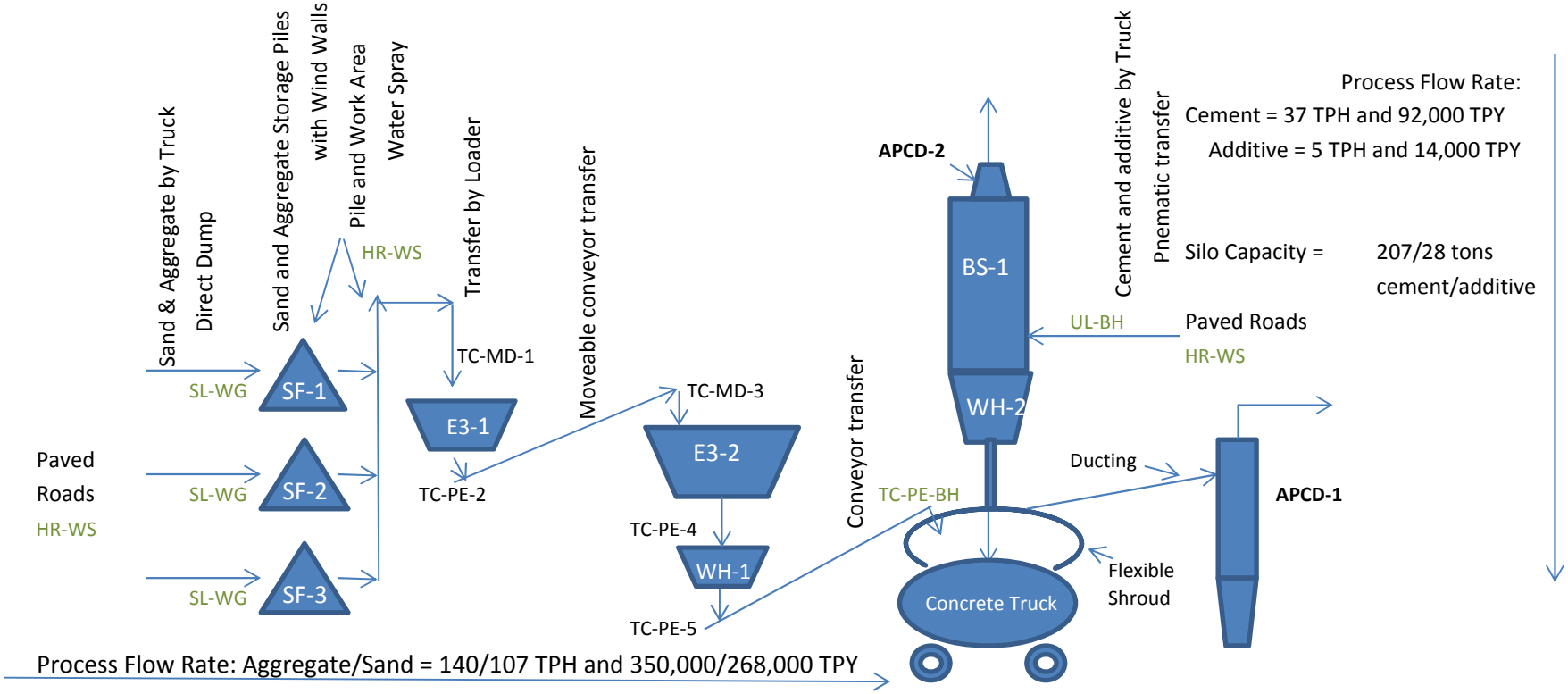
Tri-State Paving and Sealcoating, LLC
dba MoZack Ready Mix

Process Flow Diagram
Dry Concrete Batch Plant
Scott Depot, West Virginia



Legend:

SF-X	Storage Pile with Wind Wall - number	**TC-MD-X**	Transfer Point with Minimized Drop - number
E3-X	Three sided enclosure/bin -number	**SL-WG**	Storage Load Out with Wind Wall
BS-X	Enclosed Silo -number	**HR-WS**	Haul Road/Storage Pile Water Spray
WH-X	Weight Hopper/Batcher - number	**TC-PE-BH**	Transfer with partial enclosure and baghouse
APCD-X	Air Pollution Control Device - number	**UL-BH**	Truck Unloading with baghouse control

Equipment Sizes:

Plant Capacity:	150 yd3/hr (302 tons/hour)			
(Concrete)	375,000 yd3/year (755,000 tons/year)			
SF-1, 2, 3	Max Height	20 feet	**E3-1**	25 (34) Cubic Yards (tons)
	Max Diameter	50 feet	**E3-2**	90 (121) Cubic Yards (tons)
			BS-1	7,300 Cubic Feet

MoZack Ready Mix
Air Permit Application
Assumptions

Production:

150	yd3/hour
2500	hours/year (10 hours/day, 5 days/wk, 50 weeks/yr)
375,000	yd3/year

Typical Mix Ratios:

1865	aggregate	46.3%
1428	sand	35.5%
491	cement	12.2%
73	lbs additive	1.8%
167	lbs water	4.2%
4024	lbs/yd3 total	
149	lbs/ft3 total	

Hourly and Annual Throughputs:

	Hourly		Annual	
	yd3	tons	yd3	tons
aggregate	69.5	139.9	173,801	349,688
sand	53.2	107.1	133,077	267,750
cement	18.3	36.8	45,757	92,063
lbs additive	2.7	5.5	6,803	13,688
water	6.2	12.5	15,563	31,313
Total		**301.8**		**754,500**
Total no water		289		723188

Conversions:

27	ft3/yd3
4024	lbs/yd3 concrete

Plant Configuration:

Roads are paved, 400 foot (0.076 mile) loop for trucks in-load/unload-out

3 storage piles (1 sand, 2 aggregate), pile size info needed - max diameter, height, capacity

20	feet high	density sand	1.3 tons/yd3		
50	feet diameter	density agg	1.4 tons/yd3	Base Area =	157.0796
58	yd3 of storage/pile (pi x r x h)				
76	tons sand/pile	81	tons agg/pile		

Storage pile fines content - % less than 200 mesh sieve - assume 10% max

Storge pile typical moisture % - 5% aggregates, 3% sand

Storage Pile Surface Area =

R=	32.02	ft		
Area =	201	ft2 per pile		
Area 3 piles =	603	ft2	=	0.013854

One Silo - 1,000 barrels (55 gallon per client) -			55,000	gallons
60%	cement		7.48	gallons/ft3
40%	additive		7353	ft3, total silo capacity
94	(lb/ft3)density cement (Tapco)		4412	ft3 for cement
SG = 2.3	19	(lb/ft3)density additive (Fritzpak)	2941	ft3 for additive
	8.34	lb/ft3 water	207	tons cement capacity (5.6 hours capacity)
			28	tons additive capacity (5 hours capacity)

Vehicle Trips:

Sand/Aggregate

Aggregate and sand to site by truck, average weight 50 tons, maximum tires - 10

Semi-end dump trucks, 25 ton capacity, 250 tons/hr sand+agg, 10 trucks/hr — VMT = 0.76 per hour; 1900 per year

Cement/Additive

Cement/additive delivery to site by truck, 2 trucks to fill silo, 18 wheels, assume 50 tons, 2 trucks/day

Watering Truck — VMT = 0.0152 per hour; 38 per year

Single watering truck for roads/storage area, assume 10 wheels, 20 tons

Ready Mix Trucks

Assume 10 yd3 trucks, 150 yd3/hour, 15 trucks/hr — VMT= 1.14 per hour; 2850 per year

30 tons, 10 wheels

Process Description:

Aggregate and sand transfer to storage by tip dump, no emissions controls

Pile movement in yard by front end loader, water spray to control pile wind and yard dust emissions

Transfer to elevated sand/agg bin using loader
Transfer from elevated bin to conveyor by direct drop with minimum drop
Transfer from conveyor to batch mixer by direct drop with minimize drop
Cement/additive transfer to silo pnematic, silo controlled with VH 245JP silo vent baghouse
Cement/additive transfer to batcher totally enclosed
Cement/additive/aggregate/sand transfer to ready mix haul trucks controlled by flexible shroud (partial enclosure) vented to baghouse
Assume saturated surface dry + 1% moisture for pile conditions - 5% for aggregate, 3% for sand
Assume aggregate feed bin dimensions at top are 28'x14', at bottom are 14'x4' at discharge to batcher with 4' straight vertical section at top and 9

Bin Capacity =	2324	ft3
	86	yd3
	116.2	tons

Assume loader bin is 25 yd3 and 34 tons capacity

' vertical slope to batcher

Attachment A: Current Business Certificate

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Attachment B: Process Description

Tri-State Paving and Sealcoating is planning to construct a dry concrete batch plant in Scott Depot, West Virginia. Travel, working and storage areas within the plant site will be paved in concrete or asphalt. Sand, aggregate, cement and cement additive will be delivered by truck.

Sand and aggregate will be transferred to storage piles (SF-1 through SF-3) by direct dump from delivery trucks. The pile storage area will have wind walls to minimize emissions (SL-WG). From the sand and aggregate storage piles, material loadout will use a front end loader to transfer sand and aggregate to a three-sided conveyor feed bin (E3-1). The loader operator will minimize the drop distance to reduce fugitive emissions (TC-MD-1). The bin will act as a partial enclosure as well. Sand and aggregate will be transferred via open, moveable conveyor to an open-top aggregate and sand process bin (E3-2). The drop distance onto the conveyor will be minimized and fitted with a partial enclosure (TC-PE-2). The drop distance into the aggregate and sand process storage will be minimized (TC-MD-3). The bin will act as a partial enclosure as well. Sand and aggregate will bottom discharge from E3-2 into a weigh hopper (WH-1). The drop into WH-1 will be partially enclosed (TC-PE-4). From WH-1 the sand and aggregate will discharge onto an open transfer conveyor routed to the concrete truck loading rack. The drop distance onto the conveyor from the process bin will be minimized and fitted with a partial enclosure (TC-PE-5). Particulate emissions from loading of sand and aggregate into concrete trucks will be collected by a flexible shroud enclosure (TC-PE-BH) and routed to a baghouse (APCD-1). In addition to minimizing drop distances, conveyor transfer points will be fitted with either a partial enclosure, or a hood, or a curtain, or a shroud as required by the concrete batch plant general permit condition 2.2.5.d.viii. The specific treatment for each point will be determined as the plant design is finalized.

Cement and additive will be pneumatically transferred from delivery trucks to a single, split storage silo (BS-1) direct vented through a baghouse (APCD-2) for particulate control (UL-BH). Cement and cement additive will be bottom discharged from the storage silo (BS-1) through a total enclosure to the weigh hopper/batcher (WH-2). Discharge from the batcher into concrete trucks will be within a flexible shroud enclosure (TC-PE-BH). Particulate emissions from truck loading will be collected by the flexible shroud and routed to a baghouse (APCD-1).

Fugitive emissions from trucks traveling on the paved roads will be controlled by watering during dry weather (HR-WS). Wind erosion on storage piles will be controlled by pile watering during dry weather using the same water truck (HR-WS).

The plant capacity, based on final mixed concrete volume, is 150 cubic yards per hour (yd3/hr), and 375,000 cubic yards per year (yd3/yr). This is approximately 302 tons per hour (TPH), and 755,000 tons per year (TPY) respectively on a weight basis.

The plant process flow volumes and weights are based on final mix concrete with the following approximate composition for one yard of concrete (per AP-42, Section 11.12, Concrete Batching):

Aggregate	1865 pounds	46.3%
Sand	1428 pounds	35.5%
Cement	491 pounds	12.2%
Cement Additive	73 pounds	1.8%
Water	167 pounds	4.2%
Total	4024 pounds	

Attachment C: Description of Fugitive Emissions

Fugitive emissions may occur as a result of truck travel on paved roads, travel of the front end loader between sand and aggregate storage piles and the process feed bin (E3-1), wind erosion on sand and aggregate storage piles (SF-1, SF-2, SF-3), and at transfer points for sand and gravel in the process (TC-MD/PE-1 through 5).

The following control methods will be employed to reduce fugitive emissions:

- Site Fugitives from Vehicles (trucks on roads, loader movement on site) – the site will be paved, a water truck (HR-WS) will be used during dry weather to water roads and work areas.
- Storage Piles – storage piles will be surrounded by a wind wall (SL-WG) to minimize fugitives during truck unloading and watered during dry weather conditions using the watering truck (HR-WS).
- Sand and Aggregate Transfers – drop distance will be minimized at all transfers (TC-MD). Non-bin transfer points will be fitted with partial enclosures (TC-PE).

The exact watering plan will be developed as the owner gains experience with this specific site and requirements to minimize dust emissions. To start, the watering plan is to water active work areas and roads at the site during dry weather conditions with an anticipated frequency of three times per day. Storage piles will be watered only if dust is observed leaving the piles from wind erosion to maintain product water content near needed levels.

The watering truck has not been procured, but a typical truck will have an application rate of approximately 120 to 400 gallons per minute per spray head. The anticipated watering truck will have 4 spray heads and an expected water application rate of 500 to 1,000 gallons per minute. Winterization methods are also still under investigation. A water heater may be installed at the site for production purposes and may be used for winter water application. Alternatively, additives may be used.

Best Management Practices – if fugitive dust emissions are observed moving offsite, the watering frequency or application rate will be increased until emissions are controlled.

Attachment D: Process Flow Diagram

Attachment E and Attachment F: Plot Plan and Area Maps

To supply the information requested by the G50-B application, the following drawings are attached:

- USGS 7.5 minute map showing the facility, nearest residential use, and nearest commercial use
- A Google Earth Map showing the facility, nearest residential use, and nearest commercial use, site access, and existing onsite building. The approximate boundary of the working area of the site is also shown. The working area of the site is more than 300 feet from the nearest adjacent use, which is commercial.
- A site layout plan showing property lines, driveway location, and existing onsite building which will remain.
- A site /grading & drainage plan showing equipment locations

Attachment G: Equipment Data Sheets and Registration Section Applicability Form

CBP PRODUCTION AFFECTED SOURCE SHEET

CBP Production Information	Source Identification Number[1]	WH-1	
	Manufacturer & Model Number	VH*, LP12B	
	Date of Manufacture	New	
	Maximum Design Production Rate[2]	250	tons/hour
	Maximum Annual Production[3]	620,000	tons/year
	Daily Operation	10	hours/day
	Annual Operation	250	days/year
		2500	hours/year
	Approximate Percentage of Operation from: **Note: This will vary based on sales**	25	Jan - Mar
		25	April - June
		25	July - Sept
		25	Oct - Dec

1. Enter the appropriate Source Identification Number for each concrete batch plant production weigh hopper or central mixer. Batch plant weigh hopper should be designated WH-1, WH-2, etc. Batch plant central mixer should be designated CM-1, CM-2, etc.

2. Enter the manufacturer's Maximum Design Production Rate of the concrete batch plant production equipment. Specify units in tons/hour.

3. Enter the Maximum Annual Production of the concrete batch plant. Specify units of cubic yards per year or tons per year. To calculate Maximum Annual Production, multiply the Maximum Design Production Rate (tons/hr) by the Annual Operation (hrs/yr).

*VH = Vince Hagan

CBP PRODUCTION AFFECTED SOURCE SHEET

CBP Production Information	Source Identification Number[1]	WH-2	
	Manufacturer & Model Number	VH*, LP12B	
	Date of Manufacture	New	
	Maximum Design Production Rate[2]	42	tons/hour
	Maximum Annual Production[3]	106,000	tons/year
	Daily Operation	10	hours/day
	Annual Operation	250	days/year
		2500	hours/year
	Approximate Percentage of Operation from: **Note: This will vary based on sales**	25	Jan - Mar
		25	April - June
		25	July - Sept
		25	Oct - Dec

4. Enter the appropriate Source Identification Number for each concrete batch plant production weigh hopper or central mixer. Batch plant weigh hopper should be designated WH-1, WH-2, etc. Batch plant central mixer should be designated CM-1, CM-2, etc.

5. Enter the manufacturer's Maximum Design Production Rate of the concrete batch plant production equipment. Specify units in tons/hour.

6. Enter the Maximum Annual Production of the concrete batch plant. Specify units of cubic yards per year or tons per year. To calculate Maximum Annual Production, multiply the Maximum Design Production Rate (tons/hr) by the Annual Operation (hrs/yr).

*VH = Vince Hagan

Attachment H: Air Pollution Control Devise Sheets

AIR POLLUTION CONTROL DEVICE AFFECTED SOURCE SHEET

CBP Air Pollution Control Device Data Sheet		Fabric Filter Baghouse	Filter Vent	Fabric Filter Discharge Sock
General Information	APCD Identification Number[1]	APCD-1	APCD-2	
	Manufacturer & Model Number	Vince Hagan VH-700IP	Vince Hagan VH245IP	
	Number of Compartments	1		
	Gas Inlet Area (ft^2)	1.07	5.05	
	Gas Outlet Area (ft^2)	2.35	0.226	
	Fabric Filter Cleaning Mechanism[2]	Pulsr Jet	Pulse Jet	
	Total Cloth (fabric) Area (ft^2)	700	245	
	Draft Fan HP	7.5		
	Outlet Stack Area (ft^2)	No stack		
Operational Parameters	Minimum Design PD (in H_2O)	2		
	Maximum Design PD (in H_2O)	6		
	Inlet Gas Flow Rate (ACFM)	4200	600	
	Inlet Gas Temperature (^oF)	70	70	
	Inlet Gas Pressure (PSIA)	0.19		
	Inlet Gas Velocity (ft/sec)	65.4	2	
	PM Inlet Rate (grains/scf)			
	PM Outlet Rate (grains/scf)	<0.005		
	Operating Air/Cloth Ratio (ft/min)	6	2.45	

1. Enter the appropriate Air Pollution Control Device Identification Number for each fabric filter baghouse, filter vent or discharge sock. The devices should be designated APCD-1, APCD-2, APCD-3, etc.
2. Enter method used to clean bags: shaker, pulse jet, reverse jet or other.
3. Complete more than one CBP Air Pollution Control Device Data Sheet if necessary.
4. Enter the fractional efficiency of the fabric filter baghouse.

CBP PARTICULATE MATTER CAPTURE SYSTEM
AFFECTED SOURCE SHEET

Pursuant to Section 2.2.4 of General Permit G50-B, the registrant shall not cause, suffer, allow, or permit any registered concrete batch plant to operate that is not equipped with an effective particulate matter capture system(s) and associated air pollution control device(s) to minimize the emission of particulate matter from production equipment, storage structures and silos. The particulate matter capture system shall ensure the lowest fugitive particulate emissions reasonably achievable.

A particulate matter capture system shall be used to confine, collect, and transport displaced particulate matter from production weigh hoppers, cement and flyash storage structures and/or silos to an air pollution control device. Particulate matter capture systems may include but not be limited to: hoods, bins, ductwork, enclosures and air pollution control devices such as fabric filter baghouses, associated fans, discharge socks and filter vents.

Provide a written description of the concrete batch plant's particulate matter capture system below:

WH-2 (Cement/Additive Weigh Hopper/Batcher) Capture System
A flexible dust shroud will be used to capture particulate from the weigh hopper. Captured
Emissions will be routed through flexible and hard ducting to the baghouse (APCD-1). This
system will also capture emissions from sand/aggregate loading to concrete trucks.
BS-1 (Cement/Additive Silo) Capture System
The silo vent dust collector will be direct mounted to the top of the cement/additive storage silo
And does not have an associated capture system.

CBP MATERIAL STORAGE & HANDLING
AFFECTED SOURCE SHEET

Source Identification Number[1]	SF-1	SF-2	SF-3	E3-1	E3-2	BS-1
Material Stored[2]	Sand/Flyash	Aggregate	Aggregate	Sand and Aggregate	Sand and Aggregate	Cement and Additive
Maximum Yearly Throughput (tons/year)[3]	268,000	175,000	175,000	618,000	618,000	106,000
Typical Moisture Content (%)[4]	3%	5%	5%	3 to 5%	3 to 5%	Nil
Average % of Material Passing Through 200 Mesh Sieve[5]	5 – 10%	--	--	2 – 5 %	2 – 5%	100
Maximum Stockpile Base Area (ft^2)[6]	160	160	160	NA	NA	NA
Maximum Stockpile Height (ft)[7]	20	20	20	NA	NA	NA
Maximum Storage Capacity (tons)[8]	76	81	81	34	121	235
Dust Control Method Applied to Storage[9]	HR-WS	HR-WS	HR-WS	OT – partial enclosure	OT – partial enclosure	FE
Method of Material Load-in to Bin or Stockpile[10]	TD	TD	TD	FE	MC	OT -pneumatic
Dust Control Method Applied During Load-in[11]	MD	MD	MD	MD	MD	OT-FE+baghouse
Method of Material Load-out from Bin or Stockpile[10]	FE	FE	FE	MC	SS	OT –direct coupled
Dust Control Method Applied During Load-out[11]	HR-WS	HR-WS	HR-WS	MD/PE	OT- shroud/ baghouse	OT – shroud/ baghouse

1. Enter the appropriate Source Identification Number for each storage activity using the following codes. For example, if the facility utilizes four open stockpiles and one storage silo, the Source Identification Numbers should be OS-1, OS-2, OS-3, and OS-4; and BS-1, respectively.
   OS Open Stockpile E3 Enclosure (three-sided enclosure)
   BS Bin or Storage Silo (full enclosure) SB Storage Building (full enclosure)
   SF Stockpiles with wind fences OT Other _____ (please specify)
2. Describe the type of material stored or stockpiled.
3. Enter the maximum yearly storage throughput for each storage activity.
4. Enter the average percent moisture content of the stored material.
5. Enter the average percent of material that will pass through a 200 mesh sieve.
6. For stockpiles, enter the maximum stockpile base area.
7. For stockpiles, enter the maximum stockpile height.
8. Enter the maximum storage capacity for each storage activity in tons (e.g. silo capacity, maximum stockpile size, etc.).
9. Enter the dust control method applied to storage activity using the following codes:
   CA Crusting Agent WS Water Spray
   FE Full Enclosure NO None
   OT Other _____ (please specify)
10. Enter the method of load-in or load-out to/from stockpiles or bins using the following codes:
   FE Front Endloader SS Stationary Conveyor/Stacker
   ST Stacking Tube MC Mobile Conveyor/Stacker
   CS Clamshell TD Truck Dump
   OT Other _____ (please specify)
11. Enter the dust control method applied during load-in or load-out using the following codes:
   CA Crusting Agent WS Water Spray
   FE Full Enclosure MD Minimize Drop Height
   ST Stacking Tube NO None
   OT Other _____ (please specify)

CBP FUGITIVE DUST CONTROL SYSTEM
AFFECTED SOURCE SHEET

Fugitive Dust Control System Data	Fugitive Dust Control Method [1]	WT (HS-WS)
	Design Water Flow Rate (gpm) [2]	400 to 1000
	Chemical Additive [3]	None
	Water/Additive Mix Ratio [4]	NA
	Amount (gal/yd) [5]	Unknown
	Frequency of Application [6]	Initial 3 times per day
	Haulroad Surface [7]	Paved
	Work/Storage Area Surface [7]	Paved
	Haulroad Length [8]	Approx.. 400 feet (0.076 mile)
	Number of Vehicles per day [9]	250
	Number of Wheels per Vehicle [10]	10 (most), 16 (cement trucks)
	Weight of Vehicle (tons) [11]	38

1.Enter the fugitive dust control method(s) using the following codes:
WT Water Truck WS Fixed Water Sprays
UW Underbody Truck Wash RS Rumble Strips
OT Other _____ (please specify)
2. Enter the design water flow rate for the water truck or fixed water sprays in gallons per minute.
3. Enter manufacturer and type, specification or grade of chemical additive.
4. Enter the water/chemical additive mix ratio.
5. Enter the amount of water or water/chemical additive mix to be applied to haulroads, storage and work areas in gallons per square yard.
6. Enter the frequency of application of water/chemical additive mix to haulroads, storage and work areas during periods of dry weather.
7. Enter the type of haulroad, work and storage area surface (asphalt pavement, concrete, dirt, coarse gravel, reddog, etc.).
8. Enter the approximate length of haulroad(s) in miles or feet. List appropriate units.
9. Enter the maximum daily vehicle traffic (trucks per day).
10. Enter the maximum number of wheels per vehicle.
11. Enter the mean vehicle weight in tons.
12. Complete a separate HMA Plant Fugitive Dust Control System Data sheet for each fugitive dust control system.

Provide a written description of the concrete batch plant's particulate matter capture system below:

Please refer to the"**CBP PARTICULATE MATTER CAPTURE SYSTEM"** form.

Attachment I: Emissions Calculations

Attachment J: Class I Legal Advertisement

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that Tri-State Paving & Sealcoating, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a General Permit for a Concrete Batch Plant located on 962 Winfield Rd, Winfield in Putnam County, West Virginia. The latitude and longitude coordinates are: 38.44796 N and 81.83978 W.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be:

- Particulate Matter: 24.8 tons per year
- Fine Particulate Matter (PM-10): 9.4 tons per year

Startup of operation is planned to begin on or about the 1st day of May, 2015. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 17th day of March, 2015.

By: Tri-State paving & Sealcoating, LLC
Un Kyung (U.K.) Corns
Member of LLC
P.O. Box 9449
Huntington, WV 25704

Attachment L: General Permit Registration Application Fee

General Permit G50-B Class II Concrete Batch Plant processing fee is $500.00 and 45 day processing time for facilities not subject to a New Source Performance Standard (NSPS). This facility does not include crushing, grinding, or screening operations and is not subject to the NSPS.

A check for the fee is included with this application submittal.

Attachment N: Material Safety Data Sheets (MSDS)

Attachment O: Emissions Summary Sheets

G50-B Emission Calculation Spreadsheets

For purposes of the General Permit for concrete batch plants, the following emission calculation methods will provide an adequate estimate of facility emissions from point sources and fugitive emission sources. However, where source (facility) specific tests are available, such information is preferable. Other emission factors may be acceptable provided documentation as to accuracy and appropriateness are provided by the applicant.

Completely fill out the following pages with all requested facility specific information.

Tri-State Paving & Sealcoating, LLC

MoZack Ready Mix

Please print out all pages of the completed spreadsheet and submit with Registration Application.

Revised 06/11/2007

General Permit G50-B Emission Calculation Spreadsheet G50ECALC for Concrete Batch Plants

BATCH DROP/CONTINUOUS DROP OPERATIONS

TRANSFER POINT	TRANSFER RATE TPH	TPY	TYPE OF CONTROL	CONTROL EFFICIENCY	PM lb/hour	PM-10 lb/hour	PM TPY	PM-10 TPY
AGGREGATE TRANSFER EMISSIONS								
e= 0.0069 lb/ton (PM emission factor)				e=	0.0033	lb/ton (PM-10 emission factor)		
Dump truck to stockpile	140	350000	SL-WG	50	0.4830	0.2310	0.6038	0.2888
loader to stockpile	0	0			0.0000	0.0000	0.0000	0.0000
loader to feed hopper	140	350000	TC-MD-1		0.9660	0.4620	1.2075	0.5775
hopper to conveyor	140	350000	TC-MD/PE-2	50	0.4830	0.2310	0.6038	0.2888
conveyor to bin	140	350000	TC-MD-3		0.9660	0.4620	1.2075	0.5775
bin to scale hopper	140	350000	TC-MD/PE-4&5	50	0.4830	0.2310	0.6038	0.2888
conveyor to mixer truck	140	350000	TC-PE-BH	90	0.0966	0.0462	0.1208	0.0578
TOTAL AGGREGATE TRANSFER EMISSIONS					3.4776	1.6632	4.3470	2.0790
SAND TRANSFER EMISSIONS								
e= 0.0021 lb/ton (PM emission factor)				e=	0.0010	lb/ton (PM-10 emission factor)		
Dump truck to stockpile	107	268000	SL-WG	50	0.3692	0.1766	0.4623	0.2211
loader to stockpile	0	0			0.0000	0.0000	0.0000	0.0000
loader to feed hopper	107	268000	TC-MD-1		0.7383	0.3531	0.9246	0.4422
hopper to conveyor	107	268000	TC-MD/PE-2	50	0.3692	0.1766	0.4623	0.2211
conveyor to bin	107	268000	TC-MD-3		0.7383	0.3531	0.9246	0.4422
bin to scale hopper	107	268000	TC-MD/PE-4&5	50	0.3692	0.1766	0.4623	0.2211
conveyor to mixer truck	107	268000	TC-PE-BH	90	0.0738	0.0353	0.0925	0.0442
TOTAL SAND TRANSFER EMISSIONS					2.6579	1.2712	3.3286	1.5919

BATCH DROP/CONTINUOUS DROP OPERATIONS

TRANSFER POINT	TRANSFER RATE TPH	TPY	TYPE OF CONTROL	CONTROL EFFICIENCY	PM lb/hour	PM-10 lb/hour	PM TPY	PM-10 TPY
CEMENT UNLOADING TO ELEVATED STORAGE SILO (PNEUMATIC)								
e= 0.7200 lb/ton (PM emission factor)				e=	0.4600 lb/ton (PM-10 emission factor)			
truck to cement silo	37	92000	UL-BH	99	0.2664	0.1702	0.3312	0.2116
CEMENT SUPPLEMENT UNLOADING TO ELEVATED STORAGE SILO (PNEUMATIC)								
e= 3.1400 lb/ton (PM emission factor)				e=	1.1000 lb/ton (PM-10 emission factor)			
truck to cement silo	5	14000	UL-BH	99	0.0360	0.0230	0.0504	0.0322
WEIGH HOPPER LOADING								
e= 0.0051 lb/ton (PM emission factor)				e=	0.0024 lb/ton (PM-10 emission factor)			
silo to cement weigh bin	42	106000	FE	100	0.0000	0.0000	0.0000	0.0000
TRUCK LOADING (TRUCK MIX)								
e= 0.9950 lb/ton (PM emission factor)				e=	0.2780 lb/ton (PM-10 emission factor)			
cement weigh bin to truck	42	106000	TC-PE-BH	90	3.0240	1.9320	3.8160	2.4380
TOTAL CEMENT TRANSFER EMISSIONS					3.3264	2.1252	4.1976	2.6818
TOTAL TRANSFER EMISSIONS					**9.4619**	**5.0596**	**11.8732**	**6.3527**

UNPAVED HAULROADS - Aggregate Truck Sand & gravel

PM EMISSIONS			PM-10 EMISSIONS		
k	4.9	particle size multiplier (assumed)	k	1.5	particle size multiplier (assumed)
s	10	silt in road surface (%)	s	10	silt in road surface (%)
a	0.7	equation constant	a	0.9	equation constant
b	0.45	equation constant	b	0.45	equation constant
S		mean vehicle speed (mph)	S		mean vehicle speed (mph)
W		mean vehicle weight (tons)	W		mean vehicle weight (tons)
w		mean number of wheels	w		mean number of wheels
p	150	days of precipitation (assumed)	p	150	days of precipitation (assumed)
e	0.0000	LB/VMT	e	0.0000	LB/VMT
TRAVEL		VMT/HOUR	TRAVEL		VMT/HOUR
TRAVEL		VMT/YR	TRAVEL		VMT/YR
CONTROLS		control efficiency (%)	CONTROLS		control efficiency (%)
EMISSIONS	**0.0000**	**lb/hour**	**EMISSIONS**	**0.0000**	**lb/hour**
EMISSIONS	**0.0000**	**TPY**	**EMISSIONS**	**0.0000**	**TPY**

PAVED HAULROADS - Aggregate Trucks Sand & gravel

PM EMISSIONS			PM-10 EMISSIONS		
k	0.082	base emission factor for particle	k	0.016	particle size multiplier (assumed)
sL	12	road surface silt load. (g/m^2)	s	5.5	silt in road surface (%)
W	50	mean vehicle weight (tons)	W	50	mean vehicle weight (tons)
P	151	# of wet days with at least 0.01" precip	P	151	# of wet days with at least 0.01" precip
C	0.00047	emission factor for brake/tire wear	C	0.00047	emission factor for brake/tire wear
N	365	# of days in averaging period	N	365	# of days in averaging period
e	17.8803	LB/VMT	e	2.1007	LB/VMT
TRAVEL	1	VMT/HOUR	TRAVEL	1	VMT/HOUR
TRAVEL	1,900	VMT/YR	TRAVEL	1,900	VMT/YR
CONTROLS	70	control efficiency (%)	CONTROLS	70	control efficiency (%)
EMISSIONS	**5.3641**	**lb/hour**	**EMISSIONS**	**0.4727**	**lb/hour**
EMISSIONS	**5.0959**	**TPY**	**EMISSIONS**	**0.5987**	**TPY**

UNPAVED HAULROADS - Cement Tanker

PM EMISSIONS			PM-10 EMISSIONS		
k	4.9	particle size multiplier (assumed)	k	1.5	particle size multiplier (assumed)
s	10	silt in road surface (%)	s	10	silt in road surface (%)
a	0.7	equation constant	a	0.9	equation constant
b	0.45	equation constant	b	0.45	equation constant
S		mean vehicle speed (mph)	S		mean vehicle speed (mph)
W		mean vehicle weight (tons)	W		mean vehicle weight (tons)
w		mean number of wheels	w		mean number of wheels
p	150	days of precipitation (assumed)	p	150	days of precipitation (assumed)
e	0.0000	LB/VMT	e	0.0000	LB/VMT
TRAVEL		VMT/HOUR	TRAVEL		VMT/HOUR
TRAVEL		VMT/YR	TRAVEL		VMT/YR
CONTROLS		control efficiency (%)	CONTROLS		control efficiency (%)
EMISSIONS	**0.0000**	**lb/hour**	**EMISSIONS**	**0.0000**	**lb/hour**
EMISSIONS	**0.0000**	**TPY**	**EMISSIONS**	**0.0000**	**TPY**

PAVED HAULROADS - Cement Tanker

PM EMISSIONS			PM-10 EMISSIONS		
k	0.082	base emission factor for particle	k	0.016	particle size multiplier (assumed)
sL	12	road surface silt load. (g/m^2)	s	5.5	silt in road surface (%)
W	50	mean vehicle weight (tons)	W	50	mean vehicle weight (tons)
P	151	# of wet days with at least 0.01" precip	P	151	# of wet days with at least 0.01" precip
C	0.00047	emission factor for brake/tire wear	C	0.00047	emission factor for brake/tire wear
N	365	# of days in averaging period	N	365	# of days in averaging period
e	17.8803	LB/VMT	e	2.1007	LB/VMT
TRAVEL	0	VMT/HOUR	TRAVEL	0	VMT/HOUR
TRAVEL	38	VMT/YR	TRAVEL	38	VMT/YR
CONTROLS	70	control efficiency (%)	CONTROLS	70	control efficiency (%)
EMISSIONS	**0.0805**	**lb/hour**	**EMISSIONS**	**0.0095**	**lb/hour**
EMISSIONS	**0.1019**	**TPY**	**EMISSIONS**	**0.0120**	**TPY**

UNPAVED HAULROADS - Concrete Mixer

PM EMISSIONS			PM-10 EMISSIONS		
k	4.9	particle size multiplier (assumed)	k	1.5	particle size multiplier (assumed)
s	10	silt in road surface (%)	s	10	silt in road surface (%)
a	0.7	equation constant	a	0.9	equation constant
b	0.45	equation constant	b	0.45	equation constant
S		mean vehicle speed (mph)	S		mean vehicle speed (mph)
W		mean vehicle weight (tons)	W		mean vehicle weight (tons)
w		mean number of wheels	w		mean number of wheels
p	150	days of precipitation (assumed)	p	150	days of precipitation (assumed)
e	0.0000	LB/VMT	e	0.0000	LB/VMT
TRAVEL		VMT/HOUR	TRAVEL		VMT/HOUR
TRAVEL		VMT/YR	TRAVEL		VMT/YR
CONTROLS		control efficiency (%)	CONTROLS		control efficiency (%)
EMISSIONS	**0.0000**	**lb/hour**	**EMISSIONS**	**0.0000**	**lb/hour**
EMISSIONS	**0.0000**	**TPY**	**EMISSIONS**	**0.0000**	**TPY**

PAVED HAULROADS - Concrete Mixer

PM EMISSIONS			PM-10 EMISSIONS		
k	0.082	base emission factor for particle	k	0.016	particle size multiplier (assumed)
sL	12	road surface silt load. (g/m^2)	s	5.5	silt in road surface (%)
W	30	mean vehicle weight (tons)	W	30	mean vehicle weight (tons)
P	151	# of wet days with at least 0.01" precip	P	151	# of wet days with at least 0.01" precip
C	0.00047	emission factor for brake/tire wear	C	0.00047	emission factor for brake/tire wear
N	365	# of days in averaging period	N	365	# of days in averaging period
e	8.3097	LB/VMT	e	0.9761	LB/VMT
TRAVEL	1	VMT/HOUR	TRAVEL	1	VMT/HOUR
TRAVEL	2,850	VMT/YR	TRAVEL	2,850	VMT/YR
CONTROLS	70	control efficiency (%)	CONTROLS	70	control efficiency (%)
EMISSIONS	**2.8419**	**lb/hour**	**EMISSIONS**	**0.3338**	**lb/hour**
EMISSIONS	**3.5524**	**TPY**	**EMISSIONS**	**0.4173**	**TPY**

UNPAVED HAULROADS- Endloader

PM EMISSIONS			PM-10 EMISSIONS		
k	4.9	particle size multiplier (assumed)	k	1.5	particle size multiplier (assumed)
s	10	silt in road surface (%)	s	10	silt in road surface (%)
a	0.7	equation constant	a	0.9	equation constant
b	0.45	equation constant	b	0.45	equation constant
S		mean vehicle speed (mph)	S		mean vehicle speed (mph)
W		mean vehicle weight (tons)	W		mean vehicle weight (tons)
w		mean number of wheels	w		mean number of wheels
p	150	days of precipitation (assumed)	p	150	days of precipitation (assumed)
e	0.0000	LB/VMT	e	0.0000	LB/VMT
TRAVEL		VMT/HOUR	TRAVEL		VMT/HOUR
TRAVEL		VMT/YR	TRAVEL		VMT/YR
CONTROLS		control efficiency (%)	CONTROLS		control efficiency (%)
EMISSIONS	**0.0000**	**lb/hour**	**EMISSIONS**	**0.0000**	**lb/hour**
EMISSIONS	**0.0000**	**TPY**	**EMISSIONS**	**0.0000**	**TPY**

Note: Endloader operates on paved areas. Loader trips are included with other paved road trips.

STORAGE PILE- Sand

PM EMISSIONS			PM-10 EMISSIONS		
s	30	silt content (%)	s	30	silt content (%)
p	150	days of precipitation (assumed)	p	150	days of precipitation (assumed)
f	5	time the wind exceeds 12 mph (%)	f	5	time the wind exceeds 12 mph (%)
A	0.030	surface area (acres)	A	0.030	surface area (acres)
N	1	number of storage piles	N	1	number of storage piles
CONTROLS	75	%	CONTROLS	75	%
EMISSIONS	**0.0032**	**lb/hour**	**EMISSIONS**	**0.0015**	**lb/hour**
EMISSIONS	**0.0142**	**TPY**	**EMISSIONS**	**0.0067**	**TPY**

STORAGE PILE- Aggregate

PM EMISSIONS			PM-10 EMISSIONS		
s	10	silt content (%)	s	10	silt content (%)
p	150	days of precipitation (assumed)	p	150	days of precipitation (assumed)
f	5	time the wind exceeds 12 mph (%)	f	5	time the wind exceeds 12 mph (%)
A	0.060	surface area (acres)	A	0.060	surface area (acres)
N	2	number of storage piles	N	2	number of storage piles
CONTROLS	75	%	CONTROLS	75	%
EMISSIONS	**0.0043**	**lb/hour**	**EMISSIONS**	**0.0020**	**lb/hour**
EMISSIONS	**0.0189**	**TPY**	**EMISSIONS**	**0.0089**	**TPY**

EMISSIONS SOURCE SUMMARY

	PM EMISSIONS		PM-10 EMISSIONS	
Point Source Emissions	**lb/hour**	**TPY**	**lb/hour**	**TPY**
Transfer Point Emissions	9.46	11.87	5.06	6.35
Point Source Emissions Total	**9.46**	**11.87**	**5.06**	**6.35**
Fugitive Emissions	**lb/hour**	**TPY**	**lb/hour**	**TPY**
Unpaved Haulroad Emissions	0.00	0.00	0.00	0.00
Paved Haulroad Emissions	8.29	8.75	0.82	1.03
Stockpile Emissions	0.01	0.03	0.00	0.02
Fugitive Emissions Total	**8.29**	**8.78**	**0.82**	**1.04**
FACILITY EMISSIONS TOTAL	**17.76**	**20.66**	**5.88**	**7.40**