Prevention of Significant Air Quality Deterioration Review
Of Archer Daniels Midland – Valdosta
Located in Lowndes County, Georgia

FINAL DETERMINATION
SIP Permit Application No. 16260
September 2006

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

Stationary Source Permitting Program (SSPP)	**Planning & Support Program**
Prepared by	
Tyneshia Tate – NOx Unit	**Peter Courtney – Data & Modeling Unit**
Reviewed and Approved by:	
Michelle Keith – NOx Unit Coordinator **James A. Capp – SSPP Manager**	**James Boylan – Unit Coordinator, Data & Modeling Unit**
Heather Abrams – Chief, Air Protection Branch	

BACKGROUND

Archer Daniels Midland (hereafter ADM-Valdosta) submitted an application dated June 14, 2005 which was later modified per a January 12, 2006 addendum for an air quality permit to construct and operate two wood fired boilers. The facility is located at 1841 Clay Road in Valdosta, Lowndes County. ADM-Valdosta wishes to construct and operate two new wood-fired boilers rated at 52 million British Thermal Units per hour (MMBTU/hr) of heat input generating a total 80,000 pounds per hour of process steam. The steam generated by the proposed wood-fired boilers will displace steam currently generated by natural gas. The steam will be used for the facility's desolventizing, toasting meal, and drying processes. The steam will also be used for building heating and cooling.

On May 11, 2006, the Division issued a Preliminary Determination stating that the modifications described in Application No. 16260 should be approved. The Preliminary Determination contained a draft Air Quality Permit for the construction and operation of the modified equipment.

The Division requested that ADM-Valdosta place a public notice in a newspaper of general circulation in the area of the existing facility notifying the public of the proposed construction and providing the opportunity for written public comment. Such public notice was placed in *The Valdosta Daily Times* (legal organ for Lowndes County) on May 12, 2006. The public comment period expired on June 12, 2006.

During the comment period, comments were received from U.S. EPA Region IV and the facility. There were no comments received from the general public.

A copy of the final permit is included in Appendix A. A copy of written comments received during the public comment period is provided in Appendix B.

U.S. EPA REGION 4 COMMENTS

Comments were received from Brandi Jackson, Environmental Engineer, U.S. EPA Region 4, in a letter dated July 14, 2006. The comments are typed, verbatim, below and were the result of reviews by Ms. Brandi Jackson of U.S. EPA Region 4.

Comment 1
Typographical Error – In a sentence on page 4 of the preliminary determination (under the proposal section), "three existing natural gas-fired boilers" should be "four existing natural gas-fire boilers."

EPD Response to Comment 1
The Division will grant this request to correct the typographical error. The sentence in question will be revised as indicated below.

Upon startup and operation of the proposed boilers, the facility proposes to use the existing wood-fired boiler and the proposed wood-fired boilers to produce necessary facility steam, and reduce the usage of the ~~three~~ four existing natural gas-fired boilers.

Comment 2
Averaging Period – The averaging period for determining compliance with the NOx emission limit is not clear in the permit. In a discussion between EPA and GEPD on March 10, 2006, we indicated that a 30-day averaging period for small boilers such as these might be appropriate. However, the permit would need to state that the compliance averaging period is 30 days and would need to specify a direct or parametric means of showing compliance for a 30-day period. The only numerical NOx emission limit in the draft permit is a rate of 0.30 lb/MMBtu limit. These are short-term measurement methods, implying that the emission limit has short-term compliance averaging period. Without a specific compliance averaging period (either short-term or 30-day), the limit is not enforceable in a practical manner.

Comment 3
NOx Emission Limit – The application establishes an emission rate of 0.30 lb/MMBtu for NOx emissions from the wood-fired boilers based on information for similar units in the RACT/BACT/LAER Clearinghouse. According to page 4-21 of the application, the emission rate is correlated to a best available control technology emission limit of 31.5 lb/hr. A limit of 31.5 lb/hr should be indicated in the permit.

EPD Response to Comments 2 and 3:
As requested the NOx lbs/MMBTU emission limit averaging period will be based on the averaging period specified in the performance test method. Per the applicable approved test methods, the average parameter values measured during each test run over the three-run performances test must be calculated. Each test run must last at least one hour. Condition 4.2.19 has been revised to clarify this.

Regarding the request to include a 31.5 lb/hr NOx emission limit in the permit, EPD is not aware of any requirement for BACT limits to be on a mass per unit time basis (i.e. lb/hr). In fact, it is common practice for BACT limits from combustion processes to be a concentration basis. EPA provided no other explanation other than the fact the applicant used this limit in the application. Since the NOx limit in the draft permit of 0.30 lbs/MMBTU meets the BACT requirements under the PSD rules and since additional NOx limits in different units would be superfluous, no changes to the permit are made based on this comment.

As a result the permit will be revised as follows.

4.2.19 The Permittee shall demonstrate initial compliance with Permit Condition 3.3.10 by conducting initial performance testing using the appropriate procedures in Method 7 or Method 7E. Performance testing shall be conducted as an initial performance tests only. <u>The sampling time for each test run shall be a minimum of sixty (60) minutes.</u>

The Permittee shall conduct a total of three (3) performance tests. The performance tests shall be conducted for the following operating scenarios: Boiler 115A operating independently, Boiler 115B operating independently, and Boiler 155A and Boiler 115B operating concurrently. Such performance tests shall be conducted at maximum load for both boilers (Source Codes: B115A and B115B) and using worst-case proposed fuel blend. In the event, however, the Permittee proposes to make any changes to the operation of either boiler (Source Code: B115A or B115B) the facility must submit the proposed changes to the Division for review at least 30 days prior to the proposed changes for review and approval. If the Division deems necessary, the Permittee shall conduct performance testing by applicable methods before the propose changes can occur.

In the event that the Permittee fires a fuel blend in either boiler (Source Code: B115A or B115B) that differs that fuel blend fired during performance testing required by this permit condition, the facility must conduct fuel analysis to demonstrate that the applicable pollutant content level is less than that used to demonstrate initial compliance. If the pollutant content level established during the initial performance tests is exceeded, then a new performance test is required to demonstrate compliance with the applicable emission limit/operation standard. No performance tests shall be conducted during periods of startup, shutdown, or malfunction.
[40 CFR 52.21]

ADM-VALDOSTA COMMENTS

Comments were received from Amsey Boyd, Extraction Plant manager, by letter on June 19, 2006.

Comments (Comments 1, 2, 5, 6, 7, 8, 9, and 10) relating only to non-PSD pollutants are addressed in the Narrative Addendum associated with Permit Number 2075-185-0051-V-01-6.

Comment 3

Conditions 4.2.8, 4.2.15, 4.2.17, 4.2.18, 4.2.19, and 4.2.23 state: The Permittee shall conduct a total of three (3) performance tests. The performance tests shall be conducted for the following operating scenarios: Boiler 115A operating independently, Boiler 115B operating independently, and Boiler 115A and Boiler 115B operating concurrently.

Request – Change Conditions 4.2.8, 4.2.15, 4.2.17, 4.2.18, 4.2.19, and 4.2.23 to state: The Permittee shall conduct a total of two (2) performance tests. The performance tests shall be conducted for the following operating scenarios: Boiler 115A operating independently and Boiler 115B operating independently.

Rationale – If testing of the individual boilers is conducted, there is no need for testing with both boilers operating given none of the emission compliance calculations use the emission factor from the combined test.

EPD Response to Comment 3

The Division will address comments to Permit Conditions 4.2.8, 4.2.15, and 4.2.17 will be addressed in the Narrative Addendum associated with Permit Number 2075-185-0051-V-01-6.

ADM-Valdosta has permit limits for applicable pollutant emissions for Boiler 115A and Boiler 115B operating individually as well as concurrently. In order to demonstrate compliance with the concurrent boiler operation limits, the performance testing with Boiler 115A and Boiler 115B operating concurrently is deemed necessary. Therefore, the Division will not modify the testing requirements for Permit Conditions 4.2.18, 4.2.19, and 4.2.23.

Comment 4

Condition 4.2.9, 4.2.10, 4.2.11, 4.2.12, 4.2.13, 4.2.15, 4.2.17, 4.2.18, 4.2.19, 4.2.20, 4.2.22, and 4.2.23 state: In the event, however, the Permittee makes any changes to operation including but not limited to the fuel blend fired in either boiler (Source Code: B115A or B115B) the facility must ……

Request – Change Condition 4.2.9, 4.2.10, 4.2.11, 4.2.12, 4.2.13, 4.2.15, 4.2.17, 4.2.18, 4.2.19, 4.2.20, 4.2.22, and 4.2.23 to state: In the event, however, the Permittee makes any changes to operation not addressed by the permit application the facility must ……

Rationale – The requested change seems to be a more reasonable approach.

EPD Response to Comment 4

Comments on Permit Conditions 4.2.9, 4.2.10, 4.2.11, 4.2.12, 4.2.13, 4.2.15, 4.2.17, and 4.2.22 will be addressed in the Narrative Addendum associated with Permit Number 2075-185-0051-V-01-6.

The Division has considered ADM-Valdosta's request and is not inclined to modify the conditions in question as requested. The Division has incorporated provisions for ADM-Valdosta to test using the worst-case fuel blend for the regulated pollutant. ADM-Valdosta can use different fuel blends for which fuel analysis indicates that the each regulated pollutant content level is less than that used to demonstrate initial compliance. If the pollutant content level established during the initial performance tests is exceeded, then a new performance test is required to demonstrate compliance with the applicable emission limit/operation standard. Operation changes could possibly affect the emissions from the boilers, and therefore the Division needs reasonable assurance that such changes do not affect the ADM-Valdosta's ability to comply with applicable limits. Consequently, the Division requests submittal of proposed changes to operation at least 30 days prior to the proposed changes for review and approval. If the Division deems such changes acceptable without requiring additional performance tests, ADM is able to make such changes with the Division's approval. In the event the Division deems that performance testing is required, then ADM will be required to perform such testing. Therefore, Permit Conditions 4.2.18, 4.2.19, 4.2.20, and 4.2.23 are deemed necessary but will be modified as follows.

4.2.18 To demonstrate initial compliance with Permit Condition 3.3.11, the Permittee shall conduct initial performance tests and establish operating limits, as applicable, according to §63.7520, paragraph (c), Tables 5 and 7 of 40 CFR Part 63, Subpart DDDDD.

The Permittee shall conduct annual performance tests thereafter to determine compliance the Permit Condition 3.3.11.

The Permittee shall conduct a total of three (3) performance tests. The performance tests shall be conducted for the following operating scenarios: Boiler 115A operating independently, Boiler 115B operating independently, and Boiler 155A and Boiler 115B operating concurrently. Such performance tests shall be conducted at maximum load for both boilers (Source Codes: B115A and B115B) and using worst-case proposed fuel blend. In the event, however, the Permittee proposes to make~~s~~ any changes to the operation ~~including but not limited to the fuel blend fired in~~ of either boiler (Source Code: B115A or B115B) ~~the facility must conduct performance testing by applicable methods.~~ must submit the proposed changes to the Division for review at least 30 days prior to the proposed changes for review and approval. If the Division deems necessary, the Permittee shall conduct performance testing by applicable methods before the propose changes can occur.

In the event that the Permittee fires a fuel blend in either boiler (Source Code: B115A or B115B) that differs that fuel blend fired during performance testing required by this permit condition, the facility must conduct fuel analysis to demonstrate that the applicable pollutant content level is less than that used to demonstrate initial compliance. If the pollutant content level established during the initial performance tests is exceeded, then a new performance test is required to demonstrate compliance with the applicable emission limit/operation standard. No performance tests shall be conducted during periods of startup, shutdown, or malfunction.

4.2.19 The Permittee shall demonstrate initial compliance with Permit Condition 3.3.10 by conducting initial performance testing using the appropriate procedures in Method 7 or Method 7E. Performance testing shall be conducted as an initial performance tests only. The sampling time for each test run shall be a minimum of sixty (60) minutes.

The Permittee shall conduct a total of three (3) performance tests. The performance tests shall be conducted for the following operating scenarios: Boiler 115A operating independently, Boiler 115B operating independently, and Boiler 155A and Boiler 115B operating concurrently. Such performance tests shall be conducted at maximum load for both boilers (Source Codes: B115A and B115B) and using worst-case proposed fuel blend. In the event, however, the Permittee proposes to makes any changes to the operation ~~including but not limited to the fuel blend fired in~~ of either boiler (Source Code: B115A or B115B) the facility ~~must conduct performance testing by applicable methods.~~ must submit the proposed changes to the Division for review at least 30 days prior to the proposed changes for review and approval. If the Division deems necessary, the Permittee shall conduct performance testing by applicable methods before the propose changes can occur.

In the event that the Permittee fires a fuel blend in either boiler (Source Code: B115A or B115B) that differs that fuel blend fired during performance testing required by this permit condition, the facility must conduct fuel analysis to demonstrate that the applicable pollutant content level is less than that used to demonstrate initial compliance. If the pollutant content level established during the initial performance tests is exceeded, then a new performance test is required to demonstrate compliance with the applicable emission limit/operation standard. No performance tests shall be conducted during periods of startup, shutdown, or malfunction.
[40 CFR 52.21]

4.2.20 The Permittee shall conduct an initial performance test per Permit Condition 4.2.19 to establish a Nitrogen Oxides Emission Factor for each boiler (Source Codes: B115A and B115B), in pounds of nitrogen oxides per ton of wood wasted combusted. Such performance tests shall be conducted at maximum load for both boilers (Source Codes: B115A and B115B) and using worst-case proposed fuel blend.

In the event, however, the Permittee proposes to makes any changes to the operation ~~including but not limited to the fuel blend fired in~~ of either boiler (Source Code: B115A or B115B) the facility ~~must conduct performance testing by applicable methods.~~ must submit the proposed changes to the Division for review at least 30 days prior to the proposed changes for review and approval. If the Division deems necessary, the Permittee shall conduct performance testing by applicable methods before the propose changes can occur.

In the event that the Permittee fires a fuel blend in either boiler (Source Code: B115A or B115B) that differs that fuel blend fired during performance testing required by this permit condition, the facility must conduct fuel analysis to demonstrate that the applicable pollutant content level is less than that used to demonstrate initial compliance. If the pollutant content level established during the initial performance tests is exceeded, then a new performance test is required to demonstrate compliance with the applicable emission limit/operation standard. The Permittee shall furnish to the Division a written report of the results of such performance tests.

No performance tests shall be conducted during periods of startup, shutdown, or malfunction.

4.2.23 The Permittee shall conduct an initial performance test to establish the maximum wood waste firing rate, nitrogen content of the fuel, and heat value at which compliance with Condition No. 3.3.10 can be demonstrated.

The Permittee shall conduct a total of three (3) performance tests. The performance tests shall be conducted for the following operating scenarios: Boiler 115A operating independently, Boiler 115B operating independently, and Boiler 155A and Boiler 115B operating concurrently. Such performance tests shall be conducted at maximum load for both boilers (Source Codes: B115A and B115B) and using worst-case proposed fuel blend. In the event, however, the Permittee proposes to makes any changes to the operation ~~including but not limited to the fuel blend fired in~~ of either boiler (Source Code: B115A or B115B) ~~the facility must conduct performance testing by applicable methods.~~ must submit the proposed changes to the Division for review at least 30 days prior to the proposed changes for review and approval. If the Division deems necessary, the Permittee shall conduct performance testing by applicable methods before the propose changes can occur.

In the event that the Permittee fires a fuel blend in either boiler (Source Code: B115A or B115B) that differs that fuel blend fired during performance testing required by this permit condition, the facility must conduct fuel analysis to demonstrate that the applicable pollutant content level is less than that used to demonstrate initial compliance. If the pollutant content level established during the initial performance tests is exceeded, then a new performance test is required to demonstrate compliance with the applicable emission limit/operation standard. The Permittee shall furnish to the Division a written report of the results of such performance tests.

No performance tests shall be conducted during periods of startup, shutdown, or malfunction.
[40 CFR 52.21]

Comment 11

On page 27 of the Preliminary Determination, it states: EPD believes that catalytic oxidation is technically feasible and achievable in practice for the proposed modification.
Request – Rewrite the exclusion rationale to be consistent with the rationale for SCR.
Rationale – Be consistent with the rationale for SCR.

EPD Response to Comment 11

The discussion for both SCR (page 25) and catalytic oxidation in the Preliminary Determination both indicate that these control technologies are technically feasible since a permit has been issued for the institution of such technologies for control of nitrogen oxides and carbon monoxide emissions for wood-fired boilers, which have yet to be constructed. The Division hereby modifies the discussion of catalytic oxidation as follows to be consistent with the discussion of SCR.

Catalytic oxidation is a post combustion control technique for reducing emissions of CO. A catalytic oxidation system is a passive reactor, which consists of a honeycomb grid of metal panels, typically coated with a platinum or rhodium. The catalyst grid is placed in an enlarged duct or reactor with flue gas inlet and outlet distribution plates. An acceptable catalyst operation range is 450 ^{o}F to 1,100 ^{o}F. To achieve this temperature range for the proposed boilers, the catalysts would need to be installed in each boiler before the second fire tube section. The oxidation process takes place spontaneously, without the requirement for introducing reactants (such as ammonia) into the flue gas stream. The catalyst serves to lower the activation energy necessary for complete oxidation of these incomplete combustion byproducts to carbon dioxide. The active component of most catalytic oxidation systems is platinum metal, which has been applied over a metal or ceramic substrate.

The primary limitation that may preclude the use of catalytic oxidation is catalyst poisoning and deactivation by sulfur containing compounds in the flue gas. EPD believes that catalytic oxidation is technically feasible ~~and achievable in practice~~ for the proposed modification. This determination is based on the issuance of a permit to South Point Power for the installation of boilers discussed under SCR control. As previously discussed, the proposed boilers have yet to be constructed. Therefore, there is no technical demonstration of the catalytic oxidation in the US. …

Comment 12

On page 31 of the Preliminary Determination, it states: The modeling of the boilers was performed using actual stack height since the stack exceeded GEP requirements.
Request – Change this to state: The modeling of the boilers was performed using the proposed stack height, which did not exceed GEP.
Rationale – This is how the modeling was conducted.

EPD Response to Comment 12
The Division hereby grants this request to correct the typographical error. The sentence in question will be revised as indicated below.

The modeling of the boilers was performed using actual stack height ~~since the stack exceeded GEP requirements.~~, which did not exceed the GEP requirements.

Comment 13
On page 34 of the Preliminary Determination, it states: The labor force at the ADM Valdosta facility is approximately 57,000.
Request – Change this to state: The labor force for the Valdosta metropolitan statistical area is approximately 57,000.
Rationale – Correct the typo.

EPD Response to Comment 13

The Division will grant this request to correct the typographical error. The sentence in question is hereby revised as indicated below.

The labor force ~~at~~ in the ~~ADM-Valdosta facility~~ Valdosta metropolitan statistical area is approximately 57,000. …

EPD CHANGES

Page 25 of the Preliminary Determination is hereby updated to reflect the changes resulting from EPA Region IV's comment. The document was modified as follows:

> EPD has determined that the proposal to use a good combustion with an emission limit of 0.30 lbs NOx/MMBTU to meet the requirements of BACT. The NOx lbs/MMBTU emission limit averaging period will be based on the averaging period specified in the performance test method. Per the applicable approved test methods, the average parameter values measured during each test run over the three-run performances test must be calculated. Each test run must last at least one hour. Therefore, this limit will be a 3-hour average limit. This NOx BACT limit applies during all periods of boiler firing, including startup, shutdown, and malfunction.

Page 27 of the Preliminary Determination is hereby updated to read as follows:

> The primary limitation that may preclude the use of catalytic oxidation is catalyst poisoning and deactivation by sulfur containing compounds in the flue gas. EPD believes that catalytic oxidation is technically feasible for the proposed modification. This determination is based on the issuance of a permit to South Point Power for the installation of boilers discussed under SCR control. As previously discussed, the proposed boilers have yet to be constructed. Therefore, there is no technical demonstration of the catalytic oxidation ~~in the US~~.

APPENDIX A

AIR QUALITY PERMIT

2075-185-0051-V-01-6

APPENDIX B

WRITTEN COMMENTS
RECEIVED DURING
COMMENT PERIOD