



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

SOUTHEAST REGIONAL OFFICE

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DATE **August 2021 DRAFT Rev 0**

RE Operating Permit Renewal Review
Title V Operating Permit No. 23-00004
Covanta Delaware Valley, L.P.
City of Chester, Delaware County
APS ID: 570425, AUTH ID: 1338439, PF ID: 484329

Introduction

On December 23, 2020, the Department of Environmental Protection (DEP) received a Title V Operating Permit (TVOP) renewal application from Covanta Delaware Valley, L.P. (Covanta) for its Delaware Valley Resource Recovery facility located at 10 Highland Avenue, City of Chester, Delaware County.

Included in the OP renewal application is a modification to change the NO_x emission limit on each municipal waste combustor (MWC) to comply with presumptive RACT II requirements as specified in 25 Pa. Code §§129.96 through 129.100.

The application indicates that there are no physical and process changes at the facility since the last TVOP renewal in September 2016. There are no proposed changes to the potential emissions from the facility.

This facility is located in an Environmental Justice Community, and an area designated as marginal non-attainment for ozone and moderate non-attainment for PM_{2.5}.

Facility Description

The facility operates six (6) rotary waterwall combustors (Westinghouse Model RC170), commenced in 1991. Each of the combustors has a capacity to burn 448 tons/day of municipal waste and to produce 161,000 lbs/hr of steam for power generation. This facility generates approximately 90 net megawatts of electricity per hour for internal use and to be sold on the electrical grid.

The facility is limited to burn the following types of waste in the combustors:

- 1) municipal waste, as defined in 25 Pa. Code § 287.1;
- 2) municipal-like residual waste, as permitted in the Department's Waste Permit No. 400593, and the Miscellaneous Section of this permit; and
- 3) residual waste, as permitted in the Department's Waste Permit No. 400593, and the Miscellaneous Section of this permit.

The residual waste (Form R waste list) accepted at the facility shall not exceed 500 tons per day, or 10 weight percent residual waste in the total amount of waste processed, whichever is higher.

This Covanta facility is classified as a major emission facility for the following requirements and/or pollutants:

- Prevention of Significant Deterioration (PSD) source for PM, NO_x, CO, VOC, and SO_x emissions;
- Nonattainment New Source Review (NNSR) source for NO_x and VOC emissions;
- Hazardous Air Pollutant (HAP) emissions source for individual HAP of HCl; and
- Greenhouse gas (GHG) emissions.

Actual Emissions from this Covanta facility are shown below (unit: ton/yr):

Pollutants	2020	2019
CO	346.8	420.1
NO _x	1,167.9	1,030.6
PM10	54.8	52.9
SO _x	151.6	142.1
VOC	15.1	15.1
HCl	11.5	10.03

Source Information

Tabularized below are the emission sources at this Covanta facility:

ID	Source Name	Description	Control Devices
101	Rotary Combustor No. 1	Exhaust from each combustor enters its associated Spray Dryer Absorber, then followed by a pulse-jet fabric baghouse. VOC and HAP organic compounds are controlled by flue gas combustion	C02 → C01A → stack
102	Rotary Combustor No. 2		C04 → C03 → stack
103	Rotary Combustor No. 3		C06 → C05 → stack
104	Rotary Combustor No. 4		C08 → C07 → stack
105	Rotary Combustor No. 5		C010 → C08 → stack

106	Rotary Combustor No. 6	temperature.	C12 → C11 → stack
107	Vehicle Traffic on Roads		
108	Cooling Tower	Mist eliminators for PM control	C108 → stack
110	Lime Storage Silo	Equipped with fabric filter	
111	Ash Handling		
112	Cold Degreaser (2)		
113	Emergency Engine	manufactured by Cummins Engine Company, Inc. Model No. QSL9-G2 NR3, Engine Nameplate: 364 HP	
114	Emergency Fire Pump Engine	manufactured by Cummins Engine Company, Inc. Model No. NT-855 F3, 300 HP	

Combustors (Source IDs 101 through 106)

Each of the combustor consists of two operating zones, a waste combustion chamber and a boiler (furnace) section:

Waste combustion chamber: waste is unloaded onto the tipping room floor, where it is pushed onto conveyors to each combustor. A feed ram forces the waste into waste combustion section of combustor. The waste combustion chamber is about 18 feet in diameter and 60 feet long, and it is inclined at ~6°. It rotates three times per hour, and waste takes about 40 minutes to pass from one end to the other. Each unit has four (4) units of 12.5 MMBtu/hr auxiliary burners which fire on natural gas only to bring the unit temperature up during its startups. Bottom ash drops out through the grate, and it is conveyed to the ash handling area.

Boiler (Furnace) section: exhaust from the waste combustion chamber enters the waterwall boiler (furnace) section, where water in waterwall tubes is heated to produce steam for power generation. Flue gas temperature in this section is maintained in a required range to ensure that VOC and HAP organic compounds emissions meets the permitted limits.

Control Devices for Combustor Exhaust

The exhaust from each combustor enters its associated spray dryer absorber (dry scrubber), where lime slurry is sprayed into the exhaust stream for acidic gas (SOx and HCl) removal. Next the exhaust enters the associated pulse-jet baghouse for PM removal, which consists of six cells with 188 bags per cell. An induction fan, at downstream of the baghouse, then pulls the exhaust through the stack and discharges it into the atmosphere.

Monitoring and Test for Combustors

The facility uses the Department certified continuous emissions monitoring systems (CEMS) to monitor the following pollutant emissions on each of the combustors.

Table 1. Pollutant Emissions Monitored by Certified CEMS

Pollutants	Monitoring Device	Emission Limits		Description
CO	CEMS	100.0 ppmvd	29.95 lbs./hr	-using CEMS to monitor emissions in ppmvd unit - calculate actual emissions in lbs/hr based on CEMS data
SO2	CEMS	29.0 ppmvd	68.45 lbs./hr	
NOx	CEMS	180 ppmvd	88.56 lbs./hr	
HCl	CEMS	25 ppmvd or 95% reduction	36.58 lbs/hr	
Opacity	CEMS	10%		-for visible emissions

Performance testing may be substituted by CEM data to demonstrate compliance with the emission limits. The permittee shall perform CO, SO₂, NO_x, HCl, Opacity CEMS performance audit for each combustor during each annual performance test.

The following operating parameters are also continuously monitored by Department approved continuous monitoring systems (CMS):

Parameters	Monitoring Device	To verify:
Flue gas temperature at furnace roof top location	CMS	VOC removal efficiency
Flue gas temperature at baghouse inlet	CMS	PM removal efficiency
Flue gas Oxygen	CMS	
Lime slurry injection rate	CMS	Acid gas removal efficiency
Steam load	CMS	

The facility is required to conduct annual performance test on each of the combustors for the following pollutants:

- (1) total filterable particulate matter using Method 5, and condensable and filterable PM-10 using Method 202 and 201A respectively
- (2) arsenic and compounds (expressed as arsenic);
- (3) cadmium and compounds (expressed as cadmium);
- (4) hexavalent chromium and compounds (expressed as chromium);
- (5) nickel and compounds (expressed as nickel);
- (6) lead and compounds (expressed as lead);
- (7) beryllium and compounds (expressed as beryllium);
- (8) mercury and compounds (expressed as mercury);
- (9) PCDD and PCDF (expressed as 2,3,7,8 TCDD equivalents calculated according to the Department approved method and as total dioxin and furan);
- (10) VOC (expressed as total hydrocarbons);
- (11) PAH, including Benzo(a)pyrene;
- (12) NO_x;
- (13) SO₂;
- (14) HCl;
- (15) CO; and
- (16) Visible emissions of fugitive combustion ash from the ash conveying system (Source ID 111)

Annual Dispersion Modeling for Combustors

The facility is required to demonstrate compliance with ambient air standards by utilizing dispersion air modeling techniques. A certification must be supplied to the Department stating compliance with maximum allowable ambient concentrations with every stack test report on each of the combustors.

Cooling Tower (Source ID 108)

The 6-cell countercurrent flow cooling tower was designed with water recirculation rate of 74,105 gallons/minute (GPM), and maximum air flow per cell of 1,041,700 actual cubic feet/minute (acfm). The cooling tower is to cool the circulating water in the main turbine heat exchanger to condense

turbine exhaust steam back to its liquid phase. In the cooling process, approximately 1,000,000 gallons per day of water is evaporated.

Other Emission Sources

Source IDs 107, 110, 111, 112, 113 and 114, are minor emission sources.

Facility Inspection

A full compliance facility inspection was conducted on January 13, 2020. There are no physical and operational changes at the facility since the last Title V Operating Permit renewal in September 2016.

Permittee Requests

The permittee requests to make the following amendments to reflect the change in the facility operation:

1. Section 1.3 Contact Information – updated from Kim Bradford to Brandee Blasi, the new facility Environmental Compliance Specialist.

DEP response: permit contact person is updated.

2. Section 6.1 General Source Information, Source IDs 101 through 106, Exhaust Flow Volume – updated listed volume from 45,092 SCFM to 68,914 SCFM

DEP response: the exhaust flow for Source IDs 101 through 106 is updated to 68,679 dscfm as stated in Condition #005(b) under Group Name: Large MWC:

“(b)(2) Emission rate (lbs/hr) was based on an exhaust rate of 68,679 dscfm, at 7% oxygen.”

3. Section 9.1 General Stack/Vent Information Unit IDs S01, S03, and S05:
 - Exhaust Temperature – Updated listed temperature from 270 to 285 deg F
 - Exhaust Volume – updating listed volume from 138,000 to 125,305 ACMF and 78,150 to 68,914 SCFM

DEP response: the exhaust flow and the exhaust temperature values are NOT updated for the following reasons:

- (a). the exhaust flow in ACMF varies during actual operation, such as startup and shutdown, and
- (b). this operating permit allows that the exhaust temperature varies within a range as stated in Condition #014 of Group Name: Large MWC:

“(b) The flue gas temperature, measured at the particulate matter control device inlet and averaged arithmetically in 4-hour block, shall not exceed 300°F or 30°F above the maximum demonstrated particulate matter control device temperature, as defined in 40 C.F.R. §60.51b, whichever is lower, except during the annual dioxin/furan or mercury performance test and the 2 weeks preceding the annual dioxin/furan or mercury

performance test, when the particulate matter control device inlet flue gas temperature limitation of 300°F is applicable.”

Regulatory Analysis

40 C. F. R. 60 Subpart Cb—*Emissions Guidelines and Compliance Times for Large Municipal Waste Combustors That are Constructed on or Before September 20, 1994*

Pursuant to 40 C. F. R. 60 Subpart Cb, the Department developed Section 111(d)/129 State Plan for Large Municipal Waste Combustors (MWCs) that are constructed on or before September 20, 1994 (State Implementation Plan, or State Plan). The State Implementation Plan, as protective as the Subpart Cb requirements, was approved by the USEPA as indicated in 40 C. F. R. §62.9640:

“The 111(d)/129 plan for municipal waste combustors (MWC) units with a capacity greater than 250 tons per day (TPD) and the associated Pennsylvania Department of Environmental Protection operating permits that were submitted to EPA on April 27, 1998, and as amended on September 8, 1998, and July 7, 2000, including supplemental information dated August 15, 2000. All affected facilities must achieve full compliance with all 111(d)/129 plan requirements on or before December 19, 2000. [66 FR 43511, Aug. 20, 2001] ”

The facility opted to comply with the State Implementation Plan emission limitations and requirements; therefore, the combustors are **NOT** subject to 40 C. F. R. 60 Subparts Cb.

40 C. F. R. 60 Subpart Ea—*Standards of Performance for Municipal Waste Combustors for Which Construction Is Commenced After December 20, 1989 and On or Before September 20, 1994*

The combustors are **NOT** subject to this subpart as they operate under the DEP Waste Program Permit No. 400593, as per Section 3005 of Subtitle C, under the Solid Waste Disposal Act.

40 C. F. R. 60 Subpart Eb—*Standards of Performance for Large Municipal Waste Combustors for Which Construction is Commenced After September 20, 1994 or for Which Modification or Reconstruction is Commenced After June 19, 1996*

The combustors are **NOT** subject to 40 C. F. R. 60 Subpart Eb as they are commenced before 1996.

40 C. F. R. 60 Subpart Db—*Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*

The combustors are **NOT** subject to the provisions of 40 C.F.R. 60 Subpart Db as per 40 C.F.R. §60.40b(k).

40 C. F. R. PART 64—*Compliance Assurance Monitoring (CAM)*

Combustors (Source IDs 101 through 106)

In accordance with 40 C. F. R. Part 64 §60.2,

*“ (b) Exemptions—(1) Exempt emission limitations or standards. The requirements of this part shall not apply to any of the following emission limitations or standards:
(i) Emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to section 111 or 112 of the Act. “*

the combustors are **NOT** subject to the CAM requirements as they are subject to the State Implementation Plan with emission limitations and/or standards as protective as the NSPS Subpart Cb requirements.

Lime Storage Silo (Source ID 110)

The Lime Storage Silo does have an add-on control device for the control of particulate matter. However, the pre-controlled PM emissions from this source do not exceed the major source threshold for this pollutant, therefore CAM does not apply to the Lime Storage Silo.

Other emission units at this facility are **NOT** subject to the CAM requirements as potential to emit amounts for the criteria pollutants are less than the CAM threshold levels.

25 Pa. Code §129:91 through §129.95 — *STATIONARY SOURCES OF NO_x AND VOCs
The Pennsylvania’s Reasonably Available Control Technology [RACT Phase I]*

This Covanta facility is subject to the RACT Phase I rules as it is a major source for VOC and NO_x emissions. The VOC and NO_x emission limits in the current operating permit were set in the RACT Phase I review process for the application submitted in 1994 (for the former owner American Ref-Fuel Company) according to case-by-case analysis.

25 Pa. Code §129:96 through §129.100 — *Additional RACT Requirements for Major
Sources of NO_x and VOCs
The Pennsylvania’s Reasonably Available Control Technology [RACT Phase II]*

Pursuant to 25 Pa. Code §129.96, the following emission sources at this facility are subject to the following Pennsylvania RACT Phase II requirements pertaining to NO_x emissions:

- 25 Pa. Code §§129.97(f) and 129.100(a)(3) for the combustors (Source IDs 101 through 106).
- 25 Pa. Code §129.97(c)(8) for the emergency engine and the emergency fire pump engine (Source IDs 113 & 114). **[500 hr/yr operating hours, please Condition #005/Condition #002 and #008/#007 for limitation and recordkeeping requirements, respectively]**

This facility is **NOT** subject to the Pennsylvania RACT Phase II requirements pertaining to VOC emissions as it is NOT a major facility for VOC emissions (the facility-wide VOC emissions are limited to less than 50 tons per year).

40 C. F. R. 60 Subpart IIII — *Standards of Performance for Stationary Compression
Ignition Internal Combustion Engines.*

The emergency engine (Source ID 113, installed in 2011, 364 HP) is subject to the applicable requirements of this subpart.

40 C. F. R. 63 Subpart ZZZZ— *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.*

The emergency fire pump engine (Source ID 114, installed around 1990, 300 HP) is subject to the applicable requirements of this subpart.

25 Pa. Code §129.203 - Stationary Internal Combustion Engines

Both emergency engine (Source ID 113) and emergency fire pump engine (Source ID 114) are **NOT** subject to 25 Pa. Code §129.203 as the engines are rated less than 1,000 horsepower.

There are no other applicable regulations for this facility.

Updates:

The renewal includes the following updates:

1. Condition 13 in Section C, the following condition is added:
“For those contaminants monitored by a Department certified CEMS for which the Department's Enforcement Policy - Continuous Emission Monitoring System (CEMS) established penalties for excess emissions, the aforementioned notification and reporting requirements shall be waived.”
2. RACT Phase II requirements pertaining to NOx emissions are incorporated to the following emission sources:
 - Combustors (Source IDs 101 – 106): Condition No. 001 under Group Name: Large MWC, in Section E
 - Emergency Engine (Source ID 113): Condition Nos. 005 and 008 in Section D.
 - Emergency Fire Pump Engine (Source ID 114): Condition Nos. 001 and 004 in Section D.
3. The following permit conditions under Group Name: Large MWC are updated

Public Notification

Notice of intent to issue this operating permit will be published in PA Bulletin on August 22, 2021

Recommendation

I recommend that TVOP No. 23-00004 be renewed and issued to Covanta.