Title V Air Operation Permit Renewal
Permit No. 0570005-041-AV

APPLICANT

The applicant for this project is CF Industries, Inc. The applicant's responsible official and mailing address are: Mr. Herschel E. Morris, Vice-President Phosphate Operations & General Manager, CF Industries, Inc., P.O. Drawer L, Plant City, Florida 33564.

FACILITY DESCRIPTION

The applicant operates the Plant City Phosphate Complex, which is located at in Hillsborough County at 10608 Paul Buchman Highway, Plant City, Florida. The facility consists of sulfur storage and handling systems, four sulfuric acid production plants, two phosphoric acid production plants, a phosphoric acid cleanup unit and four ammonium phosphate production plants with associated storage and shipping units. The facility also includes several emergency diesel engines and a phosphogypsum stack. Final products produced at the facility include sulfuric acid, phosphoric acid, ammonium sulfate, diammonium phosphate (DAP), and monoammonium phosphate (MAP). A brief description of the facility's emissions units are summarized below:

Johnson Scotch Marine Type Boiler (E.U. No. 001): The facility includes an 83.3 MMBtu/hour boiler that is fired with natural gas as the primary fuel and no. 2 fuel oil as the backup.

A, B, C & D Sulfuric Acid Plants (E.U. Nos. 002, 003, 007 & 008): The A, B, C and D Sulfuric Acid Plants have maximum permitted production capacities of 1,300, 1,600, 2,600 and 2,600 tons per day of 100% sulfuric acid, respectively. Sulfur dioxide and sulfuric acid mist (acid mist) emissions generated at A & B Sulfuric Acid Plants (E.U. Nos. 002 & 003) are controlled at each plant by a two-stage SO_2 scrubber and a high-efficiency mist eliminator at, while sulfur dioxide and sulfuric acid mist (acid mist) emissions generated at a C & D Sulfuric Acid Plants (E.U. Nos. 007 & 008) are controlled at each plant via a Double Contact Process and high-efficiency mist eliminator. These units utilize Continuous Emissions Monitoring Systems for compliance purposes for SO_2.

A & B Phosphoric Acid Plants (E.U. Nos. 004 & 009): The A and B Phosphoric Acid Plants are permitted for maximum process input rates of 1,699 and 2,530 tons per day of 100% P_2O_5 feed, respectively. Fluoride emissions generated at facility's A & B Phosphoric Acid Plants are controlled at each plant by a cyclonic scrubbers followed by packed bed scrubber.

Phosphoric Acid Cleanup (E.U. No 032): The Phosphoric Acid Cleanup Unit clarifies phosphoric acid from the phosphoric acid plants and is permitted for maximum process input rates of 671 tons of phosphoric acid. Fluoride emissions generated at the Phosphoric Acid Cleanup (E.U. No. 032) are controlled by fume duct sprays followed by a packed bed scrubber.

A, Z, X & Y DAP/MAP (E.U. Nos. 010, 011, 012 & 013): The "A" DAP/MAP Plant is permitted for maximum process input rates of 29.53 tons/hour in DAP production mode and 33.30 tons/hour in MAP production mode. The "Z","X" and "Y" DAP/MAP Plants are each permitted for maximum process input rates of 48.7 tons/hour in DAP production mode and 55.0 tons/hour in MAP production mode. Particulate Matter and Fluorides emissions generated at each of these plants are controlled by cyclones, venturi scrubbers & wet Scrubbers located in the plants.

A & B Storage Buildings (E.U. No. 014): These buildings are used for the storage of DAP and MAP produced at the A, Z, X & Y DAP/MAP Plants. Particulate matter emissions from the "A" & "B" Storage Buildings are minimized by the use of dust suppressant.

A & B Shipping Units (E.U. Nos. 015, 018, 019 & 020): "A" & "B" Shipping units consists of sizing, screening, and conveying systems for transferring DAP/MAP from storage buildings "A" and "B" to the truck and railcar loading operations associated with these buildings. Particulate matter emissions from each of the unit (i.e., "A" & "B" Shipping Units) are controlled by baghouse dust collectors. Additionally, emissions from the truck and railcar loading operations are minimized by the use of dust suppressant.

Sulfur Storage and Handling System (E.U. Nos. 022, 023, 024 & 033): The sulfur storage and handling system includes Truck Pit A (E.U. No. 023), Truck Pit B (E.U. No. 024), a 2600 Ton Storage Tank (E.U. No. 022), a 5000 Ton Storage Tank (E.U. No. 033) and a railcar unloading pit. Molten sulfur delivered by trucks or railcar is unloaded into the sulfur storage system. Emissions from the storage vessel are vented uncontrolled through a round stack with a rain cap.

Emergency Diesel Engines (E.U No. 034): The emissions unit includes a total of four emergency diesel engines that are regulated under 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

Phosphogypsum Stack (E..U No. 100): The emissions unit includes a phosphogypsum stack that is regulated under 40 CFR 61, Subpart R - National Emission Standards for Radon Emissions from Phosphogypsum Stacks.

Also included in this permit are miscellaneous unregulated/insignificant emissions units and/or activities.

PROJECT DESCRIPTION

The purpose of this permitting project is to renew the existing Title V permit for the above referenced facility and incorporate the terms and conditions of several construction permits as detailed in the project review section below.

PROCESSING SCHEDULE AND RELATED DOCUMENTS

Renewed Title V Air Operation Permit issued October 13, 2005
Title V Air Operation Permit Revision issued December 17, 2007
Application for a Title V Air Operation Permit Revision October 3, 2008
Title V Air Operation Permit Revision issued March 23, 2009
Application for a Title V Air Operation Permit Revision October 2, 2009
Additional Information Request dated November 19, 2009
Additional Information Response received February 17, 2010
Application for a Title V Air Operation Permit Renewal received March 2, 2010
Additional Information Request dated April 30, 2010
Additional Information Response received July 29, 2010
Additional Information Request dated August 27, 2010
Additional Information Response received January 25, 2011
Additional Information Request dated February 22, 2011
Additional Information Response received May 23, 2011
Additional Information received July 21, 2011
Additional Information received August 18, 2011
Notice of Intent to Issue Air Permit issued August 18, 2011
Public Notice Published August 23, 2011

PRIMARY REGULATORY REQUIREMENTS

Title III: The facility is identified as a major source of hazardous air pollutants (HAP).

Title V: The facility is a Title V major source of air pollution in accordance with Chapter 62-213, Florida Administrative Code (F.A.C.).

PSD: The facility is a Prevention of Significant Deterioration (PSD)-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

NSPS: The facility does operate units subject to the New Source Performance Standards (NSPS) of 40 Code of Federal Regulations (CFR) 60.

NESHAP: The facility does operate units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR 63.

CAIR: The facility is not subject to the Clean Air Interstate Rule (CAIR) set forth in Rule 62-296.470, F.A.C.

CAM: Compliance Assurance Monitoring (CAM) applies to Emissions Unit No. 032. Emissions Unit 032 (Phosphoric Acid Cleanup) is subject to CAM for the regulated emissions of fluoride, which are controlled by a packed-bed scrubber.

PROJECT REVIEW

This renewal reformats the Title V permit from the old format to the new and revised format that became the new standard for Title V renewal projects in 2011.

This renewal incorporates provisions of the following construction permits:

1) Permit No. 0570005-021-AC/PSD-FL-355, which authorized the following changes:
   a. "B" Sulfuric Acid Plant (E.U. No. 003): The production rate was increased from 1,300 to 1,600 tons per day. Emissions limits for the pollutants SO_2, SAM and NOx were also revised.
   b. A & B Phosphoric Acid Plants (E.U. Nos. 004 & 009): The "A Phosphoric Acid Plant" process input rate was increased from 1,416 to 1,699 tons per day of 100% P_2O_5. The "B Phosphoric Acid Plant" process input rate was increased from 2,107 to 2,530 tons per day of 100% P_2O_5. The emissions limits for the pollutant Fluoride was also revised for both plants.
   c. "A" & "Z" DAP/MAP Plants (E.U. Nos. 010 & 011): The PM emissions limits were revised.
   d. "A" & "B" Shipping Baghouses (E.U. Nos. 015 & 018): Baghouse design and maintenance requirements were added.
   e. "A" Sulfuric Acid Plant (E.U. No. 002): A 24-hour average SO_2 emissions limit of 250 lb/hr was added.

2) Permit No. 0570005-028-AC, which authorized a change in the method of operation for the Phosphoric Acid Cleanup Unit (PACU, EU 032). The change allowed acid transfer to/from the storage tanks and operation of the acid clarification process without the operation of the PACU scrubber for up to 730 hours per year for maintenance purpose only.

3) Permit No. 0570005-030-AC, which authorized a change in the methods of operation for the "A", "Z", "X" and "Y" DAP/MAP Granulation Plant Scrubbers (E.U. Nos. 010, 011, 012 & 013). In the "Z", "X" and "Y" DAP/MAP Plant , the change in method of operation allowed the use of partially-neutralized phosphoric acid in the secondary scrubbers and discontinued use of the secondary cooler scrubbers. In the "A" DAP/MAP Plant, product cooler down-comer (previously considered control equipment) now operates only as a duct with a duct sprayer.

4) Permit No. 0570005-033-AC, which authorized the replacement of the pre-neutralizer (reactor) in the "X" DAP/MAP Granulation Plant.

5) Permit No. 0570005-034-AC (BART Exemption Project – Scenario A), which requires the permittee to comply with the BART exemption limits under Scenario A of the permit. This included requirements to reduce the production rates of the C & D Sulfuric Acid Plants (E.U. Nos. 007 & 008) from 2,962 to 2,600 tons/day and lower the SO2 emissions rates from the facilities four (A, B, C & D) sulfuric Acid Plants .

6) Permit No. 0570005-037-AC , which authorized a change the method of operation that allows the transfers of phosphoric acid to and from storage tanks and the operation of the evaporation process for up to 730 hours per year, while the "A" and "B" Phosphoric Acid Plants (PAPs) are not operating due mainly to scrubber maintenance activities.

7) Permit No. 0570005-038-AC, which authorized the replacement of the burners in the product dryers of the "X", "Y" and "Z" DAP/MAP plants. Burners in the "Y" and "Z" DAP/MAP Plants have been replaced.

Burners in the "X" DAP/MAP Plant will be replaced in the future and has been incorporated into the renewal permit with a compliance plan.

8) Permit No. 0570005-044-AC, which authorized changes to permit specific conditions established in previous construction permits. Additionally, this permit authorizes the replacement of the rubber-lined steel shell of the existing cyclonic scrubber in the "A" Phosphoric Acid Plant, with a stainless steel shell of identical dimensions.

9) Permit No. 0570005-046-AC, which authorized the replacement of the filter pans on the tilting-pan filter and the existing hood on the belt filter in the "A" Phosphoric Acid Plant (E.U. 004).

This renewal also includes the following notable permit language and condition changes which are summarized below:

1) Johnson Scotch Marine Type Boiler (E.U. No. 001):

   a. The visible emissions testing language was revised for this boiler. In the previous Title V Permit (0570005-032-AV), visible emission testing was required every federal fiscal year. The renewal permit revised testing frequency to once every 5 years prior to obtaining a renewed operation permit. Under the previous Title V permit, this boiler was only operated for short periods (1 to 7 hours) during each year. This boiler is normally fired with natural gas and is limited to a maximum of 400 hr of operation with No. 2 fuel oil.

   b. A BACT Determination was added for the boiler. This boiler is subject to Rule 62-296.406, F.A.C. but the previous versions of the Title V permits did not include a BACT Determination. The BACT added a maximum fuel oil sulfur limit of 0.05% by weight to the permit.

2) C & D Sulfuric Acid Plants (E.U. Nos. 007 & 008): The limit on molten sulfur utilization specified in Specific Condition B.1.c of the previous Title V Permit (0570005-032-AV) was removed in the renewal Title V permit. This limit was added in Construction Permit 0570005-019-AC/PSD-FL-339 for the "C" and "D" sulfuric acid plants but was superseded by a molted sulfur rate for all sulfuric acid plants in Construction Permit 0570005-026-AC/PSD-FL-339B.

3) A DAP/MAP (E.U. Nos. 010):

   a. Specific Condition D.3 of the previous Title V Permit (0570005-032-AV), the language "based on the design capacity of 23 tons/hr of P_2O_5 input" and the two fluoride equivalent emission rates (1.38 lbs/hr and 6.04 tons/yr) were removed in the renewal permit because the facility is permitted for 29.53 tons/hr of P_2O_5 input and total fluoride emissions of 0.06 lb/ton of P_2O_5 based on rule 62-296.403, F.A.C.

   b. Specific Condition D.16.(3)(ii) of the previous Title V Permit (0570005-032-AV) dealt with calculations used to determine total fluoride emissions rates. The condition is from 40 CFR 63.626(c)(3)(ii). In the renewal permit, the condition references the subpart instead of copying it into the permit. Additionally, at the request of the permittee, the condition was changed to allow the P_2O_5 content (R_p) of the feed to be determined using as appropriate the methods specified in the "Book of Methods Used and Adopted by The Association Of Florida Phosphate Chemists, Tenth Edition, 2009" instead of the older version (Seventh Edition, 1991) referenced in 40 CFR 63.626(c)(3)(ii). As part of their request for additional information response submitted on March 23, 2011, the applicant provided an Information Collection Request (IRC) letter from the USEPA dated April 13, 2010 in which the Tenth Edition of the reference was cited as the as the recommended method for fluoride analysis.

4) Z, X & Y DAP/MAP Plant (E.U. Nos. 011, 012 & 013):

   a. "Raw Material Inputs" (phosphate rock, acid and NH_3) were removed as permitted input limits in Emissions Unit Nos. 011, 012 and 013. P_2O_5 is the only remaining permitted input variable for these

emissions units. This is consistent with specific condition for the raw material inputs in the A DAP/MAP plant and in other phosphate facilities.

b. For the X DAP/MAP Plant (E.U. No. 012), the operating time restrictions in the previous permit were transformed into annual P_2O_5 input capacity limits. As a result of this change, the hours of operation for this emissions unit were increased to 8,760 hr/year.

c. Based on the RAI Response received from C.F. Industries on May 23, 2011, the X, Y and Z Plants are not subject to CAM. CAM was considered applicable in previous Title V permits; however, equipment that was previously classified as control equipment was determined to be inherent process equipment.

5) Sulfur Storage and Handling System (E.U. Nos. 022, 023, 024 & 033): Recordkeeping for the sulfuric acid plant daily utilization rate in Specific Condition H.7. of the previous Title V Permit (0570005-032-AV) was removed in the renewal permit. The requirement was not used to show compliance with any specific limit in the system. If necessary, sulfuric acid plant daily utilization rate can be determined based on sulfuric acid production records which are requires and maintained for the A, B, C & D Sulfuric Acid Plants.

6) Appendix U-1: Fugitive hydrogen fluoride (HF) emissions from the Phosphogypsum Stack and Cooling Pond were added to Appendix U-1: List of Unregulated Emissions Units and/or Activities.

CONCLUSION

This project renews Title V air operation permit No. 0570005-032-AV, which was issued on March 23, 2009. This Title V air operation permit renewal is issued under the provisions of Chapter 403, Florida Statues (F.S.), and Chapters 62-4, 62-210 and 62-213, F.A.C.