VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
INTRA-AGENCY MEMORANDUM
Engineering Analysis

Permit Writer	Alison Sinclair
Air Permit Manager	James Kyle
Memo To	File
Date	January 10, 2022
Facility Name	Potomac Supply
Registration Number	40371
Application No.	15
Date Fee Paid	October 5, 2021
Amount ($)	$28,347
Distance to SNP (km)	>100 km
Distance to JRF (km)	>100 km
FLM Notification (Y/N)	N
Application Fee Classification	Title V

Permit Writer Signature

Permit Manager Signature

I. Introduction

Potomac Supply LLC (a Teal-Jones Company) has been located at this site, 1398 Kinsale Road, Kinsale, since 1948 and has steadily upgraded every decade or so. It is located in Westmoreland County, which is in attainment for all pollutants. It is less than a mile from the town of Kinsale. The surrounding area is primarily agriculture and forest, dotted with smaller, older (some registered as historic) homes or farms, many of which pre-date the facility. A Local Governing Body Certification Form signed by the Planning Commission of Westmoreland County was submitted on November 17, 2021 indicating that the facility was fully consistent with all applicable local ordinances. Potomac Supply's property is zoned M1 for industrial activity.

The last air inspection conducted at the facility was on July 21, 2021 and the facility was found to be out of compliance due to missing records of visible emissions evaluations of

the first quarter of 2020, required by Condition 9 of the Title V permit. The facility is now in compliance with all requirements.

The facility is requesting the following changes in their permit:

- Installation of a new 220-ft drying kiln (DK-4) that uses bark and sawdust as fuel
- Increase throughput to woodworking (W-2, W-3)
- Removal of the wood-fired dryers (RD-4, RD-5)
- Removal of the bagging operations (W-5)
- Removal of the Sawing/Top chipper (W-1)

Permitted emissions of VOC from the new kiln will increase by over 40 tons so that is significant and triggers a major modification, which is subject to public notice.

II. Emission Units/Process Description

The facility takes raw timber (southern yellow pine), cuts it into rough boards, and manufactures pallets with some of these boards. They chip the wood waste generated by the woodworking process and occasionally make wood fuel pellets. Planer shavings are retained, open-air dried and used as the primary fuel for the kilns (DK-2, DK-3). Potomac Supply is permitted for kiln-dried lumber production, sawing, chipping, and planing of wood, pellet production, and pallet painting. The facility is currently a Title V major source of volatile organic compounds (VOC), and is located in an attainment area for all pollutants. The facility is currently permitted as a State Major Source under a Minor Source New Source Review (NSR) permit. It is a Title V major source and has a Title V permit. An exempt wood treatment site is within the property but there are plans to lease that area to Chicago Flameproof in the near future.

The new drying kiln (DK-4) will have a 38 mmBtu burner fired with bark and sawdust that will provide indirect heating for the kiln (with hot oil). Particulate matter from the fuel combustion will be controlled with an electrostatic precipitator (ESP). The kiln can dry 16,553 bd-ft/hour and will be permitted to dry 125 million bd-ft/year.

III. Regulatory Review

A. <u>9VAC5 Chapter 80, Part II, Article 6 – Minor New Source Review</u>

The provisions of Article 6 apply throughout Virginia to (i) the construction of any new stationary source, (ii) the construction of any project (which includes the affected emissions units), and (iii) the reduction of any stack outlet elevation at any stationary source.

The application is for a change that meets the definition of "project" contained in 9VAC5-80-1110 C. To be exempt from permitting, the regulations provide that a project must be exempt under both the provisions of 9VAC5-80-1105 B through D as a group and the provisions of 9VAC5-80-1105 E and F.

The project has no affected emissions units listed in 9VAC5-80-1105 B (a saw mill is exempt, unless it engages in the kiln drying of lumber, which this facility does). This project is not for a new stationary source so 9VAC5-80-1105 C is not applicable. In determining if a project is exempt under 9VAC5-80-1105 D, a calculation of the uncontrolled emission rate (UER) increase from the project is required. The project's increase is the sum of the UER increases from each affected emissions unit not listed in 9VAC5-80-1105 B. An emissions unit's increase is the difference between the new UER after the project (NUE) and the current UER (CUE) for that emissions unit and cannot be less than zero.

The CUE for the new drying kiln (DK-4) and its burner is zero as this is a new emissions unit. VOC emissions from the unit were calculated using the factors from the Air Permit Guidance memo #573 (APG-573). Emissions from the burner were calculated using factors from AP-42 tables 1.6-3 and 1.6-4 for wood combustion. Table 1 below shows the applicability of minor new source review (NSR) permitting.

Table 1 – Article 6 applicability determination for new kiln (units are in tons/year)

Pollutant	CUE	NUE	Increase	Exemption Level	Exempt?
PM	**0**	**93.21**	**93.21**	**15**	**No**
PM_{10}	**0**	**86.05**	**86.05**	**10**	**No**
$PM_{2.5}$	**0**	**74.40**	**74.40**	**6**	**No**
NOx	**0**	**10.33**	**10.33**	**10**	**No**
CO	0	99.86	99.86	100	Yes
SO_2	0	4.16	4.16	10	Yes
VOC	**0**	**299.32**	**299.32**	**10**	**No**
Lead	0	0.01	0.01	0.6	Yes

A separate project involves an increase to the annual throughput to the woodworking processes (W-2 and W-3). See Table 2.

Table 2 – Article 6 applicability determination for woodworking (units are in tons/year)

Pollutant	CUE*	NUE	Δ	Exemption Rate (TPY)	Exempt ?
PM	10.02	78.48	68.46	15	No
PM_{10}	5.01	39.24	34.23	10	No
$PM_{2.5}$	0	19.62	19.62	6	No

* the removal of the W-1 process cannot be used to net out of Article 6 applicability but the CUE did not include W-1, since it is not part of the project's emission increase. The previous permit did not include emission limits for $PM_{2.5}$ so it is considered a new pollutant from the woodworking and the current emissions are zero.

Both projects trigger Article 6 NSR permitting for PM, PM_{10}, $PM_{2.5}$, NOx, and VOC.

In order to determine if there is a "major modification" at a state major source (as defined in 9VAC5-80-1110) due to the changes at the facility, a determination must be made on whether a significant emissions increase (as defined in 9VAC5-80-1110) has occurred. Increases from the new kiln and increased woodworking, as well as decreases from the removed equipment, were included. See Table 3 below.

Table 3 – Significant Emissions Increase determination (units are in tons/year)

Pollutant	Old facility limits	New facility limits	Total increase	Significance Level	Significant?
PM	46.7	37.8	None	25	No
PM_{10}	29.2	25.6	None	15	No
$PM_{2.5}$	29.2	12.6	None	10	No
NOx	82.8	69.5	None	40	No
CO	127.5	160.2	32.7	100	No
SO_2	3.7	6.7	3.0	40	No
VOC	**211.2**	**377.6**	**166.4**	**40**	**Yes**
Lead	0.009	0.013	0.004	0.6	No

The increase in VOC from the new kiln is considered significant so a major modification is triggered. The project requires public participation pursuant to 9VAC5-80-1170 D.3. These requirements are discussed in Section X.

As described in Section F below, the kilns are in a source category subject to a standard promulgated pursuant to 40 CFR 63 Subpart DDDD. None of the affected emissions units are subject to federal hazardous air pollutant new source review. Therefore, the project is exempt from the state toxics rule (9VAC5-80-1105 F) and is not subject to Article 6 for toxic pollutant emissions.

B. <u>9VAC5 Chapter 80, Part II, Article 8 and Article 9 – PSD and Non-Attainment Major New Source Review</u>
Westmoreland County is a PSD area for all pollutants as designated in 9VAC5-20-205. After this project, the facility has the potential to emit VOC at major stationary source thresholds (over 250 tons/year). This project by itself does not have a major stationary source PTE. PSD review does not apply. However, after issuance of this permit, the facility will be considered a PSD major source and PSD review will apply for any future projects at the facility.

C. <u>9VAC5 Chapter 80, Part II, Article 5 – State Operating Permit (SOP)</u>
The facility is currently operating under a Minor New Source Review permit and is not subject to any State Operating Permit requirements.

D. <u>9VAC5 Chapter 50, Part II, Article 5 – NSPS</u>
There are no changes to the applicability of New Source Performance Standards for this facility.

E. 9VAC5 Chapter 60, Part II, Article 1 – NESHAPS
There are no applicable NESHAPS for this facility.

F. 9VAC5 Chapter 60, Part II, Article 2 – MACT
After issuance of this permit, the facility will be a major source of HAP emissions. As such, it will become subject to MACT Subpart DDDD. The new drying kiln (DK-4) and the existing drying kilns (DK-2, DK-3) will be subject to this MACT. Per §63.2252 the kilns are not subject to the compliance options or work practice requirements of §63.2240. The facility will not be subject to the compliance options, work practice requirements, performance testing, monitoring, and recordkeeping or reporting requirements of this subpart, or any other requirements in subpart A of this part, except for the initial notification requirements in §63.9(b). Virginia has accepted delegation of this rule.

Additionally, the facility operates two diesel emergency generators and a fire water pump. These units are categorically exempt from NSR permitting; however, they may have applicable requirements in MACT, Subpart ZZZZ. Virginia has accepted delegation of this rule. No changes are proposed for those engines.

G. State Only Enforceable (SOE) Requirements (9VAC5-80-1120 F)
There are no SOE requirements necessary for this permit action.

H. 9VAC5 Chapter 40, Part II, Existing Sources - Emission Standards
There are no Existing Source Rules applicable to lumber kilns. The woodworking (W-2 and W-3) are subject to Chapter 40, Article 17 for woodworking and subject to a particulate matter standard of 0.05 gr/scf of exhaust gas, which is included in Condition 26.

IV. Best Available Control Technology Review (BACT)

BACT applicability is pollutant-by-pollutant based on the permitting applicability thresholds. Each affected emissions unit emitting a pollutant that is subject to permitting shall apply BACT for that pollutant (9VAC5-50-260 C). BACT is applicable for PM, PM_{10}, $PM_{2.5}$, NOx, and VOC.

BACT for VOC for lumber kilns is operation of the lumber kiln in accordance with the manufacturer's recommendations and no add on controls. Though a top down BACT analysis is not required for this permit action, a discussion is presented below (from analysis of PSD application for the Biewer Sawmill, Winona, MS) on various control equipment and why each is not feasible for the kiln.

- Regenerative Thermal Oxidation (RTO) – The use of an RTO is technically infeasible due to the high moisture content and low temperature (around 170°F) of the drying kiln exhaust.

- Regenerative Catalytic Oxidation (RCO) – The temperature of the exhaust is also well below the temperature for optimal use of an RCO and catalyst poisoning from contaminants in the exhaust stream would lead to additional costs of control.
- Carbon Adsorption – The high moisture content of the exhaust stream reduces the capacity and efficiency of the adsorption system and therefore is not a feasible solution.
- Condensation – The gas stream would need to be cooled to below the freezing point of water to condense out the terpenes (large component of the VOC emissions) and this would result in ice freezing and plugging the condensation unit.
- Wet scrubbing – The terpenes in the exhaust stream can be highly viscous and would result in plugging the absorption media of a wet scrubber.

BACT for NOx from the kiln burner is the use of overfire air and good combustion practices.

BACT for particulate matter (PM, PM10, and PM2.5) from wood combustion by the kiln burner is the use of an electrostatic precipitator (ESP). BACT for PM, PM10 and PM2.5 from the woodworking processes (W-2 and W-3) will continue to be the use of cyclones.

V. Summary of Potential Emissions Increase

This is discussed in Section III.A above.

VI. Dispersion Modeling

A. Criteria Pollutants

Due to the significant increase of VOC from the kiln, modeling was performed for ozone. The impact on ozone from the facility's NO_X and VOC emissions was calculated by DEQ using EPA modeling results. This analysis was based on the highest maximum 8-hour ozone impacts from multiple hypothetical source model simulations in the southeast US region contained in EPA's *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program* (April 30, 2019). The estimated impact was approximately 0.73 parts per billion (ppb) of ozone. The monitored ozone design value for the area is approximately 60 ppb for the period 2018 through 2020. It is assumed that Potomac Supply's current facility emissions are included in the air quality background concentration. The area surrounding the Potomac Supply facility complies with the 8-hour ozone NAAQS of 70 ppb. It is important to note that this approach is highly conservative because it adds a daily maximum 8-hour ozone concentration to a design value. The project's actual modeled impact on the design value (4th highest ozone concentration averaged over 3 years) is likely to be much less than the result obtained using this approach.

B. Toxic Pollutants
After this permit is issued, the facility will be a major source of HAP and will be subject to MACT Subpart DDDD. As such, the Virginia State Toxics Rule is no longer applicable (9VAC5-60-90.C) and modeling is not required.

VII. Boilerplates and Boilerplate Deviations

The standard NSR boilerplate was used to draft this permit with minimal deviations.

VIII. Compliance Demonstration

The facility will be required to track the throughput of bark/sawdust and lumber through the kiln (DK-4). Additionally the throughput of lumber to the lower chipper (W-2) and planing (W-3) will be tracked. The facility must monitor the kiln, ESP, and cyclones for proper operation of each.

IX. Title V Review – 9VAC5 Chapter 80 Part II Article 1 or Article 3

The facility is subject to Article 1 permitting and will be required to submit a modification to their TV permit as a result of the inclusion of the new kiln and other changes to the facility.

X. Public Participation and Notifications

This permit action will be a major modification under 9 VAC 5-80-1110 and will be subject to a 30-day public comment period, a public hearing, and 15 additional days of public comment (9VAC5-80-1170).

XI. Other Considerations

The facility did not request that any information be held confidential. The draft permit does not contain confidential information.

XII. Recommendations

Based on the information submitted, it is recommended that this permit be issued.

Attachments – Modeling Report
Calculations