APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Agricultural Chemicals Complex
White Springs Agricultural Chemicals, Inc.
PSD-FL-297 / 0470002-039-AC
White Springs, Hamilton County

The project proposed by White Springs Agricultural Chemicals, Inc. includes the conversion of the B Phosphoric Acid Plant to a hemi-hydrate process and an increase in the processing rate from 83 to 100 tons per hour P_2O_5 input; an increase in the processing rate of D Phosphoric Acid Plant from 95 to 110 tons per hour P_2O_5 input; an increase in the processing rate of Acid Clarification from 100 to 110 tons per hour P_2O_5 input; an increase in the processing rate of C & D Superphosphoric Acid Plant from 95 to 110 tons per hour P_2O_5 input; and an increase in the production rate of the X Train (Dical) from 45 to 55 tons per hour product.

The proposed modification will result in a significant increase in emissions of fluorides (F). The project is, therefore, subject to Prevention of Significant Deterioration (PSD) review in accordance with Rule 62-212.400, Florida Administrative Code (F.A.C.). A Best Available Control Technology (BACT) determination is part of the review required by Rules 62-212.400 and 62-296, F.A.C.

DATE OF RECEIPT OF COMPLETE BACT APPLICATION:

August 11, 2000

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 - Standards of Performance for New Stationary Sources or 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants.

- All scientific, engineering, and technical material and other information available to the Department.

- The emission limiting standards or BACT determination of any other state.

- The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

The air pollutant emissions from this facility can be grouped into categories based upon the control equipment and techniques that are available to control emissions from these emission units. Using this approach, the emissions can be classified as indicated below:

- ***Fluorides*** (HF, SiF_4). Controlled generally by scrubbing with pond water.
- ***Particulate Matter*** (PM, PM_{10}). Controlled generally by wet scrubbing or filtration.
- ***Combustion Products*** (SO_2, NO_X, PM). Controlled generally by good combustion of clean fuels.
- ***Products of Incomplete Combustion*** (CO, VOC). Controlled generally by proper combustion.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis.

Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "non-regulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., PM, SO_2, H_2SO_4, fluorides, etc.), if a reduction in "non-regulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

BACT LIMITS PROPOSED BY APPLICANT:

POLLUTANT	EMISSION LIMIT	LIMIT BASIS	CONTROL TECHNOLOGY
F (X Train)	1.65 lb/hr	0.03 lb/ton product	Wet scrubbers using pond water
F (B Phos.Acid)	1.35 lb/hr	0.0135 lb/ton P_2O_5 input	Wet scrubbers using pond water
F (D Phos.Acid)	1.49 lb/hr	0.0135 lb/ton P_2O_5 input	Wet scrubbers using pond water
F (C&D Superphos.)	0.96 lb/hr	0.0087 lb/ton P_2O_5 input	Wet scrubbers using pond water
F(Acid Clarification)	3.3 lb/hr	0.03 lb/ton P_2O_5 input	Wet scrubbers using pond water

BACT POLLUTANT ANALYSIS

Fluoride-containing gases, including hydrogen fluoride (HF), are evolved during the chemical reactions from the processes associated with the above emission units. Scrubbing the gas stream with pond water removes most of the fluoride evolved from the process. The applicant has proposed that the existing emission control equipment be considered as BACT.

BACT DETERMINATION BY THE DEPARTMENT:

Based on the information provided by the applicant and other information available to the Department, the following emission limits are established employing the top-down BACT approach.

POLLUTANT	EMISSION LIMIT	LIMIT BASIS	CONTROL TECHNOLOGY
F (X Train)	1.1 lb/hr	0.02 lb/ton product	Wet scrubbers using pond water
F (B Phos.Acid)	1.2 lb/hr	0.012 lb/ton P_2O_5 input	Wet scrubbers using pond water
F (D Phos.Acid)	1.32 lb/hr	0.012 lb/ton P_2O_5 input	Wet scrubbers using pond water
F (C&D Superphos.)	0.96 lb/hr	0.0087 lb/ton P_2O_5 input	Wet scrubbers using pond water
F(Acid Clarification)	3.3 lb/hr	0.03 lb/ton P_2O_5 input	Wet scrubbers using pond water

The top-down BACT determination for fluorides identified the control technologies listed below starting with the most stringent:

1. Packed scrubber using once-through fresh water.
2. Packed scrubber using neutralized water from a dedicated pond (fresh water makeup).
3. Existing scrubber, using packing, and process cooling pond water.

Use of once-through fresh water would achieve the highest level of fluoride removal but this option is not practical for operations where water conservation is required and plant water balance problems would be created.

Option 2 is possible, the main considerations being the cost of installing the pond and equipment and the cost of operating a lime treatment unit. Costs for Option 2, based on data for a similar

project amounted to almost $40,000 per ton of fluorides removed. FDEP considers this figure sufficiently high to rule out Option 2. However, it should be noted that the low magnitude of fluoride emissions relative to their potential environmental impact justifies the consideration of higher fluoride cost effectiveness figures relative to the high tonnage pollutants such as sulfur dioxide and nitrogen oxides.

For the proposed project, Option 3 is determined by the top-down approach as the basis for the fluoride BACT emission limit.

The BACT limits tabulated above for the emission units evaluated are based on the recent compliance test results for the units between 1995 - 1999. These limits have been demonstrated to be achievable based on the historical test data for the emission units.

COMPLIANCE

Compliance with the fluoride limit shall be demonstrated using EPA Reference Method 13A or 13B as contained in 40 CFR 60, Appendix A.

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

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Recommended By:	Approved By:
C. H. Fancy, P.E., Chief Bureau of Air Regulation	Howard L. Rhodes, Director Division of Air Resources Management
Date:	Date: