



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-3061
Plant ID No.: 037-00094
Applicant: Lowe Products Company Inc.
Facility Name: Shepherdstown
Location: Shepherdstown
SIC Code: 424910
Application Type: Construction (After the Fact)
Received Date: March 22, 2013
Engineer Assigned: Edward S. Andrews, P.E.
Fee Amount: \$2000.00
Date Received: March 25, 2013
Completeness Date: July 2, 2013
Due Date: September 30, 2013
Newspaper: The Journal
Applicant Ad Date: March 26, 2013
UTMs: Easting: 256.8 km Northing: 4,368.3 km Zone: 18
Description: This permitting request is for the after-the-fact construction of a topdressing (mulch) processing facility.

DESCRIPTION OF PROCESS

Lowe Products recycles wood waste by transforming it into topdressing (mulch), a marketable product. This is achieved by basic grinding operations using the following mobile devices:

(1S) Large Tub Grinder

The large tub grinder grinds sawmill bark and tree grindings to produce shredded hardwood mulch, which accounts for about 60% of the facility's total operations.

Moisture content can vary based on rain/snow accumulations but normally is around 25% on an average. Water is added when necessary to raise the water content to around 25%. This is usually necessary during drought like conditions. Dirt content is minimal at an average of 1% or less. The portable shielding device is used with this grinder.

- (2S) Small Grinder and
- (3S) Horizontal grinder (Hog Shredder)

These two machines are always used together to grind white wood (clean dry lumber) and tree grindings to create a base material for colored topdressings. This process accounts for about 40% of the facility manufacturing operations.

Moisture content can vary based on rain/snow accumulations but normally is around 35% on an average. Lowe Products soak these specific piles before grinding unless it is raining to control dust and/or keep moisture content to above 25%.

- (4S) Trommel Screen

This machine is used as a coloring machine only during peak season April through May or as a back-up if the other coloring machine breaks down.

The moisture content of the material is 100%. Color water is sprayed as the material is mixed in the trommel screen to achieve the desired color mulch.

Finally, the raw materials are sized in a trommel screen. Lowe Products ships bulk loads of mulch or loaded it into individual bags, which are loaded onto pallets for individual retail sale.

SITE INSPECTION

On August 15, 2012, the writer accompanied Mr. Gene Coccari, the Small Business Assistance Officer of the DAQ, to the facility in question. The purpose of Mr. Coccari visit was to obtain site-specific information to assist Lowe Products to develop a permit application for their operation at 777 Potomac Farms Dr. in Shepherdstown, WV. The site sits just west of State Route 45. There are several residential homes along the western and southern sides of the site. Potomac Farms Nursery is located just north of the site. Overall, the site was deemed acceptable for this type of manufacturing activity.

The writer notes that the access and haul roads at the site are unpaved but short (less than quarter mile in length). Due to the nature of the manufacturing process, a significant amount of water is added to the long runs (heaps) of raw materials. The application of this water on a small site carries over onto these roads thus minimizing dust emissions.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions from the facility are mainly from sizing the material and the internal combustion engines, which are used to operate the grinders and trommel screen. Each piece of equipment has its own dedicated engine, which has been sized based on the equipment. The applicant used engine model specific emissions data whenever available for particulate matter (PM), oxides of nitrogen (NO_x), and carbon monoxide (CO). AP-42 factors were used when model specific emission data was not available for estimated emission rates of other pollutants, which were mainly hazardous air pollutants.

The applicant based the sulfur dioxide (SO₂) emissions on consuming diesel fuel with a sulfur content of 0.5 percent. Lowe Products actually only purchases ultra-low sulfur diesel (ULSD) which has a sulfur content of 15 ppm or 0.0015% by weight. The writer corrected these SO₂ estimates in the following table to illustrate the emissions from these four internal combustion engines.

Engine Location	Large Tub Grinder	Small Tub Grinder	Horizontal Grinder	Trommel Screen
Engine Model/Power Output	CAT C32/1200 bhp	Cat 3412/800 bhp	CAT 3412/1000 bhp	John Deere 4045TF250/125 bhp
Pollutant				
PM/PM less than 10 microns (PM ₁₀) /PM less than 2.5 microns (PM _{2.5})	0.26	0.44	0.33	0.275
NO _x	10.65	9.70	13.01	3.88
SO ₂	0.015		0.01	0.002
CO	3.16	2.82	2.20	0.84
Volatile Organic Compounds	0.85	0.56	0.71	0.31
Total HAPs	0.04	0.023	0.03	0.004

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SO ₂	0.015		0.01	0.002
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Volatile Organic Compounds	0.85	0.56	0.71	0.31
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The applicant used emission factors listed in documents published by the Bay Area Air Quality Management District of San Francisco and Sacramento Metropolitan Air Quality Management District to estimate PM emissions from grinder and sizing operations. The following table illustrates these emissions from the specific equipment.

Engine Location	Large Tub Grinder	Small Tub Grinder	Horizontal Grinder	Trommel Screen
Rated Capacity (ton per hour)	40	20	22	15
Pollutant (lb/hr)				
PM	0.96	0.48	0.53	0.32
PM ₁₀ /PM _{2.5}	0.46	0.23	0.25	0.15
PM Allowable Under Rule 7	32.2	28.0	29.2	13.0

Lowes Products' manufacturing process handles the raw/process materials several times over the entire process, which generates fugitive particulate matter emissions. The applicant estimated 56 transfer points, which has the potential to emit 0.07 pounds of PM per hour and 0.03 pounds of PM₁₀/PM_{2.5} per hour. Annual rates are 0.07 tpy of PM and 0.03 tpy of PM₁₀/PM_{2.5}, which are based on a limited operating schedule of 2,000 hours per year. Wind erosion of the stockpiles would contribute 1.2 tpy of PM and 0.6 tpy of PM₁₀/PM_{2.5}.

The applicant used the agency's Emission Calculate Spreadsheet for Nonmetallic Mineral Processing Plants. Fugitive PM emissions from paved and unpaved haul roads were estimated to be 30.5 tpy after controls. Of this amount, 6.1 tons would be classified as PM₁₀ and 1.5 tons as PM_{2.5}. Unpaved roads at the site have been estimated to have the potential of 9 tons of PM per year with 2.6 tons being classified as PM₁₀ and 0.3 tons of PM_{2.5}.

Pollutant	(TPY)
PM	43.2
PM ₁₀	11.1
PM _{2.5}	4.2
NO _x	37.24
SO ₂	0.0
CO	9.02
Volatile Organic Compounds	0.43
Total HAPs	0.04

REGULATORY APPLICABILITY

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

The total allowable particulate emission rate listed in 45CSR7, section 4.1, for Type 'a' source operations (physical change) is a process weight standard. The allowable by this rule for each process is listed in Table #3 of this evaluation. Comparing the allowable with the estimated potential, there is a significant margin of compliance for these sources (greater than 12.5 lb per hour), which indicates that these emission units will meet the PM standards requirements of 45CSR7, section 4.1. The particulate matter generated from the facility is subject to the particulate emission standards under 45CSR7, Table 45-7A, and the 20% opacity limit set forth in section 3.1. Lowe Products Company is subject to the opacity requirements set forth in 45CSR7. In effect to minimize visible emissions created from operating the large tub grinder, the facility has constructed a shield

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

According to the application, Lowe Products Company proposes construction of a mulch manufacturing facility, which falls under Section 2.5 for construction permits and will be subject to all applicable requirements concerning construction permits in 45CSR13. 45CSR13 applies to this source because they exceed 10 tons/year of PM and NO_x emissions. The applicant submitted a complete application, paid the filing fee, and published a Class I Legal Ad in accordance with 45 CSR 13.

45CSR22 Air Quality Management Fee Program

Lowe Products Company met the fee schedule set forth in 45CSR22, which consists of a \$1,000.00 permit application fee. They are also required to keep their Certificate to Operate (CTO) status up to date as a "9M" source.

Federal Regulations

Engines

A separate compression ignition engine powers each of these four pieces of equipment. These engines are specifically integrated into the equipment. The manufacturers of the grinders, and the trommel screen made these units so that they are easy moved from site to site. Lowes moves these units as needed to the stockpiles. Thus, these units are portable.

There are two possible regulations that might be applicable to these engines for the grinder and trommel screen, which are 40 CFR Part 60, Subpart IIII or 40 CFR Part 63, Subpart ZZZZ. Both of these regulations use the same definition for "stationary internal combustion engine" in Subpart IIII and "stationary reciprocating engine" in Subpart ZZZZ, which is the following:

“Means any internal combustion engine that converts heat energy into mechanical work and is not mobile.”

Therefore, these engines are considered mobile (portable) and not considered as stationary sources under these regulations. There are no other federal regulations that might be applicable to this facility.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Emissions of hazardous air pollutants (HAPs) are limited to the diesel engines. Based on the limited operating schedule of these engines the potential to emit of HAPs would be just under 0.1 tons per year. These HAPs would be a mixture of formaldehyde, benzene, propylene, toluene, xylenes, and acetaldehyde. Due to the low emission rate, the writer deems it was not necessary to conduct any further review of these HAPs as part of this permitting action.

AIR QUALITY IMPACTS ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed construction does not meet the definition of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

Typically, most source operations would be required to track their processing rate or throughput. However, this type of mulching operation may need to reprocess the same material two or more times to maximize the yield of specific material from a certain pile. Thus, setting an annual throughput limit for this particular source would falsely restrict Lowe Products Company's operations. Lowes proposes operating each engine 2,000 hours per year. These engines are equipped with hour meters. This approach would cover the process operation as well as the engines.

The process operations at the facility are subject to a visible emission limit under Rule 7. Normally, requiring visible emission checks using a Method 22 to would be the preferred method of monitoring. These operations really have no defined release or exhaust point. Thus, any observation conducted should be conducted in accordance with a written site-specific protocol that has been reviewed and approved by the agency.

In lieu of observations, the writer recommends ensuring on that the shield is installed on the large tube grinder for each batch and tracking when water is applied to stockpiles staged for processing. This approach would ensure to the agency that the proposed fugitive control measures would be implemented.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates the proposed operation will meet all the requirements of the application rules and regulations when operated in accordance to the permit application. Therefore, this writer recommends granting Lowes Products Company, Inc. a Rule 13 construction permit for their facility located in Shepherdstown, WV.

Edward S. Andrews, P.E.
Engineer

Date: August 6, 2013