

## **3.2 Asphalt Production**

### **3.2.1 General Description of Source Category**

LANL operates an existing small asphalt batch plant that produces hot mix asphalt for minor road patching and paving. The plant, located at TA-3-73, is a Barber-Greene Model No. 892 and was installed at LANL in 1960.

The plant mixes aggregate with liquid asphaltic cement to produce bituminous pavement material. Aggregate is stored in piles near the plant. Asphaltic cement, consisting of asphaltenes, resins, and oils, is stored in a tank adjacent to the plant. The asphaltic cement is a solid at normal ambient temperature; a 1.4 MMBtu/hr natural gas fired heater is used to liquefy the asphaltic cement during production.

When hot mix asphalt is required, aggregate is transported by conveyor to a natural gas fired rotary dryer. A conveyor lifts the dry aggregate to a storage hopper. The plant operator releases aggregate from the hopper onto a measuring tray. A measured amount of aggregate is then dropped into a mixing chamber, where it is mixed with the proper proportion of liquid asphaltic cement, to produce the desired consistency of hot mix asphalt. The hot mix asphalt is dispensed directly into dump trucks for transport to the job site.

A new asphalt plant, BDM Engineering, Model Number TM2000, will be constructed to replace the existing plant, which will cease to operate upon startup of the new plant. Moist rock and sand are fed into a rotary dryer where it is dried and heated using a 25 MMBtu/hr propane gas burner. The dried aggregate is discharged into a bucket elevator, which discharges onto a vibrating screen that separates the material into different sizes. Material is discharged into a weigh hopper and then into a mixer where liquid asphalt is added as a percentage of the total mixture. The dust from the dryer is passed through a cyclone and baghouse to clean the gas stream. The clean gases are discharged to the atmosphere while the dust collected is discharged into the hot elevator

by means of a screw conveyor and incorporated into the hot mix. The plant was permitted under 20.2.72 NMAC in October of 2002. Start-up of the unit is expected early in 2003.

LANL procures asphalt paving material from outside contractors whenever possible. LANL will produce asphalt only when outside asphalt contractors are unavailable to provide support. LANL will require any asphalt contractors bringing equipment onto the site to provide a copy of their current air permit from the New Mexico Environment Department and demonstrate they are in compliance with all applicable air quality control requirements.

LANL wishes to establish a federally enforceable permitted production limit for asphalt in order to limit criteria pollutant emissions. The proposed asphalt production limit is 13,000 tons per year, 12-month rolling average. The production limit is based on anticipated demand, and actual production rates for recent years.

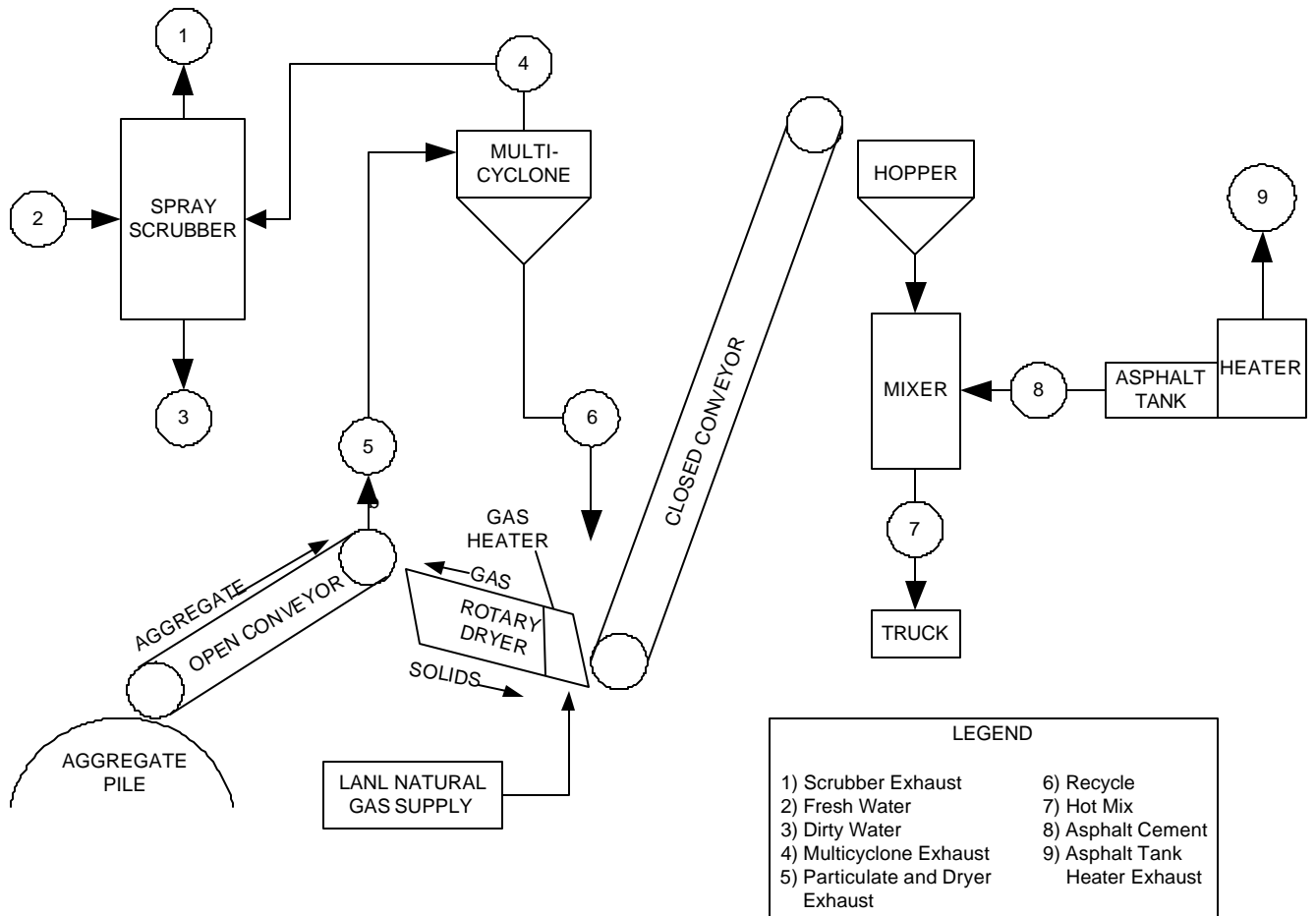
### **3.2.2 Operating Schedule**

The normal operating schedule for the Barber-Greene asphalt plant is less than 8 hours per day once or twice a week when patching is being performed. The maximum asphalt production rate is 60 tons per hour (120,000 pounds per hour). The maximum operating schedule for the BDM Engineering asphalt plant is 10 hours a day, 7 days a week for approximately 25 weeks per year with a maximum production rate of 80 tons per hour (160,000 pounds per hour). The actual schedule will be similar to the current schedule. A proposed production limit of 13,000 tons per year will be set on the asphalt plant through this application. The actual hours of operation will depend on the production rate.

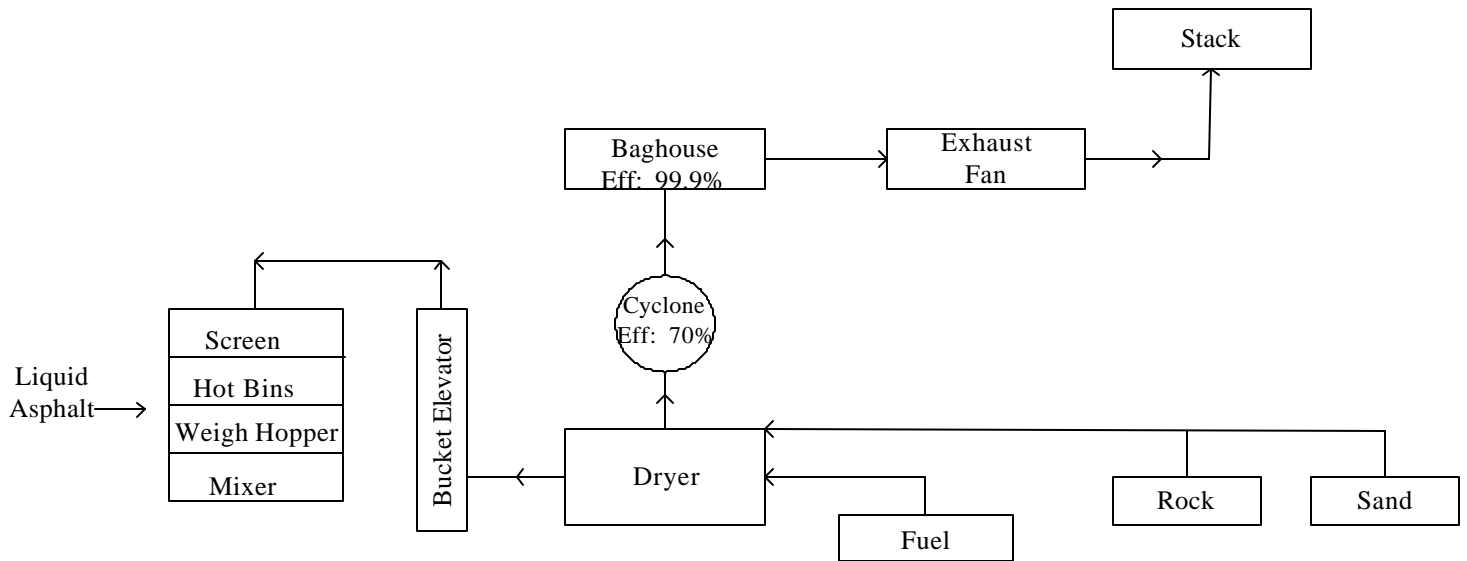
### **3.2.3 Process Flow Diagram**

Flow diagrams for the operation of the two asphalt plants are provided in Figures 3.2-1 and 3.2-2.

**Figure 3.2-1. Process Flow Diagram for Existing Asphalt Plant – Barber Greene**



**Figure 3.2-2. Process Flow Diagram for New Asphalt Plant – BDM Engineering**



### 3.2.4 Emissions

Emissions from the asphalt plant include criteria pollutants (NO<sub>x</sub>, CO, SO<sub>2</sub>, PM and VOCs), and trace amounts of HAPs. The emissions estimates are presented in Table 3.2-1. The emission factors for regulated air pollutants from the asphalt plant are summarized in Table 3.2-2. These factors were obtained from EPA's AP-42, as well as from results of a source test for controlled particulate matter emissions conducted by Kramer and Associates on LANL's asphalt plant on August 25, 1993 (see Appendix C).

Emissions were calculated using the following general formula:

$$Emission\ Rate\ \left(\frac{lb}{yr}\right) = [Emission\ Factor\ \left(\frac{lb}{ton\ asphalt}\right)] [Asphalt\ Production\ Rate\ \left(\frac{ton\ asphalt}{year}\right)]$$

The controlled emission rate for particulate matter from the BDM Engineering asphalt plant was calculated using the AP-42 uncontrolled emission rate factor and applying the manufacturer's suggested control efficiencies for the cyclone and the baghouse.

The particulate emissions from the BDM Engineering asphalt plant, calculated using the proposed limit of 13,000 tons per year of asphalt produced are as follows:

$$\text{Emission Rate} \left( \frac{\text{lb}}{\text{year}} \right) = \text{Uncontrolled Particulate Emissions} \left( \frac{\text{lb}}{\text{year}} \right) * \left[ 1 - \left( \frac{70}{100} \right) \right] * \left[ 1 - \left( \frac{99.9}{100} \right) \right]$$

**Table 3.2-1. Emissions Estimates for Asphalt Production**

	Emissions (ton/year)			
	Barber-Greene Plant		BDM Engineering Plant	
	Uncontrolled	Controlled	Uncontrolled	Controlled
NO <sub>x</sub>	0.16	0.16	0.16	0.16
SO <sub>2</sub>	0.03	0.03	0.03	0.03
PM	208	0.46	208	0.06
CO	2.60	2.60	2.60	2.60
VOC	0.05	0.05	0.05	0.05
HAP	0.05	0.05	0.05	0.05

**Table 3.2-2. Asphalt Plant Emission Factors**

Air Pollutant	Emission Factor (lb/ton)
NO <sub>x</sub> <sup>(a)</sup>	0.025
CO <sup>(a)</sup>	0.40
SO <sub>2</sub> <sup>(a)</sup>	0.0046
Uncontrolled PM <sup>(a)</sup>	32
Controlled PM <sup>(b)</sup> ( <i>Barber-Greene plant</i> )	0.07
Controlled PM <sup>(c)</sup> ( <i>BDM Engineering</i> )	0.0096
VOC <sup>(a)</sup>	0.0082
HAP <sup>(a)</sup>	0.0076

- (a) AP-42, 12/00, Section 11.1, Hot Mix Asphalt Plants, Tables 11.1-1, 11.1-5, 11.1-6, and 11.1-9, Natural Gas-Fired Dryer
- (b) Kramer and Associates, Source Test Performed 08/25/1993.
- (c) Calculated using the AP-42 uncontrolled emission rate factor and applying the manufacturer's suggested control efficiencies for the cyclone and the baghouse.

### 3.2.5 Emissions Control Equipment

The Barber-Greene asphalt plant is equipped with a multiple cyclone and wet scrubber Model Number CB-50, manufactured by Barber-Greene. This system of control for particulate matter has been rated by the manufacturer as 93% efficient. The BDM Engineering asphalt plant is equipped with a cyclone, Model Number 84M and a baghouse, Model Number 18000M. The cyclone and baghouse are rated by the Manufacturer, BDM Engineering, to have 70% and 99.9% efficiencies respectively.

### 3.2.6 Applicable Requirements

20.2.11 NMAC sets maximum particulate matter emission rates in pounds per hour. In addition, the regulation requires the existence of a fugitive dust control system such that all particulate emissions are limited to the stack outlet. The maximum asphalt production rate of the Barber-Greene plant at TA-3-73 is 60 tons per hour (120,000 pounds per hour). By interpolation, the limit from 20.2.11 NMAC is 33.8 pounds per hour of particulate matter emitted from the stack. Based on a source test performed on August 25, 1993, provided in Appendix C, the particulate matter emission rate at maximum capacity is 4 pounds per hour, well below the 33.8 pound per hour limit in 20.2.11 NMAC. The BDM Engineering asphalt plant has a maximum production rate of 80 tons per hour (160,000 pounds per hour). This production rate corresponds to a 35.4 pounds per hour emission limit for particulate matter. Manufacturer's data indicates that the controlled hourly emissions are 1.44 pounds per hour. A source test will be performed to demonstrate compliance. Table 3.2-3 summarizes the applicable requirements for asphalt production. The proposed production limit of 13,000 tons per year listed in the table is a combined limit for both asphalt plants.

**Table 3.2-3. Applicable Requirements for Asphalt Plants**

Source Category	Applicable Requirement
Barber-Greene Asphalt Plant	<p><b><i>Operating Requirements:</i></b></p> <ul style="list-style-type: none"> <li>• Emission limit of 33.8 pounds per hour of particulate matter. (20.2.11.107(A)(6)-(7) NMAC)</li> <li>• The asphalt process equipment shall not operate without a fugitive dust control system to limit particulate emissions to the stack outlet.</li> </ul>

Source Category	Applicable Requirement
	<p>(20.1.11.108 NMAC)</p> <ul style="list-style-type: none"> <li>• Production shall not exceed 13,000 tons per year, 12-month rolling average. (LANL proposed condition)</li> </ul>
BDM Engineering Asphalt Plant	<p><b>Operating Requirements:</b></p> <ul style="list-style-type: none"> <li>• Emission limit of 35.4 pounds per hour of particulate matter. (20.2.11.107(A)(6)-(7) NMAC)</li> <li>• Production shall not exceed 13,000 tons per year, 12-month rolling average. (LANL proposed condition)</li> <li>• Particulate matter (PM) emissions released to the atmosphere from the baghouse, dryer, or mixer shall not exceed concentrations of 0.04 grains/dry standard cubic foot of particulate matter and shall not exhibit 20 percent opacity or greater. (40 CFR §60.92 and GCP-3-2195G III.H.1)</li> <li>• The asphalt process equipment shall not operate without a fugitive dust control system to limit particulate emissions to the stack outlet. (20.1.11.108 NMAC and GCP-3-2195G III.H.2)</li> <li>• Official six (6) minute opacity readings must be performed monthly. (GCP-3-2195G IV.C.1)</li> <li>• The baghouse must be equipped with a device to continuously monitor differential pressure across the baghouse. (GCP-3-2195G III.H.2.a.)</li> <li>• Equip and operate all screens, conveyor belts, and transfer points with dust collection and control systems sufficient to prevent opacity from exceeding 20%. (GCP-3-2195G III.H.3.)</li> <li>• Total sulfur content shall be no more than 0.75 percent by volume for any natural gas used. (GCP-3-2195G III.C.3.c.)</li> <li>• Total sulfur content shall be no greater than 0.5 percent by weight for any propane used. (GCP-3-2195G III.C.3.a.)</li> <li>• Hours of operation are limited to one-half hour following sunrise, one-half hour before sunset, and those hours in between. (GCP-3-2195G III.G.)</li> <li>• Hours of operation are limited to 4,380 hours per year. (GCP-3-2195G III.G.)</li> <li>• Haul roads must be watered. (GCP-3-2195G III.I.)</li> </ul>

### 3.2.7 Proposed Monitoring, Recordkeeping, and Reporting

Recordkeeping and reporting requirements are presented in the following table. Required recordkeeping and reporting are followed with a citation for the basis of the requirement.



**Table 3.2-4. Proposed Monitoring, Recordkeeping, and Reporting for Asphalt Plants**

<b>Source Category</b>	<b>Monitoring, Recordkeeping, and Reporting</b>
Barber-Greene Asphalt Plant	<p><b><i>Monitoring/Recordkeeping:</i></b></p> <ul style="list-style-type: none"> <li>• Records will be maintained to document compliance with the proposed production limit of 13,000 ton/year. (LANL proposed condition)</li> </ul> <p><b><i>Reporting:</i></b></p> <ul style="list-style-type: none"> <li>• Report criteria pollutant and HAP emissions on a semiannual basis. (20.2.73.300 NMAC for criteria pollutants and LANL proposed condition for HAPs and semiannual basis)</li> <li>• Submit semiannual report of any required monitoring within 45 days from the end of each reporting period. The reporting periods are January to June and July to December. (20.2.70.302(E)(1) NMAC)</li> </ul>

Source Category	Monitoring, Recordkeeping, and Reporting
BDM Engineering Asphalt Plant	<p><b>Monitoring:</b></p> <ul style="list-style-type: none"> <li>• Perform monthly six (6) minute opacity readings for each emission point having opacity greater than zero. (GCP-3-2195G IV.C.1)</li> <li>• Monitor the differential pressure (inches of water) across the baghouse by the use of a differential pressure gauge. (GCP-3-2195G IV.C.2)</li> <li>• A compliance test for particulate matter and opacity must be conducted within 60 days of initial startup. (GCP-3-2195G IV.E.1, .3)</li> </ul> <p><b>Recordkeeping:</b></p> <ul style="list-style-type: none"> <li>• Keep records of actual hours of operation, production rates, number of haul truck trips daily, pressure drop across the baghouse, fuel sulfur content, tickets of fuel purchased, quantity and frequency of water applied to haul roads, frequency of haul road sweeping, and copies of proposed and performed maintenance. (GCP-3-2195G IV.D.2)</li> <li>• Keep compliance test results for particulate matter and opacity performed within 60 days of initial startup. (GCP-3-2195G IV.E.1, .3)</li> <li>• Maintain results of the monthly six (6) minute opacity readings. (GCP-3-2195G IV.C.1)</li> <li>• Maintain records of the monitoring of the differential pressure across the baghouse. (GCP-3-2195G IV.C.2)</li> <li>• Retain records for 2 years. (GCP-3-2195G IV.D.1)</li> </ul> <p><b>Reporting:</b></p> <ul style="list-style-type: none"> <li>• Notify the Air Quality Bureau of the actual date of initial startup of the asphalt plant within 15 days after the startup date. (GCP-3-2195G IV.A.1.d)</li> <li>• Schedule with the Air Quality Bureau a pre-test meeting at least 30 days prior to the compliance test. (GCP-3-2195G IV.E.5)</li> <li>• Submit to NMED the compliance test protocol at least one week prior to the anticipated pre-test meeting date. (GCP-3-2195G IV.E.5.a)</li> <li>• If a malfunction results in excess emissions, notify the Air Quality Bureau within 24 hours and submit written report within 10 days. (GCP-3-2195G III.B.2, GCP-3-2195G IV.A.2 and 20.2.7.110 NMAC)</li> <li>• Submit copy of the compliance test results to NMED within 30 days after completing the compliance test. (GCP-3-2195G IV.E.9)</li> <li>• Report criteria pollutant and HAP emissions on a semiannual basis. (20.2.73.300 NMAC for criteria pollutants and LANL proposed condition for HAPs and semiannual basis)</li> <li>• Submit semiannual report of any required monitoring within 45 days from the end of each reporting period. The reporting periods are January to June and July to December. (20.2.70.302(E)(1) NMAC)</li> </ul>