



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-3323
Plant ID No.: 039-00671
Applicant: Cummins Crosspoint, LLC
Facility Name: Cross Lanes
Location: Cross Lanes, Kanawha County
SIC/NAICS Code: 5013/441310
Application Type: Construction
Received Date: May 25, 2016
Engineer Assigned: Joe Kessler
Fee Amount: \$3,500
Date Received: June 6, 2016
Complete Date: September 9, 2016
Due Date: November 14, 2016
Applicant's Ad Date: May 27, 2016
Newspaper: *Charleston Gazette-Mail*
UTM's: 431.207 km Easting • 4,250.102 km Northing • Zone 17
Latitude/Longitude: 38.39663/-81.78790
Description: After-the-Fact construction of an engine repair and rebuild shop.

In August of 2015, Cummins Crosspoint, LLC (Cummins) acquired 100% equity ownership of Crosspoint, the owner and operator of the Cross Lanes engine repair and rebuild shop. After an internal environmental audit, Cummins discovered that the Cross Lanes facility required a permit under 45CSR13. On April 1, 2016, Cummins voluntarily disclosed to the Division of Air Quality (DAQ) that the facility did not have a required permit. On August 22, 2016, Cummins entered into a Consent Order (CO-R13-E-2016-13) with the DAQ over this issue.

DESCRIPTION OF PROCESS

Cummins' Cross Lanes facility repairs, rebuilds, and sells large industrial and mobile source engines. The facility includes both an engine and chassis dynamometer, a paint booth, a filter cleaner, and various parts washers to accomplish this.

The engine dynamometer testing station (consisting of two dynamometers only one of which is currently used at a time) is used to test the performance of repaired and rebuilt engines (1S). Currently diesel-fired engines up to 2,500 horsepower (hp) are tested. Engines are hooked to the dynamometer and then run at various loads and speeds to verify the engines are working properly. Cummins has estimated a maximum of 190,000 gallons of diesel a year will be combusted in the testing station. Emissions generated by the engines are captured by a hose and vented to a stack through the roof of the building. There are two testing stations, each with an individual stack. However, at this time, only one engine is tested at a time due to the set-up of the stations.

The chassis dynamometer testing station (2S) uses four large spinning mounts to test fully assembled diesel-fired vehicles not exceeding 600 hp. Vehicles are driven onto the mounts and started. When in gear, the wheels move and spin the mounts while the vehicle stays in place. This allows for testing of engines in fully assembled vehicles. Emissions generated by the engines are captured by a hose attached to the vehicles' exhaust and vented to a stack through the roof of the building.

A fully enclosed paint booth (3S) is used to apply coatings to rebuilt and repaired engines. The coatings are applied with spray guns at a maximum usage rate of 1.5 gallons/hr with an estimated minimum transfer efficiency of 60%. The coating room is kept under slightly negative pressure to capture all of the overspray and direct it to a fiberglass paint arrester filter that is designed to capture a minimum of 99% of the particulate matter generated by the overspray.

A filter cleaner (4S) is used to clean dirty particulate filters from used diesel engines. The dirty filters are loaded into a chamber and a nozzle blows pressurized air and generates electric heat as needed to clean the filters. The exhaust from the cleaning action is vented through a filter cartridge before venting inside the building and then outside through one of the general exhaust fans. The particulate matter outlet emissions from the Filter Cleaner shall not exceed 0.01 gr/dscf pursuant to the manufacturer's specifications of the cartridge filter.

Cummins also operates eight (8) parts washers (collectively identified as 5S). These washers are self-contained free-standing units that use solvents to de-grease and clean various engine parts. Solvents and cleaning agents are used and filtered internally until such time as they are disposed of off-site. VOC emissions from these units occur from evaporation off of the cleaned parts and from the units themselves when the lid is open to insert or remove a part. Therefore, the VOC emissions occur inside the building and are then evacuated by the general exhaust fans.

Additional emissions sources at the facility include the use of a small cooling tower (7S) to cool non-contact water used for heat-transfer cooling of the engine dynamometer. Also on the site is a 4-stroke rich burn (4SRB) natural gas-fired (with propane backup) 67 hp/42 kW_e (47 kW_e - propane) Ford Model ESG-642 Emergency Generator Set (6S - Cummins Model GGFE-5938919). This unit will be limited to 500 hours of non-emergency operation and was (according to the permit application) manufactured in November 2007 and installed in May of 2009.

SITE INSPECTION

On July 13, 2016, the writer conducted an inspection of the Cummins' Cross Lanes facility. The facility is located in a commercial/industrial area of Kanawha County approximately 1.5 miles northwest of Institute, WV just off of State Route (SR) 622 (New Goff Mountain Road). The writer was accompanied on the inspection by Mr. Doug Irwin, Parts Manager for Cummins. Observations from the inspection include:

- The existing facility is located along a small access road next to a Bobcat dealership just off of SR 622 approximately 1.5 miles northwest of Institute, WV;
- At the time of the inspections, the facility was in operation and engaged in the repair and refurbishment of various Cummins engines. The facility is also a dealership for new/refurbished Cummins engines and Cummins parts. The facility appeared clean and well maintained. No substantive odors were noticed during the inspection; and
- The occupied dwelling located nearest to the facility is approximately 0.30 miles to the north, also along SR 622.

Directions: [Latitude: 38.39663°, Longitude: -81.78790°] From the Cross Lanes exit on I-64, travel south on SR 622 for approximately 1.3 miles to the access road on the right.

AIR EMISSIONS AND CALCULATION METHODOLOGIES

Cummins included in Attachment N of the permit application air emissions calculations for the existing Cross Lanes facility. The following will summarize the calculation methodologies used by Cummins to calculate the potential-to-emit (PTE) of the facility.

Dynamometers (1S, 2S)

Emissions from both the engine and chassis dynamometers (1E, 2E, and 3E) were based on emission factors as given in AP-42, Section 3.3 (AP-42 is a database of emission factors maintained by USEPA): "Gasoline And Diesel Industrial Engines." Maximum hourly emissions from the engine dynamometers were based on testing a maximum of 2,500 hp diesel-fired engines at any one time. Maximum annual emissions from the units were based on combusting 190,000 gallons of diesel fuel per year (based on a fuel consumption conversion of 7,000 Btu/hp and a diesel heat content of 0.13 mmBtu/gal). Maximum hourly emissions from the chassis dynamometer were based on testing a maximum of one 600 hp engine. Maximum annual emissions from the unit were based on operating 4,380 hours per year.

Paint Booth (3S)

VOC Emissions From Coating Operations

VOC and HAP emissions from the paint booth (4E) were based on the worst-case VOC/HAP containing coatings used (as based on constituent percentages listed in the MSDS). It was assumed

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that all VOCs/HAPs within the coatings volatilize and are emitted (no VOC control devices are used). Emission estimates for the application of surface coatings were based on the coating usages for the designated period of time. Maximum annual coating usages are based on the estimated maximum amount of coatings to be used in a twelve-month rolling basis as provided by the applicant. Maximum hourly coating usages were determined by using the full capacity of the spray gun (1.5 gallons/hour).

Particulate Matter Emissions From Coating Operations

Particulate matter may be emitted (4E) from the coating operations from the overspray generated in the spray booth. The amount of particulate matter in the coatings are based on the worst-case solids content of the individual coatings currently used (lb/gal) as given in the MSDS or certified product data sheets. Overspray will be limited through the use of spray guns with a transfer efficiency of 60%. The remaining overspray is evacuated from the spray-booths and, after passing through a fiberglass particulate filter, is vented up through the stack. The particulate filter has a collection efficiency of 99% as based on information provided by the vendor. To be conservative, for the purposes of this calculation, all particulate matter emissions are assumed to be PM_{2.5}. Maximum annual coating usages are based on the estimated maximum amount of coatings to be used in a twelve-month rolling basis as provided by the applicant. Maximum hourly coating usages were determined by using the full capacity of the spray gun (1.5 gallons/hour).

Filter Cleaner (4S)

Particulate matter emissions from the filter cleaner (5E) are based on the guaranteed maximum outlet emissions from the cartridge filter not to exceed 0.01 gr-PM/dscf. Volumetric air flow is based on vendor specification. To be conservative, for the purposes of this calculation, all particulate matter emissions are assumed to be PM_{2.5}. The emission point for the filter cleaner is the general exhaust fans of the shop building as the unit vents in side the building.

Parts Washers (5S)

VOC emissions from solvent use (5E) in the parts washers are based on use of the worst-case cleaning solvents and the physical characteristics of the cleaner. Additionally, a 90% control factor is applied to account for the time when the units lids are closed mitigating any VOC loss. The emission point for the filter cleaner is the general exhaust fans of the shop building as the unit vents in side the building.

Emergency Generator

Potential emissions from the 4SRB natural gas-fired (with propane backup) 67 hp/42 kW_e (47 kW_e - propane) Ford Model ESG-642 Emergency Generator (6E - Cummins Model GGFE-5938919) were based on emission factors provided the engine vendor and as given in AP-42, Sections 1.5 (Propane) and 3.2 (natural-gas). The PTE was based on the worst-case emissions of the unit based on calculating emissions from use of each fuel. Hourly emissions were based on the maximum design heat input (MDHI) of the engine of 0.5875 mmBtu/hr and the maximum horsepower rating. Annual emissions were based on 500 hours of operation per year.

Cooling Tower

Potential emissions from the cooling tower (7E) were based on emission factors as given in AP-42, Section 13.4. Maximum water processing rates of 9,240 gallons/hour and 80,942,400 were used in the calculations. No drift eliminator is used on the cooling tower.

Emissions Summary

Based on the above estimation methodology as submitted in Attachment N of the permit application, the facility-wide PTE of Cummins' Cross Lanes facility is given in Attachment A to this evaluation.

REGULATORY APPLICABILITY

The existing Cross Lanes facility is subject to the following substantive state air quality rules and regulations: 45CSR7, 45CSR13, and 45CSR21. Each applicable rule (and those that have questionable non-applicability), and Cummins' compliance therewith, will be discussed in detail below.

45CSR7: To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations

45CSR7 has three substantive requirements potentially applicable to the particulate matter-generating source operations at the Cross Lanes engine repair and rebuild shop: the opacity requirements under Section 3, the mass emission standards under Section 4, and the fugitive emission standards under Section 5. Each of these sections will be discussed below.

45CSR7 Opacity Standards - Section 3

Section 3.1 sets an opacity limit of 20% on the "particulate matter [emitted] into the open air from any process source operation which is greater than twenty (20) percent opacity." The applicable 45CSR7 source operations located at the Cross Lanes engine repair and rebuild shop are the Paint Booth, Filter Cleaner, and Cooling Tower. The use of particulate matter filters on the Paint Booth and Filter Cleaners should mitigate any substantive opacity problems from these sources. Any particulate matter emitted from the Cooling Tower will be from solids entrained in the evaporated cooling water. Actual emissions from this source are expected to be minimal and the unit is not expected to exceed 20% opacity.

45CSR7 Weight Emission Standards - Section 4

Section 4.1 of 45CSR7 requires that each manufacturing process source operation or duplicate source operation meet a particulate matter limit based on the weight of material processed through the source operation. The Paint Booth, Filter Cleaner, and Cooling Tower are each defined as a type 'a' source type operation under §45-7-2.38. Based on the exemption given under §45-7-10.5, "[t]he owner or operator of a manufacturing process shall be exempt from subsection 4.1 for

source(s) of emissions that have a potential to emit less than one (1) pound per hour of particulate matter and an aggregate of less than one thousand (1000) pounds per year for all such sources of particulate matter located at the stationary source.” The particulate matter emissions of the Paint Booth and Filter Cleaner are each less than 1.0 lb/hr and 1000 lbs/yr. Therefore, these sources are not subject to the requirements under Section 4.1.

Section 4.1 compliance is given in the following table for the Cooling Tower:

Table 1: 45CSR7 Section 4.1 Compliance

Source Operation	Source Type	Process Weight Rate (lb/hr)	Table 45-7A Limit (lb/hr)	PTE (lb/hr)	% of Limit	Control Device
Cooling Tower	A	78,469 ⁽¹⁾	32.14	0.77	2.40	None

(1) As based on 9,420 gal/hr water processing rate @ density of 8.33 lb/gallon.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The after-the-fact construction of the existing Cross Lanes facility has a potential to emit a regulated pollutants in excess of the emission thresholds that, pursuant to §45-13-2.24, define the facility as a “stationary source” under 45CSR13. Pursuant to §45-13-5.1, “[n]o person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct.” Therefore, Cummins is required to obtain a permit under 45CSR13 for the after-the-fact construction and operation of the existing facility.

As required under §45-13-8.3 (“Notice Level A”), Cummins placed a Class I legal advertisement in a “newspaper of *general circulation* in the area where the source is . . . located.” The ad ran on May 27, 2016 in *Charleston Gazette-Mail* and the affidavit of publication for this legal advertisement was submitted on June 23, 2016.

45CSR21: Regulation to Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds (Limited Applicability)

45CSR21 applies to the application of VOC-containing materials in Putnam County, Kanawha County, Cabell County, Wayne County, and Wood County. As the Cummins’ Cross Lanes facility is located in Kanawha County, the facility is potentially subject to the limitations under 45CSR21. Specifically, Section 19 applies to any miscellaneous metal parts and products coating line such as the Paint Booth located at the Cross Lanes facility. However, pursuant to §45-21-19.1(d), an exemption is provided:

The emission limits in this section 19. do not apply to any coating line within a facility whose actual emissions without control devices from all miscellaneous metal part and products coating lines within the facility are less than 6.8 kilograms (kg) (15 pounds [lb]) volatile organic compound (VOC) per day. An owner or operator of a facility whose emissions are below this applicability threshold shall comply with the certification, recordkeeping, and reporting requirements of section 19.7.a.

Cummins has stated in the permit application that the actual emissions of the paint booth are below the applicability thresholds given above. Therefore, the Paint Booth will not be considered an applicable source for the purposes of this permitting action but Cummins will be required to meet the record-keeping requirements under Section 19.7(a) to show on-going compliance.

45CSR30: Requirements for Operating Permits - (NON APPLICABILITY)

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The existing Cross Lanes facility does not meet the definition of a “major source under §112 of the Clean Air Act” as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. The facility-wide PTE of any regulated pollutant does not exceed 100 TPY, 10 TPY of any individual HAP, or 25 TPY of aggregate HAPs.

Further, no equipment or processes at the proposed facility are subject to a federal standard under 40 CFR 60, 61, or 63. Therefore, Title V will not apply to the modified facility.

40 CFR 60 Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.

Cummins existing 4SRB natural gas-fired (with propane backup) 67 hp/42 kW_e (47 kW_e - propane) Ford Model ESG-642 Emergency Generator (Cummins Model GGFE-5938919) is defined under 40 CFR 60, Subpart JJJJ as a stationary spark-ignition internal combustion engine (SI ICE) and is, pursuant to §60.4230, potentially subject to the applicable provisions of the rule. However, pursuant to §60.4230(a)(4)(iv), emergency engines with a maximum engine power greater than 25 hp manufactured prior to January 1, 2009 are not subject to Subpart JJJJ. The Cummins emergency engine was, according to information provided by Cummins, manufactured on November 26, 2007. Therefore, the engine is not subject to any emission standards under Subpart JJJJ.

Additionally, pursuant to §60.4230(b), engines tested in the dynamometers are not subject to Subpart JJJJ.

Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (Non-Applicability)

The Cross Lanes facility does not utilize any stationary compression ignition internal combustion engines and pursuant to §60.4200(b), engines tested in the dynamometers are not subject to Subpart IIII. Therefore, Subpart IIII does not apply.

40 CFR 63 Subpart ZZZZ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart ZZZZ. As the Cross Lanes facility is defined as an area source of HAPs (see Attachment A), the facility is subject to applicable requirements of Subpart ZZZZ. Pursuant to §63.6590(c):

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An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

§63.6590(c)(1) specifies that “[a] new or reconstructed stationary RICE located at an area source” is defined as a RICE that shows compliance with the requirements of Subpart ZZZZ by “meeting the requirements of . . . 40 CFR part 60 subpart JJJJ, for spark ignition engines.” Pursuant to §63.6590(a)(2)(iii), a “stationary RICE located at an area source of HAP emissions is new if [the applicant] commenced construction of the stationary RICE on or after June 12, 2006.” The Ford Model ESG-642 emergency generator located at the Cross Lanes facility is defined as a new stationary RICE and, therefore, will show compliance with Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart JJJJ. Compliance with Subpart JJJJ is discussed above.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the existing Cross Lanes facility and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM₁₀ and PM_{2.5}), and Sulfur Dioxide (SO₂). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs for the modified sources were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The following table lists each HAP with a facility-wide PTE above 0.05 TPY () and the associated carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 2: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Ethyl-benzene	VOC	No	Category D - Not Classifiable
Formaldehyde	VOC	Yes	B1 - Probable Human Carcinogen
Methyl Isobutyl Ketone	VOC	No	Inadequate Data
Xylenes	VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at www.epa.gov/iris.

AIR QUALITY IMPACT ANALYSIS

The estimated maximum emissions of the existing facility are less than applicability thresholds that would define the existing facility as “major” under 45CSR14 and, therefore, no air quality impacts modeling analysis was required. Additionally, based on the nature and location of the source, an air quality impacts modeling analysis was not required under 45CSR13, Section 7.

MONITORING, COMPLIANCE DEMONSTRATIONS, REPORTING, AND RECORDING OF OPERATIONS

The draft permit uses parametric usage monitoring (1S, 2S, 6S, and 7S) and actual emissions tracking (4S) for on-going compliance demonstrations. Refer to Section 4.2 of the draft permit for the unit-specific monitoring, compliance demonstration, reporting, and record-keeping requirements (MRR).

PERFORMANCE TESTING OF OPERATIONS

The following substantive performance testing requirement shall be required: At such reasonable time(s) as the Secretary may designate, in accordance with the provisions of 3.3 of the draft permit, Cummins shall be required to conduct or have conducted test(s) to determine compliance with the emission limitations established in this permit and/or applicable regulations.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-3323 to Cummins Crosspoint, LLC for the after-the-fact construction of the Cross Lanes Facility located near Cross Lanes, Kanawha County, WV.

Joe Kessler, PE
Engineer

Date

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