

## **DRAFT**

### **EVALUATION REPORT BoDean Company Inc. Application # 23889 Plant # 13584**

#### **I. BACKGROUND**

Bodean Company has applied for Authorities to Construct and/or Permits to Operate for the following equipment at its Santa Rosa facility:

- S-26 Three Hot Mix Asphalt Silos and Conveyors: Make Astec, Model NGW 300, Capacity 300 Ton Per Silo; Abated by A-4: Blue Smoke Control System, Model 6S20C, 40,000 CFM Capacity.**
- S-27 Hot Mix Asphalt Truck Load-out at S-26 Silos; Abated by A-4: Blue Smoke Control System, Model 6S20C, 40,000 CFM Capacity.**

The facility is a batch mix plant producing hot mix asphalt (HMA). This project will install three additional silos along with a conveyor system. The HMA is loaded into the silos from above, then loaded into trucks underneath the silos. A new drag conveyor will be installed to transport materials from the existing drag conveyor (S-19) to the new silos, and two new horizontal conveyors will be added to transport materials from the new drag conveyor to two of the new silos. In addition, the facility proposed to install a Blue Smoke Control System to abate emissions from silo loading and truck load-out at the three new silos. In order to capture and vent the emissions to A-4, all the drag and horizontal conveyors will be totally enclosed, and the truck load-out area will be enclosed from the top and two sides to form a tunnel. The proposed Blue Smoke Control System contains six stages of filters that allow the collected oil to drip off the filter and into the dirty air plenum for disposal as a liquid.

The facility proposes to process up to 759,000 tons of HMA per year at this site. All HMA is produced at the existing hot mix asphalt batch plant (S-1), and can be loaded onto delivery trucks at the batch plant, under the existing silo (S-18), and under the new silos (S-26).

In order to verify that the addition of three new silos will not debottleneck the upstream process at S-1, the facility agreed to establish daily and annual throughput limits at S-1 as permit conditions at a production rate that was attained before the addition of these new silos. The facility has provided actual truck load-out records to demonstrate the highest historic hourly and daily production rates. The records from 9:00 PM on June 21, 2011 to 2:00 AM on June 22, 2011 show that the facility produced 294.8 tons of HMA per hour averaging over this 5-hour shift. The records from 6:00 AM on July 22, 2010 to 6:00 AM on July 22, 2010 show that the facility produced 5,475.1 tons over this 24-hour period. The definition of Modified Source in Regulation 2-1-234 states:

“For the purposes of applying this definition, an hourly limit or capacity may be converted to a daily limit or capacity by multiplication by 24 hours/day; a daily capacity may be converted to an annual capacity or limit by multiplication by 365 days/year.”

Therefore, the daily limit for S-1 based on the highest historic hourly production rate is 7,075 tons per day. The annual limit for S-1 based on the highest historic daily production rate would be 1,998,375 tons per year. However, the facility has voluntarily agreed to reduce the annual limit to 759,000 tons as a permit condition for S-1.

After this project, the facility has agreed to load only one HMA delivery truck at any given time at the entire site. Therefore, with no increase in overall HMA production at the facility, truck traffic inside the facility is not expected to increase as a result of this project.

#### **II. EMISSION CALCULATIONS**

**Basis:**

- Equations for Precursor Organic Compounds (POC), Particulate Matter (PM), and Carbon Monoxide (CO) emissions for silo filling and load-out are from EPA's AP-42, Chapter 11.1, Table 11.1-14 (dated 3/04)
- $T = 325 \text{ }^\circ\text{F}$
- $V = -0.5$  asphalt volatility
- The overall silo filling rate and truck load-out rate are limited by the daily and annual throughput limits of the hot mix asphalt batch process (S-1), which will be specified as permit conditions after this project. Therefore, Annual Throughput = 759,000 tons; Daily Throughput = 7,075 tons.
- According to the manufacturer specifications, A-4 has a reduction efficiency of 98% for POC and PM.
- For S-26 (Silo Filling), a capture efficiency of 100% is assumed as the conveyers are totally enclosed. Therefore, an overall capture and reduction efficiency of 98% will be used for S-26.
- For S-27 (Truck Load-out), a capture efficiency of 90% is assumed as the load-out area are enclosed on the top and sides. Therefore, an overall capture and reduction efficiency of 88.2% will be used for S-26.

### S-26 Silo filling:

$\text{TOC} = 0.0504 (-V) \exp [(0.0251)(T+460)-20.43] = 0.0122 \text{ lb TOC/ton asphalt}$

$\text{POC} = 100\% \text{ TOC} = 0.0122 \text{ lb POC/ton asphalt}$

Unabated POC Annual Emissions = 759,000 ton/yr X 0.0122 lb/ton = 9259.8 lb/yr

Unabated POC Daily Emissions = 7,075 ton/day X 0.0122 lb/ton = 86.32 lb /day

Abated POC Annual Emissions = 9,259.8 lb/yr X (1-98%) = 185.20 lb/yr or 0.093 tpy

Abated POC Daily Emissions = 86.32 lb/day X (1-98%) = 1.73 lb /day

$\text{PM}_{10} = 0.000332 + 0.00105 (-V) \exp [(0.0251)(T+460)-20.43] = 0.000586 \text{ lb PM/ton}$

Unabated  $\text{PM}_{10}$  Annual Emissions = 759,000 ton/yr X 0.000586 lb/ton = 444.77 lb/yr

Unabated  $\text{PM}_{10}$  Daily Emissions = 7,075 ton/day X 0.000586 lb/ton = 4.15 lb /day

Abated  $\text{PM}_{10}$  Annual Emissions = 444.77 lb/yr X (1-98%) = 8.90 lb/yr or 0.004 tpy

Abated  $\text{PM}_{10}$  Daily Emissions = 4.15 lb/day X (1-98%) = 0.08 lb /day

$\text{CO} = 0.00488(-V) \exp [(0.0251)(T+460)-20.43] = 0.00118 \text{ lb PM/ton}$

CO Annual Emissions = 759,000 ton/yr X 0.00118 lb/ton = 895.62 lb/yr or 0.448 tpy

CO Daily Emissions = 7,075 ton/day X 0.00118 lb/ton = 8.35 lb /day

### S-27 Truck load-out:

$\text{TOC} = 0.0172 (-V) \exp [(0.0251)(T+460)-20.43] = 0.00416 \text{ lb TOC/ton asphalt}$

$\text{POC} = 94\% \text{ TOC} = 0.00391 \text{ lb POC/ton asphalt}$

Unabated POC Annual Emissions = 759,000 ton/yr X 0.00391 lb/ton = 2967.69 lb/yr

Unabated POC Daily Emissions = 7,075 ton/day X 0.00391 lb/ton = 27.66 lb /day

Abated POC Annual Emissions = 2,967.69 lb/yr X (1-88.2%) = 350.19 lb/yr or 0.175 tpy

Abated POC Daily Emissions = 27.66 lb/day X (1-88.2%) = 3.26 lb /day

$\text{PM}_{10} = 0.000181 + 0.00141 (-V) \exp [(0.0251)(T+460)-20.43] = 0.000522 \text{ lb PM/ton}$

Unabated  $\text{PM}_{10}$  Annual Emissions = 759,000 ton/yr X 0.000522 lb/ton = 396.20 lb/yr

Unabated  $\text{PM}_{10}$  Daily Emissions = 7,075 ton/day X 0.000522 lb/ton = 3.69 lb /day

Abated  $\text{PM}_{10}$  Annual Emissions = 396.20 lb/yr X (1-88.2%) = 46.75 lb/yr or 0.023 tpy

Abated  $\text{PM}_{10}$  Daily Emissions = 3.69 lb/day X (1-88.2%) = 0.44 lb /day

$\text{CO} = 0.00558(-V) \exp [(0.0251)(T+460)-20.43] = 0.00135 \text{ lb CO/ton}$

CO Annual Emissions = 759,000 ton/yr X 0.00135 lb/ton = 1024.65 lb/yr or 0.512 tpy

CO Daily Emissions = 7,075 ton/day X 0.00135 lb/ton = 9.55 lb /day

**III. PLANT CUMULATIVE INCREASE**

		<u>Current (ton/yr)</u>	+	<u>New (ton/yr)</u>	=	<u>New Total (ton/yr)</u>
<b>POC</b>	=	0.047		0.268		0.315
<b>PM10</b>	=	0.100		0.027		0.127
<b>CO</b>	=	0.009		0.960		0.969

**IV. TOXICS SCREENING ANALYSIS**

EPA’s AP-42, Chapter 11.1, Tables 11.1-15 and 11.1-16 provide emission factors for toxic pollutants emitted from silo filling and load-out operations. The toxic emissions will be abated by A-4, which has a reduction efficiency of 98% according to the manufacturer specifications. For S-26 (Silo Filling), a capture efficiency of 100% is assumed as the conveyers are totally enclosed. An overall capture and reduction efficiency of 98% will be used for S-26. For S-27 (Truck Load-out), a capture efficiency of 90% is assumed as the load-out area is enclosed on the top and sides. An overall capture and reduction efficiency of 88.2% will be used for S-27.

Appendix A contains the calculations for the emissions of toxic air contaminants from the silo filling and load-out operations. The following emissions of toxic air contaminants exceed the District’s trigger levels in Table 2-5-1 of Regulation 2-5, so a health risk screening analysis (HRSA) was completed.

<u>Toxic Pollutant</u>	<u>Emissions</u> <u>Annual (lb/yr)</u>	<u>Trigger Levels</u> <u>Chronic (lb/yr)</u>
Benzo(a)anthracene (PAHs)	0.00796	0.00069
Benzo(b)fluoranthene (PAHs)	0.00232	0.00069
Chrysene (PAHs)	0.03954	0.000069

Based on the interoffice memorandum from Ted Hull dated May 2 2012, results from the HRSA indicate that the maximum cancer risk is 0.14 in a million, the chronic hazard index is 0.00019, and the acute hazard index is 0.0025. In accordance with Regulation 2-5-301 and 2-5-302, these are acceptable risks.

**V. BEST AVAILABLE CONTROL TECHNOLOGY**

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NOx, CO, SO<sub>2</sub> or PM<sub>10</sub>. Based on the emission calculations above, the owner/operator of S-26 and S-27 is subject to BACT for POC. The facility has proposed to abate POC emissions from S-26 and S-27 with A-4, Blue Smoke Control System. The District’s current BACT Handbook does not contain guidelines for silo loading and truck load-out operations at hot mix asphalt facilities. A BACT search of the South Coast Air Quality Management District (SCAQMD) and San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) showed that abatement to a blue smoke recovery system (emissions vented back to the combustion zone of the rotary drum burner) or a blue smoke control system (emissions collected and vented through a series of filters designed to capture blue smoke) was achieved in practice.

BACT Determinations for Truck Load-out at Asphalt Plants

Agency (Plant)	Drum Size & Production Rate	Blue Smoke (VOC)
SCAQMD	175 MMBtu/hr,	Truck Load-out: Enclosed tunnels vented to two-stage

(Blue Diamond Division of Sully Miller Contracting)	600 tph	filter packs
SBCAPCD (Granite Construction)	150 MMBtu/hr, 450 tph	Truck Load-out: Blue smoke 2-stage filter pack
SJVUAPCD (Summary for 4 plants)	26-135 MMBtu/hr, 1400-6000 tpy	Achieved in practice VOC: vented to the rotary-dryer burner (blue smoke recovery system Technologically feasible VOC: vented to an afterburner
		Achieved in practice PM10: none Technologically feasible PM10: enclosed on two sides vented to blue smoke control (electrostatic precipitator or filter pack)

BAAQMD permit application 15287 (November 2007) for a new HMA plant also abated truck load-out emissions with a blue smoke control system. Therefore, BACT 2 for S-26 and S-27 will be abatement by a blue smoke control system.

## VI. OFFSETS

Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NO<sub>x</sub> per Regulation 2-2-302. The District may provide offsets from the Small Facility Bank for a facility with emissions between 10 and 35 tons/yr of POC or NO<sub>x</sub>, provided that facility has no available offsets. The facility's emissions of POC and NO<sub>x</sub> are each less than 10 tons per year, so no POC or NO<sub>x</sub> offsets are required.

The facility is not a Major Facility. Therefore, offsets of PM10 and sulfur dioxide are not required for this application per Regulation 2-2-303.

## VII. PUBLIC NOTIFICATION

This project is within 1000 feet from the nearest school and is therefore subject to the public notification requirements in Regulation 2-2-412. Notifications will be distributed to parents or guardians of children enrolled at Abraxis Charter School, and all residential and business neighbors within 1,000 feet of the proposed new sources.

## VIII. STATEMENT OF COMPLIANCE

### District Regulations

The owner/operator of S-26 and S-27 shall comply with Regulation 6, Rule 1 Particulate Matter – General Requirements. Because the particulate matter emissions from S-26 and S-27 will be abated by A-4, Blue Smoke Control System, the owner/operator is not expected to emit any visible emissions that exceed Ringelmann 1.0 per Sections 301. At the maximum throughput of 300 tons of material per hour at S-26 and S-27, the unabated particulate emissions into the atmosphere of 0.18 lb/hr and 0.16 lb/hr, respectively, are well below the allowable limit of 40 lb/hr based on Section 311.

### California Environmental Quality Act (CEQA)

The project is considered to be ministerial under the District's CEQA regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emissions factors outlined in the Permit Handbook Chapter 11.2, and therefore is not discretionary as defined by CEQA.

**New Source Performance Standards (NSPS)**

The owner/operator of S-26 and S-27 is subject to the Federal NSPS 40 CFR Part 60 Subpart I: Standard of Performance for Hot Mix Asphalt Facilities. §60.92 states that the owner/operator shall not discharge or cause discharge into the atmosphere from any affected facility any gases which: 1) Contain particulate matter in excess of 90 mg/dscm (0.04 grain/dscf); 2) Exhibit 20% opacity or greater. S-26 and S-27 are expected to meet the NSPS requirements since the particulate matter emissions from S-26 and S-27 will be abated by A-4, Blue Smoke Control System. At the rated capacity of 40,000 CFM at A-4, the abated particulate matter emissions at the outlet of A-4 is estimated to be approximately 0.01 grain/dscf when S-26 and S-27 are operated at the maximum throughput of 300 tons per hour.

**Prevention of Significant Deterioration (PSD)**

The emission increase resulting from this project is expected to be less than 1 TPY for each criteria pollutant. Since it is far below the PSD thresholds, the project is not subject to PSD review.

**National Emission Standards for Hazardous Air Pollutants (NESHAP)**

The facility is not defined as affected by any Subpart of 40 CFR Part 61 or Part 63.

**IX. PERMIT CONDITIONS**

Proposed Permit Conditions for S-1 (Hot Mix Asphalt Batch Plant), S-26 (Three Hot Mix Asphalt Silos with Convey System), and S-27(Truck Load-out at S-26 Silos), at Plant # 13584, via Application # 23889:

1. The owner/operator shall not produce more than 759,000 tons of hot mix asphalt during any consecutive 12-month period. The owner/operator shall not exceed a production rate of 7,075 tons per day of hot mix asphalt.  
(Basis: Regulation 2-1-234.3)
2. The owner/operator shall not load hot mix asphalt onto more than one truck at any given time in Plant 13584.  
(Basis: Cumulative Increase)
3. The owner/operator shall not operate S-26 (Three Hot Mix Asphalt Silos with Conveyor System) and S-27 (Hot Mix Asphalt Truck Load-out at S-26 Silos) unless emissions from these sources are abated by A-4 (Blue Smoke Control System).  
(Basis: Cumulative Increase; Toxics; BACT)
4. The owner/operator shall totally enclose the conveyor system at S-26, including one drag conveyor and two horizontal conveyors.  
(Basis: Cumulative Increase; Toxics; BACT)
5. The owner/operator shall enclose the truck load-out operation of S-27 on at least three sides.  
(Basis: Cumulative Increase; Toxics; BACT)
6. The owner/operator shall maintain A-4 (Blue Smoke Control System) in good operating condition at all times.  
(Basis: Cumulative Increase; Toxics; BACT)
7. To demonstrate compliance with the above parts, the owner/operator shall keep the following records on a daily basis:
  - a. Total weight of hot mix asphalt produced in Plant 13584.
  - b. Number of trucks loaded in Plant 13584.

c. Records of repair and maintenance performed for A-4.

These records shall be kept in a District approved log and retained for a period of at least two years from the date of entry. These records shall be kept on site and made available to the District staff upon request.

(Basis: Cumulative Increase; Recordkeeping)

**X. RECOMMENDATION**

Recommendation to be determined after the public comment period.

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*Xuna Cai*  
*Air Quality Engineer*

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*Date*

## Appendix A

Hourly Throughput (ton/hr) =	300
Annual Throughput (ton/yr) =	759,000
Silo Filling Abatement Efficiency =	98%
Load Out Abatement Efficiency =	88.2%

Load Out Organic PM EF (lb/ton) =	0.00034	Load Out TOC EF (lb/ton) =	0.00416
Silo Filing Organic PM EF (lb/ton) =	0.00025	Silo Filing TOC EF (lb/ton) =	0.01219
Load Out Organic PM (lb/hr) =	0.10228	Load Out TOC (lb/hr) =	1.24768
Silo Filing Organic PM (lb/hr) =	0.07617	Silo Filing TOC (lb/hr) =	3.65601
Load Out Organic PM (lb/yr) =	258.771	Load Out TOC (lb/yr) =	3156.642
Silo Filing Organic PM (lb/yr) =	192.702	Silo Filing TOC (lb/yr) =	9249.694

	<i>AP-42 Table 11.1-16 Silo Filing</i>			<i>AP-42 Table 11.1-16 Load Out</i>			<i>Abated Combined Emission</i>	<i>Chronic Trigger</i>	<i>Abated Combined Emission</i>	<i>Acute Trigger</i>
	<i>% compound/TOC</i>	<i>Abated Emission lb/yr</i>	<i>Abated Emission lb/hr</i>	<i>% compound/TOC</i>	<i>Abated Emission lb/yr</i>	<i>Abated Emission lb/hr</i>	<i>lb/yr</i>	<i>lb/yr</i>	<i>lb/hr</i>	<i>lb/hr</i>
Benzene	0.032	0.059	0.00002	0.052	0.194	0.0000766	0.253	3.8	0.00010	2.9
Ethyl Benzene	0.038	0.070	0.00003	0.280	1.043	0.0004122	1.113	43	0.00044	N/A
Formaldehyde	0.690	1.276	0.00050	0.088	0.328	0.0001296	1.604	18	0.00063	0.12
Hexane	0.100	0.185	0.00007	0.150	0.559	0.0002208	0.744	270000	0.00029	N/A
Methyl Chloroform	0.000	0.000	0.00000	0.000	0.000	0.0000000	0.000	39000	0.00000	150
Toluene	0.062	0.115	0.00005	0.210	0.782	0.0003092	0.897	12000	0.00035	82
Xylene	0.257	0.475	0.00019	0.490	1.825	0.0007214	2.301	27000	0.00091	49
Methylene Chloride	0.000	0.000	0.00000	0.000	0.000	0.0000000	0.000	110	0.00000	31

	<i>AP-42 Table 11.1-15 Silo Filing</i>			<i>AP-42 Table 11.1-15 Load Out</i>						
	<i>% compound/organic PM</i>			<i>% compound/organic PM</i>						
Benzo(a)anthracene (PAHs)	0.056	0.002158	0.0000009	0.019	0.006	0.0000023	0.00796	0.00069	0.00000	N/A
Benzo(a)pyrene (PAHs)	0.000	0.000000	0.0000000	0.002	0.001	0.0000003	0.00070	0.00069	0.00000	N/A
Benzo(b)fluoranthene (PAHs)	0.000	0.000000	0.0000000	0.008	0.002	0.0000009	0.00232	0.00069	0.00000	N/A
Benzo(k)fluoranthene (PAHs)	0.000	0.000000	0.0000000	0.002	0.001	0.0000003	0.00067	0.00069	0.00000	N/A
Chrysenes (PAHs)	0.210	0.008093	0.0000032	0.103	0.031	0.0000124	0.03954	0.000069	0.00002	N/A
Indeno(1,2,3-c,d)pyrene (PAHs)	0.000	0.000000	0.0000000	0.000	0.000	0.0000001	0.00014	0.00069	0.00000	N/A
Naphthalene	1.820	0.070144	0.0000277	1.250	0.382	0.0001509	0.45183	3.2	0.00018	N/A
Phenol	0.000	0.000000	0.0000000	1.180	0.360	0.0001424	0.36031	7700	0.00014	13