Teresa file for

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JAN 2 2 2008

RECEIVED
JAN 28 2008
BUREAU OF AIR REGULATION

Trina Vielhauer, Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
Bob Martinez Center
2600 Blair Stone Road
Tallassee, FL 32399-2400

Dear Ms.Vielhauer:

Thank you for the opportunity to review the proposed Best Available Retrofit Technology (BART) evaluation for the CF Industries Plant City Phosphate Complex dated December 24, 2007. We have reviewed the draft and enclosed our initial comments. We will continue our review and may have additional comments at a later time.

We appreciate your transmittal of this package for our consideration. If you have questions regarding this letter, please contact Heidi LeSane of the Region 4 staff at (404) 562-9074.

Sincerely,

Richard A. Schutt
Chief
Air Planning Branch

Enclosures

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CF Industries Plant City Phosphate Complex Comments

Cesium promoted catalysts in Sulfuric Acid Plant

SAP A BART - This unit is a single contact acid plant with an ammonia scrubber. Unit A apparently does not use a Cesium promoted catalyst. There is no explanation why Florida did not further evaluate a process modification using this technology for this unit since its sister unit, unit B already has experience with it. Emission rates below 2.5 lbs SO_2/ton of Acid produced have been achieved by single contact acid plants with this technology. Cesium promoted catalysts were introduced in the late 1990's to early 2000's timeframe. They extend the temperature range over which the catalyst is active. This increases the conversion efficiency by about 50%. They are designed to directly replace the phosphorus promoted vanadium pentoxide catalysts in use. So, in many cases, other than catalyst replacement costs, the changes necessary to implement this technology are minimal even though this is a single contact acid plant.

SAP B, C, and D BART - Unit B is a single contact acid plant with an ammonia scrubber and units C and D are double contact acid plants. Proposed BART is 3.5 lbs/ton of acid produced for unit B and 3.25 lbs/ton of acid produced for units C and D. These units presently use a Cesium promoted catalyst to some extent. It appears that the plant switched to Cesium promoted catalysts on these units for the purpose of increasing production while maintaining emission rates at NSPS levels. Several plants have received BACT determinations in the past few years for expansions while meeting the NSPS based 3.5-4.0 lbs SO_2/ton of acid produced range rather than achieving the 1.5-2.5 lbs SO_2/ton of acid produced capability the new catalyst provides. Typically when this occurs the unit has increased the concentration of SO_2 entering the unit without a commensurate increase in % oxygen, allowing these units to increase production 10-20% while maintaining an NSPS based compliance limit of 3.5-4.0 lbs SO_2/ ton of acid produced. Although these units have the right technology, they have not been optimized to lower emissions. These plants should determine the feasibility of the process modification necessary to bring the operating parameters (temperature, % SO_2, % oxygen) to the optimum ranges. This can be done by adjusting inlet SO2 concentrations or adding air either in the initial feed or in the final stage(s) where the Cesium catalyst is introduced. As with unit A, this process modification should be identified as an available technology. This evaluation should include a cost effectiveness evaluation (*i.e.*, dollars/ton of SO_2 removed) of operating the cesium catalyst at optimum oxygen levels resulting in lower emission limits (*e.g.*, 2.0 lb SO_2/ton acid).

Enforcement Issues

CF Industries has submitted a permit application for a BART determination at four sulfuric acid plants (SAPs No. A, B, C, and D) located at its phosphate fertilizer production facility in Plant City, FL. The Florida Department of Environmental Protection (FDEP) intends to issue this BART determination permit at the end of its 30-day comment period which commenced on December 24, 2007. This permit will set an emission limit of 3.25 lbs of SO_2 per ton of 100% sulfuric acid (lbs/ton) produced as BART on SAPs C and D based on dual absorption and an

emission limit of 3.5 lbs/ton on SAPs A and B based on single absorption with ammonia scrubber.

EPA has concluded that the FDEP determination of BART is incomplete due to the fact that several control options where not considered in their top-down BART Technical Analysis. Furthermore, the consideration of these control options may result in a different conclusion of an appropriate BART emission limitation.

Emission rates of 1.5 lbs/ton and lower have been demonstrated to be cost effective at retrofits of similarly designed dual absorption and scrubbed sulfur burning sulfuric acid plants. It is unclear why an emission rate of 1.5 lbs/ton or less would not be determined to be achievable at SAPs C and D being that they are industry standard dual absorption sulfur burning sulfuric acid plants. It is unclear why and emission rate of 1.3 lbs/ton would not be determined to be achievable at SAPs A and B being that they are industry standard single absorption plants controlled with an ammonia scrubber.

Comments on BART:

SAPs C and D – Comments have been submtted on a proposed PSD permit to expand SAPs C and D and set BACT emission limits at 3.25 lbs/ton. Those comments disagreeed with CFI and FDEP's proposed BACT emission rate. Now, CFI and FDEP have proposed the same emission limits as BART. EPA disagrees with this determination for the same reasons as the BACT determination. Please refer to comments the BACT determination. Furthermore, in the event that CFI chooses to abandon its proposed expansion of SAPs C and D, EPA would continue disagree with this BART determination. FDEP incorrectly identified an emission rate of 3.25 lbs/ton as the top option in its top-down analysis. This is simply not accurate, as emission rates well below 3.25 lbs/ton are achievable with dual absorption technology, and should be evaluated under BART.

- As the top option, FDEP should consider the combination of dual absorption and scrubbing systems to yield an emission limit of 0.2 lbs/ton (established in a recent permitting action for a DuPont plant in New Jersey). Several scrubbing systems when used on sulfuric acid plants, such as hydrogen peroxide, the amine based Cansolv system, and Belco's Labsorb have extremely high removal efficiencies without generating a waste stream. The average cost-effectiveness and incremental cost-effectiveness should be provided for this option. The Friedman paper, attached below, has more information about scrubbing systems.

- In the event the top option is eliminated on the basis of cost-effectiveness, FDEP should consider operation and design improvements to CFI's existing dual absorption system including (but not limited to) installation of a 5th catalyst bed, improving catalyst loading, optimizing the O_2/SO_2 ratio, and optimizing heat exchanger performance. These improvements are discussed at length in my January 10, 2007 comments to the BACT determination. This option is capable of emission rates of 1.5 lbs/ton or less. As I've stated before, I believe this option is cost-effective.

SAPs A and B -- The BART Determination for SAPs A and B are somewhat different than other sulfuric acid plants in Florida because these plants utilize the single absorption with scrubber sulfuric acid process in lieu of dual absorption. While this process is unique in Florida, it is quite common nationally and internationally. EPA disagrees with FDEP's BART analysis because it incorrectly identifies an emission rate of 3.5 lbs/ton the top option in the BART analysis. As with SAPs C and D, the top option is the combination of dual absorption with a scrubbing system to achieve an emission rate of 0.2 lbs/ton. The average and incremental cost-effectiveness should be provided for this option.

In the event that the top option is eliminated on the basis of cost-effectiveness, FDEP should consider operation and design improvements to CFI's existing single absorption plants and scrubbing systems. EPA's *Guidelines for BART Determinations* in Appendix Y to 40 CFR Part 51 provides guidance for both add-on control equipment or inherently lower polluting process equipment that have a wide range of emission performance levels:

- Many control techniques, including both add-on controls and inherently lower polluting processes, can perform at a wide range of levels. Scrubbers and high and low efficiency electrostatic precipitators (ESPs) are two of the many examples of such control techniques that can perform at a wide range of levels. It is not our intent to require analysis of each possible level of efficiency for a control technique as such an analysis would result in a large number of options. It is important, however, that in analyzing the technology you take into account the most stringent emission control level that the technology is capable of achieving. You should consider recent regulatory decisions and performance data (e.g., manufacturer's data, engineering estimates and the experience of other sources) when identifying an emissions performance level or levels to evaluate.

Attached to this email is a list of 21 domestic sulfuric acid plants with federally enforceable emission limits less than 2.5 lbs/ton. 10 of these plants are controlled with various types of scrubber technologies. Additionally, scrubber manufacturers, vendors, and consultants all advertise control efficiencies of upwards of 99% and emission rates below 1.0 lbs/ton. I have attached to this email a paper presented at the 2007 American Association of Chemical Engineers, Central Florida Chapter, Clearwater Conference held in Clearwater, Florida by Leonard J. Friedman P.E., Acid Engineering and Consulting, Inc. Mr. Friedman is considered an expert in sulfuric acid plant technology and design and has published many papers on the subject. Mr. Friedman is clear that an emission rate of 1.0 lbs/ton is achievable at a single absorption sulfuric acid plant with gas inlets as high as 40,000 ppm. CFI's scrubber inlet is likely an order-of-magnitude less than this.

Furthermore, certain information in CFI's application and FDEP's analysis suggest that emission rates considerably below 3.5 lbs/ton are feasible and cost effective on SAPs No. A and B. It was noted from FDEP's Technical Support document that single absorption plants can achieve a conversion efficiency of 98%. This equates to 26.6 lb/ton uncontrolled (1306/0.98 - 1306 = 26.6 lb/ton - see pg 473, Air Pollution Engineering Manual). With a scrubber SO_2 removal efficiency of 95% (easily achievable using an ammonia scrubbing system), SAPs A and B should be capable of complying with an emission limit of at most

1.3 lbs/ton (26.6 lb/ton x (1-0.95) = 1.3 lbs/ton). Mr. Friedman's paper suggests emission rates somewhat less than this should be considered as well.

Because SAPs A and B are already equipped with scrubbers and they already are equipped with a system for handling scrubber effluent, I expect that an emission rate of no greater than 1.3 lbs/ton should be considered cost-effective and representative of BART for these units.

Considering mass SO_2 emissions, the difference between FDEP's proposed emission limits of 3.25 for SAPs C and D and 3.5 for SAPs A and B, and my recommended emission limits of 1.5 lbs/ton for SAPs C and D and 1.3 for SAPs A and B is over 3050 tons per year of SO_2. This reduction should be achievable through the use of technologies already employed on these units (dual absorption on C and D and ammonia scrubbing on SAPs A and B) and is therefore extremely cost effective, consistent with BART guidance.