TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Covanta Lake II, Inc.
3830 Rogers Industrial Park Road
Okahumpka, Florida 34762

Lake County Resource Recovery Facility
Facility ID No. 0690046

PROJECT

Project No. 0690046-011-AC
Application for Minor Source Air Construction Permit
Temporary Leachate Injection Project

COUNTY

Lake County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Office of Permitting and Compliance
Chemicals and Combustion Key Industry Group
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1. GENERAL PROJECT INFORMATION

Air Pollution Regulations

Projects at stationary sources with the potential to emit air pollution are subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The statutes authorize the Department of Environmental Protection (Department) to establish regulations regarding air quality as part of the Florida Administrative Code (F.A.C.), which includes the following applicable chapters: 62-4 (Permits); 62-204 (Air Pollution Control - General Provisions); 62-210 (Stationary Sources - General Requirements); 62-212 (Stationary Sources – Preconstruction Review); 62-213 (Operation Permits for Major Sources of Air Pollution); 62-296 (Stationary Sources - Emission Standards); and 62-297 (Stationary Sources - Emissions Monitoring). Specifically, air construction permits are required pursuant to Chapters 62-4, 62-210 and 62-212, F.A.C.

In addition, the U. S. EPA establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 specifies New Source Performance Standards (NSPS) for numerous industrial categories. Part 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP) based on specific pollutants. Part 63 specifies NESHAP based on the Maximum Achievable Control Technology (MACT) for numerous industrial categories. The Department adopts these federal regulations in Rule 62-204.800, F.A.C.

Facility Description and Location

The Lake County Resource Recovery Facility (LCRRF) consists of two identical 288 tons per day mass-burn municipal waste combustors (Units 1 and 2) and associated support equipment. The LCRRF is categorized under Standard Industrial Classification Code No. 4953. The facility is located in Lake County at 3830 Rogers Industrial Park Road, Okahumpka. The UTM Coordinates are: Zone 17; 413.12 kilometers (km) East; and 3179.21 km North. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to Ambient Air Quality Standards (AAQS). The LCRRF shown on the left-hand side of Figure 1 is similar to the standard two-unit, mass-burn Covanta/Martin GmbH arrangement on the right.

1. Tipping Floor
2. Refuse Holding Pit
3. Grapple Feed Chute
4. Feed Chute
5. Martin Stoker Grate
6. Combustion Air Fan
7. Martin Ash Discharger
8. Combustion Chamber
9. Radiant Zone (furnace)
10. Convection Zone
11. Superheater
12. Economizer
13. Spray Dryer Absorber
14. Fabric Filter Baghouse
15. Fly Ash Handling System
16. Induced Draft Air Fan
17. Dual Flue Stack
18. NO_X, Hg Control Not shown

Figure 1. Covanta/Martin, GmbH Mass Burn Process and Aerial Photograph of LCRRF.

Each furnace is equipped with an aqueous ammonia (NH_3) injection system (not shown in the diagram) based on the principle of selective non-catalytic reduction (SNCR) for nitrogen oxides (NO_X) control. After heat recovery for electrical energy production, the exhaust gas from each furnace is further cooled by injection of water and slaked lime slurry into a spray dryer absorber (scrubber) where acid gases react with lime and are converted to solid reaction products.

Activated carbon is injected (not shown) after the scrubber to bind with mercury and dioxin/furan. Fly ash, including reaction products from the scrubber and the spent activated carbon are removed in a fabric filter baghouse. The exhaust is conveyed via an induced draft fan into a flue located within the facility stack. The fly ash, stoker grate bottom ash and other wastes are combined and transported to the nearby Lake County (Astatula) Landfill.

The facility is equipped with continuous emission and opacity monitoring systems (CEMS and COMS) for carbon monoxide (CO), sulfur dioxide (SO_2), NO_X, and visible emissions. Annual stack testing is required for particulate matter (PM), hydrogen chloride (HCl), mercury, dioxin/furan, cadmium and lead.

Refer to Figure 2 provided by Covanta. The facility relies on groundwater from a nearby production well. Most water is used and evaporated in the cooling tower associated with the steam cycle. The water that is not evaporated in the cooling tower is treated and further purified in an on-site reverse osmosis (RO) unit. The product water is recycled to the cooling tower or used as boiler makeup water. Most of the RO reject water (containing elevated dissolved solids) is injected into the scrubbers at a rate of approximately 12 gallons per minute (gpm) together with the slaked lime slurry. Approximately 6 gpm are sent to a settling basin that provides water to the ash discharge system.

Figure 2. Lake County Resource Recovery Facility - Existing Process Water Balance.

Project Description

Refer to Figure 3 provided by Covanta. The applicant requests authorization to replace the reject water injected into the scrubbers with leachate generated at the Lake County (Astatula) Landfill near Tavares. In the proposed process, RO reject water presently injected into the scrubbers would instead be injected into the furnace through some unused aqueous NH_3 injection ports.

Figure 3. Lake County Resource Recovery Facility, Proposed Process Water Balance.

The landfill includes municipal solid waste (MSW) storage cells as well as storage cells for municipal waste combustor (MWC) ash generated at the LCRRF. According to the County, sewage sludge is not disposed at the landfill. The leachate is generated by decomposition of the MSW, as well as, percolation of rain water though the MSW and MWC ash cells. At the present time, the leachate is shipped by tanker trucks to a treatment facility in Duval County at substantial cost to Lake County.

The leachate typically has high dissolved solids and contains both organic and inorganic components. The applicant provided the information summarized in Table 1.

Table 1. Summary of Astatula Landfill Leachate Sample Analyses.

Chemical Species, Average Concentrations [1]				
Total Dissolved Solids	Mercury	Cadmium	Lead	Chloride
55,637 mg/L	0.31 µg/L	7.35 µg/L	31.8 µg/L	33,290 mg/L

1. mg/L and µg/L means milligrams per liter and micrograms per liter, respectively. These units are approximately equal to parts per million (ppm) and parts per billion (ppb) by weight for dilute solutions.

For reference, the leachate has greater concentrations of total dissolved solids compared with the RO reject water presently injected (12,390 mg/L). The leachate is also very high in chlorides compared with the RO reject water (308 mg/L).

The leachate will be injected into the scrubbers at a temperature between 420 – 435 °F. Injection into the scrubbers will reduce the tendency to form HCl compared with injection within the furnace. By contrast, injection of the RO reject stream will not have such a tendency when injected into the furnace because of the low chloride concentration.

No modifications will be required to inject leachate through the existing scrubbers. The existing reagent storage and injection system, which includes tanks, pumps, injectors and associated controls, will be utilized for the leachate injection process. During the temporary leachate injection project, the leachate will be stored in a new temporary above-ground tank. If Covanta permanently injects leachate into the scrubbers, the company will construct a new permanent leachate storage tank for direct unloading of leachate from trucks.

During the course of the project, Covanta will operate in compliance with all of the requirements of its permits and will evaluate the effects of leachate injection on its operations. Covanta will also evaluate CEMS and COMS data and regularly scheduled stack tests to determine whether there will be emissions increases due to the project. The annual testing required by its permits for PM, HCl, mercury, dioxin/furan, cadmium and lead will be conducted while practicing leachate injection for comparison with previous tests conducted when leachate injection was not practiced.

A full description of the project is available in the revised application report received on November 14, 2011. Link to Application report .

The project to temporarily inject leachate into the scrubbers is planned to commence in January 2012 and be completed before March 2013. During the course of the project, or after its completion, Covanta may submit an application (supported by their test results) to permanently practice leachate injection into the scrubbers.

Processing Schedule

07/29/2011	Received the application for a minor source air pollution construction permit.
08/26/2011	Sent Request for Additional Information (RAI).
11/14/2011	Received revised application for a minor source air pollution construction permit.
11/18/2011	Received RAI response.
11/28/2011	Determined that application is complete (as of 11/18/2011).
12/05/2011	Issued draft permit.

Facility Regulatory Categories

- The facility is a major source of hazardous air pollutants (HAP).
- The facility does not operate units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400, F.A.C. for the PSD of Air Quality.
- The facility is subject to the applicable provisions of Title 40 CFR, part 60 Subpart A - General Provisions and Subpart Cb - Emissions Guidelines and Compliance Times for Large Municipal Waste Combustors.

2. PSD APPLICABILITY

General PSD Applicability

The Department regulates major stationary sources in accordance with Florida's PSD program pursuant to Rule 62-212.400, F.A.C. PSD preconstruction review is required in areas that are currently in attainment with the state and federal AAQS or areas designated as "unclassifiable" for these regulated pollutants.

The more common PSD pollutants include: CO, NO_X, SO_2, PM, PM smaller than 10 micrometers (PM_{10}), volatile organic compounds (VOC), lead, fluorides, sulfuric acid mist (SAM), and mercury. Other PSD pollutants include: hydrogen sulfide (H_2S), total reduced sulfur (TRS) including H_2S, reduced sulfur compounds (RSC) including H_2S, MWC organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans (dioxin/furan), MWC metals measured as PM; MWC acid gases measured as SO_2 and HCl, MSW landfill emissions as non-methane organic compounds (NMOC), and mercury.

As defined in Rule 62-210.200(189)(a)1, F.A.C., a "major stationary source" is any of 28 listed stationary sources of air pollutants which emits, or has the potential to emit, 100 tons per year (TPY) or more of any PSD pollutant. Link to Rule 62-210, F.A.C. The major stationary source threshold for source categories not on the cited list is 250 TPY or more of any PSD pollutant.

The list given in the citation includes the category of "Municipal incinerators capable of charging more than 250 tons of refuse per day". The LCRRF is a major stationary source based on its actual emissions of and its potential to emit PSD pollutants.

For major stationary sources such as LCRRF, PSD applicability for modification projects is based on thresholds known as the significant emission rates (SER) as defined in Rule 62-210.200(274), F.A.C. Any "net emissions increase" as defined in Rule 62-210.200(204), F.A.C. of a PSD pollutant from the project that equals or exceeds the respective SER is considered "significant".

SER also means any emissions rate or any net emissions increase of a PSD pollutant associated with a major stationary source or major modification which would construct within 10 km of a Class I area and have an impact on such area equal to or greater than 1 gram per cubic meter, 24-hour average.

Although a facility may be "major" (i.e. emits or has the potential to emit 100 or 250 TPY as applicable) for only one PSD pollutant, a project must include BACT controls for any PSD pollutant that exceeds the corresponding SER given in Table 1.

Table 2. List of Significant Emission Rates (SER) by PSD-Pollutant. [3]

Pollutant	SER (TPY)	Pollutant	SER (TPY)
CO	100	NO_X	40
PM	25	PM_{10} [1]	15
Ozone (VOC) [2]	40	Ozone (NO_X) [2]	40
SO_2	40	SAM	7
fluoride	3	lead	0.6
mercury	0.1	H_2S	10
TRS including H_2S	10	RSC including H_2S	10
MWC organics as dioxin/furan	3.5×10^{-6}	MWC acid gases as HCl and SO_2	40
MWC metals as PM	15	MSW Landfill Emissions as NMOC	50

1. PM with a diameter less than 2.5 micrometers ($PM_{2.5}$) is also a PSD pollutant, but an SER has not yet been defined in the Department's rules. It is regulated by its precursors and surrogates (e.g. PM/PM_{10}, ammonia, SO_2 and NO_X).
2. Ozone (O_3) is regulated by its precursors (VOC and NO_X).
3. The federal SER of 75,000 TPY for Greenhouse Gases (GHG) as carbon dioxide equivalent (CO_2e) has not been incorporated into Department rules.

$PM_{2.5}$ is also a Federal PSD pollutant and the Department is in the process of adopting a SER of 10 TPY. Refer to Link to $PM_{2.5}$ Rule . Until the rule is finalized, projects in Florida are not subject to a SER for $PM_{2.5}$.

PSD Applicability for the Project

The project is located in Lake County, which is in an area that is currently in attainment with the state and federal AAQS or otherwise designated as unclassifiable. The applicant provided a PSD applicability analysis comparing baseline actual emissions compared with projected actual emissions and concluded that there will be no (i.e. zero) net emissions increase of any PSD pollutants. The summary table is given below. The full applicability analysis is available in the application report. Link to Application Report

Table 3. Applicant's Summary table of Net Emissions Increases and PSD Applicability

PSD Pollutant	Baseline Actuals (TPY)	Projected Actuals (TPY)	Increase Emissions (TPY)	SER (TPY)	PSD? (yes/no)
CO	28.2	28.2	0	100	no
NO_X	393	393	0	40	no
PM	6.53	6.53	0	25	no
PM_{10}	6.53	6.53	0	15	no
SO_2	6.05	6.05	0	40	no
VOC	1.68	1.68	0	40	no
Lead	2.20E-02	2.20E-02	0	0.6	no
MWC Acid Gases (SO_2+HCl)	31.1	31.1	0	40	no

The Department does not necessarily agree that there will be no net emissions increase of any PSD pollutant. One reason is that it will likely take more energy to evaporate the additional water introduced into the system.

The Department agrees that it is unlikely that the net emissions increase of any PSD pollutant will be equal to or greater than its respective SER. Therefore, PSD is not applicable to the temporary leachate injection project.

3. SITE VISIT BY DEPARTMENT PERSONNEL

On November 18, 2011, Department engineers, Al Linero and Yousry Attalla, visited the facility and met with Lake County officials, Covanta, Arcadis and Trinity Consultants to attain a full understanding of the projects. A tour was conducted of the control room, with direct views of the refuse pit operations. An outdoor tour was also conducted with a walk through observance of pollution control equipment, reagent tanks and silos, the facility stack, COMS and CEMS probes, and the monitoring instrument shelter.

Figure 4 is a photograph of the probes located at the stack. Figure 5 is the control room continuous readout of the CEMS and COMS within the larger process data panel boards.

Figure 6 is the type device (including including rotary atomizer) through which lime slurry and RO reject water (dilution water) are presently injected into the scrubbers. Figure 7 is an overhead view taken from a vantage point above one of the scrubbers that shows an in place injector.

There will be no difference to the eye between the present and future slurry injection and liquid dilution systems. The main visible difference due to the project will be the routing of the RO reject water to the furnace NH_3 ports, the temporary tank and increased truck unloading operations.

Figure 4. Locations of COMS, CEMS probes. **Figure 5. Control Room COMS, CEMS Readouts.**

Figure 6. Spare Slurry Injector-Atomizer **Figure 7. Installed Slurry Injector-Atomizer.**

At this time, the main concern is the control of possible odors. The applicable Department rule states:

Objectionable Odor Prohibited – No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rule 62-296.320(2), F.A.C.

The permit will add no additional requirements to the LCRRF. If Covanta decides to inject leachate water on a permanent basis the company will need to provide the results of stack tests conducted while injecting leachate, an updated estimate of net emission increases projections and a brief update of the submitted application.

5. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant and the conditions specified in the draft permit. No air quality modeling analysis is required because the project does not result in a significant increase in emissions. Yousry (Joe) Attalla is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Office of Permitting and Compliance at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.