission Rate (lb/VMT)
TSP	0.73
PM <sub>10</sub>	0.15
PM <sub>2.5</sub>	0.04

Amount of trips per year = (500,000 tpy) x (1 trip/35 ton)  
= 14,286

### Haul Road Activity Emissions (Paved)

TSP tpy = (14,286 trips/yr) x (2 miles/trip) x (0.73 lb/VMT) x (100%-50 %) / (2,000 lb/ton) = <b>5.22</b>
PM <sub>10</sub> tpy = (14,286 trips/yr) x (2 miles/trip) x (0.15 lb/VMT) x (100%-50 %) / (2,000 lb/ton) = <b>1.04</b>
PM <sub>2.5</sub> tpy = (14,286 trips/yr) x (2 miles/trip) x (0.04 lb/VMT) x (100%-50 %) / (2,000 lb/ton) = <b>0.26</b>

Reduction in emissions due to paving 95%

### Blasting Emission Factors

Fugitive TSP emissions from blasting operations are estimated using AP-42 Table 11.9-1, PM<sub>10</sub> = TSP x 0.52, PM<sub>2.5</sub> = TSP x 0.03

$$E = 0.000014 (A)^{1.5}$$

Where: A = horizontal blast area  
A = 100 ft<sup>2</sup>  
Blast per year = 42

Pollutant	Emission Rate (lb/blast)
TSP	0.014
PM <sub>10</sub>	0.0073
PM <sub>2.5</sub>	0.0004

### Blasting Emissions

TSP lb/yr = (0.014 lb/blast) x (42 blast/yr) = <b>0.59</b>
PM <sub>10</sub> tpy = (0.59 lb/yr) x (0.52) = <b>0.31</b>
PM <sub>2.5</sub> tpy = (0.59 lb/yr) x (0.03) = <b>0.02</b>

Total Pit Emissions (tpy)			
Source	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>
Crushing	0.68	0.30	0.06
Screening	3.13	1.09	0.07
Exposed Acreage	3.42	1.03	0.15
Truck Loading & Stockpiling	10.59	5.01	0.76
Haul Road (Paved)	5.22	1.04	0.26
Blasting	0.59	0.31	0.02
<b>Total Emissions</b>	<b>23.61</b>	<b>8.77</b>	<b>1.31</b>

Potential Operating Schedule:

Hours/day: 10 \*\*\* Use for each piece of equipment \*\*\*

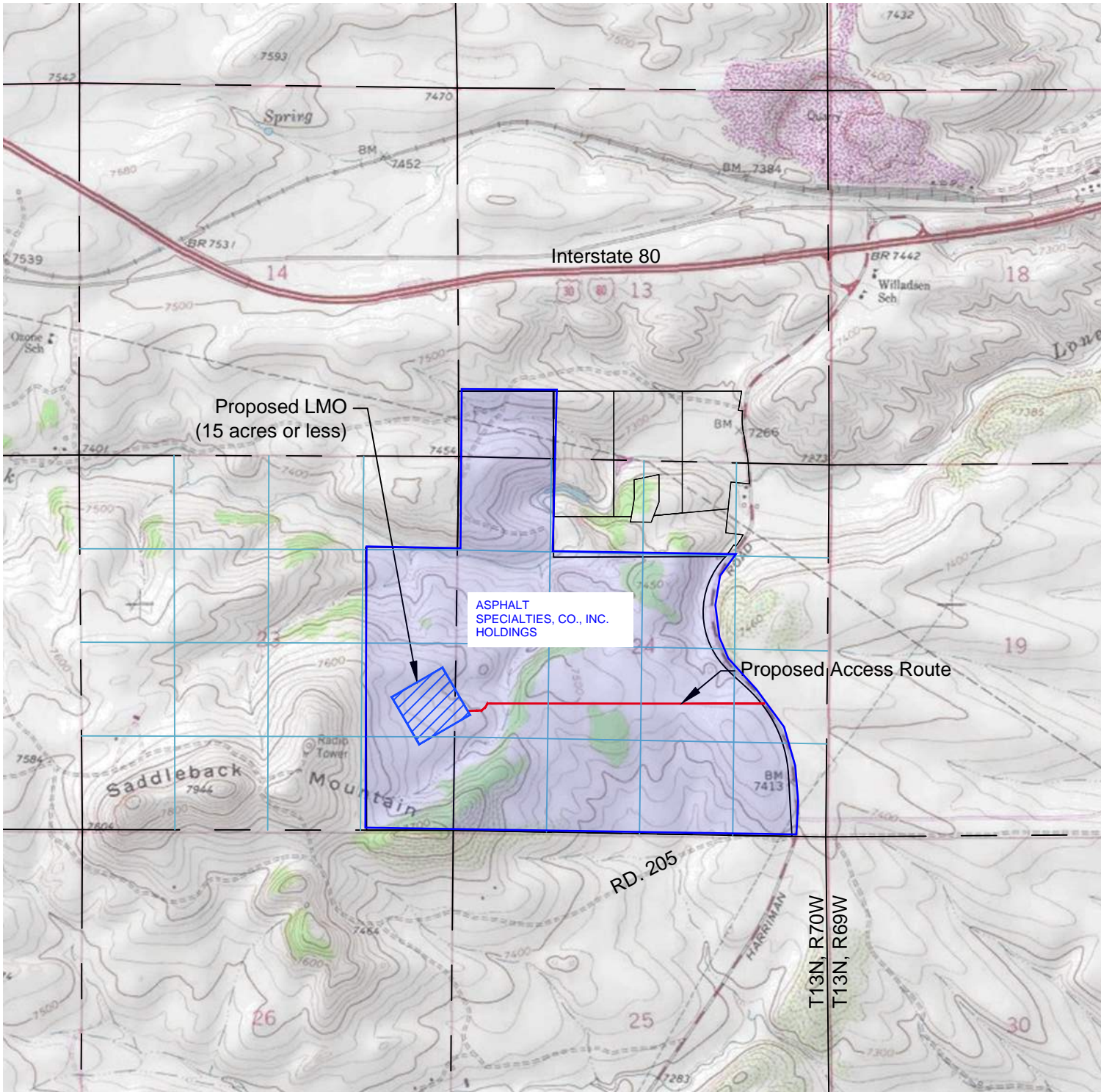
Crushing Equipment:

Company Equipment ID:	Maximum Annual Throughput	Units	Manufacturer	Model Name and Number	Serial Number	Effective Date	Type of material crushed	Type of crusher	Manufacture Date	Power Source	Max Crusher Capacity (tons/hr):
CR-44	300,000	tons	KPI-JCI	FT2650	416231	11/15/2017	Granite	Jaw	2016	Generator	250
CR-45	300,000	tons	KPI-JCI	FT4250	417139	12/31/2017	Granite	Impact	2017	Generator	180

Company Equipment ID:	Maximum Annual Throughput	Units	Manufacturer	Model Name and Number	Serial Number	Effective Date	Type of Material Screened	Manufacture Date	Type of Screen	Power Source	Max Screen Capacity (tons/hr):	Operating in Conjunction with a Crusher?:
CR-24	175,000	tons	ASTECC	2512KT	62504	6/30/2013	Granite	2012	Dry Screen	Generator	180	Yes
CR-35	300,000	tons	KPI-JCI	GT205S	154168	12/31/2016	Granite	2016	Dry Screen	Generator	350	Yes

Loading/Unloading/Dumping:

Company Equipment ID:	Type of Material	Material Description	Maximum Annual Throughput	Units	Maximum Hourly Throughput	Units	Detailed Description of Loading/Unloading/Dump Source:
ED-01 (Dozer)	Solid	Rock/Topsoil/Overburden	N/A	tons/yr	N/A	tons/hr	CAT D8T Dozer - For transporting rock/stockpile materials at facility
EE-26 (Excavator)	Solid	Rock/Topsoil/Overburden	N/A	tons/yr	N/A	tons/hr	CAT 349FL Excavator - For loading rock into transport trucks and moving stockpile materials
EL-55 (Loader)	Solid	Rock/Topsoil/Overburden	N/A	tons/yr	N/A	tons/hr	CAT 980M Wheel Loader - For loading rock into transport trucks and moving stockpile materials
EL-59 (Loader)	Solid	Rock/Topsoil/Overburden	N/A	tons/yr	N/A	tons/hr	CAT 972M Wheel Loader - For loading rock into transport trucks and moving stockpile materials
ETU-07 (Loader)	Solid	Rock/Topsoil/Overburden	N/A	tons/yr	N/A	tons/hr	CAT 289D Track Loader - Compact track loader for transporting materials at facility
ET-07 (Dump Truck)	Solid	Rock/Topsoil/Overburden	N/A	tons/yr	N/A	tons/hr	CAT 740 Articulated Dump Truck - For transporting rock/stockpile materials at facility
ET-08 (Dump Truck)	Solid	Rock/Topsoil/Overburden	N/A	tons/yr	N/A	tons/hr	CAT 740 Articulated Dump Truck - For transporting rock/stockpile materials at facility
CR-31 (Stacker)	Solid	Rock	250,000	tons/yr	N/A	tons/hr	McCloskey ST 100T Stacker - For creating stockpiles of rock at facility
CR-32 (Stacker)	Solid	Rock	250,000	tons/yr	N/A	tons/hr	McCloskey ST 100T Stacker - For creating stockpiles of rock at facility



Map to Accompany  
Notification for Proposed  
Limited Mining Operation:

Lone Tree Creek Quarry

Pit Location:  
14.8 acres located in the NW $\frac{1}{4}$   
SW $\frac{1}{4}$  of Section 24,  
T13N, R70W  
and the E $\frac{1}{2}$  SE $\frac{1}{4}$  of Section 23,  
T13N, R70W

**OPERATOR:**  
Asphalt Specialties, Co., Inc.  
10100 Dallas Street  
Henderson, CO 80640  
Daniel Hunt  
(303)289-8555

USGS Topo/Quad Base Map:  
*Granite Canyon, Wyoming*

**SCALE:**  
1" = 2,000'

