

FINAL DETERMINATION

Hillsborough County Resource Recovery Facility
Nominal 600 Tons per Day Municipal Waste Combustor
Unit 4

DEP File No. 0570261-007-AC (PSD-FL-369, PA83-19A)



Florida Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation

September 29, 2006

The Department of Environmental Protection (Department) distributed an Intent to Issue PSD Permit on May 25, 2006 for the construction of a nominal 600 tons per day (TPD) municipal waste combustor (MWC) at the existing Hillsborough County Resource Recovery Facility located southeast of Tampa, west of I-75 and near Brandon. The package included the Draft PSD Permit and the Department's Technical Evaluation and Preliminary Determination. These documents are available at the Department's web page at the following site:

www.dep.state.fl.us/Air/permitting/construction/hillsborough.htm

The Public Notice to Issue PSD Permit was published in the Tampa Tribune on May 25, 2006. The County provided proof of publication to the Department on June 13, 2006. No comments were received from the public. Comments were received from the U.S. Environmental Protection Agency (EPA).

A number of comments were submitted on behalf of the facility owner by its consultant, Camp Dresser McKee (CDM). Additional comments were received by the contracted facility constructor/operator, Covanta Hillsborough, Inc. These are detailed below together with the Department's responses.

No petitions for an administrative hearing regarding the Draft PSD Permit were filed. Therefore the Draft PSD permit was not a contested issue at the certification hearing that was conducted by the Division of Administrative Hearings (DOAH) on July 12, 2006. The DOAH certification case file is available at the following site:

www.doah.state.fl.us/internet/search/docket.cfm?CaseNo=05-004347

The Recommended Order was issued and filed by the Clerk of DOAH on August 2, 2006. The Recommended Order was substantially the same as the Proposed Recommended Order submitted on behalf of the County. It "Recommended that the Governor and Cabinet, sitting as the Siting Board, enter a Final Order granting a site certification for the construction and operation of Unit No. 4 at the Hillsborough County Resource Recovery Facility, in accordance with the Conditions of Certification contained in DEP Exhibit 2." The mentioned Conditions of Certification in the Recommended Order incorporated the Department's Draft PSD Permit as noticed with some minor changes documented below.

The Siting Board voted to approve the Recommended Order at its meeting of September 19, 2006. The Final Order signed by the Governor was clerked on September 27.

Following issuance of the Final Order, the Department is required to take final action on the PSD Permit. That decision is to issue the Final PSD Permit as detailed in the enclosed Notice of Permit. This Final Determination is in support of that decision and also documents the Department's consideration of comments received pursuant to the 30-day comment period and changes to the Draft PSD Permit resulting from those comments.

COMMENTS FROM U.S. EPA REGION 4

The EPA comments were submitted by letter from Mr. Gregg M. Worley dated June 20, 2006. Its comments are given in *italics*. The Department responses follow each comment and are in normal font.

- 1. The preliminary determination does not contain a specific acknowledgement of fine particulate matter (PM_{2.5}) as a pollutant that will be emitted from Unit 4. Although EPA has not yet issued PM_{2.5} new source review (NSR) implementation rules, PM_{2.5} is a regulated NSR pollutant because it is subject to national ambient air quality standards. We recommend that FDEP acknowledge PM_{2.5} as a regulated NSR pollutant in the final determination. As part of this acknowledgement, you could comment that PM₁₀ is being used as a surrogate for PM_{2.5} and that the particulate matter emissions controls proposed for this project are appropriate for control of fine particles.*

The Department acknowledges that fine particulate matter (PM_{2.5}) is a pollutant that will be emitted from Unit 4 and that PM_{2.5} is subject to National Ambient Air Quality Standards (NAAQS). Furthermore, the Department acknowledges that precursors, including sulfur dioxide (SO₂), nitrogen oxides (NO_x), hydrogen chloride (HCl), and ammonia (NH₃) are also emitted from Unit 4.

MWC Metals/(PM/PM₁₀) and opacity are surrogates for PM_{2.5} directly emitted from Unit 4. MWC Acid Gases (HCl/SO₂) and NH₃ are directly limited and thus reduce the potential for PM_{2.5} formation in the environment.

Overall, the Department's determination of best available control technology (BACT) is the most stringent to date in the United States. It is more stringent than the requirements in 40 CFR 60, Subpart Eb-Standards of Performance for New Stationary Sources and Emission Guidelines (including hazardous air pollutants) for Existing Sources Municipal Waste Combustors as revised and published by the Environmental Protection Agency (EPA) on May 10, 2006.

The control strategy to meet the BACT emission limits consists of: spray dryer and fabric filter for MWC Acid Gases (HCl/SO₂) and MWC Metals/(PM/PM₁₀); flue gas recirculation (FGR); and, urea-based selective non-catalytic reduction (SNCR). The described strategy is appropriate for control of fine particles.

- 2. We are unable to tell if consideration was given to the possibility of condensible particle emissions from Unit 4. The test method specified for particulate matter emissions in Condition 23 of the draft permit is EPA Method 5 which does not measure condensibles. Since the project narrowly avoided PSD review for PM₁₀, any particulate component not included in the PM₁₀ emissions estimate could be important. We suggest that the final permit include a requirement for a one-time test of condensible emissions to assess whether such emissions need to be considered further for Unit 4.*

The Department acknowledges the possibility of condensable particulate formation from Unit 4. At the time the Department received the application, the applicable Subpart Eb limit for MWC Metals as PM was 24 milligrams per dry standard cubic meter (mg/dscm) corrected to 7 percent oxygen. The applicant proposed a PM BACT limit of 20.6 mg/dscm that equates to 25.1 tons per year (TPY).

The recently issued Subpart Eb reduced the MWC Metals/PM limitation to 20 mg/dscm that would marginally avoid PSD for PM. The specified test method is still EPA Method 5 and it is consistent with the Department's definition of PM.

The Department reduced the MWC Metals/PM limit to 12 mg/dscm. This value is substantially less than the latest requirement in Subpart Eb and equates to 14.6 TPY. The significant emission rate for PM₁₀ is 15 TPY. It is reasonable to expect that the condensable fraction would be less than 10 TPY and that the project will avoid PSD for PM.

It is also reasonable to assume that measurement of PM emissions less than 12 mg/dscm by EPA Method 5 will insure that PM₁₀ emissions will (even when considering the condensable fraction) be less than 15 TPY.

The presence of the lime cake in the fabric filter provides ample opportunity for condensation, impaction, diffusion, and interception of condensable PM/PM₁₀ to support the conclusion above.

3. *The tabular emissions limits summary in Condition 14 of the draft permit for sulfur dioxide and hydrogen chloride includes limits in terms of parts per million or percent reduction, with the following footnote: "Whichever standard is less stringent." Similarly, the emissions limits for mercury include limits in micrograms per dry standard cubic meter with the same footnote. The footnote is not assigned, however, to the listed pounds-per-hour emissions rates for these three pollutants. Furthermore, the text description of the limits is not altogether consistent with the tabular listings. For example, the text description of the sulfur dioxide limits in Condition 17 is "shall exceed neither 26 ppmvd nor 19.2 lb/hr on a 24-hr daily geometric mean, or an emissions reduction of 80 percent shall be achieved." Please provide an explanation of how the emissions limits for sulfur dioxide, hydrogen chloride, and mercury are to be interpreted. Specifically, does compliance with the percent reduction requirements supersede compliance with all other limits?*

Compliance with the percent reduction requirements does supersede compliance with the concentration and mass emission limits. The Department adhered to the form of the standards in Subpart Eb and insured that the limits (BACT or to avoid PSD) are at least as stringent as the requirements of that Subpart.

COMMENTS FROM CAMP DRESSER MCKEE (CDM)

Comments were received from Mr. Jason M. Gorrie of CDM by letter dated June 8, 2006. Mr. Gorrie is the professional engineer who sealed the air permit application on behalf of the County. The format and numeration are continued from the previous section.

4. *The emission limits we applied for in our application would have been the lowest emission limits in the USA. We are very concerned that the limits imposed in the Draft Permit may promote undesirable secondary effects.*

The Department agrees that the NO_x limits are the lowest in the USA. However, European facilities have demonstrated they can achieve even lower limits without promoting the claimed "undesirable secondary effects." This analysis is detailed in the Department's Technical Evaluation and Preliminary Determination and BACT.

5. *The County will need to inject urea at an aggressive rate if the Facility is to comply with the Department's proposed 90 ppmvd emission limit for NO_x. Increasing the urea injection rate is likely to result in increased levels of ammonia slip, which may exceed 10 ppmvd.*

The Department believes that it will not be necessary to inject urea at an overly aggressive rate given incorporation of flue gas recirculation (FGR) into the design. This feature and the lower pre-treatment values were not considered by the bidder (FuelTech) in its proposal to supply the SNCR system. The 90 ppmvd NO_x emission limit applies on a 12-month basis and not on a 24-hour basis. Proper operation of the FGR system will moderate the average and typical maximum pre-treatment NO_x concentrations such that the SNCR urea injection rate should remain within the levels presumed necessary to meet the County's proposed 24-hr limit of 110 ppmvd while meeting the Department's 12-month limit of 90 ppmvd. See also the Department's Technical Evaluation and Preliminary Determination and BACT.

6. *A footnote to the previous CDM comment states: "The emissions data for the MWC facility in Brescia, Italy, show that there can be significant levels of ammonia slip when facilities try to reduce NO_x emissions to extremely low levels. The data for the Brescia facility were provided to the Department on February 28, 2006, in the County's response to the Department's Notice of Insufficiency."*

The Department does not believe that 110 ppmvd on a 24-hour basis and 90 ppmvd on a 12-month basis are "extremely low levels." The Department addressed the Brescia data on page 18 of the Technical Evaluation distributed with the Draft PSD Permit. A Department representative has since visited the Brescia facility while on personal travel and discussed operation of the facility with the operations manager. These discussions support the Department's position that the 110 ppmvd and 90 ppmvd limits for NO_x are achievable without ammonia slip problems. See the attached summary of the trip report from Mr. Al Linero to Mr. Tom Smith in the e-mail dated July 18, 2006.

7. *Under certain operating and atmospheric conditions, the ammonia slip may produce a highly opaque plume of ammonium chloride, which may violate the 10% opacity limit. Even if the plume does not constitute a permit violation, the plume is likely to generate negative publicity and ill will for the Facility, the County, and the Department. Other operating experience with SNCR to produce NO_x levels as low as that contemplated by the Draft Permit indicates that there will be other undesirable side effects such as plume formation and/or ammonia vapors in the workplace.*

Other operators' experience with SNCR to produce NO_x levels as low or lower than contemplated by the Draft Permit support the DEP's conclusion that plume should not be an issue. The DEP added a permitting note to acknowledge this concern raised by the applicant.

8. *Specific Condition B.14 limits ammonia slip to 10 ppmvd when Unit 4 is operated at 195 MMBtu/hr and 15 ppmvd when Unit 4 is operated at 260 MMBtu/hr. It is our understanding that the Department derived these emission levels from the preliminary SNCR equipment specifications prepared by FuelTech. The FuelTech specifications should not be used as permit limits in this case because the specifications were based on a NO_x emission rate of 110 ppmvd. Since the Department has imposed a NO_x emission limit of 90 ppmvd, the Facility will need to inject more urea than FuelTech anticipated and the SNCR specifications will need to be revised. Increasing the urea injection rate is likely to cause increased*

ammonia slip. We respectfully request the Department to reconsider the proposed ammonia slip limitations and adjust them in light of the proposed 90 ppmvd NO_x emission level. Please recognize that, to achieve an annual average of 90 ppmvd, it will be necessary to operate at even lower levels to offset the emissions at times when the NO_x levels are above 90 ppmvd.

The 90 ppmvd limit applies on a 12-month basis. There is no 12-month NH₃ limit. The NH₃ limit applies while the County demonstrates compliance with its short-term limit of 110 ppmvd. There is no requirement to demonstrate the ability to meet 10/15 ppmvd NH₃ while NO_x emissions are equal to 90 ppmvd.

9. *Quarterly stack tests for mercury should not be required in this case. The County has agreed to incur the expense associated with the installation and operation of a CEMS for mercury. The County should not be required to incur the additional expense of conducting quarterly stack tests for mercury on a permanent basis. Accordingly, the County respectfully requests the Department to eliminate the requirement in the Draft Permit for quarterly stack testing. If this proposal is unacceptable to the Department, the Department should amend the Draft Permit to state that the quarterly stack testing can be eliminated when the County installs and begins to operate the CEMS for mercury.*

Quarterly stack testing is specified to demonstrate that mercury emissions are less than 0.022 lb/hr to avoid PSD applicability. The quarterly test is only required for the first two years of operation if a certified CEMS is not used. The Draft Permit was revised prior to the certification hearing. The revisions are shown with strikethrough and double underline.

To eliminate any further confusion between Specific Conditions 19. and 26. with regard to this Hg testing frequency, a permitting note is added to Specific Condition 19. This permitting note, shown in italics, is added to the Revised Draft Permit. Specific Conditions 19. and 26. are now revised to read:

Specific Condition 19.

Mercury Hg: Emissions of Hg shall not exceed 28 µg/dscm or an emissions reduction of 85 percent shall be achieved as demonstrated during the required annual stack test.

During the first two years of operation, emissions of Hg shall not exceed 0.022 lb/hr as measured during quarterly stack tests to provide reasonable assurance that 12-month emissions are less than the applicable PSD threshold of 200 lb/yr.

After the certification of the Hg-CEMS as described in Specific Condition 35. ~~Thereafter,~~ the owner or operator may demonstrate compliance with all Hg limits in this permit with data collected during an annual stack test or ~~from the required Hg-CEMS as described in Specific Condition 26.~~ ~~Otherwise, the required quarterly testing for mercury shall continue.~~

{Permitting Note: If the Hg-CEMS is certified prior to the end of the first two years of operation, the permittee may use the CEMS in lieu of the remaining quarterly tests.}

Specific Condition 26.

Subsequent Compliance Testing: Annual compliance stack tests for NO_x, CO, SO₂, HCl, PM/PM₁₀, lead, cadmium, dioxins/furans, and ammonia shall be conducted during each federal fiscal year (October 1st to September 30th). Data collected from the reference

method during the required RATA tests for CO, NO_x, and SO₂ may be used to satisfy the annual testing requirement provided the notification requirements and emission testing requirements for performance and compliance tests of this permit are satisfied.

Prior to the certification of the Hg-CEMS as described in Specific Condition 35.,
~~P~~performance tests for Hg emissions shall be conducted on a calendar year basis to demonstrate compliance with the concentration/reduction standards. ~~Performance tests to demonstrate compliance with the lb/hr Hg standard shall be conducted on a quarterly basis.~~

~~Following the first two years of operation, the owner or operator may demonstrate compliance with the Hg limits in this permit using the required Hg CEMS in lieu of the quarterly and annual testing requirements provided all provisions of Specific Condition 35 and subpart 40 CFR 60.58b(n) and (o) are met. Otherwise, the required quarterly testing for mercury shall continue.~~ After the certification of the Hg-CEMS as described in Specific Condition 35., the owner or operator may demonstrate compliance with all Hg limits in this permit with data collected from the Hg-CEMS.

[Rules 62-297.310(7)(a) and (b), and 62-296.416, F.A.C., and 40 CFR 60.8 and 60.58b]

ADDITIONAL COMMENTS FROM CDM

Additional comments were received from Mr. Jason M. Gorrie of CDM by letter dated June 22, 2006.

10. Section III, Item 7 of the Draft Permit states that “the maximum steam production rate shall not exceed 164,000 pounds steam per hour (on a 4-hour block arithmetic average).” The County’s application evaluated capacity of the new Unit 4 on an MMBtu/hr basis, not on a steam production rate basis. Relating steam production rate (in pounds per hour) to heat release rate (in MMBtu) is difficult given the varying heat content of the fuel (MSW) and the relatively wider operating window that municipal waste combustors operate within. This is recognized by the USEPA in that Subpart Eb establishes the maximum steam load as 110% of the maximum demonstrated steam load during the most recent dioxin/furan performance test.

The County is not opposed to establishing a never to be exceeded value for steamflow, however, the preliminary specifications provided by the boiler vendors suggest that 164,000 lbs/hr is too low. The maximum steamflow should be 190,000 lb/hr. This is equivalent to the 288 MMBtu per hour input used in our air quality analyses.

The 164,000 pounds steam per hour value had been obtained from the technical specification document prepared by Burns and Roe, Enterprises, Inc. (see SPEC NO. Hills-SM-101A, dated 6-30-05). Similarly, the same documents indicate a heat input of 260 mmBtu/hr. The application was based on a 288 MMBtu/hr heat input.

It is conceivable that the new unit will be able to produce more steam, but the waste processing or heat input rates (or both) will likely be substantially greater than the nominal ratings. The Department will change the steam flow limitation to 190,000 pounds/hr as requested in the emissions unit description and Specific Condition 7. The emission limits for the facility remain unchanged and the permittee must operate the facility to comply with these limits.

11. *Specific Conditions 14 through 21 of the Draft Permit establish lb/hr limitations for many of the regulated pollutants emitted from Unit 4. The emission limitations established as BACT and imposed through NSPS standards are expressed on a concentration basis (either mg/dscm or ppm_v). Past Department practice has been to establish “equivalent emissions” (in ton/yr) based on the requisite concentration limitation. However, this Draft Permit establishes an actual mass limitation rather than an equivalent emission.*

From discussions with you, it is our understanding that the EPA requires a mass emission limitation to be imposed when a PSD threshold is triggered. As you know, the concentration limitations have varying averaging periods associated with them. For instance, SO₂ concentration is regulated on a 24-hr geometric mean average and CO concentration is regulated on a 4-hr block arithmetic average. In order to avoid confusion over differing averaging periods, and to satisfy EPA’s mass emission limitation requirements, we suggest that the Department establish a ton/year limitation rather than a lb/hour limitation. Such an approach will preserve operating flexibility, avoid confusion, and embody EPA’s PPSD increment-consumption requirements. With the flow CEM it will be possible to accurately determine compliance with an annual mass emission limitation.

Inclusion of pounds per hour (lb/hr) limitations is the common practice for the Department’s PSD permitting and BACT determinations. Few MWC units have been built in recent years. However, virtually all of the Department’s PSD Permit for non-MWCs include technological limits such as concentrations and relatively short-term mass limits.

12. *Specific Condition No. 29.a. authorized three hours in any 24-hour period of excess emissions. Specific Condition No. 29.c. provisionally allows up to 15 hours for certain types of malfunctions resulting in CO emissions. For clarity, we suggest that the language in 28.a. reference the special provisions of 29.c.*

The Department separates the State excess emissions rule provisions from the Federal excess emissions regulations. The permitting note after Specific Condition 28. applies to Specific Conditions 28. and 29. For clarity, the permitting note is moved after the Excess Emissions header, before Specific Conditions 28.

COMMENTS FROM COVANTA HILLSBOROUGH, INC. (CHI)

Comments were received from Mr. Joseph Threshler by letter dated June 23, 2006. Mr. Threshler is a CHI Vice President. CHI is the County’s contracted “constructor/operator” of the facility. The format and numeration are continued from the previous section. Many of the comments are duplicative of those submitted by CDM for which responses have already been provided and will not be repeated here.

13. *Emissions Unit 107 - Continuous Monitors. The equipment scope listed in under Continuous Monitors includes a continuous flue gas flow rate monitor. Continuous flue gas flow rate monitors have been applied to 40 CFR Part 75 sources; however, they have not been required or applied to large municipal waste combustors because EPA Method 19 has met all of the RATA requirements without introducing additional capital and O&M costs.*

If the Department is interested in monitoring long-term mass emission rates, EPA method 19 is recommended because of its successful history and because it does not introduce additional cost.

Given their incremental cost without the provision of any net environmental benefit, Covanta recommends that the requirement for flue gas flow rate monitors be amended to allow the Applicant the opportunity to select either a flue gas monitor or to use EPA Method 19. In either case, the mass emission rate will be subject to the same data quality as determined by the Relative Accuracy Test Audit.

The flowmeter is necessary to accurately measure CO, SO₂ and NO_x emissions on a continuous basis and consistent with the specified averaging periods. The flow meter will remain a requirement as described in Specific Condition 34. of the permit.

14. Condition 19. In order to establish consistency in permit averaging period between Condition 19 and Condition 35, the following is proposed for the third paragraph of Condition 19;

Thereafter, the owner or operator may demonstrate compliance with all Hg limits in this permit with data collected from the required Hg-CEMS as described in Specific Condition 26 with Hg-CEMS data being reported as a quarterly average. Otherwise the required quarterly testing for mercury shall continue.

The “quarterly” references are to testing frequency in Specific Condition 19. and to the reporting of data in Specific Condition 35., not to the averaging period for mercury emissions data. Specific Conditions 19. and 26. related to Hg compliance and monitoring were addressed and certain changes were made as previously mentioned.

CONCLUSION

The Department will issue the Final PSD Permit with the changes noted above.