REGULATION 13 APPLICATION FOR A PORTABLE CRUSHING AND SCREENING FACILITY KANAWHA COUNTY, WEST VIRGINIA

Prepared for:

WEST VIRGINIA PAVING, INC.
2950 Charles Avenue
Dunbar, West Virginia 25064

Prepared by:

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Project No. 0101-16-0318-010

March 2017

POTESTA

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SECTION I - III

GENERAL APPLICANT INFORMATION

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
West Virginia Paving, Inc.

2. Federal Employer ID No. ***(FEIN):***
55-0714092

3. Name of facility *(if different from above):*
Portable Crushing and Screening Facility

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
2950 Charles Avenue
Dunbar, West Virginia 25064

5B. Facility's present physical address:
2950 Charles Avenue
Dunbar, West Virginia 25064

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

➪ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

➪ If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: Oldcastle Materials, Inc.

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

➪ If **YES,** please explain: Applicant owns site.

➪ If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Portable crushing and screening facility.

10. North American Industry Classification System **(NAICS)** code for the facility:
324121

11A. DAQ Plant ID No. (for existing facilities only):
NA

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
NA

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

From I-64 take exit 53, turn right towards WV Route 25. Go 0.1 mile, turn right onto 10th street. Go 0.2 mile and turn right onto WV 25 (Fairlawn Avenue). Go 1.5 miles to stop light and turn left onto King Street. Go 0.5 miles and turn left onto Charles Avenue. Site is on the right.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Same	Dunbar	Kanawha
12.E. UTM Northing (KM): 4,247.2606	12F. UTM Easting (KM): 433.3526	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
Install a portable crushing and screening facility.

14A. Provide the date of anticipated installation or change: 06/15/2017 If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen:	14B. Date of anticipated Start-Up if a permit is granted: 06/15/2017

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17. **Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known)*. A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known)*. Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) .
- Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
- Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**
- For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations
☐ Chemical Processes
☐ Concrete Batch Plant
☐ Grey Iron and Steel Foundry
☐ General Emission Unit, specify
☒ Haul Road Emissions
☐ Hot Mix Asphalt Plant
☐ Incinerator
☐ Indirect Heat Exchanger
☐ Quarry
☒ Solid Materials Sizing, Handling and Storage Facilities
☐ Storage Tanks

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below: NA

☐ Absorption Systems
☐ Adsorption Systems
☐ Afterburner
☐ Baghouse
☐ Condenser
☐ Electrostatic Precipitator
☐ Flare
☐ Mechanical Collector
☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity
☐ Authority of Governmental Agency
☐ Authority of Partnership
☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE Bob Brookover DATE: 3.6.17

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Bob Brookover		35C. Title: President
35D. E-mail: bbrookover@wvpaving.com	36E. Phone: 304-768-9733	36F. FAX: 304-768-9351
36A. Printed name of contact person (if different from above): Trey Mattox		36B. Title: Environmental Manager
36C. E-mail: tmattox@wvpaving.com	36D. Phone: 304-720-2422	36E. FAX: Use Email

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☒ **Attachment C: Installation and Start Up Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☐ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☐ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims**
- ☐ **Attachment R: Authority Forms**
- ☐ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

BUSINESS CERTIFICATE

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
WEST VIRGINIA PAVING INC
2950 CHARLES AVE
DUNBAR, WV 25064-2103

BUSINESS REGISTRATION ACCOUNT NUMBER: **1036-6199**

This certificate is issued on: 06/14/2010

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with W.Va. Code § 11-12.

The person or organization identified on this certificate is registered
to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

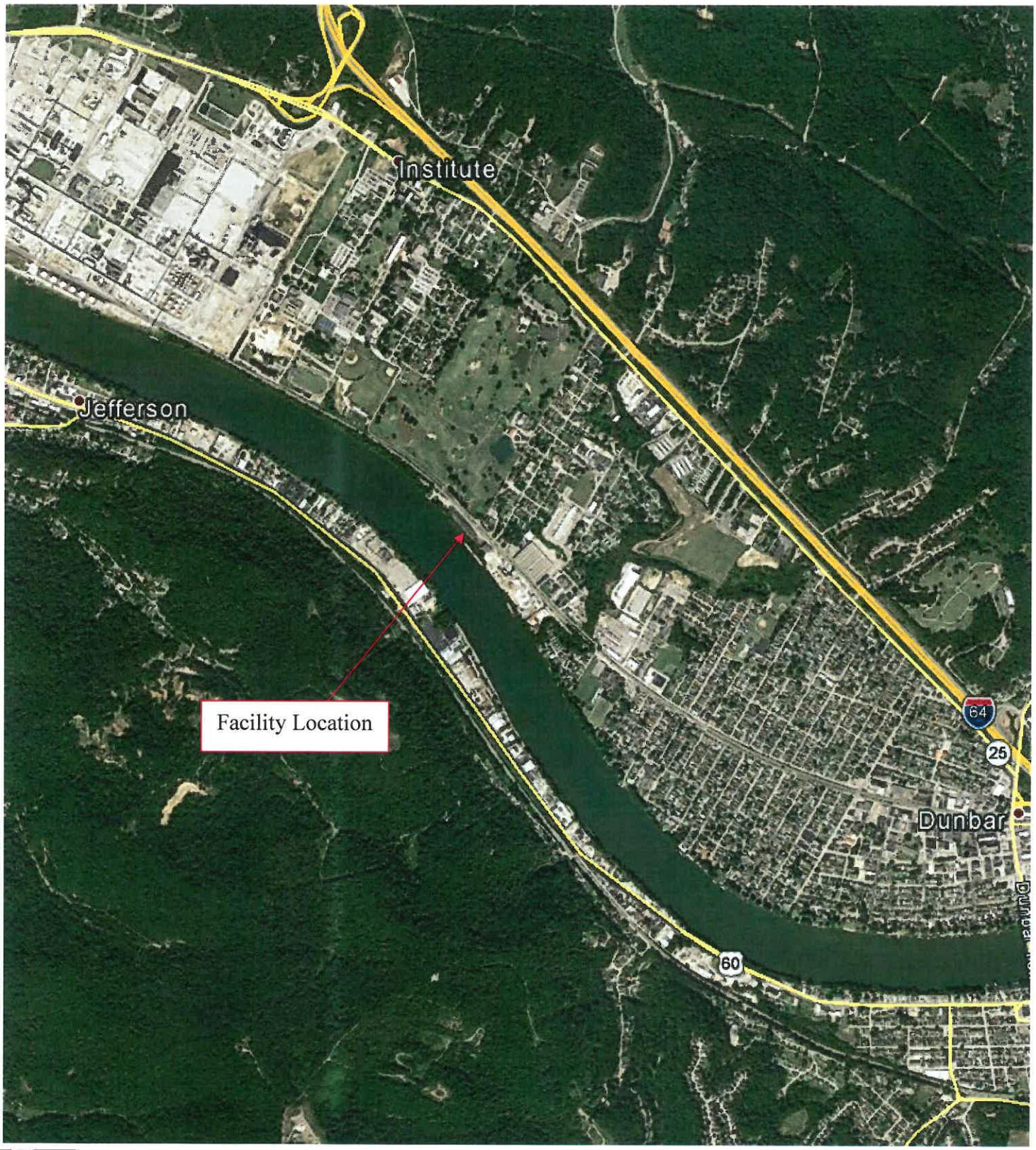
Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.1
L1112742656

ATTACHMENT B

AREA MAP



POTESTA
Engineers and Environmental Consultants

7012 MacCorkle Avenue, S.E
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

Area Map
West Virginia Paving, Inc.
Portable Crushing and Screening Facility
Dunbar Location
Kanawha County, West Virginia

ATTACHMENT C

INSTALLATION AND START UP SCHEDULE

ATTACHMENT C

INSTALLATION AND START UP SCHEDULE

The portable crushing and screening facility will be installed at the Dunbar location. It will also be employed in other locations but returned to Dunbar as needed. West Virginia Paving, Inc. proposes to install and begin operations by June 15, 2017.

ATTACHMENT D

REGULATORY DISCUSSION

ATTACHMENT D

REGULATORY DISCUSSION

The facility is subject to the following regulations:

A. 45CSR7 requires the facility to maintain fugitive dust control systems, and obtain required permits.

B. 45CSR13 – "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation"

C. 45CSR16 – "Standards of Performance for Stationary Sources," which incorporates by reference 40CFR60 Subpart OOO, "Standards of Performance for Non-Metallic Mineral Processing Plants".

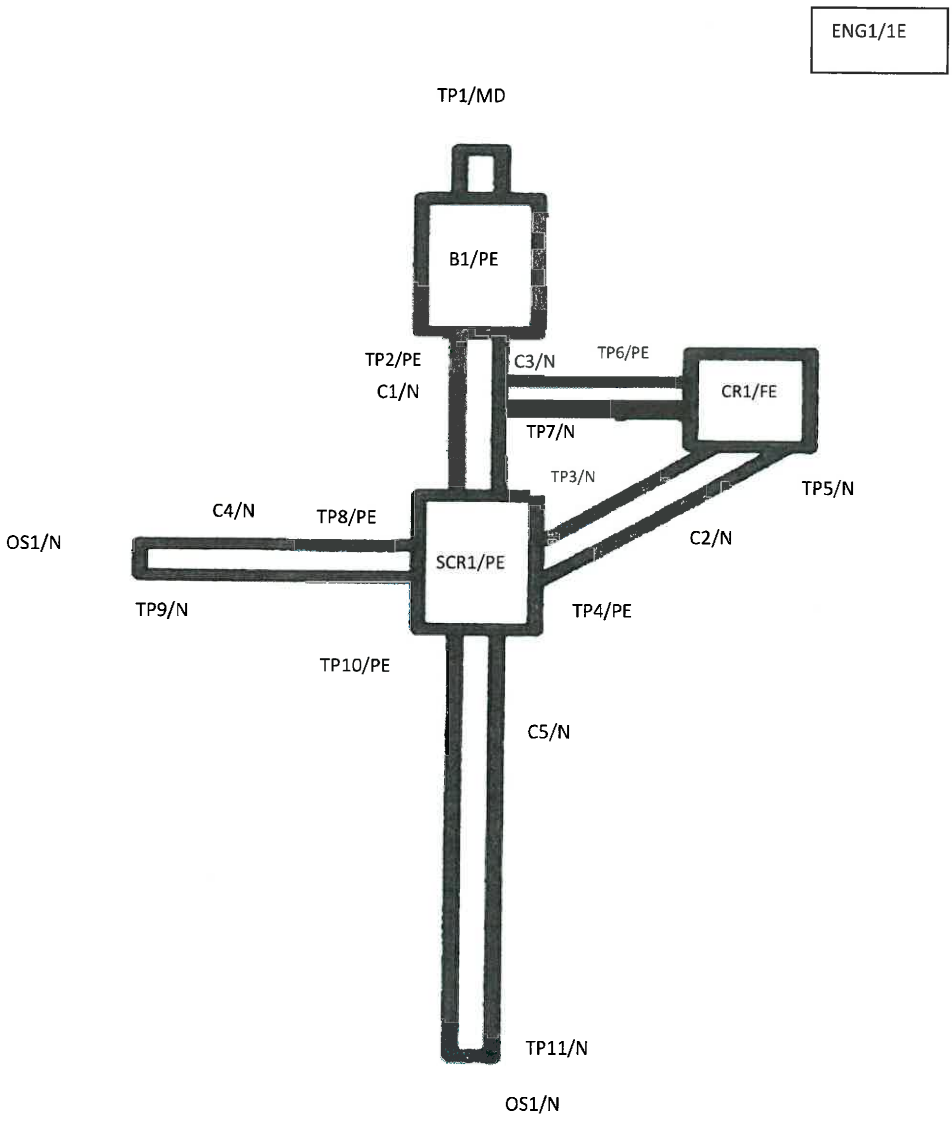
D. 45CSR22 – "Air Quality Management Fee Program"

E. 45CSR30 – "Requirements for Operating Permits" (Deferred Source). The facility potential to emit (PTE) does not exceed 100 tons per year (tpy) of a regulated air pollutant or 10 tpy of a single HAP or 25 tpy of aggregated HAPs. Therefore, the facility is a minor source under this regulation.

F. 40CFR63 Subpart ZZZZ – "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines" and 40CFR60 Subpart IIII, "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines". This engine is non-road which excludes it from the PTE and 40CFR60 Subpart IIII and 40CFR63, Subpart ZZZZ applicability.

ATTACHMENT E

PLOT PLAN



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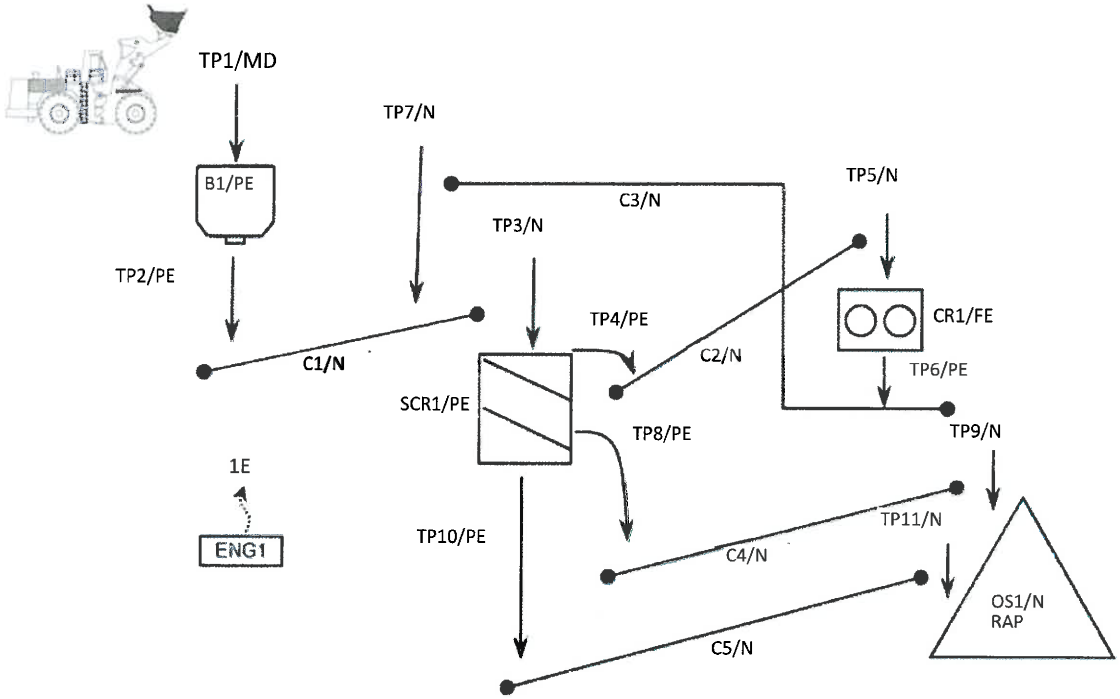
PLOT PLAN
Portable Crushing and Screening Facility
West Virginia Paving, Inc.
Project No. 0101-16-0318-010

ATTACHMENT F

DETAILED PROCESS FLOW DIAGRAM



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PROCESS FLOW DIAGRAM
Portable Crushing and Screening Facility
West Virginia Paving, Inc.
Project No. 0101-16-0318-010

ATTACHMENT G

PROCESS DESCRIPTION

ATTACHMENT G

PROCESS DESCRIPTION

West Virginia Paving, Inc. is submitting this application to obtain a permit for its Dunbar portable crushing and screening facility in Kanawha County, West Virginia. The portable unit crushes recycled asphalt pavement (RAP) and is powered by a diesel generator set (ENG1 [1E]). The portable system may be located anywhere at the existing RAP stockpile. RAP is transferred from the existing site pile permitted under G20-B187B by front endloader to RAP bin B1/PE (TP1/MD). B1/PE drops material onto belt conveyor C1/N (TP2/PE) to screen SCR1/PE (TP3/N). Oversized material transfers to belt conveyor C2/N (TP4/PE) and is transported to the RAP crusher CR1/FE (TP5/N). Material leaving the crusher transfers to belt conveyor C3/N (TP6/PE) and back to C1/N (TP7/N) then to SCR1/PE. Pass through RAP from SCR1/PE transfers to conveyor C4/N (TP8/PE) to OS1/N (TP9/N) and to conveyor C5/N (TP10/PE) to OS1/N (TP11/N).

The diesel generator set (ENG1 [1E]) is a non-road engine. This genset is mounted in a trailer. When the portable crushing and screening facility is brought to this location, it will be powered by the non-road engine-genset. The genset is brought to the site and parked. The genset is not fastened to the ground or installed in any manner except being parked on the site.

ATTACHMENT I

EMISSION UNITS TABLE

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
B1	B1	RAP Bin	2017	20 tons	New	PE
C1	C1	Belt Conveyor	2017	100 tph	New	N
SCR1	SCR1	Screen	2017	100 tph	New	PE
C2	C2	Belt Conveyor	2017	100 tph	New	N
CR1	CR1	RAP Crusher	2017	100 tph	New	FE
C3	C3	Belt Conveyor	2017	100 tph	New	N
C4	C4	Belt Conveyor	2017	100 tph	New	N
C5	C5	Belt Conveyor	2017	100 tph	New	N
ENG1	1E	Gen Set	2017	47.5 gal/hr	New	N

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.
Note: PF = Process Fugitive Emissions, OD = Open Dust Emissions

ATTACHMENT J

EMISSION POINTS DATA SUMMARY SHEET

Attachment J – Emission Points Data Summary Sheet

Table 1: Emissions Data															
Emission Point ID No. *(Must match Emission Units Table-& Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m[4])
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
TP1-11	NA	TP1-11	Transfer Points	Various	Various	NA	NA	PM PM10 PM2.5	2.97 1.44 0.18	1.55 0.75 0.14	2.33 1.12 0.14	1.25 0.61 0.12	Solid Solid Solid	EE	NA
CR1	NA	CR1	RAP Crusher	FE	Full Enclosure	NA	NA	PM PM10 PM2.5	0.20 0.10 0.02	0.06 0.03 0.01	0.04 0.02 0.01	0.01 0.01 0.01	Solid Solid Solid	EE	NA
SCR1	NA	SCR1	RAP Screen	PE	Partial Enclosure	NA	NA	PM PM10 PM2.5	2.50 0.87 0.18	2.34 0.82 0.17	1.25 0.44 0.09	1.17 0.41 0.08	Solid Solid Solid	EE	NA
1E[1]	UVS	ENG1	Diesel Engine	NA	NA	NA	NA	PM PM10 PM2.5 SOx NOx CO VOC HAPS*	2.02 2.02 2.02 1.89 28.70 6.18 2.34 0.025	2.12 2.12 2.12 1.98 30.14 6.49 2.46 0.026	2.02 2.02 2.02 1.89 28.70 6.18 2.34 0.025	2.12 2.12 2.12 1.98 30.14 6.49 2.46 0.026	Solid Solid Solid Vapor Vapor Vapor Vapor Vapor	EE	NA

* See Attachment N for speciation of VOCs and HAPs

[1] The engine is non-road which excludes its emissions from the total PTE.

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

2 Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (i.e., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

3 List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS2, VOCs, H2S, Inorganics, Lead, Organics, O3, NO, NO2, SO2, SO3, all applicable Greenhouse Gases (including CO2 and methane), etc. DO NOT LIST H2, H2O, N2, O2, and Noble Gases.

4 Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

5 Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

6 Indicate the method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

7 Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO2, use units of ppmv (See 45CSR10).

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1E	0.67	891	4,587	NA	~588 ft.	NA	4,247.2606	433.3526

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

Attachment K – Fugitive Emissions Data Summary Sheet

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ Yes ☐ No ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☒ Yes ☐ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☐ Yes ☒ No ☐ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads - Endloaders	NA					
Unpaved Haul Roads - Endloaders	PM PM10 PM2.5	17.10 5.05 0.50	10.69 3.15 0.32	5.13 1.52 0.15	3.21 0.95 0.10	EE
Storage Pile Emissions	PM PM10 PM2.5	0.11 0.05 0.01	0.47 0.22 0.04	0.11 0.05 0.01	0.47 0.22 0.04	EE
Loading/Unloading Operations	NA					
Wastewater Treatment Evaporation & Operations	NA					
Equipment Leaks	NA					
General Clean-up VOC Emissions	NA					
Other	NA					

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT L

EMISSION UNIT DATA SHEETS

Affected Source Sheet
Source Specific Emissions Data: Solid Materials Sizing, Handling and Storage Facilities

Required Information Regarding
Dust Control Equipment Measures

1. If water or chemical sprays are to be used on conveyors, transfer points, stockpiles, etc... for dust control, the location of all spray bars or spray systems should be shown on the plot plans and/or line drawings. The following information should be provided for each spray system:

   a. Design water flow through spray bar
   b. Type and amount of chemicals used and the mix ratio of chemical to water used at the sprays.
   c. Methods employed to winterize sprays (e.g. keep sprays from freezing and becoming inoperable during cold weather)

   Not Applicable

2. A detailed written description should be submitted of dust control measures/programs that will be employed on haul roads and in areas of vehicle activity around material stockpiled. The haulways and areas to be treated should be shown by shading or similar description on the plant plan. The following points should be specifically addressed:

   a. Equipment (e.g. water trucks, fixed spray bars, wheel and truck underbody washers, etc...) that will be used in this dust control program.
   b. Frequency of application of water and chemical to roads and stockpile areas during dry periods.
   c. Amount of chemical suppressants to be used, if applicable, in pounds or gallons per square yard of surface to be treated.
   d. Type of haulroad or haulway surface(s) that will be maintained (e.g. coarse gravel, reddog, etc...)
   e. Approximate maximum length of haulroads (miles or feet).
   f. Maximum daily truck traffic on haulroads (number of trucks).

   Not Applicable

3. If full or partial enclosures are to be used to minimize dust entrainment, a drawing of each such enclosure should be submitted (for example at truck dump bins, breakers, conveyor transfer points).

4. If particulate control devices such as baghouses or scrubbers are to be used, complete an appropriate Air Pollution Control Device Sheet and furnish a drawing showing details of enclosures and ductwork associated with these control systems.

AFFECTED SOURCE SHEET

Source Specific Emissions Data: Solid Materials Sizing, Handling, and Storage Facilities

Plot Plan(s) and Line Drawing(s)

a. Finish the plot plan(s) of the plant area which contains sufficient detail to show the scaled layout of the equipment involved in each materials handling system (e.g. conveyors, transfer points, crushers, screens, bins, stockpiles, truck dump bins, etc...). Show equipment or buildings described in other sections of this application on the plot plan as appropriate. The guidelines for Plot Plans should be followed to the extent possible.

b. Furnish the line drawing(s) or schematic(s) showing each component or facet of each materials handling system (e.g. conveyors, transfer points, stockpiles, crushers, screens, bins etc...). Show process equipment described in other sections of this application as needed for clarity.

c. On the line drawing(s) or schematic(s) furnished in accordance with item (b) assign an ID number to each conveyor, transfer point (including truck, barge and rail car loading/unloading etc...), storage structure, stockpile, crusher, and screening unit. If any equipment is shown on the line drawing(s) which was described in other sections of this application, use the ID numbers assigned to the equipment in those other sections and indicate equipment name or type (e.g. rotary dryer, vertical kiln etc...)

d. To the extent possible, note the numbers assigned for equipment and storage facilities as per item (c) on the Plot Plans(s).

e. The assigned ID numbers for equipment and transfer points must be used to complete Tables 1, 2, and 3 following.

Table 1: Affected Storage Activity

ID Number	OS1	B1			
Affected Source Name	Open Stockpiling	B1			
Type Storage[1]	OS	Bin			
Material Stored	RAP	RAP			
Typical Moisture Content (%)	3	3			
Avg % of material passing 200 mesh sieve	4	4			
Maximum Total Yearly Throughput in storage (tons)	125,000	125,000			
Maximum Quantity of Material in Storage[2] (tons)	50,000	20			
Maximum Stockpile Base Area (sq. ft.)	111,600	NA			
Maximum Stockpile height (ft)	25	NA			
Type dust controls during storage[3]	N	PE			
Method of material load-in to bin or stockpile[4]	SS	FE			
Type dust controls during load-in[5]	MD	MD			
Method of material load-out to bin or stockpile[4]	FE	Feeder			
Type dust controls during load-out[5]	N	PE			

Table 2: Conveying and Transfer

ID Number	Type Conveyor or Transfer Point[6]	Material Handled [(Note nominal size of material transferred][7]	Material Conveying or Transfer Rate		Type Dust Control Measures[5]	Approximate Material Moisture Content (%)
			Maximum TPH	Maximum MM TPY		
Conveyor Belts						
C1	BC	+4" to -1/2"	100	187,500	N	3
C2	BC	+4" to -1/2"	100	62,500	N	3
C3	BC	+4" to -1/2"	100	62,500	N	3
C4	BC	+4" to -1/2"	100	125,000	N	3
C5	BC	+4" to -1/2"	100	125,000	N	3
Transfer Points						
TP1	OTH1	+4"/-4"	100	125,000	MD	3
TP2	OTH2	+4"/-4"	100	125,000	PE	3
TP3	OTH5	+4"/-4"	100	187,500	N	3
TP4	OTH4	+4"/-4"	100	62,500	PE	3
TP5	OTH5	+4"/-4"	100	62,500	N	3
TP6	OTH4	+4"/-4"	100	62,500	PE	3
TP7	01	+4"/-4"	100	62,500	N	3
TP8	OTH4	+4"/-4"	100	125,000	PE	3
TP9	OTH3	+4"/-4"	100	125,000	N	3
TP10	OTH4	+4"/-4"	100	125,000	PE	3
TP11	OTH3	+4"/-4"	100	125,000	N	3
OTH1 Excavator/Endloader to Hopper			03 Belt Conveyor to Hopper or Bin			
OTH2 Hopper to Crusher or Belt			10 Excavator to Truck or Other Stockpile			
OTH3 Conveyor to Stockpile						
OTH4 Crusher/Screen to Belt Conveyor						
OTH5 Belt Conveyor to Crusher/Screen						

Table 3: Crushing and Screening

ID Number		CR1	SCR1		
Type Crusher or Screen[8]		Crusher	Double Deck		
Material Sized		RAP	RAP		
Maximum Material Throughput	Tons/hour	100	100		
	Tons/year	62,500	187,500		
Material sized from/to:[9]		+4"/-4"	+4"/-4"		
Typical moisture content as crushed or screened (%)		3	3		
Type dust control		FE	PE		
Stack Parameters	height (ft)	NA	NA		
	diameter (ft)	NA	NA		
	Volume (ACFM)	NA	NA		
	Temp (°F)	NA	NA		
Maximum Operating Schedule	hour/day	24	24		
	day/year	365	365		
	hour/year	2,100	2,100		
Approximate Percentage of Operation from:	Jan-Mar	25%	25%		
	April-June	25%	25%		
	July-Sept	25%	25%		
	Oct-Dec	25%	25%		
Maximum Particulate Emissions	lb/hour	PM/PM10/PM2.5 0.04/0.02/0.01	PM/PM10/PM2.5 1.25/0.44/0.09		
	Ton/year	PM/PM10/PM2.5 0.01/0.01/0.01	PM/PM10/PM2.5 1.17/0.41/0.08		

Describe method of determining emissions and dust control efficiencies (if by test on a similar unit provide report, if by emission factor reference emission factors):

1 Type Storage - Code as follows: (Capacity of each bin, building or enclosure)

OS - Open Stockpile
B - Bin or Storage Silo (full enclosure)
SB - Storage Building (full enclosure)
E- Enclosure (walls but no top)
SWF- Stockpiles with wind fences
OTH- Other - Specify in footnote or attachment

2. Give maximum and average quantity of material in storage at any given time (e.g. silo capacity, stockpile size, etc...)

3. TYPE DUST CONTROLS DURING STORAGE
If storage is by other than by bin or full enclosure Code as follows:

N - None
WS- Water Sprays
C- Spraying with chemical surfactant
OTH- Other - Specify in footnote or attachment

4. METHOD OF PLACING MATERIAL ONTO STOCKPILE OR INTO BINS OR LOADING OUT FROM STOCKPILES OR BINS - Code as follows:

C- Clamshell
TD- Truck Dumping
FE- Front Endloader
ST- Stacking Tubes
MS- Mobile Conveyor - Stacker
SS- Stationary Conveyor - Stacker
P- Pneumatic Conveyor - Stacker
FC- Fixed Height Chute from bins
TC- Telescoping Chute from bins
UC- Under-pole or under-bin reclaim conveyor
RC- Reclaim Conveyor (rake or bucket reclaim conveyor reclaiming from surface of stockpile)
OTH- Other - Describe in a footnote or attachment

5. TYPE DUST CONTROLS - Code as follows:

N– None
WS- Water Sprays
WSA- Water Sprays with Wetting Agents
CS- Chemical Dust Suppressant (sprays, etc...)
FE- Full Enclosures
PE- Partial Enclosures
MD- Minimization of material drop height
EM- Enclosure and evacuation to mechanical collector
EB- Enclosure and evacuation to baghouse
ES- Enclosure and evacuation to scrubber
OTH- Other - describe in footnote or attachment

6. TYPE CONVEYOR OR TRANSFER POINT - Code as follows:

Conveyors

BC- Belt Conveyor
VC- Vibrating Conveyor
SC- Screw Conveyor
DL- Drag-link conveyor
BE- Bucket Elevator
PS- Pneumatic System
OTH- Other describe in footnote or attachment

Transfer Points

01- Conveyor to Conveyor
02- Conveyor to Bucket Elevator
03- Conveyor to Hopper or Bin
04- Bucket Elevator to Hopper or Bin
05- Pneumatic conveyor to bin
06- Truck Dumping onto ground
07- Truck Dumping into hopper
08- Loading trucks through stationary chute
09- Loading trucks through telescoping chute
10- Loading Trucks by endloader
11- Railcar unloading-side or bottom dumping
12- Railcar unloading-rotary unloader
13- Railcar loading /unloading by pneumatic system
14- Railcar loading through stationary source
15- Railcar loading through telescopic chute
16- Railcar loading by front end-loader
17- Railcar loading by railcar
18- Barge loading/unloading by clamshell
19- Barge unloading - bucket ladder unloader
20- Barge unloading - from a fixed-height conveyor or stationary chute
21- Barge loading - variable height conveyor or telescoping chute
22- Other - describe in footnote or attachment

7. If more than one material is handled by the listed conveyor or transfer point list each material and furnish the requested data in the table for each material.

8. Describe type of unit such as hammermill, ball mill, double-deck (DD) screen, double roll (DR) crusher, etc....

9. Describe nominal size reduction, example +2" / -3/8

ATTACHMENT L

FUGITIVE EMISSIONS FROM UNPAVED HAULROADS

UNPAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

		PM	PM-10
k =	Particle size multiplier	See calculations for input into equation.	
s =	Silt content of road surface material (%)		
p =	Number of days per year with precipitation >0.01 in.		

Item Number	Description	Number of Wheels	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	Front Endloaders	4	31	NA	0.14	17	20,833	HR-WS	70
2									
3									
4									
5									
6									
7									

Source: *AP-42 Fifth Edition – 13.2.2 Unpaved Roads, 12/03*

$E = [k \times (s/12)^a \times (W/3)^b] * [(365 - p) \div 365]$ =lb/Vehicle Mile Traveled (VMT)

Where:

		PM	PM-10
k =	Particle size multiplier	See calculations for input into equation.	
s =	Silt content of road surface material (%)		
W =	Mean vehicle weight (tons)		
p =	Number of days per year with precipitation >0.01 in.		

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF UNPAVED HAULROAD EMISSIONS

Item No.	PM				PM-10/PM2.5			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1	17.10	10.69	5.13	3.21	5.05/0.50	3.15/0.32	1.52/0.15	0.95/0.10
2								
3								
4								
5								
6								
7								
TOTALS	17.10	10.69	5.13	3.21	5.05/0.50	3.15/0.32	1.52/0.15	0.95/0.10

ENGINE DATA SHEET

Source Identification Number[1]		ENG1*					
Engine Manufacturer and Model		Caterpillar 3412					
Manufacturer's Rated bhp/rpm		917/1,836					
Source Status[2]		NS					
Date Installed/Modified/Removed (Month/Year)[3]		2017					
Engine Manufactured/Reconstruction Date[4]		1989					
Is this a Certified Stationary Compression Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No)[5]		No*					
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[6]		No					
Engine, Fuel and Combustion Data	Engine Type[7]	4-Stroke					
	APCD Type[8]	A/F					
	Fuel Type[9]	2FO					
	H_2S (gr/100 scf)	NA					
	Operating bhp/rpm	917/1,836					
	BSFC (Btu/bhp-hr)	NA					
	Fuel throughput (ft^3/hr)	47.5 gal/hr					
	Fuel throughput ($MMft^3$/yr)	NA					
	Operation (hrs/yr)	2,100					
Reference[10]	Potential Emissions[11]	lbs/hr	tons/yr				
	NO_X	28.70	30.14				
	CO	6.18	6.49				
	VOC	2.34	2.46				
	SO_2	1.89	1.98				
	PM_{10}	2.02	2.12				
	Formaldehyde	0.0077	0.0081				

*This engine is non-road which excludes it from the PTE and 40CFR60, Subpart IIII and 40CFR63, Subpart ZZZZ regulations.

1. Enter the appropriate Source Identification Number for each reciprocating internal combustion compressor/generator engine located at the facility. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Emergency Generator engines should be designated EG-1, EG-2, EG-3 etc. If more than three (3) engines exist, please use additional sheets.

2. Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Removal of Source

3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.

4. Enter the date that the engine was manufactured, modified or reconstructed.

5. Is the engine a certified stationary compression ignition internal combustion engine according to 40CFR60 Subpart IIII. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4210 as appropriate.

   Provide a manufacturer's data sheet for all engines being registered.

6. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4243a(2)(i) through (iii), as appropriate.

   Provide a manufacturer's data sheet for all engines being registered.

7. Enter the Engine Type designation(s) using the following codes:

LB2S	Lean Burn Two Stroke	RB4S	Rich Burn Four Stroke
LB4S	Lean Burn Four Stroke		

8. Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	SCR	Lean Burn & Selective Catalytic Reduction

9. Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas
2FO	#2 Fuel Oil	LPG	Liquid Propane Gas

10. Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this *Compressor/Generator Data Sheet(s)*.

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc™	OT	Other _____	(please list)

11. Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

ENGINE TEST [81Z09481] *AUGUST 09, 2016*

Sales Model: 3412

Built Date: 18Oct1989 **Tested Date:** 16Nov1989 **Shipped Date:** 21Nov1989

Tested: B **Plant:** Mossville **Cell Number:** 00

Test Element	Eng Updates	Test Value	Test Spec Value	Measure
Spec Number		0T6514	0T6514	
Arrangement Number		2W7900	2W7900	
Corr Fl Power		890	890	HP
Speed		1,800	1,800	RPM
COR FL FUEL RATE			45.3	GAL/HR
CSFC			0.354	LB/HP-HR
Adj Boost			57.2	IN HG
Fuel Pressure			35	PSI
Oil Pressure			65	PSI
TQ COR FUEL RATE				GAL/HR
TQ CK CSFC				LB/HP-HR
TQ CK ADJ BST				IN HG
Torq Ck Speed			1,200	RPM
TQ CK COR TQ			2,754	LB.FT
Low Idle Speed		1,200	1,200	RPM
Low Idle Oil Pressure			64	PSI
High Idle Speed		1,822	1,818	RPM
Response Time				
FL Static Fuel Setting		0.285	0.285	IN
Timing Dim				
FLS (INTRCPT)				
FTS (SLOPE)				
Advertised Power			810	hp
Advertised Speed			1,800	RPM
Advertised Torque				LB.FT
Adjusted Boost (Gas Blending)				HG
Corrected Fuel Rate - Gas (Gas Blending)				BTU/MIN
Corrected Fuel Rate - Diesel (Gas Blending)				GAL/HR
Full Load Fueling (Gas Blending)				MM3/ST
Gas Substitution Ratio (Gas Blending)				%
Corr Full Load Power (Gas Blending)				HP
Full Load Speed (Gas Blending)				RPM
Exhaust Back Pressure				PSI
TQ CK Exhaust Back Pressure				PSI
Ataac Delta Pressure				PSI

Test Spec Data

Description	Measure	Nominal	Ceiling	Floor
Corr Full Load Power	hp	890	917	864
Full Load Speed	RPM	1800	1810	1790
Governor Setting Speed	RPM	1818	1823	1813
High Idle Speed	RPM	1818	1836	1800
Low Idle Speed	RPM	1200	1210	1190
FL Static Fuel Setting	in	0.285		
FT Static Fuel Setting	in	0.285		
Corrected Fuel Rate	GAL/HR	45.2	47.5	43.0
CSFC	LB/HP.H	0.361	0.379	0.341
Adjusted Boost	IN_HG	59.9	68.9	50.9
Torque Check Speed	RPM		10	-10
Corr Torq Rise at TC RPM	%	6.0		
Corr Torque at TC RPM	LB.FT	-53	-57	-50
C Fuel Rate at TC RPM	GAL/HR	45.3	-0.3	-0.3
CSFC at TC RPM	LB/HP.H			
ADJ Boost at TC RPM	IN_HG			
Power Loss/Cyl	% C FL PWR			
Specific Blowby	CU FT/HP.H			
Temp Jacket Water Pump Inlet	F	192	197	186
Delta T Jacket Water (out-in)	F	16	25	7
Inlet Manifold Temp	F			
Water Temp to Scac	F			
Scac Water Flow	GAL/MIN			
Oil Pressure	PSI	64	87	40
Oil Pressure Low Idle	PSI	61	87	40
Fuel Pressure	PSI	31	49	25
Inlet Fuel Pressure	PSI		3	
Inlet Fuel Temp	F	86	95	77
Inlet Air Pressure	IN_HG		31	26
Inlet Air Restriction	IN_HG		1.18	
Inlet Air Temperature	F		122	50
Fuel Density	DEG API		36.0	34.0
Boost Constant		1.0		
Governor Setting Constant				
Governor Setting Torque	% RTD TRQ	90.0	91.0	89.0
High Idle Stability	RPM			
Low Idle Stability	RPM			
Set Point RPM	RPM	1820	1830	1810
Adjusted Boost (Gas Blending)	HG			
Corrected Fuel Rate - Diesel (Gas Blending)	GAL/HR			

Corrected Fuel Rate - Gas (Gas Blending	BTU/MIN			
Full Load Fueling (Gas Blending)	MM3/ST			
Gas Substitution Ratio (Gas Blending)	%			
Corr Full Load Power (Gas Blending)	HP			
Full Load Speed (Gas Blending)	RPM			
Exhaust Back Pressure	PSI			
TQ CK Exhaust Back Pressure	PSI			
Ataac Delta Pressure	PSI			

Engine Reference Information

Description	Measure	Data
FL Static/FT Static Fuel Settings	in	0.285 / 0.285
Fuel Valve Part Number		4W7020
Unit Injector Part Number		
Timing Dimension Field Service	in	
Timing Dimension Factory		
Torque Control Group Number		Change Level:
Fuel Pump/Gov Grp Part Number		4W6074
Fuel Pump Type		SC
Flyweight Part Number/Attitude		
Turbo Part No and Model		4W7500 / TV8122-1.08
Advertised Power / Governor Speed		810hp 1,800 RPM
Compression Ratio		14.5
Torque Rise Cam Part Number		
Manifold Type		DRY
Engine Flash File Part Number		
Rating Number		
Flash File Change Number		
ASM Flash File Part Number		
ISM Flash File Part Number		
Advisor Flash File Part Number		
Secondary Module Flash File Part Number		
Messenger Flash File Part Number		
Tandem Software Flash File Part Number		
Governor Type		WDWRD

Torque Control Group Spring Data

Part No	Thickness	Quantity
No data found...		

Torque Control Group Spacer Data

Part No	Thickness	Quantity
No data found...		

Timing Data
Mechanical Advance Part Number: 6N3195
Chg. Level: 01
Advance: 3.5 DEG
Dog Leg Differentials: RPM: -- KW: --

Description	Measure	Spec	Minimum	Maximum
Timing Static @ 0 RPM BTDC	DEG	30.0	28.0	32.0
Ref RPM	RPM	1200	1170	1230
Timing @ Ref RPM	DEG	31.2	29.7	32.7
Start RPM	RPM	1700	1600	1800
Timing @ Start RPM	DEG	31.7	30.2	33.2
Stop RPM	RPM	2000	1900	2100
Timing @ Stop RPM	DEG	35.5	33.0	38.0

Application/Performance Data

Description	Measure	Data
Application Identification		203 GS PRIME
Engine Sales Model and Series		3412
Combustion System type		DI
Aspiration Type		TA
Engine Source Factory Ref Number		40
Power Setting PL/PP Ref Number		PL8872
Engine Perf Data Ref No and Change Level		TM4610
Multi Engine Torq/Rating		
Emissions Family		
Generator Rating W/O Fan	EKW	565
Generator	HZ	60
Brakesaver test		
Certified Engine Rating	hp	
Engineering Model Ref		E293
Low Idle In-Veh Speed	RPM	
Sales Model		
Machine Facility		
Usage		
Transmission		
Description		GS
Serial Number Prefixs		

Altitude Derating Information

Description	Measure	Data
Altitude - Maximum	FT	5,741
Engine Power (ADV)	hp	
Engine Power (Test)	hp	890

High Idle Speed	RPM	1818
FL Static Fuel Setting	in	0.285
FT Static Fuel Setting	in	0.285
Corrected Fuel Rate	GAL/HR	45.2
FL Boost Pressure	IN_HG	59.9

Spec Number vs. Arrangement Number Cross Reference		
Arrangement	1W9608	2W7900

GEN SET PACKAGE PERFORMANCE DATA [81Z09481]

AUGUST 09, 2016

Performance Number: TM4610

Change Level: 07

Sales Model: 3412CDITA
Combustion: DI
Aspr: TA
Engine Power:
545 W/F EKW 566 W/O F EKW 810 HP
Speed: 1,800 RPM
After Cooler: JWAC
Manifold Type: DRY
Governor Type: HYDRA
After Cooler Temp(F): --
Turbo Quantity: 2
Engine App: GP
Turbo Arrangement:
Hertz: 60
Application Type: PACKAGE-DIE
Engine Rating: PGS
Strategy:
Rating Type: PRIME
Certification:

General Performance Data

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
545	100	810	215.96	0.35	39.94	192.92	48.3	1,733.95	1,131.44	891.14	4,587.38
490.5	90	732	195.22	0.34	36.06	190.4	41.84	1,606.82	1,094.36	877.1	4,209.51
436	80	654	174.48	0.35	32.36	188.24	35.51	1,479.69	1,058.72	863.06	3,828.11
408.8	75	616	164.19	0.35	30.59	187.16	32.34	1,412.59	1,041.62	856.04	3,633.88
381.5	70	577	153.89	0.35	28.82	186.26	29.17	1,345.49	1,024.52	848.66	3,439.65
327	60	500	133.29	0.35	25.31	184.46	22.89	1,211.29	990.5	833.72	3,051.19
272.5	50	423	112.84	0.36	21.87	182.84	16.97	1,080.63	951.26	812.66	2,666.26
218	40	349	93.12	0.37	18.57	181.4	12.53	964.09	889.16	768.2	2,306.05
163.5	30	273	72.81	0.39	15.19	180.32	8.65	858.15	809.42	707.54	1,945.84
136.3	25	234	62.37	0.4	13.47	179.78	6.93	808.71	762.44	670.64	1,765.74
109	20	194	51.92	0.42	11.73	179.24	5.36	769.86	709.34	628.52	1,610.35
54.5	10	113	30.17	0.51	8.24	178.52	2.69	713.36	584.42	528.44	1,341.96

Engine Heat Rejection Data

GEN W/F	PERCENT	REJ TO	REJ TO	REJ TO	EXH	FROM	FROM	WORK	LHV	HHV

EKW	LOAD	JW BTU/MN	ATMOS BTU/MN	EXHAUST BTU/MN	RCOV TO 350F BTU/MN	OIL CLR BTU/MN	AFT CLR BTU/MN	ENERGY BTU/MN	ENERGY BTU/MN	ENERGY BTU/MN
545	100	19,904.5	6,198.8	31,505.9	17,345.3	2,798.0	4,009.3	34,349.4	86,328.5	91,958.6
490.5	90	17,970.9	5,345.8	28,605.6	15,639.2	2,638.8	3,082.4	31,051.0	77,911.7	82,973.2
436	80	16,151.0	4,777.1	25,818.9	13,990.0	2,468.1	2,240.7	27,752.5	69,950.0	74,499.5
408.8	75	15,298.0	4,606.5	24,340.3	13,136.9	2,382.9	1,854.0	26,103.3	66,082.8	70,404.9
381.5	70	14,445.0	4,435.9	22,975.4	12,340.8	2,297.5	1,490.0	24,454.1	62,215.6	66,310.3
327	60	12,738.8	4,094.6	20,188.8	10,748.4	2,126.9	847.4	21,212.5	54,652.0	58,234.8
272.5	50	11,032.8	3,867.1	17,402.2	9,099.2	1,962.0	318.5	17,970.9	47,202.0	50,273.0
218	40	9,383.5	3,924.0	14,558.7	7,336.2	1,768.7	-68.2	14,843.0	40,093.3	42,709.3
163.5	30	7,734.3	3,867.1	11,772.1	5,516.4	1,546.9	-364.0	11,601.5	32,813.9	34,918.1
136.3	25	6,881.3	3,810.3	10,350.3	4,663.3	1,433.1	-477.7	9,952.2	29,060.5	30,994.1
109	20	5,971.3	3,696.5	9,099.2	3,810.3	1,313.7	-568.7	8,246.1	25,364.0	27,013.2
54.5	10	4,208.4	3,241.6	6,653.8	2,217.9	1,057.8	-705.2	4,833.9	17,743.4	18,937.7

EXHAUST Sound Data: 4.92 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
545	100	108	98	108	109	108	101	99	97	88
490.5	90	108	97	107	108	107	100	98	97	87
436	80	107	96	106	107	106	99	97	96	86
408.8	75	107	96	106	107	106	99	97	95	86
381.5	70	106	96	106	106	106	99	96	95	85
327	60	105	95	105	106	105	98	96	94	85
272.5	50	105	94	104	105	104	97	95	93	84
218	40	104	93	103	104	103	96	94	93	83
163.5	30	103	92	102	103	102	95	93	92	82
136.3	25	102	92	102	103	102	95	93	91	82
109	20	102	91	101	102	101	94	92	91	81
54.5	10	101	90	100	101	100	93	91	90	80

EXHAUST Sound Data: 22.97 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
545	100	95	89	98	93	93	88	87	87	79
490.5	90	94	88	98	93	92	87	86	86	78
436	80	94	87	97	92	91	86	85	85	77
408.8	75	93	87	96	91	91	86	85	85	77
381.5	70	93	86	96	91	91	85	84	84	76
327	60	92	86	95	90	90	85	84	84	76
272.5	50	91	85	94	89	89	84	83	83	75
218	40	90	84	94	89	88	83	82	82	74
163.5	30	90	83	93	88	87	82	81	81	73
136.3	25	89	83	92	87	87	82	81	81	73
109	20	89	82	92	87	86	81	80	80	72
54.5	10	87	81	91	86	85	80	79	79	71

EXHAUST Sound Data: 49.21 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB

545	100	88	82	92	87	86	81	80	80	72
490.5	90	88	81	91	86	86	80	79	79	71
436	80	87	81	90	85	85	80	79	79	71
408.8	75	87	80	90	85	84	79	78	78	70
381.5	70	86	80	89	84	84	79	78	78	70
327	60	85	79	89	84	83	78	77	77	69
272.5	50	85	78	88	83	82	77	76	76	68
218	40	84	77	87	82	82	76	75	75	67
163.5	30	83	76	86	81	81	75	74	74	66
136.3	25	82	76	86	81	80	75	74	74	66
109	20	82	75	85	80	80	74	73	73	66
54.5	10	81	74	84	79	79	73	72	72	64

MECHANICAL Sound Data: 3.28 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
545	100	104	102	111	103	100	99	97	82	77
490.5	90	104	102	111	103	100	99	97	82	77
436	80	104	102	111	103	100	99	97	82	77
408.8	75	104	102	111	103	100	99	97	82	77
381.5	70	104	102	111	103	100	99	97	82	77
327	60	104	102	111	103	100	99	97	82	77
272.5	50	104	102	111	103	100	99	97	82	77
218	40	104	102	111	103	100	99	97	82	77
163.5	30	104	102	111	103	100	99	97	82	77
136.3	25	104	102	111	103	100	99	97	82	77
109	20	104	102	111	103	100	99	97	82	77
54.5	10	104	102	111	103	100	99	97	82	77

MECHANICAL Sound Data: 22.97 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCJ 8000HZ DB
545	100	92	90	98	90	86	86	86	79	70
490.5	90	92	90	98	90	86	86	86	79	70
436	80	92	90	98	90	86	86	86	79	70
408.8	75	92	90	98	90	86	86	86	79	70
381.5	70	92	90	98	90	86	86	86	79	70
327	60	92	90	98	90	86	86	86	79	70
272.5	50	92	90	98	90	86	86	86	79	70
218	40	92	90	98	90	86	86	86	79	70
163.5	30	92	90	98	90	86	86	86	79	70
136.3	25	92	90	98	90	86	86	86	79	70
109	20	92	90	98	90	86	86	86	79	70
54.5	10	92	90	98	90	86	86	86	79	70

MECHANICAL Sound Data: 49.21 FEET

| GEN W/F EKW | PERCENT LOAD | OVERALL SOUND DB(A) | OBCF 63HZ DB | OBCF 125HZ DB | OBCF 250HZ DB | OBCF 500HZ DB | OBCF 1000HZ DB | OBCF 2000HZ DB | OBCF 4000HZ DB | OBCF 8000HZ DB |

545	100	86	85	92	86	82	80	79	74	62
490.5	90	86	85	92	86	82	80	79	74	62
436	80	86	85	92	86	82	80	79	74	62
408.8	75	86	85	92	86	82	80	79	74	62
381.5	70	86	85	92	86	82	80	79	74	62
327	60	86	85	92	86	82	80	79	74	62
272.5	50	86	85	92	86	82	80	79	74	62
218	40	86	85	92	86	82	80	79	74	62
163.5	30	86	85	92	86	82	80	79	74	62
136.3	25	86	85	92	86	82	80	79	74	62
109	20	86	85	92	86	82	80	79	74	62
54.5	10	86	85	92	86	82	80	79	74	62

EMISSIONS DATA

Certification:

To properly apply this data you must refer to performance parameter DM1176 for additional information...

REFERENCE EXHAUST STACK DIAMETER	8 IN
WET EXHAUST MASS	7,943.2 LB/HR
WET EXHAUST FLOW (890.60 F STACK TEMP)	4,590.91 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	1,645.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	1,507.23 STD CFM
FUEL FLOW RATE	40 GAL/HR

RATED SPEED "Potential site variation"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
545	100	810	13.6100	.4800	.1300	.8300	10.0000	4.8000	1.5500
408.8	75	616	11.0300	.2800	.1600	.4100	10.5000	3.4000	1.3500
272.5	50	423	8.4100	.1600	.1900	.3200	11.3000	2.5000	1.2800
136.3	25	234	5.6600	.1400	.1800	.2500	13.5000	1.7000	1.2800
54.5	10	113	3.5700	.1500	.2700	.2200	15.9000	1.4000	1.2900

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
545	100	810	11.2500	.2600	.0700	895.7	.4200	10.0000	4.8000	1.5500
408.8	75	616	9.1200	.1500	.0900	683.3	.2100	10.5000	3.4000	1.3500
272.5	50	423	6.9500	.0900	.1000	487.6	.1600	11.3000	2.5000	1.2800
136.3	25	234	4.6800	.0800	.1000	304.3	.1300	13.5000	1.7000	1.2800
54.5	10	113	2.9500	.0800	.1400	186.6	.1100	15.9000	1.4000	1.2900

Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 FT	809.98 hp	809.98 hp	809.98 hp	809.98 hp	809.98 hp	809.98 hp
984.25 FT	809.98 hp	809.98 hp	809.98 hp	809.98 hp	809.98 hp	809.98 hp
1,640.42 FT	809.98 hp	809.98 hp	809.98 hp	809.98 hp	809.98 hp	809.98 hp
3,280.84 FT	809.98 hp	809.98 hp	809.98 hp	809.98 hp	809.98 hp	809.98 hp
4,921.26 FT	809.98 hp	809.98 hp	809.98 hp	799.25 hp	773.77 hp	809.98 hp
6,561.68 FT	809.98 hp	801.93 hp	775.11 hp	750.97 hp	728.17 hp	809.98 hp
8,202.1 FT	780.47 hp	753.65 hp	728.17 hp	705.38 hp	683.92 hp	768.4 hp
9,842.52 FT	732.2 hp	708.06 hp	683.92 hp	662.46 hp	642.35 hp	729.51 hp
11,482.94 FT	686.6 hp	663.8 hp	642.35 hp	620.89 hp	602.12 hp	693.31 hp
13,123.36 FT	643.69 hp	622.23 hp	602.12 hp	582 hp	564.57 hp	657.1 hp
14,763.78 FT	603.46 hp	583.34 hp	563.23 hp	545.8 hp	528.36 hp	622.23 hp
16,404.2 FT	564.57 hp	544.45 hp	527.02 hp	510.93 hp	494.84 hp	590.05 hp
18,044.62 FT	527.02 hp	509.59 hp	492.15 hp	477.4 hp	462.65 hp	557.86 hp
19,685.04 FT	492.15 hp	474.72 hp	459.97 hp	445.22 hp	431.81 hp	528.36 hp

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	7W7170	**Lube Oil Press @ Rated Spd(PSI):**	68.6
Effective Serial No:	81Z21911	**Piston Speed @ Rated Eng SPD(FT/Min):**	1,773.6
Primary Engine Test Spec:	0T6512	**Max Operating Altitude(FT):**	6,479.7
Performance Parm Ref:	TM5739	**PEEC Elect Control Module Ref**	
Performance Data Ref:	TM4610	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:	TD3040	**Turbocharger Model**	TV8122-1.08 VTF
Certification Ref:		**Fuel Injector**	4W7020
Certification Year:		**Timing-Static (DEG):**	30.00
Compression Ratio:	14.5	**Timing-Static Advance (DEG):**	3.50
Combustion System:	DI	**Timing-Static (MM):**	13.00
Aftercooler Temperature (F):	--	**Unit Injector Timing (MM):**	--
Crankcase Blowby Rate(CFH):	--	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(Gal/HR):	--	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(PSI):	65.6	**Peak Torque (LB.FT):**	--

Reference Number: TM4610

THIS PERFORMANCE CURVE IS ALSO APPLICABLE WITH ENGINE ARRANGEMENTS 7W-7170 AND 126-2417.
*
EMODEL GS014
SPECS 0K0517 (HYDRA) AND 0K0519 (2301) ON ARRANGEMENTS 148-3598 (HYDRA) AND 148-3599 (2301) ARE ALSO APPLICABLE TO THIS PERFORMANCE CURVE.

Parameters Reference: TM5739

GEN SET - PACKAGED - DIESEL

TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

Power	+/- 3%
Exhaust Stack Temperature	+/- 8%
Generator Power	+/- 5%
Inlet Airflow	+/- 5%
Intake Manifold Pressure-gage	+/- 10%
Exhaust Flow	+/- 6%
Specific Fuel Consumption	+/- 3%
Fuel Rate	+/- 5%
Heat Rejection	+/- 5%
Heat Rejection - Exhaust Only	+/- 10%

T4i Tolerance Exceptions
C15: Power Tolerance +4% , -0%
C27: Power Tolerance +0% , -4%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1349. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL
APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1349, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR

INLET DURING NORMAL ENGINE OPERATION.

NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS

EMERGENCY STANDBY POWER (ESP)

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY
OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

STANDBY POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY
OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE STANDBY POWER RATING. TYPICAL OPERATION IS 200 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 500 HOURS PER YEAR.

PRIME POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70% OF THE PRIME POWER RATING. TYPICAL PEAK DEMAND IS 100% OF PRIME RATED EKW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

CONTINUOUS POWER RATING

OUTPUT AVAILABLE WITH NON-VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70-100% OF THE CONTINUOUS POWER RATING. TYPICAL PEAK DEMAND IS 100% OF CONTINUOUS RATED EKW FOR 100% OF OPERATING HOURS.

SOUND DEFINITIONS:

Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 03/14/12

ATTACHMENT N

SUPPORTING EMISSIONS CALCULATIONS

	Point Source Emissions				Fugitive Emissions			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PM	5.67	3.95	3.62	2.43	17.21	11.16	5.24	3.68
PM_{10}	2.41	1.60	1.58	1.03	5.10	3.37	1.57	1.17
$PM_{2.5}$	0.38	0.32	0.24	0.21	0.51	0.36	0.16	0.14

Total Proposed PTE

	Uncontrolled		Controlled	
Emissions Type	lb/hr	tons/yr	lb/hr	tons/yr
PM	22.88	15.11	8.86	6.11
PM_{10}	7.51	4.97	3.15	2.20
$PM_{2.5}$	0.89	0.68	0.40	0.35

Emissions for Caterpillar Engiene 3412 [1]

	Uncontrolled		Controlled	
Emissions Type	lb/hr	tons/yr	lb/hr	tons/yr
NO_X	28.70	30.14	28.70	30.14
CO	6.18	6.49	6.18	6.49
SO_X	1.89	1.98	1.89	1.98
$PM/PM_{10}/PM_{2.5}$	2.02	2.12	2.02	2.12
TOC (VOC)	2.34	2.46	2.34	2.46
Hazardous Air Pollutants (HAPS)				
Benzene	0.0061	0.0064	0.0061	0.0064
Toluene	0.0027	0.0028	0.0027	0.0028
Xylenes	0.0019	0.0020	0.0019	0.0020
1,3-Butadiene	0.0003	0.0003	0.0003	0.0003
Formaldehyde	0.0077	0.0081	0.0077	0.0081
Acetaldehyde	0.0050	0.0053	0.0050	0.0053
Acrolein	0.0006	0.0006	0.0006	0.0006
Naphthalene	0.0006	0.0006	0.0006	0.0006
Total HAPS	0.025	0.026	0.025	0.026

1. This engine is non-road which excludes its emissions from the PTE.

Materials Handling

Defining transfer point empirical expression variables, where:

$e = k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$

e =	?	lb/ton
k for TSP =	0.74	dimensionless
k for PM_{10}=	0.35	dimensionless
k for $PM_{2.5}$=	0.053	dimensionless
U =	10	mean wind speed, mph
M_{RAP}=	3	material moisture content, %

Calculating transfer point emission factor for TSP:

e_{RAP} = 0.0033 lb/ton

Calculating transfer point emission factor for PM_{10}:

e_{RAP} = 0.0016 lb/ton

Calculating transfer point emission factor for $PM_{2.5}$:

e_{RAP} = 0.0002 lb/ton

Emission factor calculation taken from AP-42 Section 13.2.4
Aggregate Handling and Storage Piles

Materials Handling

PM Emissions

Rounding = 2

ID	Transfer Capacities		e (U)	Control Device		Emissions			
						Uncontrolled		Controlled	
	tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1	100	125,000	0.0033	MD	0	0.33	0.21	0.33	0.21
TP2	100	125,000	0.0033	PE	50	0.33	0.21	0.17	0.11
TP3	100	187,500	0.0033	N	0	0.33	0.31	0.33	0.31
TP4	100	62,500	0.0033	PE	50	0.33	0.10	0.17	0.05
TP5	100	62,500	0.0033	N	0	0.33	0.10	0.33	0.10
TP6	100	62,500	0.0033	PE	50	0.33	0.10	0.17	0.05
TP7	100	62,500	0.0033	N	0	0.33	0.10	0.33	0.10
TP8	100	125,000	0.0033	PE	50	0.33	0.21	0.17	0.11
TP9	100	125,000	0.0033	N	0	0.33	0.21	0.33	0.21
TP10	0	0	0.0033	PE	50	0.00	0.00	0.00	0.00
TP11	0	0	0.0033	N	0	0.00	0.00	0.00	0.00
					Total	2.97	1.55	2.33	1.25

* Assumes a maximum of 50% of RAP is crushed and recycled through the screen.

Materials Handling

PM_{10} Emissions

ID	Transfer Capacities		e (U)	Control Device		Emissions			
						Uncontrolled		Controlled	
	tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1	100	125,000	0.0016	MD	0	0.16	0.10	0.16	0.10
TP2	100	125,000	0.0016	PE	50	0.16	0.10	0.08	0.05
TP3	100	187,500	0.0016	N	0	0.16	0.15	0.16	0.15
TP4	100	62,500	0.0016	PE	50	0.16	0.05	0.08	0.03
TP5	100	62,500	0.0016	N	0	0.16	0.05	0.16	0.05
TP6	100	62,500	0.0016	PE	50	0.16	0.05	0.08	0.03
TP7	100	62,500	0.0016	N	0	0.16	0.05	0.16	0.05
TP8	100	125,000	0.0016	PE	50	0.16	0.10	0.08	0.05
TP9	100	125,000	0.0016	N	0	0.16	0.10	0.16	0.10
TP10	0	0	0.0016	PE	50	0.00	0.00	0.00	0.00
TP11	0	0	0.0016	N	0	0.00	0.00	0.00	0.00
					Total	1.44	0.75	1.12	0.61

* Assumes a maximum of 50% of RAP is crushed and recycled through the screen.

Materials Handling

$PM_{2.5}$ Emissions

ID	Transfer Capacities		e (U)	Control Device		Emissions			
						Uncontrolled		Controlled	
	tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1	100	125,000	0.0002	MD	0	0.02	0.02	0.02	0.02
TP2	100	125,000	0.0002	PE	50	0.02	0.02	0.01	0.01
TP3	100	187,500	0.0002	N	0	0.02	0.02	0.02	0.02
TP4	100	62,500	0.0002	PE	50	0.02	0.01	0.01	0.01
TP5	100	62,500	0.0002	N	0	0.02	0.01	0.02	0.01
TP6	100	62,500	0.0002	PE	50	0.02	0.01	0.01	0.01
TP7	100	62,500	0.0002	N	0	0.02	0.01	0.02	0.01
TP8	100	125,000	0.0002	PE	50	0.02	0.02	0.01	0.01
TP9	100	125,000	0.0002	N	0	0.02	0.02	0.02	0.02
TP10	0	0	0.0002	PE	50	0.00	0.00	0.00	0.00
TP11	0	0	0.0002	N	0	0.00	0.00	0.00	0.00
					Total	0.18	0.14	0.14	0.12

* Assumes a maximum of 50% of RAP is crushed and recycled through the screen.

West Virginia Paving, Inc.
Portable Aggregate Processing

Potesta & Associates, Inc.
Project No. 0101-16-0318-010

By: AM
Date: 01/23/2017

Checked by: JJD
Date: 01/30/2017

Crushing and Screening

Emission Factors (lb/ton)

	PM	PM10	Source
Primary Crushing	0.002	0.001	DAQ G40-C Emissions Worksheet
Secondary & Tertiary Crushing	0.0054	0.0024	DAQ G40-C Emissions Worksheet
Screening	0.025	0.0087	DAQ G40-C Emissions Worksheet

Crusher Emissions
PM Emissions

PM Crusher Identification	Crusher Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Crusher	Primary	CR1	100	62,500	FE	80	0.20	0.06	0.04	0.01
						Totals:	0.20	0.06	0.04	0.01

PM10 Emissions

Crusher Identification	Crusher Type	ID	0 Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Crusher	Primary	CR1	100	62,500	FE	80	0.10	0.03	0.02	0.01
						Totals	0.10	0.03	0.02	0.01

PM2.5 Emission

Crusher Identification	Crusher Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Crusher	Primary	CR1	100	62,500	FE	80	0.02	0.01	0.01	0.01
						Totals	0.02	0.01	0.01	0.01

Screen Emissions
PM Emissions

Screen Identification	Screen Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Screen	Double Deck	SCR1	100	187,500	PE	50	2.50	2.34	1.25	1.17
						Totals:	2.50	2.34	1.25	1.17

PM10 Emissions

Screen Identification	Screen Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Screen	Double Deck	SCR1	100	187,500	PE	50	0.87	0.82	0.44	0.41
						Totals:	0.87	0.82	0.44	0.41

PM2.5 Emissions

Screen Identification	Screen Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Screen	Double Deck	SCR1	100	187,500	PE	50	0.18	0.17	0.09	0.08
						Totals:	0.18	0.17	0.09	0.08

Totals for Crushing and Screening

PM				PM10				PM2.5			
Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled	
(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)
2.70	2.40	1.29	1.18	0.97	0.85	0.46	0.42	0.20	0.18	0.10	0.09

(1)- PM2.5 equal to PM/14:
Partlicle size multipliers (k) AP42 Section 13.2.4-4 (11/06):

PM	PM10	PM2.5
0.74	0.35	0.053
Conversion Factor	2.1	14

By: AM
Date: 01/23/2017

Checked by: JJD
Date: 01/30/2017

Stockpiles

Reference: AP-42 Section 11.2.3, Fugitive Emissions (May, 1983), Equation #2

E = 1.7 (s/1.5) ((365-p)/235) (f/15)

E =	?	Emissions factor, pound per day per acre, (lb/day/acre)
s_{agg} =	1	Silt content of material (%)
p =	157	number of days with at least 0.254 mm (0.01 in.) of precipitation per year
f =	15	Time wind speed exceeds 12 mph (%)
e_{agg} =	1.003	lb/day/acre for aggregates and RAP

Rounding to 3

Stockpile ID	Stockpile Material	Base Area (acres)	Control Device	Control Eff. (%)	Uncontrolled Emissions lb/hr	Uncontrolled Emissions tpy	Controlled Emissions lb/hr	Controlled Emissions tpy
OS1	RAP	2.56	N	0	0.11	0.47	0.11	0.47
				PM	0.11	0.47	0.11	0.47
				PM_{10}*	0.05	0.22	0.05	0.22
				$PM_{2.5}$*	0.01	0.04	0.01	0.04

* PM10 = PM/2.1; PM2.5 = PM/14.

VEHICLE ACTIVITY

Emission factor equation:

$E = k(s/12)^a (W/3)^b((365-p)/365)$

From *AP-42 Fifth Edition*, Section 13.2.2, Fugitive Sources

	PM	PM10	PM2.5	
E =	?	?	?	lb/VMT
k =	4.9	1.5	0.15	particle size multiplier
a =	0.7	0.9	0.9	constant
b =	0.45	0.45	0.45	constant
s =	10	10	10	% silt in road surface
$W_{endloader}$ =	34	34	34	mean vehicle weight
p =	157	157	157	# days with 0.01" rain
				0
				0
$E_{endloader}$ =	**7.33**	**2.16**	**0.22**	lb/VMT

Annual Production (tpy) 125,000
Hourly Production (tph) 100

	Vehicle Wt	Load Wt
Endloaders	31	6

Rounding to = 2

Vehicular Traffic		Number of	Number of	Control		TSP Emissions			
				Device		Uncontrolled		Controlled	
ID	Miles/Trip[1]	Trips/Hour	Trips/Year	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Endloaders	0.14	17	20,833	HR-WS	70	17.10	10.69	5.13	3.21
						17.10	**10.69**	**5.13**	**3.21**

Vehicular Traffic		Number of	Number of	Control		PM10 Emissions			
				Device		Uncontrolled		Controlled	
ID	Miles/Trip (miles)	Trips/Hour (trips/hour)	Trips/Year (trips/year)	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Endloaders	0.14	17	20,833	HR-WS	70	5.05	3.15	1.52	0.95
						5.05	**3.15**	**1.52**	**0.95**

Vehicular Traffic		Number of	Number of	Control		PM2.5 Emissions			
				Device		Uncontrolled		Controlled	
ID	Miles/Trip (miles)	Trips/Hour (trips/hour)	Trips/Year (trips/year)	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Endloaders	0.14	17	20,833	HR-WS	70	0.50	0.32	0.15	0.10
						0.50	**0.32**	**0.15**	**0.10**

Notes
1. Miles/trip from Dunbar FRAP

By: AM
Date: 01/23/2017

Checked by: JJD
Date: 01/30/2017

Caterpillar 3412 (ENG1) Manufactured 1989

Fuel Usage =	47.5	gallons/hour	Client
	99,750	gallons/year	Calculated
	7.2	lbs/gal Diesel Fuel	Constant
Assumed HeatingValue of Diesel Fuel[2] =	137,000	Btu/gallon	Constant
Maximum Horsepower =	917	hp	Client
Maximum Fuel Input =	6.51	MMBtu/hour	Calculated

Hours Per Year = 2,100

Regulated Pollutant	Emission Factor (lb/MMBtu)[1]	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)
NO_X	4.41	28.70	30.14
CO	0.95	6.18	6.49
SO_X	0.29	1.89	1.98
$PM/PM_{10}/PM_{2.5}$	0.31	2.02	2.12
TOC (VOC)	0.36	2.34	2.46
Hazardous Air Pollutants (HAPS)			
Benzene	9.33E-04	0.0061	0.0064
Toluene	4.09E-04	0.0027	0.0028
Xylenes	2.85E-04	0.0019	0.0020
1,3-Butadiene	3.91E-05	0.0003	0.0003
Formaldehyde	1.18E-03	0.0077	0.0081
Acetaldehyde	7.67E-04	0.005	0.0053
Acrolein	9.25E-05	0.0006	0.0006
Naphthalene	8.48E-05	0.0006	0.0006
Total HAPS		0.025	0.026

Notes:
1. Emission factors from AP-42 Table 3.3-1(Criteria Pollutants) Table 3.3-2 (HAPS) unless noted.
2. Heating value of diesel fuel from AP-42 Appendix A.

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, TESTING PLANS

ATTACHMENT O
MONITORING/RECORDKEEPING/ REPORTING/TESTING PLANS

West Virginia Paving, Inc. plans to follow the monitoring, recordkeeping, reporting, and testing required by the issued permit.

ATTACHMENT P

PUBLIC NOTICE

ATTACHMENT P

PUBLIC NOTICE

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that West Virginia Paving, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Regulation 13 Permit to install a portable crushing and screening facility at Dunbar, Kanawha County, West Virginia. The latitude and longitude coordinates are: 38.37105 and -81.76296.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: PM of 6.11 tons per year (tpy) of which 3.68 tpy are fugitive, PM10 of 2.20 tpy of which 1.17 tpy are fugitive, PM2.5 of 0.35 tpy of which 0.14 tpy are fugitive.

The facility will begin operation under the modified permit when the permit is issued on or about June 15, 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, 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 1250, during normal business hours.

Dated this the (PLEASE INSERT DAY) day of March, 2017.

By: West Virginia Paving, Inc.
Bob Brookover
President
2950 Charles Avenue
Dunbar, West Virginia 25064