

Prevention of Significant Air Quality Deterioration Review

Final Determination

August, 2013

Facility Name: DSM Chemicals North America, Inc.

City: Augusta

County: Richmond

AIRS Number: 04-13-24500003

Application Number (PSD, Title V): 21476

Date Application Received: October 1, 2012

Review Conducted by:

State of Georgia-Department of Natural Resources
Environmental Protection Division - Air Protection Branch
Stationary Source Permitting Program

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BACKGROUND

DSM Chemicals North America, Inc. (DCNA) submitted a PSD application for a large number of projects at their facility located at 1 Columbia Nitrogen Road, Augusta, Richmond County, Georgia. The application was received on October 1, 2012. The application was found to be administratively deficient upon submittal and the applicant resolved all of the administrative deficiencies by November 29, 2012. The applicant resolved all technical and regulatory issues by April 30, 2013.

The facility requested authorization to implement plant projects to improve the plant's reliability which may increase the plant capacity. The projects are being proposed for a variety of reasons including enhanced reliability, and improved mechanical integrity. Although many of the changes are not designed to increase capacity, and most do not meet the definition of "modification" as defined in the PSD regulations, collectively they could debottleneck the existing process to the extent that the plant's overall production capacity could increase. Additionally, the increased production may require additional utilization of the plant's boilers. DCNA requested authorization to construct and operate the following new equipment: (1) Chip plant storage and product handling (emission unit ID No. C316); (2) 11.6 MMBtu/hr natural gas fired hot oil furnace (emission unit ID No. B030); (3) An HPO IPL Polishing Column (emission unit ID No. G18Y); and (4) An ammonia combustor (emission unit ID No. R33).

On June 7, 2013, the Division issued a Preliminary Determination stating that the modifications described in Application No. 21476 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 DCNA 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 *Augusta Chronicle* (legal organ for Richmond County) on June 13, 2013. The public comment period expired on July 23, 2013.

A public hearing for the application and Preliminary Determination was held by Georgia EPD on July 23, 2013 at 6:30pm at the following location:

W.S. Hornsby School
310 Kentucky Avenue
Augusta, GA 30901

There were no comments received from the general public during the public comment period. Comments were received from the U.S. EPA Region IV and DCNA.

A copy of comments received from DCNA and the U.S. EPA Region IV as well as the final permit and are included as separate documents to this narrative.

REVIEW OF COMMENTS

Comments from the U.S. EPA Dated July 9, 2013:

1. U.S. EPA Comment- DCNA Plant Property: The U.S. EPA provided comments to Georgia EPD on DCNA's application in a letter to Georgia EPD dated April 5, 2013. Based on our review of DCNA's April 29, 2013, response letter to the EPA's air quality impact assessment comments on the above noted PSD permit application, the following issues/comments remain outstanding. DCNA's responses do not resolve these issues and concerns. We provided these comments to help ensure that the project meets federal Clean Air Act requirements, that the permit will provide necessary information so that the basis for the permit decision is transparent and readily accessible to the public, and that the record provides adequate support for the permit decision. . . . [Note: DCNA's indicated additional modeling was not available for review.]

Georgia EPD Response: DCNA (i.e., DSM) provided an updated Application (received May 3, 2013 and dated April 29, 2013) to Georgia EPD in response to questions posed by Georgia EPD and the U.S. EPA. DCNA also provided a letter to Georgia EPD, dated April 29, 2013 in which they responded to EPA's questions posed in a letter to Georgia EPD dated April 5, 2013.

DCNA's April 29, 2013 response letter is part of the public application record used in the preparation of Georgia EPD's Preliminary Determination.

Georgia EPD also notes that CD's containing the entire air impact assessment modeling files were submitted to the U.S. EPA on June 7, 2013 along with copies of the public application record and the Preliminary Determination..

2. U.S. EPA Comment: The plant site contains seven facilities located contiguous to each other. The provided description of the separate facilities identifies four of the seven (i.e., DSM Resin, DCNA Caprolactam, Evergreen Nylon Recycling, and Augusta Polymer Plants) as either owned and/or operated by DCNA. The other three facilities, PCS Nitrogen, Praxair, and Linde Plants are on contiguous property but owned and operated by separate entities and considered separate sources. Given the above description of the plant site, only the property associated with the four facilities owned and/or operated by DCNA could be considered non-ambient air for the air quality modeling if their boundary contains barriers to prevent public access (e.g., the employees of the other plants). Figure 6.5 provides DCNA facility plot with an indicated fence line. Confirmation is needed that the property boundary, used as the location of the nearest modeled receptors, only encompasses the properties of the four plants where DCNA either controls and/or owns the property.
 - (a) The non-ambient air used in the modeling appears to include the facilities identified in our original comment. Based on DSM's response, PCS Nitrogen property should not be included as non-ambient air. The project impacts on PCS

Nitrogen property should be included in the assessment.

- (b) The provided operating characteristics for the Praxair and Linde facilities indicate no full-time or part-time employees for both Praxair and Linde. DSM controls access of their employees as they would for any other contractor. To ensure future operational characteristics of Praxair and Linde facilities remain as described and DSM continues to control their employees as visiting contractors, these operating characteristics should be included as permit conditions.

Georgia EPD Response:

- (a) Georgia EPD determined that PCS Nitrogen facility operations constitute “ambient air” for this project. The following dialogue is taken from the Preliminary Determination on page 37: *The applicant’s proposal is found on page 44 of the April 2013 version of the application. Modeling receptors were placed on the boundary of the Title I site and outside of the Title I site. This includes modeling receptors on top of PCS Nitrogen (AIRS#: 24500002) and General Chemical (AIRS#: 24500008).*
- (b) Controlled access to the site, including treatment of neighboring facility employees in a manner similar to visiting contractors, is a matter of internal site security operations and RMP and PSM requirements and therefore does not need to be included in the facility’s air permit.

3. U.S. EPA Comment: This comment pertains to “Project Emissions.”

- (a) The project emissions for ambient impact assessment are not the same as those used for PSD applicability. The project emissions for impact modeling assessment are the difference between current actual emissions based on the previous 2-year operation, and the future allowable emissions upon completion of the project.
- (b) These project emissions should be determined for each emitted pollutant and associated averaging periods (e.g., recognize the difference between allowable/actual hourly emissions for annual vs. short-term ambient standards).
- (c) Because the project emissions should be based on the future allowable rates, the post-project emission rates used to determine project emissions for impact modeling should be included as future permit limits. (Note that DSM’s post-project emissions were developed from the pre-project actual rates plus a percent increase so the future plant allowable emissions may be less than current permit allowable limits).

Georgia EPD Response:

In the significance modeling, the emission rate for new sources should be based on the

unit's future maximum emissions or allowable emissions, whichever is lower, for both short-term and long-term averaging periods, as applicable. Existing sources that are being modified that will see a change in emissions as a result of the proposed project are modeled for both their past actual emissions (based on normal operation over the previous two years and modeled as a negative emission rate) and future maximum emission rate or allowable emissions, whichever is lower (modeled as a positive emission rate) after the proposed project is complete.

Georgia EPD reviewed the basis for the modeled emission rates for the air impact assessment performed for nitrogen dioxide.

- DCNA used the most recent two years for the past actual emissions for the existing emission units to be modified as part of this project, based on Georgia EPD's review of the record. Georgia EPD tabulated the results of its review of the record as shown in the following table: [Note: The application was submitted in October 2012.]

Unit Name	Stack ID	UTMx (Zone 17) (m)	UTMy (Zone 17) (m)	Calendar Year (CY) represented in Baseline
H2050 Hydrogen Reformer	S002	413074	3700057	CY 2010 through CY 2011 two year period
N2 Anol Converter	S012	413326	3700186	CY 2010 through CY 2011 two year period
Boiler Plant	S014	413164	3700052	CY 2010 through CY 2011 two year period
N3 Anol Converter	S017	413306	3700205	CY 2010 through CY 2011 two year period
H3050 Hydrogen Reformer	S020	413085	3700118	CY 2010 through CY 2011 two year period
Hot Oil Heater	S030	413046	3699958	Potential to Emit, no baseline emissions
New Ammonia Combustor	S033	413178	3700243	Potential to Emit, no baseline emissions

- DCNA used the potential to emit as the modeled emission rate for proposed new emission units. Although not being modified, the boilers will be subject to a new

NO_x emission limit in the permit as a result of NO₂ SIL modeling performed by Georgia EPD. Note: The draft permit specified an NO₂ modeling limit and this is permit condition is revised to represent NO_x instead of NO₂.

- DCNA used projected future actual emissions for existing units based on a future maximum emission rate scenario.

The conclusion drawn from Georgia EPD's re-analysis agrees with the conclusion drawn in the Preliminary Determination that the applicant's air impact assessment complies with the requirements of Georgia's PSD state rule.

4. U.S. EPA Comment – Meteorological Data:

Although the surface characteristics of the albedo and Bowen ratio for the selected meteorological site and the project site are similar, the surface roughness parameters are not similar for about half of the 12 wind direction sectors considered. The project site has significantly higher roughness for all but one of these sectors. Because the NO₂ NAAQS includes a 1-hour standard, the differences in surface roughness between the meteorological and project sites for these sectors may affect the resultant modeled controlling concentration. Considering the differences in roughness between the meteorological and project sites, an explanation should be provided as to why the selected meteorological data would provide representative or conservative ambient concentrations for the project locations.

- (a) The initial comment [from EPA] requested an explanation/justification for the selected meteorological data record given the differences in surface roughness between the project site and the meteorological measurement site. A demonstration should be provided to show that the selected meteorological data record provides representative or conservative ambient concentrations for the project site.
- (b) Except in areas with uniform surface characteristics, use of one 360 degree sector to represent the existing surface roughness characteristics is generally not appropriate. Three meteorological data records each processed using one 360 degree sector, and three difference relative surface roughness values were provided as alternatives to representativeness of the project site. The selection of the most representative meteorological data record from these three process records does not address the representative issue noted in this comment.

Georgia EPD Response: The applicant's representative analysis of the meteorological data used in the analysis is provided in Section 6.3 (pages 45-50) of the April 2013 application edition. Georgia EPD reviewed this section again in light of the U.S. EPA's comment. Table 6.3.1 of the application compared the surface characteristics between the meteorological and project sites, the Bowen ratios and Albedos are similar, and, the surface roughness at the project site is generally greater than at the meteorological site. However, the differences are generally within thirty (30) percent except for the following sectors: (1) 30~60 degrees; (2) 120~150 degrees; (3) 180~210 degrees; and (4) 210~240

degrees. Considering the close proximity of the Daniel Field meteorological site, located less than 10 km from the DCNA site, and cancelling effects on the concentrations from the low surface roughness and higher wind speed, the applicant concludes that the meteorological data for Daniel Field would provide the representative and conservative ambient concentrations for the project location. Georgia EPD concurs with the applicant's findings.

5. U.S. EPA Comment – DCNA Modeled Release Parameters: The following comments are associated with the modeled release parameters provided in Table 6.4.2.

- (a) The post-project emission rates used in the modeling analysis are based on the past-actual values assuming a percent increase in capacity. The basis of the percent increase should be explained (e.g., is the increase capacity based on current permit allowable or from past-actual operations). Because the modeled post-project emissions should be permit allowable or maximum potential values, they should be included as the new permit limits.
- (b) The change in stack S020 height is expected to also produce changes in the exit temperature and velocity. The reason(s) there are not changes in these exit parameters should be provided.
- (c) The project emissions for ambient impact assessment are not the same as those used for PSD applicability. The project emissions for impact modeling are the difference between current actual emissions based on the previous 2-year operation, and future allowable emissions upon completion of the project.

Georgia EPD's Response:

- (a) The draft permit contains emission limits for nitrogen oxides (NO_x) on the new ammonia combustor (Stack ID S033) and on the boiler plant stack (Stack ID S014). The NO_x emission limit for the new ammonia combustor is based on "best available control technology" (BACT) and this emission limit was used as part of the air impact assessment for nitrogen dioxide emissions (NO₂). The NO_x emission limit for the boiler plant is set as an NO₂ modeling limit for the project.

The emissions increase for applicable emission units are based solely on the increased utilization of these sources that could result from the project.

- (b) Proposed Condition No. 3.3K.1 requires, in part, that if the Permittee constructs or operates a source or modification not in accordance with the application submitted pursuant to Georgia Rule 391-3-1-.02(7) or with the terms of any approval to construct, the Permittee shall be subject to appropriate enforcement action.
- (c) This comment was posed by the U.S. EPA as part of their comment numbered "3" of this Final Determination. Please refer to Georgia EPD's response to comment

#3.

Comments from the DCNA dated July 22, 2013:

1. Draft Condition 3.1.1: DCNA requests deletion of the equipment numbers “H-5040” and R3606” for Emission Units B030 and R033. This equipment will be assigned identification numbers during installation.

Georgia EPD Response: The equipment description for emission unit ID B030 will be changed as follows:

~~H-5040~~ Hot Oil Furnace.

The equipment description for emission unit ID R033 will be changed as follows:

~~R3607~~ Ammonia Combustor Converter.

Note: Draft Condition 3.1.1 identifies the equipment number for emission unit ID No. R033 as “R3607” and not as “R3606” as noted by DCNA.

2. Draft Condition 3.3E.6: DCNA requests the following revision:

*The Permittee shall comply with all ~~application~~ applicable provisions of the New Source Performance Standards (NSPS) as found in 40 CFR 60 Subpart A “General Provision” and 40 CFR 60 Subpart Dc “Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units,” for the operation of hot oil furnace with emission unit ID No. B030.
[40 CFR 60 Subparts A and Dc]*

Georgia EPD Response: Georgia EPD agrees with the need to correct this typographical error.

3. Draft Condition 3.3K.2: DCNA requests the following revision:

*Approval to construct **source or modification as defined in Application No. 21476** shall become invalid if construction is not commenced within 18 months after receipt of such approval, if construction is discontinued for a period of 18 months or more, or if construction is not ~~compliance-completed~~ completed within a reasonable time. The Director may extend the 18-month period upon a satisfactory showing that an extension is justified. This provision does not apply to the time period between construction of the approved phases of a phased construction project; each phase must commence construction within 18 months of the projected and approved commencement date.
[40 CFR 52.21(r)(2)]*

Georgia EPD Response: Georgia EPD agrees with the need to correct this typographical error.

4. Draft Conditions 3.3K.10, 5.2K.1.c, and 6.1K.1.b.v: The limit addressed in these conditions should be converted from NO₂ to NO_x as DCNA's existing analyzers on three of the boilers are designed for NO_x. The limit can be converted from NO₂ to NO_x using the 80 percent NO₂-to-NO_x ratio specified in Condition 4.2K.3. Using this factor, the limit of 145 lb/hr of NO₂ currently written in the draft permit becomes 181 lb/hr of NO_x. Further, these conditions specify a twelve month implementation period from issuance of the permit for the installation of the continuous monitoring system to monitor compliance with this limit. Due to the time required for DCNA to obtain corporate approval of capital projects of the new monitor, DCNA requests that the implementation period in all three of these conditions be extended to 18 months.

Georgia EPD Response: The boiler plant is comprised of boilers B005 (H-002), B006 (H-2002), B014 (H-3002), and B022 (H-3003). Emissions of NO_x from boilers B005, B006, and B014, each, are regulated, in part by NSPS regulations. DCNA operates a NO_x CEMS for each of these boilers in the exhaust ductwork from the particular boiler in accordance with applicable NSPS regulations. Emissions of NO_x from boiler B022 will be regulated by new Permit No. 2869-245-0003-V-04-3 [3.3K.10]. DCNA does not operate a NO_x CEMS for boiler B022.

Georgia EPD agrees to revise draft Condition Nos. 3.3K.10, 5.2K.1.c, and 6.1K.1.b.v as requested. Georgia EPD determined that draft Condition No. 5.2K.6 should be revised as well to be consistent with the changes made to draft Condition No. 5.2K.1.c. New Condition 5.2K.10 is added to provide a compliance mechanism for draft Condition No. 3.3K.10.

3.3K.10 The Permittee shall not discharge or cause the discharge into the atmosphere ~~nitrogen dioxide (NO₂) emissions in excess of 145.0 pounds per hour~~ NO_x emissions in excess of 181 pounds per hour from boilers with emission unit ID Nos. B005, B006, B014, B022, on a combined basis. This emission rate is on a 1-hour basis. This Permit Condition becomes effective ~~twelve months~~ eighteen months from the date of permit issuance.

[NO₂ PSD Modeling Avoidance Limit assuming that NO₂ emissions are 80% of NO_x emissions]

5.2K.1.c

*A Continuous Emissions Monitoring System (CEMS) for measuring ~~NO₂~~ NO_x concentration and diluent concentration (either oxygen or carbon dioxide) discharge to the atmosphere from the boiler ~~plant with stack ID No. S014~~ with emission unit ID No. B022. ~~For purposes of this condition, the boiler plant includes boilers with emission unit ID Nos. B005, B006, B014, and B022.~~ The one-hour average nitrogen oxides emissions rates shall be recorded in pound per hour. The diluent concentration shall be expressed in percent. Each ~~NO₂~~ NO_x diluent CEMS must be installed and certified according to Performance Specification 2 in appendix B of **The Procedures for Testing and Monitoring Sources of Air Pollutants**, except the 7-day calibration drift shall be based*

on unit operating days and not calendar days. This Permit Condition becomes effective ~~twelve~~ eighteen months from the date of final permit issuance.

[NO₂ Modeling Limit, 40 CFR 70.6(a)(3)(i), and 391-3-1-.02(6)(b)1.]

5.2K.6

The Permittee shall obtain ~~NO₂~~ NO_x emissions data for at least 75 percent of the operating hours for ~~boiler plant stack ID No. S014~~ boiler with emission unit ID No. B022 during each month, ~~that any of the boilers with emission unit ID No. B005, B006, B014, and B022 are operated.~~ If this minimum data required is not met using either CEMS required by Condition No. 5.2K.1, the Permittee may supplement the emissions data with data obtained by conducting sampling using the methods prescribed in Condition 4.1.3. The Permittee shall maintain records, which identify periods during each calendar month for which ~~NO₂~~ NO_x data have not been obtained for 75 percent of the ammonia combustor operating hours during the month, includes reasons for not obtaining sufficient data and a description of corrective actions taken. This Permit Condition becomes effective ~~twelve~~ eighteen months from the date of final permit issuance.

[NO₂ Modeling Limit, 40 CFR 70.6(a)(3)(i), and 391-3-1-.02(6)(b)1.]

New Condition 5.2K.10

The Permittee shall determine and record the 1-hour average NO_x emission rate from the boiler plant stack ID No. S014. The 1-hour average NO_x emission rate shall be determined from requirements specified in Condition Nos. 5.2.1.e and 5.2K.1c. For purposes of this condition, the boiler plant includes boilers with emission unit ID Nos. B005, B006, B014, and B022. This Permit Condition becomes effective eighteen months from the date of final permit issuance.

[NO₂ Modeling Limit, 40 CFR 70.6(a)(3)(i), and 391-3-1-.02(6)(b)1.]

6.1K.1.b.v

- v. Any one-hour rolling average ~~NO₂~~ NO_x emission rate, determined in accordance with Condition No. ~~5.2K.1e~~, 5.2K.10 which exceeds ~~145~~ 181 pounds per hour for the boiler plant stack ID No. S014. For purposes of this condition, the boiler plant consists of boilers with emission unit ID Nos. B005, B006, B014, and B022. This Permit Condition becomes effective ~~twelve~~ eighteen months from the date of final permit issuance.

5. Draft Condition 3.3L.2: DCNA requests the following revisions to this condition:

The Permittee shall comply with all applicable provisions of 40 CFR 63 Subpart DDDDD – National Emission Standards for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Furnaces as the NESHAP applies to boilers with emission unit ID Nos. ~~B014 and B029~~ B014 and B022, hot oil furnaces with emission unit ID Nos. B029 and B31B, steam superheater with emission unit ID Nos. B31A on or before January 31, 2016. Boilers with emission unit ID Nos. B005 and B006 are not subject to Subpart ~~DDDD~~ DDDDD in accordance with 40 CFR 63.7491(m).

[40 CFR 63 Subpart DDDDD-40 CFR 63.7495(b)]

Georgia EPD Response: Georgia EPD agrees with the applicant's request to fix typographical errors. The **bold font** changes are introduced by Georgia EPD to fix a typographical error.

6. Draft Condition 4.2K.3: This condition requires initial stack testing on the boilers (Stack ID No. S014) within fourteen months of issuance of the permit. DCNA requests that the condition be predicated on the completion of the project rather than issuance of the permit (i.e., initial stack testing within 180 days after the completion of the project). Also, the condition should specify that the test is to address NO_x emissions rather than NO₂ emissions to be consistent with DCNA's comment #4.

Georgia EPD Response: Georgia EPD agrees to this extension because Existing Condition 4.1.1 gives Georgia EPD discretion to require DCNA to conduct a performance test at any specified emission unit when so directed by Georgia EPD. Georgia EPD may request the initial performance test at such time that the Division deems appropriate if construction and operation of all of the project is extended beyond a reasonable time frame.

Draft Condition 4.2K.3 is revised as noted below:

~~Within fourteen months of the date of issuance of the final permit,~~ 180 days of the completion of the facility-wide project defined in Application No. 21476, the Permittee shall conduct the following performance tests on stack ID No. S014 and furnish to the Division a written report of the results of each performance test:

- a. The performance tests shall be conducted with boilers with emission unit ID Nos. B005, B006, B014, and B022 operating at the increased capacity as defined in Application No. 21476, on a combined basis.*
 - b. Performance test for ~~NO₂~~ NO_x emissions to verify compliance with Condition No. 3.3K.10. ~~NO₂ emissions shall be computed as 80 percent of NO_x emissions.~~ The maximum one-hour average tested emission rate shall be compared to Condition No. 3.3K.10.*
7. Draft Conditions 6.2K.11.b and 6.2L.5: DCNA requests that these reporting requirements be modified to allow 60 days after the end of the reporting period rather than 30 days.

Georgia EPD Response:

(a) Draft Condition 6.2K.11: This draft condition establishes quarterly reporting requirements in conjunction with the reporting frequency (and submission dates) of Existing Condition 6.1.4 (Permit No. 2869-245-0003-V-04-1). Existing Condition 6.1.4, as referenced in Draft Condition 6.2K.11 already provides the 60 day time period as requested by DCNA. No change is needed to this draft permit condition.

(b) Draft Condition 6.2L.5: This draft condition establishes a reporting deadline as established in 40 CFR 63.7550(b)(2), namely January 31st. Georgia EPD cannot revise the reporting deadline of a federal regulation. The requested change is not incorporated into the draft permit.