Facility Name: **Enviva Pellets Waycross, LLC**
City: Waycross
County: Ware
AIRS #: 04-13-299-00053 Application #: TV-610193

Date SIP Application Received: N/A
Date Title V Application Received: October 29, 2021 and November 10, 2022
Permit No: 2499-299-0053-V-04-1

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Introduction

This narrative is being provided to assist the reader in understanding the content of the referenced SIP permit to construct and draft operating permit amendment. Complex issues and unusual items are explained in simpler terms and/or greater detail than is sometimes possible in the actual permit. This permit is being issued pursuant to: (1) Sections 391-3-1-.03(1) and 391-3-1-.03(10) of the Georgia Rules for Air Quality Control, (2) Part 70 of Chapter I of Title 40 of the Code of Federal Regulations, and (3) Title V of the Clean Air Act Amendments of 1990. The following narrative is designed to accompany the draft permit and is presented in the same general order as the permit. This narrative is intended only as an adjunct for the reviewer and has no legal standing. Any revisions made to the permit in response to comments received during the public comment period and EPA review process will be described in an addendum to this narrative.

I. Facility Description

A. Existing Permits

Table 1 below lists the current Title V permit, and all administrative amendments, minor and significant modifications to that permit, and 502(b)(10) attachments.

Table 1: Current Title V Permit and Amendments

Permit/Amendment Number	Date of Issuance	Description
2499-299-0053-V-04-0	July 7, 2021	Administrative Permit Amendment Name & Ownership change.

B. Regulatory Status

1. PSD/NSR/RACT

Enviva Pellets Waycross, LLC (hereinafter "facility") has potential to be a major source under the PSD regulation for nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOC) and particulate matter (PM/PM10/$PM_{2.5}$). With the control devices (ID Nos. WE01, WE02, DCS1, CBH1, HBH1 through HBH10, CBH2, and PBH1 through PBH5), and the emission limit specified in existing Condition 3.2.1 of Title V Permit No. 2499-299-0053-V-04-0, the facility was able to cap the facility-wide PM/PM10/$PM_{2.5}$ emissions below 250 tons per year (tpy). Existing Condition 2.1.1 also capped the facility-wide NOx, CO, and VOC emissions at 249 tpy. Therefore, the facility is currently a minor source under the PSD regulation.

The facility is not subject to any RACT requirements specified in the Georgia Rules for Air Quality Control for any specific industry types (all the RACT rules other than GA Rules (tt) and (yy)). The facility is located in Ware County, which is not in the county list specified in GA Rules (tt) and (yy). Therefore, the facility is not subject to any RACT requirements.

2. Title V Major Source Status by Pollutant

Table 2: Title V Major Source Status

head	Is the Pollutant Emitted?	If emitted, what is the facility's Title V status for the Pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	Yes	✓		
PM_{10}	Yes	✓		
$PM_{2.5}$	Yes	✓		
SO_2	Yes			✓
VOC	Yes	✓		
NO_x	Yes	✓		
CO	Yes	✓		

Individual HAP	Yes	✓		
Total HAPs	Yes	✓		
Total GHG	Yes	✓		

II. Proposed Modification

A. Description of Modification

Existing Condition 2.1.2 of Title V Permit No. 2499-299-0053-V-04-0 capped the facility-wide single and combined hazardous air pollutants (HAP) emissions below 10 tpy and 25 tpy, respectively. Existing Condition 6.2.2 contained the actual HAP emission tracking equations and associated HAP emission factors for the regenerative thermal oxidizer (RTO) stacks and regenerative catalytic oxidizer (RCO) stacks. In order to periodically validate the HAP emission factors, existing Condition 4.2.3 required that the facility conduct the associated HAP emission performance tests at 36-month intervals.

During the most recent HAP performance tests for the RTO and RCO stacks conducted on May 4, 2021 through May 7, 2021, the facility identified that the actual methanol emission rates are much greater than the associated methanol emission factors listed in Table 6.2.2-1; the actual combined HAP emission factors are also much greater than those listed in Table 6.2.2-1. Some of the formaldehyde and acetaldehyde actual emission rates are also higher. In order to maintain the production level, the facility submitted Application No. 610193 on October 29, 2021 and requested to remove the HAP SM limits specified in Existing Condition 2.1.2. This will make the facility a Title V major source for single and combined HAP. Since there is not any industry specific maximum achievable control technology (MACT) regulations in 40 CFR 61 and 63 for wood pellet manufacturing facilities (except Heat Energy Systems HES1 and HES2 are subject to the Boiler MACT and emergency engines are subject to RICE MACT), per 40 CFR 63.43(c)(2), the facility is required to submit a case-by-case MACT analysis for the removal of the single/combined HAP SM limits.

In the permit preparation process, the facility also identified many items that should be considered or addressed in the resulted Title V permit amendment. Also, the existing RTOs are near the end of their service life; the facility submitted the revised Title V permit amendment also 112(g) application on November 10, 2022, to include the request to replace the RTO's. The updated application included the following key requests:

- Request the removal of the single/combined HAP Title V SM limits specified in existing Conditions 2.1.2 by submitting the 112(g) application that included a case-by-case MACT analysis.

- Replace the existing RTO's and keep the same ID numbers. Each new RTO will have a lower heat input capacity (24.8 MMBtu/hr) than the existing RTO (32 MMBtu/hr). Facility-wide potential emissions have been updated.

- Update the facility-wide pellet production from 826,733 tpy of wood pellets per year to 920,000 ODT of pellets per year utilizing up to 95% softwood feedstock. This new throughput also applies to dry hammermills (HML), pellet mills (PML), and pellet coolers (PCL).

- Update the maximum hourly throughput for both Rotary Dryers (DRY1 and DRY2) to 52.5 ODT/hr. The annual throughput for each dryer will remain unchanged at 390,000 ODT/yr.

- Update potential emissions to include particulate matter (PM), volatile organic compounds (VOC), and HAP for bark hog (BH01), chipper and re-chippers (LC02 and LC03), and green chip storage silos (GCS1 and GCS2). These emissions were not previously quantified.

- Update PM emissions for other fugitive and non-fugitive sources.

- Remove the wet electrostatic precipitator (WESP) control efficiency applied for metal HAPs; update the WESP hydrochloric acid control efficiency to 90%; and update potential metal HAP emissions based on emission factors for wood?fired rotary dryers from the NCASI Wood Products Database.

- Update facility-wide potential emissions to include idle and cold startup emissions for the heat energy systems (HES1 and HES2).

- Remove fine storage silo (SS) from facility-wide potential emissions as this source does not exist.

- Emission factors for the emergency engines were also updated.

- Update potential emissions for RTO1, RTO2, RCO1, and RCO2 based on process information and recent engineering reviews. This would result in modifying the VOC emission factors in Condition 6.2.2.

- Switch the startup fuel from natural gas to manual application of distillate fuel oil as an accelerant for the Heat Energy Systems (ID Nos. HES1 and HES2).

B. Emissions Change

Table 4: Emissions Change Due to Modification

Pollutant	Is the Pollutant Emitted?	Net Potential Emissions Increase (Decrease) (tpy)
PM	Yes	10
PM_{10}	Yes	11
$PM_{2.5}$	Yes	8
SO_2	Yes	0
VOC	Yes	0
NO_x	Yes	0
CO	Yes	0
Individual HAP	Yes	34.6
Total HAPs	Yes	54.5

C. PSD/NSR Applicability

As discussed previously, the facility is a SM source under PSD regulation for NOx, CO, VOC, and PM/PM10/$PM_{2.5}$. The proposed modification did not request any modification of the associated emission limits and the PSD SM status. The proposed modification does not trigger any PSD review.

Ware County is not located in the Atlanta Ozone non-attainment area, so non-attainment area new source review (NAA NSR) is not applicable.

III. Facility Wide Requirements

A. Emission and Operating Caps:

The facility will become a major source of single and combined HAPs after the proposed modification. As requested by the facility, the major source HAPs avoidance limits (Condition 2.1.2) has been deleted in this permit amendment.

B. Applicable Rules and Regulations

Toxic Impact Assessment

The proposed production update and other revisions to potential emissions proposed in this application result in an increase in potential HAP emissions above major source threshold for single and total HAPs. Some toxic air pollutants (TAP) also have emission increases. Therefore, a toxic impact assessment (TIA) is required for the modification.

A comparison of the facility-wide potential-to-emit (PTE) for each TAP to the respective minimum emission rates (MERs) indicated that modeling is required for fifteen (15) TAPs. Below is the MER comparison table provided in the application.

Table 5: MER Comparison Table

TAP	PTE (lb/yr)	MER (lb/yr)	Modeling Required?
Acetaldehyde	2.57E+04	1.11E+03	**Yes**
Acetophenone	5.82E-04	5.69E+03	No
Acrolein	9.52E+03	4.87E+00	**Yes**
Antimony & Compounds	2.68E+01	5.84E+01	No
Arsenic & Compounds	1.92E+00	5.67E-02	**Yes**
Benzene	7.79E+02	3.16E+01	**Yes**
Beryllium	1.56E-01	9.73E-01	No
Butadiene, 1,3-	4.65E-01	7.30E+00	No
Cadmium	3.59E+00	1.35E+00	**Yes**
Carbon Tetrachloride	8.19E+00	1.62E+02	No
Chlorine	2.68E+03	1.75E+02	**Yes**
Chlorobenzene	6.00E+00	4.05E+04	No
Chloroform	5.09E+00	1.06E+02	No
Chromium VI	1.30E+01	2.43E+01	No
Chromium–Other compounds	3.03E+01	5.84E+01	No
Cobalt Compounds	2.21E+01	1.17E+01	**Yes**
Dichloroethane, 1,2-	5.28E+00	9.37E+01	No
Dichloropropane, 1,2-	6.00E+00	9.73E+02	No
Di(2-ethylhexyl) phthalate	8.55E-03	5.79E+02	No
Ethyl benzene	5.64E+00	2.43E+05	No
Formaldehyde	1.75E+04	2.67E+02	**Yes**
Hexane	1.39E+03	1.70E+05	No
Hydrochloric acid	6.67E+03	4.87E+03	**Yes**
Lead and Lead Compounds	1.83E+01	5.84E+00	**Yes**

Table 5: MER Comparison Table			
TAP	PTE (lb/yr)	MER (lb/yr)	Modeling Required?
Manganese & Compounds	8.43E+02	1.22E+01	**Yes**
Mercury	1.21E+01	7.30E+01	No
Methanol	8.92E+04	3.01E+04	**Yes**
Methyl bromide	2.73E+00	1.22E+03	No
Methyl chloride	4.19E+00	2.19E+04	No
Methylene chloride	5.28E+01	5.18E+03	No
Naphthalene	1.94E+01	7.30E+02	No
Nickel	2.61E+01	3.86E+01	No
Pentachlorophenol	9.28E-03	5.84E+01	No
Perchloroethylene	6.91E+00	7.86E+04	No
Phenol	1.47E+03	2.20E+03	No
Phosphorus Metal, Yellow or White	9.16E+01	1.17E+01	**Yes**
Propionaldehyde	2.22E+03	1.95E+03	**Yes**
Selenium Compounds	3.59E+01	2.34E+01	**Yes**
Styrene	3.46E+02	2.43E+05	No
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	1.56E-06	7.30E-02	No
Toluene	1.76E+02	1.22E+06	No
Trichloroethane, 1,1,1-	5.64E+00	2.20E+05	No
Trichloroethylene	5.46E+00	4.87E+02	No
Trichlorophenol, 2,4,6-	4.00E-03	7.30E+02	No
Vinyl Chloride	3.28E+00	5.60E+01	No
Xylene	8.39E+00	2.43E+04	No

The facility conducted an air dispersion modeling for the 15 TAPs identified in Table 5 above (with Yes checked). Modeling for each TAP was conducted using five years of meteorological data. The maximum concentration (highest-first-high) across the five individual years was compared to the AAC for each modeled TAP. The latest version of the AERMOD model (Version 22112) with default regulatory options were used in the modeling.

There are nine operating scenarios that reflect a variety of facility-wide operating conditions to determine the worst case scenarios for various toxic air pollutants. These scenarios were modeled as source groups in AERMOD modeling files. The maximum ground level concentration (MGLC) concentrations of the worst-case scenario for each pollutant and each averaging period over 2016-2020 are included in Table 6 below. Unless otherwise noted, the concentrations included are from the normal operating scenario (the source group labeled as "Norm").

Table 6: TAP MGLC Assessment					
TAP	**Averaging Period**	**AAC (µg/m³)**	**Max Modeled Conc. (µg/m³)**	**Receptor UTM Zone: 17**	
				Easting (meter)	**Northing (meter)**
Acetaldehyde	Annual	4.55	0.41	365,448.88	3,458,805.97
	15-minute	4,500	33.50	365,743.56	3,458,664.42
Acrolein	Annual	0.35	0.11	365,448.88	3,458,805.97
	15-minute	23	8.16	365,760.56	3,458,622.25
Arsenic*	Annual	0.000233	0.000037	365,778.09	3,459,115.81
	15-minute	0.2	0.038	365,828.43	3,459,015.48
Benzene	Annual	0.13	0.016	365,448.88	3,458,805.97
	15-minute*	1,600	7.29	365,828.43	3,459,015.48
Cadmium	Annual	0.00556	0.000057	365,448.88	3,458,805.97
	15-minute*	30	0.0070	365,828.43	3,459,015.48
Chlorine	24-hour	3.6	0.58	365,448.88	3,458,805.97
	15-minute	300	3.41	365,743.56	3,458,664.42
Cobalt	24-hour	0.24	0.0048	365,448.88	3,458,805.97
Formaldehyde	Annual	1.1	0.25	365,448.88	3,458,805.97
	15-minute	245	19.95	365,743.56	3,458,664.42
Hydrochloric Acid	Annual	20	0.11	365,448.90	3,458,806.00
	15-minute*	700	32.42	365,828.43	3,459,015.48
Manganese	Annual	0.05	0.014	365,448.88	3,458,805.97
	15-minute*	500	2.73	365,743.56	3,458,664.42
Methanol	Annual	20,000	2.06	365,721.70	3,459,563.20
	15-minute	32,800	123.04	365,743.56	3,458,664.42
Lead	24-hour#	0.12	0.013	365,818.64	3,459,035.17
Phosphorus Metal, Yellow or White	24-hour	0.24	0.020	365,448.88	3,458,805.97
Propionaldehyde	Annual	8.0	0.029	365,448.88	3,458,805.97
Selenium Compounds	24-hour	0.48	0.0092	365,448.88	3,458,805.97

* The worst-case scenario is the scenario that is modeled with the source group "BYP." In this group, both FHES 1 and 2 operate in "idle mode" with all other sources operating under normal conditions except for the Dryers which are not operational.

\# The worst-case scenario is the scenario that is modeled with the source group "FBYP." In this group, both FHES operating in "Cold Start-up" with all other sources operating under normal conditions except for the Dryers which are not operational.

Since the MGLC for each TAP is below the corresponding acceptable ambient concentration during the long term and short-term periods, the facility has demonstrated compliance with the Georgia Air Toxics Guidelines with the increased TAP/HAP emissions.

C. Compliance Status

The Permittee is technically out of compliance with the major source HAP avoidance limits specified in existing Condition 2.1.2. The facility plans to demonstrate compliance with all applicable regulations by submitting this permit application and by being subject to a 112(g) case by case MACT and the boiler MACT.

D. Permit Conditions

The Division agreed with the facility's request and deleted Condition 2.1.2. The resulting case-by-case MACT requirements have been incorporated into Modified Conditions 3.2.2 and 3.2.4.

Note that the HAP SM limits are officially removed from the permit when this permit amendment is finalized. So the issuance date of this permit amendment will be the date that the facility officially becomes Title V major for HAP emissions.

IV. Regulated Equipment Requirements

A. Brief Process Description

There is no change to the current process description at the facility except the increase in throughput due to removal of major source HAPs avoidance conditions in the permit.

The facility includes a wood fiber receiving and storage area, two dryers, five wood pelletizing lines, and wood pellet loadout area. The facility processes logs into fuel pellets. Tree length pulpwood logs are received via trucks. The logs are stored to promote air drying. A log loader transfers the logs into a debarker drum. The bark is separated and used as fuel in the dryers. The debarked logs are chipped into small chips. The chips are fed into two rotary dryers. Heat for the rotary dryers is provided by two bark fueled heat energy systems. The dried wood chips and dry shavings pass through 10 hammermills, which further grind the wood chips before they are compressed into pellets on a rotating press roll. The pellets are cooled in five counter-flow pellet coolers before they are loaded into rail cars where they are transported to Savannah for storage prior to shipment via vessels to electricity generating facilities in Europe.

B. Equipment List for the Process

Emission Units		**Specific Limitations/Requirements**	**Air Pollution Control Devices**	
ID No.	**Description**	**Applicable Requirements/Standards**	**ID No.**	**Description**
LC01	Wood chip Screen	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	CYC1	Cyclone
LD01	**Log Debarking**	**391-3-1-.02(2)(b)** **391-3-1-.02(2)(e)**	---	---
BH01	**Bark Hog**	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** **391-3-1-.02(2)(b)** **391-3-1-.02(2)(e)**	---	---
LC02	**Chipper**	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** **391-3-1-.02(2)(b)** **391-3-1-.02(2)(e)**	---	---
LC03	**Re-chippers (2)**	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** **391-3-1-.02(2)(b)** **391-3-1-.02(2)(e)**	---	---
GCS1	**Green Chip Storage Silo 1**	**391-3-1-.02(2)(b)** **391-3-1-.02(2)(e)**	---	---
GCS2	**Green Chip Storage Silo 2**	**391-3-1-.02(2)(b)** **391-3-1-.02(2)(e)**	---	---
HES1	193 MMBtu/hr Heat Energy System 1	40 CFR 60 Subparts A & Db 40 CFR 63 Subparts A and **DDDDD** 391-3-1-.02(2)(d)	WE01 **RTO1**	Wet ESP Regenerative Thermal Oxidizer
HES2	193 MMBtu/hr Heat Energy System 2		WE02 **RTO2**	Wet ESP Regenerative Thermal Oxidizer
DRY1	Rotary Drum Dryer 1	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** 391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	WE01 **RTO1**	Wet ESP Regenerative Thermal Oxidizer
DRY2	Rotary Drum Dryer 2		WE02 **RTO2**	Wet ESP Regenerative Thermal Oxidizer

Emission Units		Specific Limitations/Requirements	Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**ID No.**	**Description**
DCS	Dry Chip Storage Silo	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** 391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	DCS1 RC01	Baghouse Regenerative Catalytic Oxidizer (West)
CE01	Conveying Equipment Aspiration System for Hammermill Lines	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** 391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	CBH1 RCO1	Baghouse Regenerative Catalytic Oxidizer (West)
HML	Hammermill Lines (10 Hammermills)	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** 391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	HBH1 to HBH10 RCO1	10 Baghouses Regenerative Catalytic Oxidizer (West)
FS	Fiber Storage Silo	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** 391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	CBH2 RCO2	Baghouse Regenerative Catalytic Oxidizer (East)
CE02	Conveying Equipment Aspiration System for Pellet mill/Pellet Cooler Lines	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** 391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	CBH2 RCO2	Baghouse Regenerative Catalytic Oxidizer (East)
PML PCL	Pellet mill (5 Lines) Pellet Cooler (5 lines)	**40 CFR 63 Subpart A** **40 CFR 63 Subpart B** 391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	PBH1 to PBH5 RCO2	Baghouses Regenerative Catalytic Oxidizer (East)
PA01	Pelletizing Area Vacuum System	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	PAB1	Baghouse
RL	Railcar Loadouts (3)	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	RCF1 to RCF3	Compact Filters
FP01	175 hp Fire Water Pump Engine – diesel fired	40 CFR 60 Subparts A and IIII 40 CFR 63 Subparts A and ZZZZ 391-3-1-.02(2)(b) 391-3-1-.02(2)(g)	N/A	N/A
EG01	500 kW Diesel fired Emergency Generator - Dryers	40 CFR 60 Subparts A and IIII 40 CFR 63 Subparts A and ZZZZ 391-3-1-.02(2)(b) 391-3-1-.02(2)(g)	N/A	N/A
EG02	250 kW Diesel fired Emergency Generator - Pelletizing	40 CFR 60 Subparts A and IIII 40 CFR 63 Subparts A and ZZZZ 391-3-1-.02(2)(b) 391-3-1-.02(2)(g)	N/A	N/A

* Generally applicable requirements contained in this permit may also apply to emission units listed above. The lists of applicable requirements/standards are intended as a compliance tool and may not be definitive.

C. Equipment & Rule Applicability

Emission and Operating Caps –

The toxic impact assessment discussed in Section III.B. of this narrative is based on the TAP/HAP emission rates for an annual pellet production rate of 920,000 oven dried tons (ODT). Therefore, new Condition 3.2.7 contains the annual pellet throughput limit as an operating cap. If the facility produces more than 920,000 ODT pellets, the facility will be required to submit an updated toxic impact assessment that demonstrates compliance with the Georgia Air Toxics Guidelines at the higher throughput rate.

As discussed in the following section, the approved case-by-case MACT is the continued use of the existing RTO's and RCO's with a 95-percent HAP removal/control efficiency. This has been incorporated into Conditions 3.2.2 and 3.2.4. Compliance with the 95-percent HAP removal/control efficiency will be demonstrated with HAP destruction efficiency performance testing (measured as VOCs) once every three years. Between each two sets of testing, the combustion zone temperature of each RTO and each RCO are the surrogate monitoring parameters that ensure proper operation and HAP control of the control devices. So modified Conditions 3.2.3 and 3.2.5 contains the operating limits (maintaining the temperature above the minimum temperature established during the most recent testing) for the current RTO's and RCO's; Condition 3.2.6 contains the same operating limit for the new RTO's.

During the courtesy review of the draft Title V permit amendment, the facility has requested to either remove the PM PSD avoidance limit specified in existing Condition 3.2.1 or replace that limit with a facility-wide PM PSD synthetic minor (SM) limit. The Division has conducted a thorough review for this request, and has determined that the numeric PM emission limit should be replaced with a facility-wide PM control operating limit with the following reasons:

- The existing 0.047-lb/MMBtu limit applies to only the heat energy systems (ID Nos. HES1 and HES2) and dryers (ID Nos. DRY1 and DRY2), which are controlled by Wet ESP WE01 and WE02 (exhaust released from RTO1 and RTO2 stacks). Assuming that each dryer operates at full capacity (193 MMBtu/hr), the corresponding annual PM PTE would be 39.7 tpy.

- During the past 5 consecutive performance tests for each RTO stack over a 10 year period, all the test results are below 0.047 lb/MMBtu. The average test result is less than 50% of the limit for each RTO stack.

- In Application No. 610193, the facility used the lumber kiln uncontrolled PM emission factor to estimate after-controlled PM PTE for HES1/HES2/DRY1/DRY2. The result is 26.7 tpy for each RTO stack, excluding PM emissions from startup/shut down/malfunction.

- According to the past 5 consecutive tests, the real PM PTE for each RTO stack is expected to be 19.9 tpy or lower, which is lower than the 26.7-tpy PM PTE for each RTO stack presented in this application.

- Even with the 26.7-tpy PM PTE for regular operation and 1.86 tpy for startup/shut down/malfunction for each RTO stack, the two RTO stacks emit less than 25% of the facility-wide PM PTE (231 tpy).

- The majority of the facility-wide PM PTE is emitted from the RCO stacks which receive exhaust from storage silos, dry hammermills, and conveying equipment aspiration systems, via baghouses. To calculate the PM PTE, the facility used baghouse vendor guaranteed grain loading data with the design (maximum) baghouse fan flowrates and 8,760 hours of operation. This is a conservative PM PTE estimates.

- For the rest of the facility, PM PTE is calculated either with control device vendor guaranteed grain loading data or US EPA AP-42 emission factors.

- As long as the facility operates all PM control devices at all times when the associated emission units are in operation, the facility-wide PM PTE can only go as high as 231 tpy, which is lower than the PSD major source threshold of 250 tpy. Therefore, a facility-wide PM emission limit of 249 tpy is not necessary.

With the above reasons, the Division decided to require that all PM control devices be operated during the operation of the associated emission units in Condition 3.2.1.

Applicable Rules and Regulations -

40 CFR 63 Subpart B – Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections, Sections 112(g) and 112(j)

Since the facility becomes Title V major for HAP emissions when Condition 2.1.2 is deleted by this permit amendment, and most of the facility (except HES1 and HES2 and emergency engines) are not subject to any industry specific MACT standards, the facility is subject to the case-by-case MACT requirements specified in 40 CFR 63.42(c)(2). HES1 and HES2 will be subject to 40 CFR 63 Subpart DDDDD (Boiler MACT). Emergency engines FP01, EG01, and EG02 are subject to 40 CFR 63 Subpart ZZZZ.

As outlined in 40 CFR 63.43(d), there are four (4) general principles for conducting a case-by-case MACT analysis:

1. The MACT emission limitation or requirements cannot be less stringent than the emission control which is achieved in practice by the best controlled similar source.

2. The MACT emission limitation and control technology shall achieve the maximum degree of reduction in emissions of HAP which can be achieved by utilizing those control technologies that can be identified from available information, taking into consideration the costs of achieving such emission reduction and any non-air quality health and environmental impacts and energy requirements associated with the emission reduction.

3. If it is not feasible to have an enforceable emission limit, MACT can instead be chosen as a specific design, equipment, work practice, operational standard, or combination thereof.

4. If EPA has proposed a MACT emission standard or adopted a presumptive MACT determination for the source category, then the MACT analysis must consider this proposed standard or presumptive MACT.

There is no proposed MACT or presumptive MACT established for Wood Pellet Manufacturing Plants; therefore, the proposed MACT analysis relied on a review of those control technologies achieved in practice by other similar sources in the wood pellet industry. The facility stated in the case-by-case MACT analysis that it performed a review of EPA's RACT/BACT/LAER Clearinghouse (RBLC), issued permits for 125 wood pellet manufacturing facilities across the US, and commercially demonstrated technology in the wood pellet manufacturing industry.

Chipper and Rechippers

Log chipping and Rechipping result in a small amount of methanol emissions. Based on a review of the RBLC and issued permits for 125 other wood pellet manufacturing facilities, there are no other facilities currently controlling HAP emissions from log chipping. Further, no work practice or operational measures are known that will reduce emissions of HAP from the log chipper or rechippers. Since there are no feasible control options and HAP emissions from the chipper and rechippers are inherently low (0.55 tpy of methanol total from both sources), the facility proposes no control or work practices as MACT for the chipper and rechippers.

Bark Hog

Processing of purchased bark and bark from the debarker by the bark hog will result in a small amount of fugitive methanol emissions and there are no add-on control technologies that currently exist to capture and control these emissions. Based on a review of the RBLC and issued permits for 125 other wood pellet manufacturing facilities, there are no other facilities currently controlling HAP emissions from bark hogs. Additionally, no work practice standards or operational measures are known that will reduce HAP emissions from the Bark Hog. Due to the inherently low HAP emissions (0.22 tpy of methanol) and the fact there are no feasible control options, the facility proposes no control or work practices as MACT for the Bark Hog.

Rotary Dryers

The Waycross plant utilizes two (2) rotary dryers to reduce the moisture content of green wood chips. Direct contact heat is provided to each dryer via a 193 MMBtu/hr Heat Energy System (furnace). As previously described, a dedicated WESP and RTO for each of the two (2) dryer lines controls PM, VOC, and HAP emissions from the Dryers. As described in more detail below, the use of an RTO to control HAP emissions from the Dryers during normal operation is considered to meet or exceed MACT requirements. Note that the heat energy systems (ID Nos. HES1 and HES2) and rotary dryers (ID Nos. DRY1 and DRY2) all send their exhausts to the WESP's and RTO's.

There are several operating modes for each dryer line: Normal Operation, Heat Energy System Bypass (Cold Start-up/Planned Shutdown), and Heat Energy System Bypass ("Idle Mode"). Based on a review of the RBLC and issued permits for 125 other wood pellet manufacturing facilities across the US, there are no pellet manufacturing facilities in operation that have utilized add-on controls for HAP from bypass stacks. Given the magnitude of the total annual potential HAP emissions (0.12 tpy per dryer line) from use of the heat energy system and dryer bypass stacks during cold start-up, planned shutdown, and idle, the facility proposes no controls or work practices as MACT for the furnace and dryer bypass stacks. Use of bypass stacks is necessary for safe operation of the facility but is minimized to the extent possible. Therefore, for the purposes of this MACT analysis, the heat energy system and dryer bypass stacks are not further analyzed.

- Identify Control Technologies

  The following add-on control technologies are considered as potential controls for the dryers –

- Thermal Oxidation – Thermal Oxidizer (TO), Recuperative Unit, or RTO;
- Catalytic Oxidation - RCO and Thermal Catalytic Oxidation (TCO);
- Wet Scrubber - Packed-Bed/Packed-Tower; and
- Bio-oxidation/Bio-filtration.

- Review of Control Technologies

  - Thermal Oxidation

    Thermal oxidation reduces organic HAP emissions by oxidizing organic HAP to CO_2 and water vapor (H_2O) at a high temperature. Thermal oxidizers can be designed as conventional thermal units, recuperative units, or RTOs. A conventional thermal oxidizer does not have heat recovery capability. Therefore, fuel costs are extremely high making conventional thermal oxidizers not suitable for high volume flow applications. In a recuperative unit, the contaminated inlet air is preheated by the combustion exhaust gas stream through a heat exchanger. An RTO can achieve a heat recovery higher than a recuperative oxidizer. Typical thermal recovery efficiency of an RTO ranges from 90% to 99%. RTOs are commonly used to control organic HAP emissions in high volume low concentration gas streams because of significant savings in fuel costs while still achieving equal HAP emissions control efficiencies; therefore, for purposes of this case-by-case MACT analysis, only RTOs will be further discussed.

    An RTO uses high-density media such as a ceramic-packed bed still hot from a previous cycle to preheat an incoming HAP-laden waste gas stream. The preheated, partially oxidized gases then enter a combustion chamber where they are heated by auxiliary fuel (propane or natural gas) combustion to a final oxidation temperature typically between 760-820°C (1,400-1,500°F) to achieve maximum organic HAP destruction. The purified, hot gases exit this chamber and are directed to one or more different ceramic-packed beds cooled by an earlier cycle. Heat from the purified gases is absorbed by these beds before the gases are exhausted to the atmosphere. The reheated packed-bed then begins a new cycle by heating a new incoming waste gas stream.

    Particulate control must be placed upstream of thermal oxidation controls to remove unwanted particulate matter that may cause plugging of heat exchange media and result in fires and significant operational and maintenance related difficulties. Typical organic HAP control efficiencies range from 95 to 99%. An RTO is considered technically feasible for control of HAP emissions from the rotary dryers.

  - Catalytic Oxidation

    Similar to an RTO, an RCO and a thermal catalytic oxidizer (TCO) oxidize organic HAP to CO_2 and H_2O. However, an RCO and TCO use catalyst to lower the activation energy required for the oxidation so that the oxidation can be accomplished at a lower temperature than an RTO. As a result, overall fuel consumption is lower than that for an RTO. RCO technology is widely used in the reduction of organic HAP emissions. An RCO operates in the same fashion as an RTO but requires only moderate reheating to the operating range of the catalyst, approximately 450°C (around 850°F). Similar to thermal oxidation units, particulate control must be placed upstream of an RCO. Even with highly efficient particulate control, there is

the risk of catalyst blinding/poisoning and catalyst life guarantees are equal to or shorter than heat recovery packing life. The organic HAP destruction efficiency for an RCO typically ranges from 90 to 99%.

Operating much in the same fashion as an RCO, a TCO passes heated gases through a catalyst without the regenerative properties attributed by the ceramic bed used to recapture heat. Depending on design criteria, a TCO is expected to achieve a similar HAP emission destruction efficiency to that of an RTO though at a much higher operating cost.

Catalytic oxidation is considered technically feasible for controlling HAP emissions from the rotary dryers.

- Wet Scrubber

With packed-bed/packed-tower wet scrubbers (scrubbers), pollutants are removed by reaction with a sorbent or reagent slurry or absorption into a liquid solvent. Removal efficiencies for gas absorbers vary for each pollutant-solvent system and with the type of absorber used. Most absorbers can achieve removal efficiencies in excess of 90%, and packed-tower absorbers may achieve efficiencies as great as 99% for some pollutant-solvent systems. Removal efficiency is highly dependent on the composition of the exhaust stream and how water soluble the constituents are.

The facility has determined that use of a wet scrubber is technically infeasible for control of organic HAP from the rotary dryers. The control efficiency would be low given the insolubility of a large portion of the exhaust stream. It should also be noted that use of a scrubber would generate additional environmental impacts and would require on-site or off-site treatment of the scrubber blowdown water to remove/treat the soluble organic HAP components removed from the exhaust stream. Because of the expected low control efficiency and additional environmental impacts, wet scrubbers are not considered technically feasible for control of HAP emissions from the rotary dryers.

- Bio-oxidation/Bio-filtration

Bio-oxidation/Bio-filtration can provide a reduction in organic HAP emissions of 60 to 99.9%. With this technology, organic HAP are oxidized using living microorganisms on a media bed (sometimes referred to as a "bioreactor"). A fan is typically used to collect or draw contaminated air from a building or process. If the air is not properly conditioned (heat, humidity, solids), then pre-treatment is a necessary step to obtain optimum gas stream conditions before introducing it into the bioreactor. As emissions flow through the bed media, pollutants are absorbed by moisture on the bed media and come into contact with the microbes. Depending on the volume of air required to be treated, the footprint of a bio-oxidation/bio-filtration system can be excessive and take up significant acreage. The microbes consume and metabolize the excess organic pollutants, converting them into CO_2 and water, much like a traditional thermal and catalytic oxidation process.

"Mesophilic" microbes are typically used in these systems. Mesophilic microbes can survive and metabolize organic materials at conditions up to 110°F to 120°F. One company is attempting to develop a commercial-scale technology that employs "thermophilic" microbes,

but that technology has only been demonstrated on a single pilot scale installation that has a similar – but not exactly the same – exhaust stream profile as the facility. Thermophilic microbes live and metabolize organic HAP at higher operating temperatures (~160°F).

Bio-oxidation/Bio-filtration is effective in low temperature ranges and reasonably steady exhaust gas conditions; however, at higher temperatures, cell components can begin to decompose and proteins within the enzymes can become denatured and ineffective. The temperature of the exhaust steam from the proposed rotary dryers is expected to be 172°F which exceeds the typical operating temperatures of a bio-oxidation/bio-filtration system. Additionally, the primary constituents of the VOC in the exhaust stream are terpenes, which are highly viscous and toxic to biotic microbes and would cause the bio-oxidation/biofiltration system to foul. Furthermore, the expected footprint of a unit sized to handle the volume of gas needed for treatment would be extensive and impractical. Additionally, the use of this technology has not been demonstrated in practice at a wood pellet manufacturing facility. Due to the temperature limitations and lack of ability to quickly respond to varying process conditions of this control technology, expected fouling, significant land requirements and the undemonstrated nature of this technology at a wood pellet manufacturing facility, bio-oxidation/bio-filtration has been eliminated from consideration as MACT.

- Proposed MACT

  The use of an RTO to control HAP emissions from the rotary dryers is considered to meet or exceed MACT requirements. For comparison, 40 CFR 63 Subpart DDDD (Plywood NESHAP) which regulates facilities that manufacture plywood and/or composite wood products by bonding wood materials or agricultural fiber, generally with resin, only requires a HAP reduction of 90%.

  Considering the above, the facility proposed use of RTOs achieving a 95% reduction in HAP emissions (measured as VOC) as MACT for the rotary dryers. The Division agrees with the facility's determination.

Dry Chip Storage Silo, Dry Hammermills, and Conveying Aspiration System 1

The facility includes ten (10) Dry Hammermills, and is currently utilizing an RCO for control of VOC and coincidentally HAP emissions from the dry chip silo, dry hammermills, and conveying aspiration system 1 (ID Nos. DCS, CE01, and HML). As described in more detail below, the use of an RCO to control HAP emissions from these emission units is considered to meet or exceed MACT requirements.

- Identify Control Technologies

  The following add-on control technologies are considered as potential controls for DCS, CE01, and HML –

  - Thermal Oxidation – TO, Recuperative Unit, or RTO;
  - Catalytic Oxidation - RCO and TCO;
  - Wet Scrubber - Packed-Bed/Packed-Tower; and
  - Bio-oxidation/Bio-filtration.

- Review of Control Technologies

  Please refer to the technology review for the same control technologies specified in the rotary dryer section. For the reasons listed above for the rotary dryers, wet scrubber and bio-oxidation/bio-filtration are not technologically feasible for control of organic HAP emissions from DCS, CE01, and HML. Thermal oxidation and catalytic oxidation are considered technically feasible options.

- Proposed MACT

  As previously described, the facility uses an RCO to control VOC emissions and coincidentally organic HAP emissions from DCS, CE01, and HML. The RCO achieves a 95% reduction in HAP emissions. The use of an RCO to control HAP emissions from DCS, CE01, and HML is considered to meet or exceed MACT requirements. For comparison, 40 CFR 63 Subpart DDDD only requires a HAP reduction of 90%.

  Considering the above, the facility proposed use of an RCO achieving a 95% reduction in HAP emissions (measured as VOC) as MACT for DCS, CE01, and HML. The Division agrees with the facility's determination.

Pellet Mills, Pellet Coolers, Fines Storage Silo, and Conveying Aspiration System 2

The facility includes five (5) pelletizing lines, with a total of twenty-two (22) Pellet Mills and five (5) Pellet Coolers, and is currently utilizing an RCO for control of VOC and coincidentally HAP emissions from the pelletizing lines, Fines Storage Silo, and Conveying Aspiration System 2 (ID Nos. FS, CE02, PML, and PCL). As described in more detail below, the use of an RCO to control HAP emissions from FS, CE02, PML, and PCL is considered to meet or exceed MACT requirements.

- Identify Control Technologies

  The following add-on control technologies are considered as potential controls for FS, CE02, PML, and PCL –

  - Thermal Oxidation – TO, Recuperative Unit, or RTO;
  - Catalytic Oxidation - RCO and TCO;
  - Wet Scrubber - Packed-Bed/Packed-Tower; and
  - Bio-oxidation/Bio-filtration.

- Review of Control Technologies

  Please refer to the technology review for the same control technologies specified in the rotary dryer section. For the reasons listed above for the rotary dryers, wet scrubber and bio-oxidation/bio-filtration are not technologically feasible for control of organic HAP emissions from FS, CE02, PML, and PCL. Thermal oxidation and catalytic oxidation are considered technically feasible options.

- Proposed MACT

  As previously described, the facility uses an RCO to control VOC emissions and coincidentally organic HAP emissions from DCS, CE01, and HML. The RCO achieves a 95% reduction in HAP emissions. The use of an RCO to control HAP emissions from FS, CE02, PML, and PCL is considered to meet or exceed MACT requirements. For comparison, 40 CFR 63 Subpart DDDD only requires a HAP reduction of 90%.

  Considering the above, the facility proposed use of an RCO achieving a 95% reduction in HAP emissions (measured as VOC) as MACT for FS, CE02, PML, and PCL. The Division agrees with the facility's determination.

Conclusion

The Division agrees with the case-by-case MACT analysis included in Application No. 610193. Table 7 below summarizes the determined control technologies and associated MACT limits.

Table 8: Selected Case-by-Case MACT for Enviva Pellets Waycross, LLC

ID Nos.	Selected Case-by-Case MACT	MACT limit
LC02 and LC03	None	N/A
BH01	None	N/A
DRY1 and DRY2	RTO	95% Total HAP Reduction (measured as VOCs)
DCS, CE01, and HML	RCO	95% Total HAP Reduction (measured as VOCs)
FS, CE02, PML, and PCL	RCO	95% Total HAP Reduction (measured as VOCs)

<u>40 CFR 63 Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters</u>

As discussed previously, the heat energy systems (ID Nos. HES1 and HES2) are not subject to the case-by-case MACT requirements because they are subject to 40 CFR 63 Subpart DDDDD. HES1 and HES2 supply heat to Dryers DRY1 and DRY2 and hot gas to two steam generating units to generate steam. Therefore, HES1 and HES2 meet the definition of a boiler in 40 CFR 63 Subpart DDDDD. As the facility requested to remove the HAP SM limits from the permit, the facility will become HAP major under Title V of 1990 CAAA. As boilers located at a HAP major source, HES1 and HES2 are subject to 40 CFR 63 Subpart DDDDD (also named Boiler MACT).

In Application No. 610193, the facility stated that HES1 and HES2 were constructed before June 4, 2010. Per 40 CFR 63.7490(b) and (d), they are existing boilers. As the HAP source category is being bumped from "area" (minor) to major through the removal of the HAP SM limits in existing Condition 2.1.2, 40 CFR 63.7495(c)(2) specifies that the compliance date is 3 years after the source becoming HAP major. Technically, that is on the 3rd anniversary of the issuance date of this permit amendment.

40 CFR 7500(a)(1) subjects HES1 and HES2 (existing boilers) to the emission limits and work practice standards specified in Table 2 and Table 3 to 40 CFR 63 Subpart DDDDD. Since they are both

"stokers/slope grate/other units designed to burn wet biomass/bio-based solids," they are subject to the following standards. Note that the facility did not request the emission standards based on output, the table below only lists the emission standards based on input.

Table 9: Applicable Emission Standards for HES1/HES2 Found in Table 2 to 40 CFR 63 Subpart DDDDD		
Subcategory	Pollutant	Emission Standard
1. Units in all subcategories designed to burn solid fuel	Hydrogen chloride (HCl)	≤ 2.0E-02 lb/MMBtu
	Mercury (Hg)	≤ 5.4E-06 lb/MMBtu
7. Stokers/sloped grate/others designed to burn wet biomass fuel	CO	≤ 1,100 ppmvd at 3% O_2
	Filterable PM (or Total Selected Metals – TSM)	≤ 3.4E-02 lb/MMBtu (or ≤ 2.0E-04 lb/MMBtu)

Table 10: Applicable Work Practice Standards for HES1/HES2 Found in Table 3 to 40 CFR 63 Subpart DDDDD	
Boiler Scenario	Must Meet the Following
3. An existing boiler or process heater without a continuous oxygen trim system and with heat input capacity of 10 million Btu per hour or greater	Conduct a tune-up of the boiler or process heater annually. (no more than 13 months after the previous tune-up)
4. An existing boiler or process heater located at a major source facility, not including limited use units	Must have a one-time energy assessment performed by a qualified energy assessor.
5. An existing boiler or process heater subject to emission limits in Table 2 to this subpart during startup	a. Must operate all CMS during startup.
	b. Must use the following fuel during startup: natural gas, synthetic natural gas, propane, other Gas 1 fuels, **distillate oil**, syngas, ultra-low sulfur diesel, fuel oil-soaked rags, kerosene, hydrogen, paper, cardboard, refinery gas, liquefied petroleum gas, clean dry biomass, and any fuels meeting the appropriate HCl, mercury and TSM emission standards by fuel analysis.
	c. Two startup options work practice standards: (1) Paragraph (1) of the definition of "startup" in 40 CFR 63.7575, once you start firing fuels that are not clean fuels you must vent emissions to the main stack(s) and engage all of the applicable control devices except limestone injection in fluidized bed combustion (FBC) boilers, dry scrubber, fabric filter, and selective catalytic reduction (SCR). You must start your limestone injection in FBC boilers, dry scrubber, fabric filter, and SCR systems as expeditiously as possible. Startup ends when steam or heat is supplied for any purpose, OR (2) Paragraph (2) of the definition of "startup" in 40 CFR 63.7575, once you start to feed fuels that are not clean fuels, you must vent emissions to the main stack(s) and engage all of the applicable control devices so as to comply with the emission limits within 4 hours of start of supplying useful thermal energy. You must engage and operate PM control within

Table 10: Applicable Work Practice Standards for HES1/HES2 Found in Table 3 to 40 CFR 63 Subpart DDDDD	
Boiler Scenario	Must Meet the Following
	one hour of first feeding fuels that are not clean fuels. You must start all applicable control devices as expeditiously as possible, but, in any case, when necessary to comply with other standards applicable to the source by a permit limit or a rule other than this subpart that require operation of the control devices. You must develop and implement a written startup and shutdown plan, as specified in 40 CFR 63.7505(e).
	d. Must comply with all applicable emission limits at all times except during startup and shutdown periods at which time you must meet this work practice. You must collect monitoring data during periods of startup, as specified in 40 CFR 63.7535(b). You must keep records during periods of startup. You must provide reports concerning activities and periods of startup, as specified in 40 CFR 63.7555.
6. An existing boiler or process heater subject to emission limits in Table 2 to this subpart during Shutdown	a. Must operate all CMS during shutdown.
	b. While firing fuels that are not clean fuels during shutdown, you must vent emissions to the main stack(s) and operate all applicable control devices, except limestone injection in FBC boilers, dry scrubber, fabric filter, and SCR but, in any case, when necessary to comply with other standards applicable to the source that require operation of the control device.
	c. If, in addition to the fuel used prior to initiation of shutdown, another fuel must be used to support the shutdown process, that additional fuel must be one or a combination of the following clean fuels: Natural gas, synthetic natural gas, propane, other Gas 1 fuels, distillate oil, syngas, ultra-low sulfur diesel, refinery gas, and liquefied petroleum gas.
	d. You must comply with all applicable emissions limits at all times except for startup or shutdown periods conforming with this work practice. You must collect monitoring data during periods of shutdown, as specified in 40 CFR 63.7535(b). You must keep records during periods of shutdown. You must provide reports concerning activities and periods of shutdown, as specified in 40 CFR 63.7555.

40 CFR 7500(a)(2) subjects HES1 and HES2 to the operating limits specified in Table 4 to 40 CFR 63 Subpart DDDDD. Items 1 through 6 of this table list the operating limits for boilers equipped with various kinds of control devices. However, none of them would apply to HES1/HES2 that are equipped with a wet ESP. Items 4 is for boilers equipped with dry ESP, so it does not apply. The only applicable items are Items 7 and 8 listed as follows.

Table 11: Applicable Operating Limits for HES1/HES2 Found in Table 4 to 40 CFR 63 Subpart DDDDD	
Compliance Option	Operating Limits
7. Performance testing	For boilers and process heaters that demonstrate compliance with a performance test, maintain the 30-day rolling average operating load of each unit such that it does not exceed 110 percent of the highest hourly average operating load recorded during the performance test.

8. Oxygen analyzer system	For boilers and process heaters subject to a CO emission limit that demonstrate compliance with an O_2 analyzer system as specified in 40 CFR 63.7525(a), maintain the 30-day rolling average oxygen content at or above the lowest hourly average oxygen concentration measured during the CO performance test, as specified in Table 8.

In order to demonstrate compliance with the emission standards specified in Table 9 of this Narrative, 40 CFR 63.7505(c) allows that the facility demonstrate compliance with performance stack testing, fuel analysis, or continuous monitoring systems (CMS). The facility elected to demonstrate compliance with the CO and PM emission standards with performance stack testing. For HCl, Hg, and TSM (the alternative standard to the PM standard), the facility requested to have the flexibility to have both performance stack testing and fuel analyses in the permit amendment. Details are listed below:

- Performance testing methods are listed in Table 5 to 40 CFR 63 Subpart DDDDD. According to 40 CFR 63.7515(a) through (c), tests must be conducted annually with a possibility to relax the testing frequency to one test every 3 years.

- Fuel analyses requirements are listed in Table 6 to 40 CFR 63 Subpart DDDDD. According to 40 CFR 63.7515(e), fuel analyses must be conducted monthly with a possibility to relax the analysis frequency to quarterly.

- Per 40 CFR 63.7510(a)(2)(i), the startup fuel (distillate fuel oil for HES1/HES2) is not subject to the fuel analysis requirements.

- The facility must establish the operating limits (thresholds) per Table 7 to 40 CFR 63 Subpart DDDDD. Item 4 of Table 7 specifies the procedure to establish the minimum oxygen level during the CO performance test. Item 5 of Table 7 specifies the procedure to establish the maximum operating load during all performance tests.

- 40 CFR 63.7530(b) requires that, if fuel analysis is opted, the facility establish the maximum chlorine, mercury, and/or TSM fuel input levels.

Note that the facility did not request any emission averaging options provided in the Boiler MACT.

40 CFR 63.7535 and 63.7540 includes the continuous compliance requirements for HES1/HES2. Mainly, the facility must conduct periodic performance testing and/or fuel analyses, and operate CMS to ensure compliance with the maximum operating load and minimum oxygen level operating limits. In addition, the facility must have a site-specific monitoring plan.

40 CFR 63.7545 through 63.7560 contains all the Boiler MACT notification, reporting, and record keeping requirements. The initial notification requirement specified in 40 CFR 63.7545(b) has been satisfied by the submittal of Application No. 610193. Within 60 days after the conducted performance tests, results must be included in the required Notification of Compliance Status. The Boiler MACT did not specify how fuel analyses results should be reported; the Division would require the monthly fuel analyses results be included in the semiannual Boiler MACT reports.

Other Federal and State Rules

Other rule applicability (such as 40 CFR 63 Subpart ZZZZ, and GA Rules (b), (d), (e), (g), and (n)) have been discussed in the narrative that explained Title V Permit No. 2499-299-0053-V-03-0. None of these would be impacted by the proposed modification. Therefore, these will not be discussed in this Narrative.

Note that the compliance date for Boiler MACT for HES1/HES2 is the 3rd anniversary of the permit amendment issuance date. Before that date, the Division would require that the facility continues to comply with all applicable requirements of 40 CFR 63 Subpart JJJJJJ for the operation of HES1 and HES2.

D. Permit Conditions

As explained in Section IV.C. of this Narrative, the PM emission limit is not necessary to keep the entire facility a PSD SM source for PM emissions. It is replaced with the operating requirements which will ensure that the entire facility would operate all PM control devices and emit less than 231 tpy PM.

Existing Condition 3.2.2 has been modified to specify the RTO's as the case-by-case MACT for the heat energy systems and dryers. The numeric case-by-case MACT standard is 95% control over the total HAP emissions (measured as VOCs).

Existing Condition 3.2.3 has been modified by adding the case-by-case MACT citation. If the combustion zone temperature falls below the minimum temperature established during the most recent VOC performance test, the 95-percent HAP control efficiency might not be achieved. This condition applies to the existing RTO1 and RTO2.

Similarly, existing Condition 3.2.4 has been modified to specify the RCO's as the case-by-case MACT for the hammermill, pellet mill, pellet cooler, conveying equipment aspiration systems, and silos. The numeric case-by-case MACT standard is 95% control over the total HAP emissions (measured as VOCs).

Existing Condition 3.2.5 has been modified by adding the case-by-case MACT citation. If the RCO combustion zone temperature falls below the minimum temperature established during the most recent VOC performance test, the 95-percent HAP control efficiency might not be achieved.

New Condition 3.2.6 applies to the new RTO1 and RTO2. It requires that the new RTO's be operated at a combustion zone temperature above the minimum temperature established during the most recent VOC performance test. Before the initial performance test is conducted, the minimum temperature is 1,500°F.

Since the toxic impact assessment described in Section III.B. of this Narrative is conducted based on the maximum hourly TAP emission rates at an annual pellet production rate pf 920,000 ODT. Therefore, the permit amendment will require that the facility maintain its pellet production rate at or below 920,000 ODT/yr. Any actual annual pellet production rate over 920,000 ODT will require that the facility conduct an updated TIA based on the higher production rate.

As discussed previously, the applicable 40 CFR 63 Subpart JJJJJJ conditions will continue to apply until the compliance date for Boiler MACT. This has been updated in Modified Condition 3.3.4 and 3.3.5.

Existing Conditions 3.3.6 and 3.3.8 has been modified with the correct citation.

As requested by the facility, existing Condition 3.3.7 has been modified to change the startup fuel from natural gas to distillate fuel oil.

New Conditions 3.3.9 through 3.3.15 contains the Boiler MACT requirements for the heat energy systems as below:

- Condition 3.3.9 is the general Boiler MACT applicability condition for HES1 and HES2. The compliance date is 3 years after the issuance date of this permit amendment.

- Condition 3.3.10 includes the emission standards found in Table 2 to 40 CFR 63 Subpart DDDDD.

- Condition 3.3.11 contains the startup requirements specified in Item 5. of Table 3 to 40 CFR 63 Subpart DDDDD.

- Condition 3.3.12 contains the shutdown requirements specified in Item 6. of Table 3 to 40 CFR 63 Subpart DDDDD.

- Condition 3.3.13 contains the operating load operating limit specified in Item 7. of Table 4 to 40 CFR 63 Subpart DDDDD.

- Condition 3.3.14 contains the oxygen analyzer system operating limit specified in Item 8. of Table 4 to 40 CFR 63 Subpart DDDDD.

- Condition 3.3.15 includes the general requirements specified in 40 CFR 63.7500(a)(3).

Existing Condition 3.4.2 has been modified to apply to all manufacturing processes at the facility.

V. Testing Requirements (with Associated Record Keeping and Reporting)

The Boiler MACT citations have been added to Conditions 4.1.1 and 4.1.2.

Methods 2F, 2G, and 320 have been added in Condition 4.1.3.b. and k.

Condition 4.1.3e. no longer references Condition 3.2.1 which has been replaced with an operating limit.

Since Condition 3.2.1 no longer includes the PM emission limit, the associated testing requirements in existing Condition 4.2.1 are also removed from the proposed Title V permit amendment.

The testing and monitoring conditions included in this permit amendment have various "effective/compliance dates." The following table illustrates the various dates that apply to each requirement.

Table 12: Illustration of Various Effective/Compliance Dates and Rationale

Topic	Requirements	Effective/Compliance Dates	Rationale
Case-by-case MACT	95% HAP Reduction Limit	Issuance date of this Permit Amendment	The HAP SM limits are officially removed when this permit amendment is issued.
	Initial HAP Reduction Testing (measured as VOCs) for RCO's	Within 180 days after the issuance date of this Permit Amendment.	Compliance must be demonstrated within 180 days after the case-by-case MACT effective date.
	Initial HAP Reduction Testing (measured as VOCs) for RTO's	Within 180 days after the initial startup of new RTO1 and RTO2	New RTO1 and RTO2 are expected to be constructed soon after the issuance date of this Permit Amendment.
NOx, CO, and VOC PSD Avoidance Limits	Numeric PSD Avoidance Limits	Continue to apply	None of the PSD avoidance limits are impacted by the proposed modification.
	NOx and CO Testing on RTO's	Within 180 days after the initial startup of new RTO1 and RTO2	Testing is required to ensure that the actual NOx and CO emission rates are still at or below the associated NOx and CO emission factors in Table 6.2.1-1 of the permit. Such test is required within 180 days of the initial startup of the new RTO's.
	VOC Testing on RTO's	Within 180 days after the initial startup of new RTO1 and RTO2	Testing is required to ensure that the actual VOC emission rates are still at or below the associated VOC emission factors in Table 6.2.2-1 of the permit. Such test is required within 180 days of the initial startup of the new RTO's and must conducted simultaneously with the above HAP testing.

Table 12: Illustration of Various Effective/Compliance Dates and Rationale			
Topic	Requirements	Effective/Compliance Dates	Rationale
	VOC Testing on RCO's	Within 180 days after the issuance date of this Permit Amendment.	Because VOC and HAP testing must be conducted simultaneously, VOC needs to be tested again because the RCO's are to be tested for the 95-percent HAP reduction demonstration.
Boiler MACT Emission Standards	HCl, Hg, CO, PM (TSM) Emission Limits	The 3rd anniversary of the issuance date of this Permit Amendment.	40 CFR 63.7495(c)(2).
	Initial HCl, Hg, CO, and PM Performance Testing	Within 180 day after the 3rd anniversary of the issuance date of this Permit Amendment.	40 CFR 63.7510(e).
	Initial HCl, Hg, and TSM Fuel Analyses	Within 180 day after the 3rd anniversary of the issuance date of this Permit Amendment.	40 CFR 63.7510(e).
Boiler MACT Work Practice Standards	Annual Tune-up Requirement	No later than the 3rd anniversary of the issuance date of this Permit Amendment.	40 CFR 63.7510(e).
	One-time Energy Assessment	No later than the 3rd anniversary of the issuance date of this Permit Amendment.	40 CFR 63.7510(e).

Modified Condition 4.2.2 requires the initial NOx and CO performance testing within 180 days after the initial startup of the new RTO's.

Modified Condition 4.2.3 requires the initial VOC and HAP performance testing (measured as VOCs) within 180 days after the initial startup of the new RTO's. Note that the HAP test has been modified to test Total HAPs (measured as VOCs) at both the inlet and outlet of the new RTOs in order to determine the HAP reduction efficiencies. Since the RTO replacement is expected soon after the issuance of this Permit Amendment, no testing on the existing RTO's is required.

Modified Condition 4.2.4 requires a new round of VOC and HAP performance testing (measured as VOCs) within 180 days after the issuance date of this Permit Amendment mainly to determine the HAP reduction efficiencies (measured as VOCs) of the RCO's.

New Condition 4.2.5 contains the same requirements of existing Condition 4.2.4.

New Condition 4.2.6 requires the initial HCl, Hg, CO, and PM performance testing within 180 days after the 3rd anniversary of the issuance date of this Permit Amendment. The tests are needed to demonstrate compliance with the Boiler MACT emission limits.

As an alternative to the performance testing, the facility may choose to conduct fuel analyses for HCl, Hg, and TSM to demonstrate compliance with the Boiler MACT emission limits. The initial fuel analyses requirements are included in new Condition 4.2.7.

New Condition 4.2.8 contains the repeated annual and 3-yr performance testing requirements.

New Condition 4.2.9 contains the repeated monthly and quarterly fuel analyses requirements.

New Condition 4.2.10 contains detailed Boiler MACT testing procedures.

New Condition 4.2.11 requires a new round of performance testing if the facility switch the fuel (types) in HES1 and/or HES2.

New Condition 4.2.12 contained detailed Boiler MACT fuel analysis procedures.

New Condition 4.2.13 requires that the facility establish the operating load and minimum oxygen level operating limits during the most recent performance testing. It also requires that the facility establish maximum chlorine/Hg/TSM fuel input level during the fuel analyses.

New Condition 4.2.14 requires that the facility submit results of the performance testing and any associated fuel analyses within 60 days after the completion of the test. Note that the Division intends to apply this to the initial fuel analyses only. The Division does not expect that the facility submit the monthly fuel analyses results on a monthly basis (within 60 days after each month).

VI. Monitoring Requirements (with Associated Record Keeping and Reporting)

Condition 5.2.1 has been amended by adding 40 CFR 60 Subpart Db citations and language for demonstrating compliance with the boiler NSPS Subpart Db opacity standard.

Condition 5.2.2 has been amended by changing the citation. Note that a typical RCO catalyst bed (where oxidation of VOC takes place) is not equipped with a thermal couple, it is more common that the thermal couple is located at the inlet (right before the catalyst) of an RCO. The inlet temperature is still called the combustion zone temperature based on the facility's request.

Condition 5.2.7 has been modified to include the ID numbers. Note that the facility has referenced 40 CFR 63 Subpart DDDD, and requested all monitoring parameters specified in Conditions 5.2.7 and 5.2.8 be reduced to 3-hour block averages. The Division has determined that, unless the monitoring requirements are directly from 40 CFR 63 Subpart DDDD, all monitoring data must be recorded in 3-hr rolling averages.

Condition 5.2.8 has been slightly modified for adding a missing word and for updating the citation.

As discussed previously, the 40 CFR 63 Subpart JJJJJJ biennial tune-up requirements specified in existing Condition 5.2.13 has been retained until the compliance date of 40 CFR 63 Subpart DDDDD.

Condition 5.2.19 has been modified to apply to all the emission units that should be included in the CAM Plan.

New Condition 5.2.21 contains the Boiler MACT annual tune-up requirements. The initial tune-up must be completed prior to the compliance date of Boiler MACT.

New Conditions 5.2.22 and 5.2.23 contains the detailed requirements for each CMS, per 40 CFR 63.7505(d), 40 CFR 63.7525(a) and (d), 40 CFR 63.7535(a) through (d), 40CFR 63.7540(a), and Items 9. and 10. of Table 8 to 40 CFR 63 Subpart DDDDD.

New Condition 5.2.24 requires that the facility conduct the one-time energy assessment prior to the compliance date of Boiler MACT (no later than the 3rd anniversary of the issuance date of this Permit Amendment).

VII. Other Record Keeping and Reporting Requirements

Condition 6.1.7 has been modified with the following changes:

- 40 CFR 60.49b(h)(1) and (h)(3) define opacity reading by the COMS during any 6-minute periods that the average opacity exceeds 20 percent as an excess emission. Thus, the requirements specified in existing Paragraph b.i. have been moved to Subparagraph a.i.

- Since the HAP SM limits are removed by this Permit Amendment, the exceedance reporting requirement specified in existing Subparagraph b.iii. has been deleted. Instead, this subparagraph contains the exceedance reporting requirement when HES1 and/or HES2 fires any fuels other than those allowed by Condition 3.3.7.

- Subparagraph c.i. (for the existing RTO's) has been modified to update the applicable condition numbers.

- Subparagraph c.ii. has also been modified to update the applicable condition number.

- Subparagraph c.iii. has been modified to update the applicable condition numbers.

- Subparagraph c.vii. has been noted that the exceedance reporting requirement will be voided after the compliance date of Boiler MACT.

- New Subparagraph c.ix. defines as an excursion as any three-hour average combustion zone temperature of the new RTOs that is below the minimum combustion zone temperature specified in Condition 3.2.6.

- New Subparagraph c.x. defines as an excursion as anytime the annual tune-up of the Heat Energy Systems (ID Nos. HES1 and HES2) was not performed as per Condition 5.2.21.

- New Subparagraph c.xi. defines as an excursion as any 30-day rolling average operating load of any Heat Energy Systems (ID Nos. HES1 and HES2) that exceeds 110% of the highest hourly average operating load specified in Condition 3.3.13.

- New Subparagraph c.xii. defines as an excursion as any 30-day rolling average oxygen content below the lowest hourly average oxygen concentration specified in Condition3.3.14.

- New subparagraph c.xiii. defines as an excursion as any time that any of the PM control devices, specified in Condition 3.2.1, are not in operation when the associated emission units are in operation.

During an initial review of the draft TV permit amendment, the facility requested to modify the NOx and CO emission factors in Table 6.2.1-1. Past test results were all below the new emission factors. In addition, monthly NOx and CO emissions from the RCO's and emergency engines have been updated. Also, the facility included NOx and CO emissions while RTO is bypassed (during idle, startups, and planned shutdown) in the application; this has been included in the additional NOx and CO emissions (2.52 tpy NOx and 2.35 tpy CO).

Condition 6.2.2 has been significantly revised. It no longer requires any HAP emission tracking. For VOC tracking, it now includes VOC emissions from RTO bypass events; additional VOC monthly emission rate has been updated. VOC emission factors have been revised based on recent testing results and engineering estimates.

Condition 6.2.3 has been revised to exclude HAP emission tracking.

Condition 6.2.4 has been deleted because HAP emission tracking is no longer required.

Conditions 6.2.6 and 6.2.7 has been revised so that the 40 CFR 63 Subpart JJJJJJ compliance reporting requirements will remain required until the compliance date of Boiler MACT.

Condition 6.2.10 now includes the requirements of existing Condition 6.2.11. Condition 6.2.11 includes the requirements of existing Condition 6.2.10. The conditions are re-arranged more logically.

New Condition 6.2.12 contains the 40 CFR 60 Subpart Db fuel consumption record keeping requirements.

New Condition 6.2.13 contains the written startup and shutdown plan required by 40 CFR 63.7505(e).

New Condition 6.2.14 contains the notification of compliance status requirements specified in 40 CFR 63.7495(d), 40 CFR 63.7530(f), and 40 CFR 63.7545(e).

New Condition 6.2.15 contains the Boiler MACT semiannual reporting requirements specified in 40 CFR 63.7550(a), 40 CFR 63.7550(b)(1) through (b)(5), 40 CFR 63.7550(c)(1) through (c)(5), and Items 1.a. through 1.d. of Table 9 to 40 CFR 63 Subpart DDDDD.

New Conditions 6.2.16 and 6.2.17 contain the deviation reporting requirements specified in 40 CFR 63.7550(d) and (e).

New Conditions 6.2.18 and 6.2.19 contains the electronic reporting to EPA requirements specified in 40 CFR 63.7550(h)(1)(i) and (h)(3).

New Conditions 6.2.20 through 6.2.23 contains the record keeping requirements specified in 40 CFR 63.7555(a), (c), (d), and 40 CFR 63.7560.

Addendum to Narrative

The 30-day public review started on month day, year and ended on month day, year. Comments were/were not received by the Division.

//If comments were received, state the commenter, the date the comments were received in the above paragraph. All explanations of any changes should be addressed below.//