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| NORTH CAROLINA DIVISION OF AIR QUALITY <p style="text-align: center;">Air Permit Review</p> | | Region: Mooresville Regional Office County: Gaston NC Facility ID: 3600224 Inspector's Name: Bruce Ingle Date of Last Inspection: 02/01/2008 Compliance Code: C/In Compliance With Procedural Reqr | |
| Permit Issue Date: | | | |
| <p style="text-align: center;">Facility Data</p> Applicant (Facility's Name): American & Efird Plants #5 & #15 Facility Address: American & Efird Plants #5 & #15 601 American Street & 20 American Street Mt Holly, NC 28120 SIC: 2284 / Thread Mills NAICS: 313113 / Thread Mills Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V | | <p style="text-align: center;">Permit Applicability (this application only)</p> SIP: 2D .0951 & .0955 RACT (Avoided) NSPS: 40 CFR Part 60, Subpart VVV NESHAP: 40 CFR Part 63, Subpart OOOO PSD: n/a PSD Avoidance: 2Q .0317 for 2D .0531 NC Toxics: Last MACT Toxics 2Q .0705 112(r): n/a Other: | |
| <p style="text-align: center;">Contact Data</p> | | <p style="text-align: center;">Application Data</p> | |
| <p style="text-align: center;">Facility Contact</p> John Eapen Vice President of Env Health and Safety (704) 951-2578 P O Box 507 Mount Holly NC, 28120 | <p style="text-align: center;">Authorized Contact</p> John Eapen Vice President of Env Health and Safety (704) 951-2578 P O Box 507 Mount Holly NC, 28120 | <p style="text-align: center;">Technical Contact</p> John Eapen Vice President of Env Health and Safety (704) 951-2578 P O Box 507 Mount Holly NC, 28120 | Application Numbers: 3600224.05E, 3600224.06A, 3600224.06B, and 3600224.07A Date Received: December 16, 2005; January 30, 2006; May 26, 2006; and January 29, 2007 Application Type: Renewal with consolidations Application Schedule: TV-Renewal <p style="text-align: center;">Existing Permit Data</p> Existing Permit Number: 06691/T14 Existing Permit Issue Date: 11/03/2005 Existing Permit Expiration Date: 09/30/2006 |
| Review Engineer: Judy Lee Review Engineer's Signature: | | <p style="text-align: center;">Comments / Recommendations:</p> Issue 06691/T15 Permit Issue Date: Permit Expiration Date: | |
| Date: 6/13/2008 | | | |

1. Purpose of Application

This permitting action is a renewal of an existing Title V permit pursuant to 2Q .0513. The initial Title V permit (06691T07) for this facility, American & Efird Plants #5 & #15 (A&E), was issued on October 8, 2001 and has been modified several times since issuance (see below for summary). The current Title V permit (06691T14) was issued on November 3, 2005, and is currently scheduled to expire on September 30, 2006. The original renewal application was received on December 16, 2005, or at least nine months prior to the expiration date, with additional amendments and consolidations to the application received and consolidated as summarized below. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

Renewal with minor changes, Significant Modification, Last Maximum Achievable Control Technology (MACT) Toxics Modification, Application Amendment and Significant Modification (New Source RACT)

- Renewal (application number 3600224.05E, received December 16, 2005) with request for minor changes as follows:
 - (1) Section 1 Table - reclassification of four “new” thread bonding machines as “existing” per email response from United States Environmental Protection Agency (USEPA).
 - (2) Section 1 Table - ESA & ESB 2.6 MMBtu/hr not 2.0 MMBtu/hr
 - (3) Section 1 Table - ESC-ESH 3.4 MMBtu/hr not 3.2 MMBtu/hr
 - (4) Section 1 Table - Footnote 1: B2 shall not be fired simultaneously with ES 15-2 only not ES 15-3 as well
 - (5) Section 2, 2.1(C) – Footnote 2: Please note to change from “new” sources to “existing” sources**
 - (6) Section 2, 2.1(C)(5) – Language corrected to reflect change in “new” versus “existing” status
 - (7) Section 2, 2.1(C)(6) – Due to repeat efficiency testing, a generic equation (like the one used for ESG and ESH) should be used for ESC
 - (8) Section 2, 2.1(C)(7) – Again, generic equations are more reflective

**The following sources (ID Nos. ES-H, ES-I, ES-J and ES-K) listed in the current permit as “new” will be reclassified as “existing” sources per EPA’s decision; therefore, the compliance limitations in the permit will be adjusted accordingly.
- Significant Modification (application number 3600224.06A, received January 30, 2006). Application to satisfy the requirements of permit # 06691T14 (application number 3600224.05D) pursuant to 15A NCAC 2Q .0504, along with a request to remove ES-1 Polyester Thread Bonding Machine and Equipment to be renamed (spreadsheet). Previous application was made for the construction and operation of a new nylon/polyester thread bonding process (ID No. ES-K) and associated natural gas fired curing oven (3.4 million Btu per hour) controlled by an existing natural gas-fired thermal oxidizer (ID No. CD-1, 10.0 million Btu per hour heat input), which required processing per 15A NCAC 2Q .0516 “Significant Permit Modification”. The proposed modifications to the permit did not contravene or conflict with any existing permit condition; hence, application processing route (application number 3600224.05D) was per 2Q .0501(c), as included in 2Q .0516(d) through a “two-step” route, which is included in 2Q .0501(c)(2). The construction and operation permit was issued as Permit Number 06691T14, pursuant to the provisions of 2Q .0300. Subsequent to the issuance of the construction and operation permit, the permittee must submit a new application (to modify the revised permit 06691T14), within 12 months after commencing operation of the new equipment, to satisfy all requirements of 2Q .0500.

Stack testing required after thread bonding machines (ES-H and ES-K) were placed into operation was performed on June 20, 2006, as well as verification of a PTE for Machines ES-H and ES-K. The stack test was reviewed by Mrs. Shannon Vogel, SSCB and a Memorandum dated November 2, 2007 stating the testing was considered acceptable and demonstrates compliance with the applicable emissions limits and requirements, is attached to this permit review. The June 20, 2006 test report indicates eleven thread bonding machines (ES-A through ES-K) were operating and exhausting to the thermal oxidizer (CD-1) during the VOC destruction efficiency testing and permanent total enclosure (PTE) verification. Based on the testing data, a three-hour average combustion temperature of **1462.3 degrees F** was reported during the test period. The VOC destruction efficiency for thermal oxidizer CD-1 during this testing period was **98.9%**; emissions rate and destruction efficiency results are presented in Table 1 of the Memorandum.

This modification request satisfies the requirement for a complete Title V application submittal. This modification was consolidated into the renewal application and the appropriate parameters will be placed in the permit at this time.

- Last MACT Toxics Modification (application number 3600224.06B, received May 26, 2006)
- Application Amendment per Ms. Dawn Reeves, American & Efird, Inc. email dated August 29, 2006.
- Minor Modification (application number 3600224.07A, received January 29, 2007) request to modify existing Machine G – nylon thread bonding process to add the capability to process nylon and polyester substrates. Per Mr. William Willets’, Division of Air Quality (DAQ), email correspondence dated January 23, 2007 to Mr. John Eapen, A&E, consolidate Machine G application as part of the 3600224.06A application; therefore, application number 3600224.07A was consolidated with the open renewal application with no fee requirement. This modification triggered New Source Reasonably Available

Control Technology (RACT) analysis for NO_x and VOC emissions; which triggered VOC RACT for Machine G with this modification request [potential VOC emissions for modification request only are greater than 100 tons per year (tpy)]; thus, making this a significant modification.

- Reasonably Available Control Technology (RACT) Response letter received July 31, 2007 for Existing Source RACT – Facility emissions are summarized in Section 9. Upon reviewing the response letter for existing source RACT applicability, NO_x and VOC emissions are as follows:
 - (1) Potential NO_x emissions from all combustion sources as currently permitted = 119.02 tons per year (tpy) > 100 tpy; therefore, existing RACT will apply to this facility. The equipment being modified during this permit renewal (Machine G) has potential NO_x emissions of 1.46 tpy; hence exempt from New Source RACT at this time; however, will be evaluated under existing source RACT.
 - (2) Potential VOC emissions from all sources = >100 tpy; therefore, existing RACT applies. Based on application submittal for minor modification to bonding machine G only, potential emissions without controls or limitations = 738.7 tpy VOC from nylon and polyester bonding process. Potential emissions after controls (Thermal Oxidizer (TO) used for Nylon processing only) = 167.8 tpy VOC (see Section 5 below for more details).
- Permit Amendment based on email response received February 7, 2008 from Ms. Nancy Lane, A&E with comments on draft permit and information discussed during a conference call on January 22, 2008 between DAQ and A&E. Below are the requested changes:
 - (1) To avoid RACT for VOC, the facility would like to remove the six existing less than 40 tpy VOC PSD Avoidance Conditions and take a less than 100 tpy VOC limit
 - (2) Boiler B2 is currently disconnected and cannot be operated; remove from permit along with capability of burning No. 6 fuel oil, as a result RACT for NO_x will not apply because facility-wide potential to emit (PTE) NO_x is less than 100 tpy and 560 pounds per day (lbs/day).
 - (3) Boiler ES 15-2 will not be installed; remove from permit
 - (4) Benzene emissions provided in the modification request for Machine G were above the TPERs; however, it included facility-wide PTE from boilers and curing ovens; as the boiler MACT rule is not applicable at this time, TAP modeling should not be an issue
 - (5) With regard to the new I.D. No. listed on pages 11 and 12, we request that you denote ES H as ES 2 and ES I as ES 3.
 - (6) Present quarterly, semi yearly and annual reporting requirements are excessive and burdensome. We request that you streamline these reports and minimize the number of reports.

2. Facility Description

American & Efird, Inc. (A&E) owns and operates a bonded nylon and polyester thread manufacturing facility in Mount Holly, Gaston County, NC. The facility is operating under the existing air permit 06691T14. This permit was issued on November 3, 2005 and is currently scheduled to expire on September 30, 2006 as explained above.

The facility is divided into two plants, Dyeing and Finishing Plant #15 and Filament Plant #5, which are covered by this permit. The Permittee requested the two permits for Plant #15 and #5 (3556R9 and 6691R6, respectively) be combined into one Title V permit during the initial Title V review process (issued permit number 6691T07). The facility is currently operating under permit number **06691T14** with the following permitted equipment:

- Plant 15 currently has four existing boilers (ID Nos. B2, ES 15-1, ES 15-3 and ES 15-4); one proposed boiler (ID No. ES 15-2), which will replace B2 (see table below); and a wastewater pretreatment plant (ID No. 15-5).

| ID No. | Boiler Description | Heat input capacity (million Btu per hour) | Date of Construction | Status at Issuance of Renewed Permit (#06691T15) |
|---------------------------|----------------------------------|--|----------------------|--|
| ES 15-1 | Natural gas/No. 2 fuel oil-fired | 33.475 | 2000 | Operational |
| ES 15-2 | Natural gas/No. 2 fuel oil-fired | 32.7 | Not yet installed | Removed |
| ES 15-3 | Natural gas/No. 2 fuel oil-fired | 33.475 | 2002 | Operational |
| ES 15-4 | Natural gas/No. 2 fuel oil-fired | 14.7 | 2000 | Operational |
| B2 | Natural gas/No. 6 fuel oil-fired | 17 | Previous permit | Removed |
| Total Heat Input Capacity | | 131.35 | -- | 81.65 |

- Plant 5 includes eleven thread bonding processes (ID Nos. ES-1 through ES-11) and associated natural gas fired curing ovens in total (see table below).

| Existing ID No. (Existing Permit No. 06691T14) | New ID No. (Upon issuance of Permit No. 06691T15) | Coating Process | PSD Avoidance | First Operated or Date of Construction |
|--|---|------------------------|-----------------------------------|--|
| ES1 | -- | Polyester thread | Removed Nov. 2005 | 1986 |
| ESA | ES-1 | Nylon thread | | 1986 |
| ESB | ES-4 | Nylon thread | | 1986 |
| ESC | ES-5 | Nylon thread | <40 tpy VOC 2D .0530 ² | 1994 |
| ESD | ES-6 | Nylon/Polyester thread | <40 tpy VOC 2D .0531 ³ | 1994 |
| ESE | ES-7 | Nylon/Polyester thread | <40 tpy VOC 2D .0531 ⁴ | 1995 |
| ESF | ES-8 | Nylon/Polyester thread | <40 tpy VOC 2D .0531 ⁴ | 1996 |
| ESG | ES-9 | Nylon/Polyester thread | <40 tpy VOC 2D .0531 ⁶ | 2001 |
| ESH | ES-2 | Nylon thread | <40 tpy VOC 2D .0530 ¹ | 2005 |
| ESI | ES-3 | Nylon/Polyester thread | <40 tpy VOC 2D .0531 ⁵ | 2004 |
| ESJ | ES-10 | Nylon thread | <40 tpy VOC 2D .0531 ⁵ | 2004 |
| ESK | ES-11 | Nylon/Polyester thread | <40 tpy VOC 2D .0531 ⁵ | 2005 |

¹ indicates the less than 40 tons per year VOC PSD Avoidance limit for Machine ES-2

² indicates the less than 40 tons per year VOC PSD Avoidance limit for Machine ES-5

³ indicates the less than 40 tons per year VOC PSD Avoidance limit for Machine ES-6

⁴ indicates the less than 40 tons per year VOC PSD Avoidance limit for Machines ES-7 and ES-8

⁵ indicates the less than 40 tons per year VOC PSD Avoidance limit for Machines ES-3, ES-10 and ES-11

⁶ indicates the less than 40 tons per year VOC PSD Avoidance limit for Machine ES-9

The facility is a Title V major source, currently for volatile organic compounds (VOC), individual hazardous air pollutants (HAP); such as methanol, N-methyl-2-pyrrolidone (NMP) and triethylamine, total HAPs emissions, sulfur dioxide (SO₂), and nitrogen oxide (NO_x) emissions. After this revision, the facility will remain a major Title V source for these pollutants, except NO_x emissions (see Section 1 above) and VOC emissions (see Section 5 below).

3. Application Chronology

Please see the attached Comprehensive Application Reports for the following permit applications:

3600224.05E, 3600224.06A, 3600224.06B and 3600224.07A for more details

Also, please refer to attached email correspondence or application submittals.

October 29, 2007 – Sent email to Ms. Dawn Reeves, A&E, with questions/clarifications for permit updates.

November 20, 2007 – Spoke with Mr. John Eapen, A&E regarding email to Ms. Reeves. Ms. Reeves is no longer employed with A&E, so Mr. Eapen provided answers to the questions/clarifications for permit updates. I forwarded a copy of the email that we discussed and he will follow up our telephone conversation with an email response. Mr. Eapen indicated that the tower fan speed information should be in the stack test report from June 20, 2006.

November 21, 2007 – Email from Ms. Nancy Lane, A&E with responses and copies of the oxidizer vender specifications verifying the oxidizer is 5 MMBtu per hour, not 10.

November 26, 2007 – Hardcopy of Email and supporting documents received from Ms. Nancy Lane, A&E.

November 27, 2007 – DAQ emailed draft permit to Ms. Nancy Lane and Mr. John Eapen, A&E for review.

January 22, 2008 – Conference call with Mr. Eapen, A&E and DAQ staff (Mr. John Evans, Mr. William Willets, and Ms. Judy Lee) regarding RACT and comments on the draft permit.

February 7, 2008 – Email response received from Ms. Nancy Lane, A&E with comments on draft permit and information discussed during a conference call on January 22, 2008 between DAQ and A&E. These items (listed above under Section 1) have been addressed and the first draft permit and review sent to the facility on November 26, 2007 were modified to reflect the changes; as discussed throughout the review.

4. Permit Modifications/Changes and ESM Discussion

*The initial Title V permit has been modified seven times since issuance on **October 8, 2001**. The following changes were made to the initial Title V (permit number **06691T07**):*

| Modified Permit Number | Type of Permit Modification | Changes Made | Issued Permit Number |
|-------------------------------|---|---|-----------------------------|
| 06691T07 | Administrative amendment | All changes were administrative | 06691T08 |
| 06691T08 | 502(b)(10) Modification | Modify three bonding machines to manufacture polyester threads (ID Nos. ESD, ESE and ESF) | 06691T09 |
| 06691T09 | 501(c)(2) Significant Modification | Construction and operation of a new nylon/polyester thread bonding process (ID No. ESI) and associated natural gas fired curing oven | 06691T10 |
| 06691T10 | 502(b)(10)/state only toxics Modification | Modify an existing bonding machine (ID No. ESH) to process an additional substrate | 06691T11 |
| 06691T11 | 501(c)(2) Significant Modification | Construction and operation of a new nylon thread bonding process (ID Nos. ESJ) and associated natural gas fired curing oven | 06691T12 |
| 06691T12 | Administrative amendment | Administrative amendment to correct a typographical error contained in their last permit modification package | 06691T13 |
| 06691T13 | 501(c)(2) Significant Modification | Construction and operation of a new nylon/polyester thread bonding process (ID No. ESK) and associated natural gas fired curing oven controlled by an existing thermal oxidizer | 06691T14 |
| 06691T14 | Renewal/Modifications | Current permit renewal with modifications consolidated into the renewal application | 06691T15 |

Changes to American & Efird Plant #5 & #15's current permit (**permit number 06691T14**) for this renewal (application number 3600224.05E) and application consolidations are summarized in the table below:

| Old Page Number | New Page Number | Condition Number | Change |
|---------------------------|---------------------------|---|--|
| Cover Letter & Pages 1-39 | Cover Letter & Pages 1-32 | Entire permit, where applicable | Updated language with current shell guidance Removed asterisks and footnotes for previously permitted new and modified sources |
| -- | Attachment | Table of Changes | Added for this renewal |
| Page 3 | Attachment | Insignificant Activities | No change |
| Pages 4-5 | Pages 3-4 | Part I, Section 1 - Equipment Table | Removed B-2 and ES 15-2 per facility's request 2/7/2008 Renamed equipment as requested by facility Added POS and AOS, removed ES-1, updated MMBtu/hr for drying ovens, and modified descriptions as needed Changed TO from 10 MMBtu/hr to 5 |
| Pages 5-8 | Pages 5-7 | Part I, Section 1 - Condition 2.1-A.1. through 2.1-A.4. | Modified boiler descriptions to be consistent throughout, removed testing requirements that have been completed, updated per current shell guidance Removed B-2 and ES 15-2 and all reference to No. 6 fuel oil per facility's request 2/7/2008 |
| Pages 9-23 | Pages 8-15 | Part I, Section 1 - Condition 2.1-B. | Combined all thread bonding processes under Section 2.1-B. and 2.1-C into this section and renamed to be consistent throughout permit Added POS and AOS to distinguish between nylon and polyester processes |
| Pages 15-18 | -- | Part I, Section 1 - Condition 2.1-C.5. | Consolidated with Section 2.2-B because Subpart OOOO compliance date has past and all sources were determined to be "existing" per EPA's response to Ms. Dawn Reeves, American & Efird, email dated December 8, 2005 to Mr. Paul Almodovar, US EPA |
| Pages 18-20 | Pages 13-15 | Part I, Section 1 - Condition 2.1-B.6 | Added 15A NCA 2D .0614 CAM to 2D .0902 Consolidated all PSD Avoidance Conditions (2D .0530 & 2D .0531) into one less than 100 tpy RACT Avoidance limit for VOC per facility's request under 2D .0902 VOC RACT Applicability |
| -- | Page 15 | Part I, Section 1 - Condition 2.1-B.7 | Added ALTERNATIVE OPERATING SCENARIOS Condition for nylon/polyester thread bonding processes |
| Pages 22-23 | -- | Part I, Section 1 - Condition 2.1-C.8. | Removed Case by Case MACT for ESG because Subpart OOOO compliance date has past. |
| Page 23 | Page 15 | Part I, Section 1 - Condition 2.1-C. | Re-number existing 2.1-D. "Sources with no applicable requirements" to 2.1-C. because all thread bonding processes were consolidated under 2.1-B |
| Pages 24-25 | Pages 16-17 | Part I, Section 2 - Condition 2.2-A. | Updated emission sources and ID Nos Updated rule per current shell guidance |
| Page 25 | Pages 17-20 | Part I, Section 2 - Condition 2.2-B. | Modified MACT condition because compliance date has past and consolidated existing condition under Section 2.1-C.5. for "new" sources with this condition for existing sources because all sources were determined to be "existing" per EPA's response to Ms. Dawn Reeves, American & Efird, email dated December 8, 2005 to Mr. Paul Almodovar, US EPA Modified descriptions and renamed equipment |
| -- | Page 21 | Part I, Section 2 - Condition 2.2-C | Added 15A NCAC 2D .1806 Odors regulation |
| Pages 25-26 | Page 21 | Part I, Section 2 - Condition 2.2-D | Re-number 15A NCAC 2Q .0711 condition |
| -- | Page 22 | Part I, Section 2 - Condition 2.2-E | Added 15A NCAC 2Q .0705 Last MACT Toxics |
| Page 26 | Page 22 | Part I, Section 2 - Condition 2.3 | Removed Permit Shield for nonapplicable requirements for PSD Avoidance - SO2 emissions from the boilers Added Permit Shield for nonapplicable requirements for RACT - NOx emissions based on boiler removal and VOC emissions based on new less than 100 tpy VOC emission limit under PSD Avoidance Condition |
| Pages 26-34 | Pages 23-32 | Part I, Section 3 | Updated with most recent General Conditions & List of Acronyms |
| Pages 35-39 | -- | Part II | Removed Part II because all sources have been constructed and placed into operation and the complete Title V application has been submitted and consolidated with this renewal application |

5. New Equipment/Change in Emission and Regulatory Review

- No new equipment or change in emissions with this renewal (3600224.05E, received December 16, 2005)
- Significant Modification (application number 3600224.06A, received January 30, 2006). This is a second step to a previous significant modification (application number 3600224.05D) that added a new thread bonding machine, along with a request to remove ES-1 Polyester Thread Bonding Machine and Equipment to be renamed (spreadsheet).
- Significant Modification (application number 3600224.07A, received January 29, 2007) request to modify existing Machine G – nylon thread bonding process to add the capability to process nylon and polyester substrates.
- Reasonably Available Control Technology (RACT) - request to modify Machine G triggered evaluation of new source RACT for VOC
- Last MACT Toxics Modification (application number 3600224.06B, received May 26, 2006) – TAP demonstration
- Request to take less than 100 tpy PSD Avoidance limit for VOC to avoid RACT for VOC; removal of two boilers (ID Nos. B-2 and ES 15-2) and removal of capability to burn No. 6 fuel oil to avoid RACT for NOx received February 7, 2008.

Change in Emissions:

Removal of ES-1 Polyester Thread Bonding Machine - Based on an email from Mr. Richard Lasater, RCO-Toxics, on December 22, 2006 regarding Methylene Chloride emissions; he indicated that Machine No. 1 was taken out of service November 2005, which was the source of Methylene Chloride emissions from this facility. Form A4 submitted with the January 29, 2007 application for a minor change indicated “previous polyester bonding potential 200,000 lbs/yr per machine and 0 lbs/yr emitted after reduction.” Application request received on January 30, 2006 for removal of ES-1; therefore a significant reduction in methylene chloride emissions from this facility occurred once ES-1 was removed (see Facility-wide Emissions Summary in Section 9 below).

Addition of Polyester substrate to existing Machine G - Based on application submittal, primarily VOC and HAP emissions are expected from this source. Negligible combustion emissions are also expected from the oven. VOC and HAP emissions are to be controlled by the existing permitted thermal oxidizer, when this operation is processing nylon thread, as currently permitted. When this operation is processing polyester thread, VOC and HAP emissions will be uncontrolled. The following table provides an emission summary (taken from the public version of the application) for modification to Machine G to add polyester thread bonding capabilities to the existing nylon thread bonding machine. Potential emissions apply to Machine G only. Actual emissions apply to processing nylon or polyester only. Uncontrolled emissions, while processing polyester thread, are based on 8,760 hours of operation, maximum speed of machine¹, and maximum coating application rate² provided in the Confidential version. Toxic emissions are facility-wide potential to emit.

| Pollutant | Expected Actual Emissions - After Controls/Limitations (tons per year) | Potential Emissions – Before Controls/Limitations (tons per year) | Potential Emissions – After Controls/Limitations (tons per year) |
|--|---|--|---|
| Particulate Matter (PM) | | 0.11 | 0.11 |
| Particulate Matter <10 microns (PM-10) | | 0.11 | 0.11 |
| Carbon Monoxide (CO) | | 1.23 | 1.23 |
| Nitrogen Oxides (NOx) | | 1.46 | 1.46 |
| Sulfur Dioxide (SO ₂) | | 0.0088 | 0.0088 |
| Volatile Organic Compounds (VOC) | 6.07 | 738.97 | 167.81 |

¹ Refer to confidential copy of the application

² Refer to confidential copy of the application

| Pollutant | Expected Actual Emissions - After Controls/Limitations (tons per year) | Potential Emissions – Before Controls/Limitations (tons per year) | Potential Emissions – After Controls/Limitations (tons per year) |
|---|---|--|---|
| Hazardous Air Pollutant (HAP) - Triethylamine | 0.629 | 17.2 | 17.2 |
| HAP - Methanol | 0.50 | 573 | 1.84 |
| HAP - Napthalene | | 0.0000089 | 0.0000089 |
| HAP - NMP | 5.44 | 148.7 | 148.7 |
| HAP – Cobalt Compounds | | 0.00000123 | 0.00000123 |
| HAP – Selenium Compounds | | 0.000000351 | 0.000000351 |
| All HAPs (combined) | | | >25 |
| Toxic Air Pollutants (TAP) | pounds per hour | pounds per day | pounds per year |
| TAP – Benzene | | | 14.74 |
| TAP – Benzo(a)pyrene | | | 0.00126 |
| TAP – Formaldehyde | 0.031 | | |
| TAP – Hexane | | 5.18 | |
| TAP – Toluene | 0.0461 | 1.11 | |

Regulatory review associated with the modification request for processing an additional substrate (polyester) in Machine G are 15A NCAC 2D .0515, .0521, .0524, .0530, .0531, .0902, .0909, .0951, .0955, .0958, .1111; and .1400; and 2Q .0317 and .0711. Applicability and compliance for these rules are discussed in detail below.

Applicability of the following Regulations were reviewed as part of this renewal with consolidations:

- 15A NCAC 2D .0503, Particulates from Fuel Burning Indirect Heat Exchangers
- 15A NCAC 2D .0515, Particulates from Miscellaneous Industrial Processes
- 15A NCAC 2D .0516, Sulfur Dioxide Emissions from Combustion Sources
- 15A NCAC 2D .0521, Control of Visible Emissions
- 15A NCAC 2D .0524, New Source Performance Standards (40 CFR Part 60 Subpart Dc & Subpart VVV)
- 15A NCAC 2D .0530, PREVENTION OF SIGNIFICANT DETERIORATION
- 15A NCAC 2D .0531, SOURCES IN NONATTAINMENT AREAS
- 15A NCAC 2D .0614 “Compliance Assurance Monitoring” (40 CFR 64)
- 15A NCAC 2D .0900, VOC Reasonably Available Control Technology (RACT) and
- 15A NCAC 2D .0902 “Applicability”
- 15A NCAC 2D .0909 “Compliance Schedules for Sources in Non-attainment Areas”
- 15A NCAC 2D .0951, “Miscellaneous Volatile Organic Compound Emissions” for RACT
- 15A NCAC 2D .0955, “Thread Bonding Manufacturing” for RACT
- 15A NCAC 2D .0958, Work Practices for Sources of Volatile Organic Compounds
- 15A NCAC 2D .1100, Control of Toxics Air Pollutants
- 15A NCAC 2D .1111 “Maximum Achievable Control Technology (40 CFR 63, Subpart OOOO)”
- 15A NCAC 2D .1400, NOx Reasonably Available Control Technology (RACT)
- 15A NCAC 2D .1806, Control and Prohibition of Odorous Emissions
- 15A NCAC 2Q .0317, Avoidance Conditions for 15A NCAC 2D .0524, New Source Performance Standards (40 CFR Part 60 Subpart VVV)
- 15A NCAC 2Q .0317, Avoidance Conditions for 15A NCAC 2D .0530, PREVENTION OF SIGNIFICANT DETERIORATION (for VOC)
- 15A NCAC 2Q .0317, Avoidance Conditions for 15A NCAC 2D .0531, SOURCES IN NONATTAINMENT AREAS
- 15A NCAC 2Q .0508 Permit Content – POS and AOS Recordkeeping Requirement
- 15A NCAC 2Q .0512, Permit Shield for Nonapplicable Requirements
- 15A NCAC 2Q .0705, Existing Facilities and SIC Calls
- 15A NCAC 2Q .0711, Emission Rates Requiring a Permit

In addition to requirements provided in Section 3 – General Conditions, the facility will be subject to the following regulations upon issuance of the renewed permit as discussed below:

2D .0503 “Particulates from Fuel Burning Indirect Heat Exchangers”

Maximum heat input of all fuel burning indirect heat exchangers, **Q=81.65** million Btu per hour heat input capacity, was used to determine the allowable emission limit, **E=0.35** pounds per million Btu heat input for each boiler. Using the following equation:

$$E = 1.09Q^{-0.2594} = 1.09(81.65)^{-0.2594} = 0.3479 \text{ lbs/million Btu} = 0.35 \text{ lbs/million Btu}$$

Where, E = allowable emission rate in pounds per million Btu, and
Q = maximum heat input in million Btu per hour

Previously, the allowable was calculated using $Q=112.8 [14.7 + (3 * 32.7)]$:

$$E = 1.09Q^{-0.2594} = 1.09(112.8)^{-0.2594} = 0.32 \text{ lbs/million Btu}$$

This total heat input did not include boiler B-2 because it was to be replaced by boiler ES 15-2. The removal of a fuel burning indirect heat exchanger shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been established. However, for any fuel burning indirect heat exchanger constructed after, or in conjunction with, the removal of another fuel burning indirect heat exchanger at the plant site, the maximum heat input of the removed fuel burning indirect heat exchanger shall no longer be considered in the determination of the allowable emission limit of any fuel burning indirect heat exchanger constructed after or in conjunction with the removal.

During this permit renewal, **E** will be recalculated due to the removal of boilers, B-2 and ES 15-2, as well as, heat inputs for boilers, ES 15-1 and ES 15-3, will be modified from 32.7 million Btu per hour to 33.475 because they are currently permitted as 33.475 million Btu per hour, not 32.7 as in the initial TV permit (see Table in Section 2 above). Therefore, **Q=81.65** million Btu per hour heat input capacity $[33.475 + 33.475 + 14.7]$ and **E=0.35** pounds per million Btu heat input for each boiler, using the above equation.

Worst case total particulate matter emissions are estimated to be **0.007** pounds per million Btu while firing natural gas and **0.024** pounds per million Btu while firing No. 2 fuel oil. [Emission factor of 3.3 lb/1000 gallon while firing No. 2 fuel oil = 3.3 lb/1000 gal * 1 gal/140,000 Btu * 1,000,000 BTU/million Btu = 0.02357 lbs/million Btu] Estimation is based on DAQ spreadsheets submitted with RACT response letter and AP-42 emission factors (Chapter 1 Introduction to External Combustion Sources). Compliance is demonstrated with this regulation since estimated emissions are less than the allowable for worse case fuel.

2D .0515 “Particulates from Miscellaneous Industrial Processes”

The allowable particulate emission limit is calculated by the following equation:

$$E = 4.1P^{0.67}$$

Where, E = allowable emission rate for particulate matter in pounds per hour, and
P = process weight in tons per hour

Allowable emissions were estimated very conservatively during the initial Title V review using the process weight of the solvent only (actual allowables will be higher when including the weight of the thread). The facility is currently using the same solvents for the nylon and nylon/polyester machines as during the initial Title V review; therefore, compliance is demonstrated based on the same information provided with the initial Title V review:

Nylon thread bonding machines - Process rate of solvent into machines A and B (ID Nos. ESA and ESB) is 0.0647 tons per hour $[(129.4 \text{ pounds per hour}/2000 \text{ lbs per ton}) \text{ based on } 19.6 \text{ gallons per hour times } 6.6 \text{ pounds per gallon density for methanol}]$. This yields an allowable emission rate of 0.65 pounds per hour.

Nylon/Polyester thread bonding machines - Process rate of solvent into machines C through H (ID Nos. ESC through ESH) is 0.0594 tons per hour [(118.4 pounds per hour/2000 lbs per ton) based on 18 gallons per hour times 6.6 pounds per gallon density for machine D]. This yields an allowable emission rate of 0.62 pounds per hour.

Particulate matter emissions are expected from the combustion of natural gas only. Potential before control emissions are estimated using AP-42 emission factors [(0.007 lb/ million Btu * 3.4 million Btu per hour)] to be 0.0238 pounds per hour from each machine. Compliance with the allowable emission limit for the maximum process rate is demonstrated.

2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”

Boilers - Emissions from ES 15-1, ES-3 and ES 15-4 are subject to 2D .0516 when combusting natural gas. Allowable emissions per this regulation are 2.3 pounds per million Btu heat input.

Worst case sulfur dioxide emissions are estimated to be 0.51 pounds per million Btu while firing No. 2 fuel oil [emission factor of 71.0 lb/1000 gal while firing No. 2 fuel oil = 71 lb/1000 gal * 1 Btu/140,000 gal * 1,000,000 Btu/million Btu = 0.507 lbs/million Btu]. Estimation is based on DAQ spreadsheets submitted with RACT response letter and AP-42 emission factors [142S lb/1000 gal = 142 * 0.5 (% Sulfur) lb/1000 gal]. Compliance is demonstrated with this regulation since estimated emissions are less than the allowable.

A source subject to an emission standard for sulfur dioxide in Rules 2D .0524, .0527, .1110, .1111, .1205, .1206, or .1210 of this Subchapter shall meet the standard in that rule; therefore, ES 15-1, ES 15-3 and ES 15-4 are subject to 2D .0524 for sulfur dioxide emissions.

Thread bonding machines - These emission sources and their associated curing ovens are sources of combustion which discharge through a stack and therefore are subject to this regulation. Allowable emissions of sulfur dioxide from these sources while firing natural gas shall not exceed 2.3 pounds per million Btu heat input. Natural gas is an inherently low sulfur emitting fuel; compliance is expected.

SO₂ emissions from all thread bonding machines and the thermal oxidizer (40.8 million Btu/hr) are estimated to be 0.02 pounds per hour based on DAQ spreadsheets submitted with RACT response letter [(0.001 lb/million Btu * 40.8 million Btu per hour)]. Compliance is demonstrated with this regulation since estimated emissions are less than the allowable.

2D .0521 “Control of Visible Emissions”

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources which are required to install, operate, and maintain continuous opacity monitors, six-minute averaging periods may exceed 20 percent opacity if: (1) No six-minute period exceeds 87 percent opacity; (2) No more than one six-minute period exceeds 20 percent opacity in any hour; and (3) No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

The existing coating operations, as well as the proposed modification to nylon/polyester thread bonding machine (ID No. ES-G) is subject to 20 percent opacity limit. Visible emissions are not expected from this source, as the main pollutant with this process is VOC. Although negligible amount of other criteria pollutant emissions are expected from the curing oven, compliance is expected with this limit.

2D .0524 “New Source Performance Standards” 40 CFR Part 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

Since boilers ES 15-1 through ES 15-4 were constructed after June 9, 1989 and have maximum design heat capacities greater than 10 million Btu per hour, they are subject to NSPS Subpart Dc.

- ❖ Sulfur Dioxide: Per 40 CFR 60.42c(d), any **oil** combusted in the boilers shall contain less than 0.5% by weight sulfur.

“...On and after the date on which the initial performance test is completed or required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that combusts oil shall cause to be discharged into the atmosphere from that affected facility any gases that contain SO₂ in excess of 215 ng/J (0.50 lb/MMBtu) heat input; or, as an alternative, no owner or operator of an affected facility that combusts oil shall combust oil in the affected facility that contains greater than 0.5 weight percent sulfur. The percent reduction requirements are not applicable to affected facilities under this paragraph....”

- ❖ Visible Emissions: Per 40 CFR 60.43c(c), visible emissions from boilers ES 15-1 through ES 15-3 shall not be more than 20% opacity when averaged over a six-minute period except for one six-minute period per hour of not more than 27% opacity.

“...On and after the date on which the initial performance test is completed or required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that combusts coal, wood, or oil and has a heat input capacity of 8.7 MW (30 MMBtu/hr) or greater shall cause to be discharged into the atmosphere from that affected facility any gases that exhibit greater than 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity....”

All testing requirements have been met; therefore, requirements were removed during this renewal.

2D .0524 “New Source Performance Standards” (NSPS Subpart VVV “Standards of Performance for Polymeric Coating of Supporting Substrates Facilities”)

Coating operations constructed after April 30, 1987 and used to prepare coatings for the polymeric coating of supporting substrates are subject to NSPS Subpart VVV. The amount of VOC used is greater than >95 Mg per year (1 US ton = 0.9072 Megagrams; therefore, >104.72 tpy).

The applicant has chosen to reduce VOC emissions by at least 90 percent while processing nylon thread.

The applicant has chosen to use VOC less than or equal to 9% by weight of the volatile fraction while processing polyester thread to **avoid** NSPS Subpart VVV (60.740(d)(2) for the six nylon/polyester machines.

Based on the previous years inspection report [inspection date 2/9/2007 by Mr. Bruce Ingle, MRO] stack testing to confirm thermal oxidizer efficiency (ID No. CD-1) for compliance with 40 CFR 60 Subpart VVV and 40 CFR 63 Subpart OOOO on lines ESA, ESB, ESC, ESD, ESF, ESG, ESI, and ESJ was performed on July 10, 2005. On June 20, 2006 testing to determine control efficiency of oxidizer CD-1 with the addition of lines ESH and ESK was performed. Method 204 performed on lines ESH and ESK to verify PTE on the enclosures.

Stack testing performed June 20, 2006, as discussed under Section 1 above, indicates compliance with NSPS Subpart VVV. The control efficiency (E) of the control device (Equation 1 in 40 CFR Part 60 Section 60.743(a)(1)(iv)) was found to be **98.9%** and the capture efficiency (F) of the vapor capture system (Equation 2 in 40 CFR Part 60 Section 60.743(a)(1)(v)) was 100%. The total emission reduction was **98.9%**.

Modification request for Machine G, polyester processing, the Permittee has requested to limit the VOC content of the waterborne coating material, as applied, to less than 9% by weight (9%w), while processing polyester, to avoid this rule. Therefore, this proposed modification is exempt from the requirements of this NSPS when processing polyester thread, if the volatile content of the waterborne coating material is limited to 9%w. Necessary monitoring requirements will be included to assure that the volatile content of the waterborne coating material, while processing polyester, do not exceed 9%w.

2D .0530, PREVENTION OF SIGNIFICANT DETERIORATION and 2D .0531 “Sources in Nonattainment Areas” (for VOC)

See discussion under 15A NCAC 2Q .0317, Avoidance Conditions for 15A NCAC 2D .0530 and 2D .0531 below

2D .0614 “Compliance Assurance Monitoring” (40 CFR 64)

40 CFR 64 requires that a continuous assurance monitoring plan be developed for all equipment located at a major facility, that have pre-controlled emissions above the major source threshold, and use a control device to meet an applicable standard. A Compliance Assurance Monitoring (CAM) determination is required for this facility during the renewal process because: (1) the facility is a Title V facility with potential emissions that exceed the Title V major source levels without considering controls; and (2) there are sources subject to an emission limitation or standard that require controls in order to comply with the emission limitation.

CAM allows for the following exemptions:

§ 64.2 Applicability

- (b) Exemptions — (1) Exempt emission limitations or standards. The requirements of this part shall not apply to any of the following emission limitations or standards:
- (i) Emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to section 111 or 112 of the Act.

Per 64.2(b)(1)(i) - If an NSPS (or NESHAP – National Emission Standards for Hazardous Air Pollutants) is proposed or modified after the 11/15/1990 date then it is CAM approved (exempted from CAM applicability). In this case, the facility is subject to a NESHAP [40 CFR 63, Subpart OOOO]; however, CAM only exempts MACT (or NESHAP) rule emissions limitations. The MACT regulates Hazardous Air Pollutants (HAP) emissions; therefore, CAM applies to the coating operations (ID Nos. ES-1 through ES-11). However, the HAP pollutants emitted from the coating operations are also VOC pollutants. Therefore, the required monitoring under the MACT regulation, which was proposed on May 29, 2003 requires adequate monitoring to ensure compliance with the emissions limitations and standards. Compliance with the MACT requirements was demonstrated by performance testing conducted on June 20, 2006.

This facility also qualifies for an exemption under 15A NCAC 2D .0614 because they have an emissions cap [2D .0614(b)(1)(E)] that is approved under the rules of 15A NCAC 2D and 2Q and incorporated into their permit under 15A NCAC 2Q .0500 Title V Procedures. Under Title 40 Protection of Environment, Part 70 – State Operating Permit Programs, § 70.2 definitions – “*Emissions allowable under the permit* means a federally enforceable permit term or condition determined at issuance to be required by an applicable requirement that establishes an emissions limit (including a work practice standard) or a federally enforceable emissions cap that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject.”

Therefore, we are exempting this facility from CAM because: (1) the control device will be operated as necessary to comply with the PSD Avoidance limit, which requires monitoring the oxidizer temperature to ensure that they stay below the limit, and (2) the control device is required to comply with the MACT standard, which requires monitoring the oxidizer temperature and vapor capture system parameters determined during initial performance testing to ensure compliance with the MACT limit. As allowed under Part 70, § 70.6 Permit content – “(a)(3) *Monitoring and related recordkeeping and reporting requirements*. (i) Each permit shall contain the following requirements with respect to monitoring:

(A) All monitoring and analysis procedures or test methods required under applicable monitoring and testing requirements, including part 64 of this chapter and any other procedures and methods that may be promulgated pursuant to sections 114(a)(3) or 504(b) of the Act. If more than one monitoring or testing requirement applies, the permit may specify a streamlined set of monitoring or testing provisions provided the specified monitoring or testing is adequate to assure compliance at least to the same extent as the monitoring or testing applicable requirements that are not included in the permit as a result of such streamlining;” the required monitoring under PSD Avoidance and MACT satisfies criteria established in the CAM rule to provide reasonable assurance of compliance with applicable requirements as specified above by:

- Continuously monitoring and recording of combustion zone (chamber) temperature with a thermocouple system;

- Periodic internal and external inspection of the structural integrity of the control device and of the process; and
- Performance test

As previously stated, the operating parameters placed in the renewed permit are based on stack testing performed on June 20, 2006. A minimum combustion chamber temperature of **1,462** degrees F will be placed in the permit under Specific Condition 2.1-A.6. The facility will be required to monitor the chamber temperature on a continuous basis when the oxidizer is operational. If the RTO is operated below the minimum combustion chamber temperature required in the permit, the facility will be in noncompliance with 2Q .0317 Avoidance Conditions for 15A NCAC 2D .0902 and the VOC emissions will be based on no controls during that time (See 2Q .0317 for 2D .0902 below for RACT Avoidance language placed in the renewed permit).

CAM Avoidance requirements will be referenced under the PSD Avoidance conditions for coating operations (ID Nos. ES-1 through ES-11), which will be modified to include continuous compliance monitoring.

2D .0900 VOC Reasonably Available Control Technology (RACT)

In areas not in compliance with the ozone ambient air quality standards (ozone nonattainment areas), certain categories of existing major sources of VOC are required to comply with the RACT rules contained in Section 15A NCAC 2D .0900.

The modification of Machine G to process polyester (in addition to currently permitting nylon) would have triggered RACT. However, after a conference call with the facility, they requested a facility-wide 100 tpy limit on VOCs. Because 2D .0902 provides that the VOC RACT applies only to “facilities with the potential to emit 100 tons or more of [VOCs]” the requested 100 tpy limit will have the effect of avoiding otherwise applicable RACT requirements. The revised permit will include the 100 tpy limit and require monitoring, recordkeeping and reporting sufficient to make the 100 tpy limit practically enforceable. The revised permit will include a permit shield for the non-applicable RACT requirements (See Permit Conditions 2.3-C. & D.).

2D .0958 “Work Practices for Sources of Volatile Organic Compounds”

These are work practice standards for VOC emissions. Compliance with this standard is expected.

2D .1100, Control of Toxics Air Pollutants

See discussions under 2Q .0705 and 2Q .0711 below.

2D .1111 “Maximum Achievable Control Technology” (MACT Subpart OOOO “National Emission Standards for Hazardous Air Pollutants: Printing, Coating, and Dyeing of Fabrics and Other Textiles”

This standard applies to printing, coating, slashing, dyeing, or finishing of fabric other textiles at any new, reconstructed or existing source, which is a major source or which is located at a major source. This regulation was promulgated on May 29, 2003.

This facility is considered an existing source (63.4282(g)) under the Coating and Printing Subcategory (63.4281(a)(1) and 63.4282(b)) which includes any operation that coats or prints fabric and other textiles. The regulated materials for the web coating and printing subcategory are the coating, printing, thinning and cleaning materials used in the affected source. This facility was considered an existing source; therefore, their initial compliance date for Subpart OOOO was by the end of three years from promulgation of the rule, May 29, 2006.

Per the facility’s initial notification dated May 24, 2004, the following sources were deemed as:

- new affected sources:

Four thread bonding machines (ID Nos. ESH, ESI, ESJ, and ESK)

- existing affected sources:

Four nylon thread bonding machines (ID Nos. ESA through ESC, and ESG), three nylon/polyester thread bonding machines (ID Nos. ESD, ESE, and ESF), one polyester thread bonding machine (ID No. ESI) and wastewater pre-treatment plant (ID No. ES-15-5), and other fugitive and point emission sources.

The revised permit will include applicable requirements for only “existing” sources. All reference to “new” sources were removed during this permit renewal based on the following:

Per EPA’s response to Ms. Dawn Reeves, American & Efir, email dated December 8, 2005 to Mr. Paul Almodovar, US EPA, regarding the definition of a new versus existing source, the following sources (ID Nos. ES-H, ES-I, ES-J and ES-K) listed in the current permit as “new” will be reclassified as “existing” sources; therefore, the compliance limitations in the permit will be modified accord to Table 1 to 40 CFR § 63 Subpart OOOO provides the emission limits for new or reconstructed and existing affected sources in the Printing, Coating and Dye of Fabrics and Other Textiles Source Category. Mr. Almodovar’s email response states that “the affected source for this standard is the collection of all coating lines. If there already was an existing line at the facility, you are only adding a line to that existing collection.”

Wastewater pre-treatment plant (ID No. ES 15-5) - Process water from the dyeing and finishing operations is pre-treated prior to being discharged to the POTW. This source has no applicable requirements.

2D .1400 “Reasonable Available Control Technology (RACT) for nitrogen oxides (NOx)”

The facility currently has five boilers (ID Nos. B2, ES 15-1 through ES 15-4) on their permit, which are the primary sources of NOx emissions. From the review for the initial Title V, “Plant 15 has four existing boilers (ID Nos. B2, B3, ES 15-1 and ES 15-4) and two proposed boilers (ID Nos. ES 15-2 and ES 15-3) which will replace B2 and B3.” Since issuance of the initial Title V permit, ES 15-3 has replaced B3. At the time of these submittals, replacement of boiler ID No. B2 with ES 15-2 was still proposed. The facility also has NOx emissions from their Dyeing and Finishing Operations (Plant 5). As currently permitted, the facility has potential NOx emissions greater than 100 tpy NOx, which will trigger Existing Source RACT, if the boiler replacement is not done prior to April 1, 2009. Using AP-42 emission factors, the facility is below the 560 pounds per day threshold. The boiler replacement would reduce potential NOx emissions to approximately 91.72 tpy; hence exempting them from RACT.

After a conference call with DAQ, A&E has requested removal of both boilers B-2 and ES 15-2; and removal of the capability to burn No. 6 fuel oil in an email dated February 7, 2008. The renewed permit will contain a permit shield for nonapplicable requirements under Section 2.3-A. of the renewed permit (#06691T15) because NOx emissions will be below 100 tpy and 560 lbs per day.

See discussion under Section 1 above and 2Q .0512 below

2D .1806 “Control and Prohibition of Odorous Emissions” - Added during this permit renewal per current shell guidance:

The Permittee shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

2Q .0317, Avoidance Conditions for 15A NCAC 2D .0524, New Source Performance Standards (40 CFR Part 60 Subpart VVV)

See discussion under 2D .0524 above

2Q .0317, Avoidance Conditions for 15A NCAC 2D .0530, PREVENTION OF SIGNIFICANT DETERIORATION (for VOC)

See discussion under 2Q .0317 for 2D .0531 below

2Q .0317, Avoidance Conditions for 15A NCAC 2D .0531, SOURCES IN NONATTAINMENT AREAS

The A&E facility is located in Gaston County. This area has been designated as non-attainment area for 8-hr ozone standard on April 15, 2004. Effective June 15, 2004, non-attainment area new source review (NAA NSR) rule applies in this area to any new major source or a major modification to an existing major source.

Based on the last inspection report, NO exceedances of the 40 tpy limit for Machine G were noted, compliance was demonstrated.

The PSD Avoidance conditions in A&E's current permit were modified significantly during this renewal in order to consolidate the thread bonding machines into one less than 100 tpy facility-wide PSD Avoidance condition for VOC. As discussed in Section 2 above, the facility is currently operating under several avoidance conditions under 2D .0530 and 2D .0531:

- less than 250 tons per year VOC PSD Avoidance limit for Machines ES-1 and ES-4
- less than 40 tons per year VOC PSD Avoidance limit for Machine ES-2
- less than 40 tons per year VOC PSD Avoidance limit for Machine ES-5
- less than 40 tons per year VOC PSD Avoidance limit for Machine ES-6
- less than 40 tons per year VOC PSD Avoidance limit for Machines ES-7 and ES-8
- less than 40 tons per year VOC PSD Avoidance limit for Machines ES-3, ES-10 and ES-11
- less than 40 tons per year VOC PSD Avoidance limit for Machine ES-9

All eleven thread bonding machines (ID Nos. ES-1 through ES-11) are being consolidated under one less than 100 tpy facility-wide VOC RACT Avoidance condition. The less than 100 tons per year limitation will allow A&E to avoid Existing Source RACT (compliance date of April 1, 2009). The consolidated VOC emissions limitation will fall under 2Q .0317 for 2D .0902 applicability. As a result of the RACT avoidance condition, the facility is no longer a major stationary source for PSD purposes. The 40 tpy restrictions (described above) are no longer necessary and will be removed from the permit.

The current permit contains equations/formulas for calculating VOC emissions for each machine; they will be replaced with the following generic equation upon issuance of the renewed permit:

$$E_{VOC} = A [(1-F) + (F)(1-E)] + B$$

- where, E_{VOC} is the emissions of VOC in pounds per month from each thread bonding machine
- A** is the total amount of VOC used in each thread bonding machine found by multiplying the amount of each type of VOC-containing material consumed during the month by the VOC content of the material
 - B** is the amount of VOC used for cleaning each machine
 - F** is the capture efficiency [100% per June 20, 2006 approved test results]
 - E** is the control efficiency [98.9% per June 20, 2006 approved test results]

As allowed under Part 70 – Streamline Permitting, the following permitting requirements were incorporated under RACT Avoidance in order to exempt this facility from CAM (See CAM Section under 2D .0614 above for more details). This included enhanced monitoring for the TO (including minimum temperature based on June 20, 2006 stack test results) and parameters to be monitored for the Permanent Total Enclosure (PTE). The following continuous compliance monitoring requirements for the TO and PTE to ensure compliance with the VOC RACT Avoidance limit were incorporated into the renewed permit:

- appropriate monitoring, recordkeeping and reporting requirements for the thermal oxidizer (TO),
- minimum temperature and destruction efficiency for TO determined during performance testing,
- a requirement for when the oxidizer is not in operation or “deemed not in operation”, the VOC emissions shall be determined based on an uncontrolled emissions rate, assuming 0% control efficiency,
- continuous monitoring to ensure the PTE capture efficiency of 100% is met as detailed below, and
- performance testing every 5 years

The facility will continuously monitor the tower fan speed for each machine to ensure the PTE capture efficiency of 100% is met. During stack testing performed June 20, 2006, the tower fan speeds were recorded from each machine while performing EPA Method 204. The table below indicates the average fan speed (rpm) recorded during the performance testing taken from Appendix 2 Field Data Sheets, page 39:

| Machine ID No. | New ID No. | Average Machine Fan Speed (rpm) |
|----------------|------------|---------------------------------|
| ESA | ES-1 | 785.7 |
| ESB | ES-4 | 723.3 |
| ESC | ES-5 | 735.3 |
| ESD | ES-6 | 731.0 |
| ESE | ES-7 | 782.3 |
| ESF | ES-8 | 792.7 |
| ESG | ES-9 | 795.7 |
| ESH | ES-2 | 804.0 |
| ESI | ES-3 | 864.7 |
| ESJ | ES-10 | 788.7 |
| ESK | ES-11 | 820.7 |

Based on the most recent compliance inspection (2/8/2008), the fan speeds observed were consistent with the above speeds determined during performance testing. The combustion temperature of the TO observed during the inspection was 1,503 degrees F, above the minimum temperature of 1,462 degrees F. Compliance with this condition is expected based on the facilities actual emissions (Summarized in Section 9 below) and observations during the most recent inspection.

2Q .0508 Permit Content

During this permit renewal process, we are adding a Primary Operating Scenario and Alternate Operating Scenario, as follows:

- processing nylon only – Primary Operating Scenario (POS)
- processing polyester only – Alternative Operating Scenario (AOS)

See explanation under 2D .0909 above for more details on the operating scenarios.

The following language will be added to the permit under Section 2.1-B. at this time:

7. ALTERNATIVE OPERATING SCENARIOS [15A NCAC 2Q .0508(p)]

The Permittee, contemporaneously with making a change from one alternate operating scenario to another, shall record in a logbook (written or electronic format) the scenario under which it is operating. [15A NCAC 2Q .0508(p)]

2Q .0512, Permit Shield for Nonapplicable Requirements

The current permit (Air Quality Permit # 06691T14) contains a Permit Shield for Nonapplicable Requirements under Section 2.3, which states:

“The Permittee is shielded from the following nonapplicable requirements [15A NCAC 2Q .0512(a)(1)(B)].

- A. *Provided the boilers are operated as noted in Table in Part I, Section 1, 15A NCAC 2D .0530 (PSD) is not applicable to the boilers (ID Nos. B2, and ES 15-1 through ES 15-4) since the SO₂ emissions will remain under 250 tpy.*
- B. *15A NCAC 2D .0524 (40 CFR Part 60 Subpart VVV) is not applicable to two nylon thread bonding processes (ID Nos. ESA and ESB) because the lines pre-date the NSPS regulation.”*

The following revised language will be placed in the renewed permit (rationale to follow):

“The Permittee is shielded from the following nonapplicable requirements [15A NCAC 2Q .0512(a)(1)(B)]:

- A. *15A NCAC 2D .1400, Reasonable Available Control Technology (RACT) for nitrogen oxides (NO_x), is not applicable to this facility because the potential NO_x emissions are less than 100 tpy due to the removal of boilers ID Nos. B2 and ES 15-2; and the capability of burning No. 6 fuel oil, per facility’s request dated February 7, 2008.*
- B. *15A NCAC 2D .0524, 40 CFR Part 60 Subpart VVV, is not applicable to two (2) - nylon thread bonding processes (ID Nos. ES-1 and ES-4) because the lines pre-date the NSPS regulation.*
- C. *15A NCAC 2D .0951, RACT for Polyester Thread Bonding Manufacturing, is not applicable to six (6) – polyester thread bonding processes (ID Nos. ES-3, ES-6 through ES-9, and ES-11) provided the facility remains below the RACT Avoidance limit of less than 100 tpy for VOC emissions as specified in Specific Condition 2.1-B.6.*
- D. *15A NCAC 2D .0955, RACT for Nylon Thread Bonding Manufacturing, is not applicable to eleven (11) – nylon thread bonding processes (ID Nos. ES-1 through ES-11) provided the facility remains below the RACT Avoidance limit of less than 100 tpy for VOC emissions as specified in Specific Condition 2.1-B.6.”*

❖ for SO₂ emissions

The initial Title V review did not provide an explanation for the determination under existing Section 2.3-A regarding SO₂ emissions remaining below 250 tpy. A rough estimate of potential SO₂ emissions using the permitted 15A NCAC 2D .0516 emission limit indicates that potential SO₂ emissions are in excess of 250 tpy:

$$2.3 \text{ lb/million Btu} * 131.35 \text{ million Btu/hr} * 8,760 \text{ hours/year} * \text{ton}/2000 \text{ lbs} = 1,323.2 \text{ tpy SO}_2$$

Therefore, a thorough review of the SO₂ emissions was done. Review of the combustion spreadsheets provided with the RACT response letter received July 31, 2007 indicates that potential SO₂ emissions as currently permitted = 411 tpy SO₂. The facility was permitted to replace boiler B-2 with ES 15-2, which would decrease SO₂ emissions from 411 tpy to 255.9 tpy, exceeding 250 tpy. On February 7, 2008, the facility requested removal of boilers B-2 and ES 15-2; and the capability of burning No. 6 fuel (to avoid RACT for NO_x). The requested changes will decrease potential SO₂ emissions from 411.7 tpy to 181.5 tpy. The permit shield under 2.3 for SO₂ will be removed and a PSD Avoidance Condition for SO₂ will not be necessary for this permit renewal because the potential SO₂ emissions are below 250 tpy.

❖ for NO_x emissions

See discussions under Section 1 and 2D .1400 above for RACT evaluation

❖ for VOC emissions

See discussions under Section 1, 2D .0900 and 2Q .0317 above for RACT evaluation

2Q .0705 – Existing Facilities and SIC Calls

Once sources at a facility subject to a MACT standard trigger their “last MACT”, the Permittee must submit a permit application that includes an evaluation for all toxic air pollutants covered under 15A NCAC 2D .1104 for all sources at the facility, excluding those sources exempt from evaluation under 15A NCAC 2Q .0702. The last MACT for American and Efird was the Printing, Coating, and Dyeing of Fabrics and other Textiles NESHAP, which triggers applicability to this regulation. The compliance date for the last MACT was May 29, 2006. The facility submitted a TAP demonstration (received on May 26, 2006); therefore, at this time we are addressing last MACT and placing our current shell language in the permit. See Section 7 - Toxics below.

2Q .0711 "Emission Rates Requiring a Permit"

The renewal of this permit does not trigger a toxics evaluation; however, the modification does.

2Q .0706(b)(1) states that if there is any net increase in (actual) emissions of any NC regulated air toxics, which the facility was emitting before this modification, or if there is emissions of any new NC regulated pollutant that the facility was not emitting before this modification and is above its toxic pollutant emission rate (TPER), then the modification will require a permit application to comply with 2D .1100.

The facility has not modeled for any NC air toxics. The company conducted a facility wide emissions review for the five air toxics, which exhibited net increase in emissions due to modification of an existing thread bonding process (ID No. ES-G). These pollutants are benzene, formaldehyde, benzo (a) pyrene, hexane, and toluene. The permit application provided facility-wide potential emissions (as provided in Section 5 above), which indicates benzene has the potential to exceed the TPER. The facility included combustion emissions in this evaluation, which are exempt (See Section 7 below). The actual facility-wide emissions for each of these pollutants are well below the respective TPER. Hence, an air permit application to comply with 2D .1100 is not required at this time. Please refer to Sections 5, 7, and 9 for a complete summary of emissions for the modification and facility-wide emissions.

6. NSPS, NESHAPS, PSD, Attainment Status, 112(r), and CAM

NSPS

As indicated above, modification of the existing machine ES-G triggers evaluation under NSPS Subpart VVV. While processing nylon, Machine G is subject to NSPS Subpart VVV, as currently permitted; however, the facility requested an avoidance condition for Subpart VVV while processing polyester. All applicable requirements associated with emission standards, performance testing, monitoring, record keeping, and reporting will be included in the revised permit. Refer to Section 5 above for details.

NESHAP/MACT

Also as indicated in Section 5 above, the facility is subject to MACT Subpart OOOO requirements for existing affected sources. All applicable requirements associated with emission standards, performance testing, monitoring, record keeping, and reporting will be included in the renewed permit.

PSD

The County of Gaston is in attainment of all criteria pollutants, except for ozone. The facility is a "250 tons" category source for VOC. Prior to this permit revision, the facility was considered a major stationary source. The facility currently has six (6) less than 40 tons per year VOC limits for nine of their eleven thread bonding processes as detailed in Sections 2 and 5 above that are being consolidated into one (1) less than 100 tpy RACT Avoidance limit in order to Avoid Existing Source RACT. Once the renewed permit is issued, the facility will be operating under one RACT Avoidance condition of 100 tons per year VOC limit. They will be reclassified as Minor for PSD purposes for VOC.

Modification of Machine G and Renewal of this permit do not require PSD analysis because no emissions increase was requested (See Section 5 above); potential allowable VOC emissions will actually decrease and the facility will no longer be a major source for VOC.

The minor source baseline dates for PM₁₀, sulfur dioxide, and nitrogen oxides have been triggered for Gaston County. Based on potential emissions from Machine G using DAQ's Natural Gas Combustion Spreadsheet are:

| Pollutant | Before Control Potential lbs/hr rate |
|----------------------------|---|
| Particulate Matter (total) | 0.03 |
| Sulfur Dioxide | 0.0 |
| Nitrogen Oxides | 0.33 |

Therefore, the actual emissions increase for each of these pollutants due to modifying existing machine ES-G do not exceed the 1 lb/hr threshold. Hence, emission tracking for PSD Class II increment purpose is not required.

Attainment Status and Nonattainment NSR

As indicated above, the A&E facility is located in Gaston County, which is a designated county for nonattainment for 8-hr ozone standard. Also, this county has been deemed in nonattainment of the 1 hr ozone standard, because it has been classified using the Subpart 2 of Part D of the Clean Air Act, for its 8-hr ozone standard.

As indicated above, the County of Gaston has been classified in nonattainment for 8-hr ozone standard, and effective June 15, 2004, NAA NSR rule applies in this area.

Please see Section 5 for complete details on NAA NSR applicability and requirements for Machine G.

112(r)

This facility is not subject to Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the thresholds in this rule.

CAM

A Compliance Assurance Monitoring (CAM) (40 CFR Part 64) determination is required for this renewal because: (1) the facility is a Title V facility with potential emissions that exceed the Title V major source levels without considering controls; and (2) there are sources subject to an emission limitation or standard that require controls in order to comply with the emission limitation.

40 CFR 64 requires that a CAM plan be developed for all equipment located at a major facility, that have *pre-controlled emissions above the major source threshold*, and use a control device to meet an applicable standard. The analysis on applicability and CAM requirements for VOC and HAP emissions are discussed in Section 5 above.

7. Facility Wide Air Toxics

The following is a facility-wide emission summary taken from the previous review for issued permit number 06691T14, with columns added to address the modification request and Last MACT Toxics demonstration. The emissions from the proposed modification to existing bonding machine G (ID No. ES-G) are presented as provided in the Public version of the application submittal, which states they are facility-wide potential to emit. The Last MACT Toxics are presented as provided in the TAP demonstration submittal, which indicates that the facility "actual" emissions are calculated by taking the total usage and assuming 10% emission rate. "This is standard practice with pressure dyeing operations and industrial pretreatment."

| Pollutants | Facility wide Emissions prior to Machine G modification taken from permit review for issued Permit #06691T14 | Proposed Modification to Machine G Facility-wide PTE Emissions | Last MACT Toxics Submittal – PTE Process and Fuel Combustion Emissions | TPER | Modeling required to assure compliance with 2D .1100? |
|----------------|--|--|--|---------------------------|---|
| Benzene | 2.15 lbs/yr | 14.74 lbs/yr | 0.646 lbs/yr | 8.1 lbs/yr | No |
| Benzo(a)pyrene | 0.00123 lbs/yr | 0.00126 lbs/yr | 0.000369 lbs/yr | 2.2 lbs/yr | No |
| Formaldehyde | 0.00025 lbs/hr | 0.031 lbs/hr | 0.00263 lbs/hr | 0.04 lbs/hr | No |
| n-Hexane | 5.04 lbs/day | 5.18 lbs/day | 1.52 lbs/day | 23 lbs/day | No |
| Toluene | 0.0047 lbs/hr 1.12 lbs/day | 0.0461 lbs/hr 1.11 lbs/day | 0.000119 lbs/hr 0.00286 lbs/day | 14.4 lbs/hr 98 lbs/day | No No |

Benzene is the only TAP that has the potential to exceed the TPER. After further review of the modification request for Machine G, benzene emissions provided in the application submittal for modification of Machine G included facility-wide PTE (which included benzene emissions from boilers (ID Nos. ES 15-1, ES 15-3 and ES 15-4) of 14 lbs/yr). The last MACT toxics evaluation exempts combustion sources under 15A NCAC 2Q .0702(a)(18) as defined under 2Q .0703 until 18 months after promulgation of the MACT or GACT for combustion sources; therefore *modeling for benzene is not required at this time*. Also, a review of the emissions inventory for the last couple of years (see summary provided in Section 9 below) indicates the actual emissions are below the TPER.

8. Statement of Compliance

Based on the facility's most recent inspection completed by Mr. Bruce Ingle, MRO, on February 1, 2008, the facility appeared to be in compliance with the applicable air quality regulations.

9. Facility Emissions Review

The following table represents facility-wide actual emissions. The emissions from the proposed modification to bonding machine G to allow for an additional substrate (polyester) are provided in Section 5 above.

| Pollutant | 2006 Actual Emissions based on RACT response letter (tons per year) | 2006 Actual Emissions - Facility Annual Emissions Report from Fees Module Data (tons per year) | 2005 Actual Emissions - Facility Annual Emissions Report from Fees Module Data (tons per year) |
|--|--|---|---|
| Particulate Matter (PM) | 1.01 | 0.99 | 0.97 |
| Particulate Matter <10 microns (PM-10) | 1.01 | 0.81 | 0.91 |
| Carbon Monoxide (CO) | 11.13 | 11.16 | 10.03 |
| Nitrogen Oxides (NOx) | 9.12 | 9.11 | 8.02 |
| Sulfur Dioxide (SO2) | 0.08 | 0.05 | 1.93 |
| Volatile Organic Compounds (VOC) | 24.41 | 24.74 | 16.78 |
| Triethylamine | 1.4 | 1.4 | 0.877 |
| Methanol | 9.89 | 10.29 | 7.28 |
| Methylene Chloride | 0 | 0 | 101.1 |
| All HAPs (combined) | -- | 12.13 | 109.75 |

10. Stipulation Review

MRO had the following comments:

Emails to Judy Lee, RCO, on February 27, 2006 and February 22, 2007 from Ms. Tammie Watkins, MRO through Mr. Bruce Ingle, MRO

MRO Regional Comments as of February 22, 2007:

Stipulation Review

Permit 06691T14 was issued on 11/3/2005. Since issuance of this permit, MACT OOOO became effective on May 29, 2006. The current MACT stipulation does not include the necessary parameters for compliance monitoring on *the appropriate lines and needs to be updated. Also, an application for additional lines has been incorporated into the renewal application prior to this application submittal. A new permit needs to be issued as soon as possible to reflect the current status of existing equipment of the facility.*

Compliance Status

The facility appears to be in compliance with applicable air quality regulations.

**MACT Status*:*

MACT OOOO - in compliance

MRO requests a draft permit prior to issuance.

An initial draft permit and review were sent to Mr. Ingle, MRO for review on November 27, 2007 and comments received on December 7, 2007.

Since the initial draft, MRO has performed an annual compliance inspection of the facility (performed on 2/1/2008), as discussed above, and was found to be in compliance.

All of Mr. Ingle's recommendations were taken into consideration during this review.

A draft permit was sent to Mr. John Eapen, American and Efird for review on November 26, 2007 and comments received on February 7, 2008 (as detailed above).

11. Public Notice/EPA and Affected State(s) Review

Pursuant to 15A NCAC 2Q .0521, a notice of the DRAFT Title V Permit shall be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 2Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also pursuant to 2Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice provided to the public under 2Q .0521 above.

12. Conclusions, Comments, and Recommendations

- ✓ A professional engineer’s seal was not required for this renewal; however, for the significant modification a PE Seal was required. Pursuant to 15A NCAC 2Q .0112 “Application requiring a Professional Engineering Seal,” the application was sealed on November 21, 2006 by Ms. Dawn C. Reeves, PE Seal 024475.
- ✓ A consistency determination was not required for his renewal; however, for the significant modification a consistency determination was required. A letter dated December 4, 2006, from Mr. Danny Jackson, Assistant City Manager, Community Development for the City of Mount Holly verified that the proposed modification is consistent with the current Mount Holly Zoning Ordinance.
- ✓ MRO recommends issuance of the permit and DOES request a DRAFT permit prior to issuance as specified under Section 10 above.
- ✓ RCO concurs with MRO’s recommendation to issue the renewed air permit.