# TECHNICAL EVALUATION
# &
# PRELIMINARY DETERMINATION

## APPLICANT

Ascend Performance Materials Operations LLC
3000 Old Chemstrand Road
Cantonment FL 32533

Pensacola Plant
Facility ID No. 0330040

## PROJECT

Project No. 0330040-038-AC
Application for Title V Source Air Construction Permit
HMD Expansion

## COUNTY

Escambia County, Florida

## PERMITTING AUTHORITY

Florida Department of Environmental Protection
Air Resource Section
Northwest District Office
160 W. Government Street, Suite 308
Pensacola, Florida 32502-5740

July 19, 2013

## 1. GENERAL PROJECT INFORMATION

### Air Pollution Regulations

Projects at stationary sources with the potential to emit air pollution are subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The statutes authorize the Department of Environmental Protection (Department) to establish regulations regarding air quality as part of the Florida Administrative Code (F.A.C.), which includes the following applicable chapters: 62-4 (Permits); 62-204 (Air Pollution Control – General Provisions); 62-210 (Stationary Sources – General Requirements); 62-212 (Stationary Sources – Preconstruction Review); 62-213 (Operation Permits for Major Sources of Air Pollution); 62-296 (Stationary Sources - Emission Standards); and 62-297 (Stationary Sources – Emissions Monitoring). Specifically, air construction permits are required pursuant to Rules 62-4, 62-210 and 62-212, F.A.C.

In addition, the U.S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 specifies New Source Performance Standards (NSPS) for numerous industrial categories. Part 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP) based on specific pollutants. Part 63 specifies NESHAP based on the Maximum Achievable Control Technology (MACT) for numerous industrial categories. The Department adopts these federal regulations on a quarterly basis in Rule 62-204.800, F.A.C.

### Glossary of Common Terms

Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of this permit.

## Facility Description and Location

Ascend Performance Materials Operations LLC is an existing nylon and intermediate chemical manufacturing facility, which is categorized under Standard Industrial Classification Code No. 2821, 2824 and 2869. The facility manufactures various chemicals, including adipic acid, nylon fibers, nylon resins, hexamethylene diamine and maleic anhydride. The facility is located in Escambia County at 3000 Old Chemstrand Road, Cantonment, Florida. The UTM coordinates of the existing facility are Zone 16, 476.0 km East and 3385.0 km North. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to state and federal Ambient Air Quality Standards (AAQS).

### Facility Regulatory Categories

- The facility is a major source of hazardous air pollutants (HAP).
- The facility has no units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

### Project Description

The production of hexamethylene diamine (HMD) involves the hydrogenation of Adiponitrile (ADN) in the Low Pressure Diamine (LPD) process. The Pensacola Plant receives ADN from the Ascend Decatur, AL plant and produces HMD onsite. The Crude HMD produced by the LPD process is then refined in emissions units EU040 and EU041.

This project modifies existing air construction permit No. 0330040-036-AC to authorize Ascend to increase production of hexamethylene diamine approximately 20% above the previously authorized production rate. A new 200 foot purge column will be installed to replace the existing A, B and C Stripper columns. The C-Stripper column will be changed to C-Foreshots service. The existing Foreshots #1, Purge and Intermediates columns,

idled by this project, will have their service changed to recover and refine a by-product for sale rather than disposal. The project will increase dimethyl ester (DME) production through operational changes, including a reduction in batch processing time. Increased DME production will result in increased throughput at the Methanol Storage Tank.

The Permittee is authorized to perform the authorized changes in a phased approach. The Permittee is not required to shut down all HMD production while construction is in progress. Permit conditions of existing equipment will remain in effect until that equipment is idled or has its service changed.

Because the project will result in fewer components in VOC service, there will be no increase in fugitive emissions, and facility-wide emissions will not increase above the projected actual emissions from permit 0330050-036-AC.

This project will modify or affect the following emissions units.

**Facility ID No. 0330040**

| ID No. | Emission Unit Description |
|---|---|
| 040 | Hexamethylene Diamine (HMD) Refining |
| 041 | Hexamethylene Diamine (HMD) C-Foreshots and Purge Distillation Column |
| 077 | Dimethyl Ester (DME) Production Unit |
| 097 | NSPS Storage Tanks (Methanol) |
| | |
| | Low Pressure Diamine (LPD) Process (insignificant) |
| | Hexamethylene diamine (HMD) Process Tank Farm (insignificant) |
| | 314 & 442 Building DME/$HNO_3$/BHMT/AGS/HMD Loading/Unloading (insignificant) |

**Proposed changes at each affected emissions unit are as follows:**

1. Hexamethylene Diamine Refining (EU 040):
   Proposed changes at this emissions unit are:
   - Foreshots #2, A-Stripper and B-Stripper columns will be removed from service for this emissions unit.
   - Change Foreshots #1 column, purge, and intermediates columns to recover and refine a by-product.
   - Miscellaneous piping and pump improvements.
   - Instrumentation and control system improvements.

2. Hexamethylene Diamine C-Foreshots and Purge Distillation Column (EU 041):
   Proposed changes at this emissions unit are:
   - Change C-Stripper to C-Foreshots service, including new or changed supporting equipment and packing.
   - Install additional VOC Scrubber, including mass internals.
   - Install new 200 foot Purge column and miscellaneous equipment.
   - Miscellaneous piping/valve/pumping additions and/or changes.
   - Utilities changes to support new and revised service.
   - Instrumentation and control system improvements.

   Ascend is also requesting removal of the maximum head pressure limit of 100 mm Hg (surrogate parameter) for the A-Stripper, B-Stripper and C-Stripper columns. This permit condition will be removed when that equipment is removed from service or has its service changed.

The C-Foreshots (converted C-Stripper) and new 200 foot Purge column have been evaluated for 40 CFR 60, Subpart NNN applicability using option 60.660(d)(1). The permittee has selected the alternative means of compliance allowed by 40 CFR 60.660(d), which is, compliance with 40 CR 65, Subpart D, Consolidated Federal Air Rule for Process Vents. Under Subpart D, these columns are classified as Group 2B, subject only to recordkeeping and reporting requirements, and will only be required to maintain their Group 2B status in accordance with the performance requirements specified by 40 CR 65, Subpart D. No additional control will be required.

*Option 60.660(d)(1), Option to comply with 40 CFR 65, Subpart D: Owners or operators of process vents that are subject to 40 CFR 60, Subpart NNN may choose to comply with the provisions of 40 CFR 65, Subpart D, to satisfy the requirements of 40 CFR 60, Subpart NNN.*

*TRE index value means a measure of the supplemental total resource requirement per unit reduction of TOC associated with an individual distillation vent stream, based on vent stream flow rate, emission rate of TOC net heating value, and corrosion properties (whether or not the vent stream is halogenated), as quantified by the equation given under 40 CFR 60.664(e).*

3. Dimethyl Ester (DME) Production (EU 077):
   Proposed changes at this emissions unit are:
   - No physical changes are proposed.
   - Increase DME production through operational changes, including reduction of batch processing time.

4. NSPS Storage Tanks (EU 097):
   Proposed changes at this emissions unit are:
   - No physical changes are proposed.
   - Increase throughput at the Methanol Storage Tank to support increased DME production.

**Proposed changes at each affected insignificant emissions unit or activity:**
(See Appendix I-1, Insignificant Emissions Units and/or Activities.)

1. Low Pressure Diamine (LPD) Process. Proposed changes at this unit are:
   - Install closed loop tempered water system.
   - Increase cooling surface area and increase tempered water circulation rate.
   - Install new Recycle Hydrogen Cooler.
   - Increase ADN feed rates at LPD.
   - Increase catalyst injection rates (Install new catalyst injection pumps).
   - Upgrade off-gas scrubber operation.
   - Modify Decanter for increased rates.
   - Install additional hydroclones/doxies.
   - Make miscellaneous pipe, valve and pump improvements.
   - Utility upgrades.
   - Make instrumentation and control system improvements.

2. HMD Process Tank Farm. Proposed changes at the HMD process tank farm are:
   - Make miscellaneous piping and tank service changes as needed to support HMD expansion project.
   - Make instrumentation and control system improvements.

3. 314 & 442 Building DME/$HNO_3$/BHMT/AGS/HMD Loading/Unloading. Proposed changes at the loading/unloading facility are:

- Make improvements to loading/unloading facilities to support the HMD expansion project.
- Make instrumentation and control system improvements.

Utility upgrades will be made as needed to support the HMD expansion project. Utilities changes include but are not limited to systems supporting supply of air, nitrogen, water, steam and electricity.

**Processing Schedule**
June 21, 2913 Received the application for a Title V source air pollution construction permit.

## 2. PSD APPLICABILITY

### General PSD Applicability

For areas currently in attainment with the state and federal AAQS or areas otherwise designated as unclassifiable, the Department regulates major stationary sources of air pollution in accordance with Florida's PSD preconstruction review program as defined in Rule 62-212.400, F.A.C. Under preconstruction review, the Department first must determine if a project is subject to the PSD requirements ("PSD applicability review") and, if so, must conduct a PSD preconstruction review. A PSD applicability review is required for projects at new and existing major stationary sources. In addition, proposed projects at existing minor sources are subject to a PSD applicability review to determine whether potential emissions *from the proposed project itself* will exceed the PSD major stationary source thresholds. A facility is considered a major stationary source with respect to PSD if it emits or has the potential to emit:

- 250 tons per year or more of any regulated air pollutant; or
- 100 tons per year or more of any regulated air pollutant and the facility belongs to one of the following 28 PSD-major facility categories: fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input, coal cleaning plants (with thermal dryers), Kraft pulp mills, portland cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, primary copper smelters, municipal incinerators capable of charging more than 250 tons of refuse per day, hydrofluoric, sulfuric, and nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven batteries, sulfur recovery plants, carbon black plants (furnace process), primary lead smelters, fuel conversion plants, sintering plants, secondary metal production plants, chemical process plants, fossil fuel boilers (or combinations thereof) totaling more than 250 million British thermal units per hour heat input, petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels, taconite ore processing plants, glass fiber processing plants and charcoal production plants.

Once it is determined that a project is subject to PSD preconstruction review, the project emissions are compared to the "significant emission rates" defined in Rule 62-210.200, F.A.C. for the following pollutants: carbon monoxide (CO); nitrogen oxides ($NO_X$); sulfur dioxide ($SO_2$); particulate matter (PM); particulate matter with a mean particle diameter of 10 microns or less ($PM_{10}$); volatile organic compounds (VOC); lead (Pb); fluorides (Fl); sulfuric acid mist (SAM); hydrogen sulfide ($H_2S$); total reduced sulfur (TRS), including $H_2S$; reduced sulfur compounds, including $H_2S$; municipal waste combustor organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans; municipal waste combustor metals measured as particulate matter; municipal waste combustor acid gases measured as $SO_2$ and hydrogen chloride (HCl); municipal solid waste landfills emissions measured as non-methane organic compounds (NMOC); and mercury (Hg). In addition, significant emissions rate also means any emissions rate or any net emissions increase associated with a major stationary source or major modification which would construct within 10 kilometers of a Class I area and have an impact on such area equal to or greater than 1 $\mu g/m^3$, 24-hour average.

If the potential emission exceeds the defined significant emissions rate of a PSD pollutant, the project is considered "significant" for the pollutant and the applicant must employ the Best Available Control Technology (BACT) to minimize the emissions and evaluate the air quality impacts. Although a facility or project may be

*major* with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several "significant" regulated pollutants.

**PSD Applicability for Project**

The facility is a major stationary source with respect to PSD, because it is a chemical process plant that has the potential to emit 100 tons per year or more of one or more regulated air pollutants.

The applicant used the hybrid approach, described in Rule 62-212.400(2)(a)3, F.A.C., to compare baseline actual emissions (from Annual Operating Reports) to projected actual emissions adjusted for demand growth for existing emissions units, and to projected potential emissions for new emissions units.

Greenhouse Gas (GHG) evaluations were not required for this permit. GHG Tailoring Rule Step 1 applies to projects permitted prior to July 1, 2011. Under Step 1, PSD applies to the GHG emissions if both of the following are true:

- Not considering its emissions of GHGs, the new source is considered a major source for PSD applicability and is required to obtain a PSD permit (called an "anyway source"), and,
- The potential emissions of GHGs from the new source would be equal to or greater than 75,000 TPY on a CO2e basis.

Ascend was issued construction permit No. 0330040-036-AC in June of 2011 for the expansion of adipic acid production. Construction was started prior to July 1, 2011 and is ongoing. The permit covers multiple emission units and was issued based on an evaluation of past actual to future actual emissions of PSD pollutants regulated prior to July 1, 2011. Permit 0330040-036-AC was issued as a minor modification with criteria pollutants ("anyway source" pollutants) increasing below major source thresholds. Per EPA Guidance (September 9, 2011), because the emissions from this permit modification do not increase emissions from permit 0330040-036-AC, an evaluation of GHG emissions for PSD applicability, as regulated under the GHG Tailoring Rule, was not required.

As provided in the application, the following table summarizes potential emissions and PSD applicability for the project.

Table A. Potential Emissions (Tons/Year) and PSD Applicability

| Regulated Air Pollutant | Baseline Actual Emissions | Baseline Actual Emissions plus Demand Growth | Projected Actual Emissions | Net Emissions Increase | Significant Emissions Rate | Subject to PSD |
|---|---|---|---|---|---|---|
| CO | 424 | 501 | 548 | 47 | 100 | NO |
| $NO_X$ | 1927 | 2,300 | 2337 | 37 | 40 | NO |
| $PM/PM_{10}$ | 374 | 502 | 514 | 12 | 25/15 | NO |
| PM2.5 | 265 | 353 | 361 | 8 | 10 | NO |
| $SO_2$ | 3564 | 4,604 | 4,606 | 2 | 40 | NO |
| VOC | 233 | 328 | 341 | 13 | 40 | NO |

Note: Baseline actual emissions (BAE) reported for VOC has been corrected to include VOC emissions from the NSPS Storage Tanks (EU-097). VOC emissions from these storage tanks were inadvertently omitted from the actual emissions data reported in Application 0330040-036-AC. Also, the BAE values for $NO_x$ and $SO_2$ were corrected. These corrected values represent average emissions in tons per year over *one* 24 month period. The BAE values for $NO_x$ and $SO_2$ were reported in permit 0330040-036-AC as 1763 and 3413, respectively, and unintentionally represented average emissions in tons per year over an average of *two* 24 month periods.

This facility is considered a major stationary source for PSD because as a chemical process plant, it is one of the 28 PSD-major facility categories listed in Rule 62-210.200(195)(a)1., and emits 100 TPY or more of $NO_X$, CO,

PM, VOC, and $SO_2$. As shown in the above table, this project is not a major modification under PSD regulations since the differences between the baseline actual emissions including consideration of demand growth and projected actual emissions do not exceed the significant emissions rates. Therefore, the project is not subject to PSD preconstruction review.

## 3. APPLICATION REVIEW

### Application Fee

This project is classified as an AC/1D (source emitting 25 or more tons per year, but less than 50) with no required permit fees. The facility is subject to annual emission fees as a Title V source.

### Discussion of Emissions

During the preliminary engineering phase for the HMD expansion project, errors were discovered in past actual VOC emissions values reported for the HMD refining and distillation (EU 041 & EU 041). On November 26, 2012, Ascend notified the Department of the error and submitted corrected Annual Operating Reports for years 2003 through 2011. VOC emissions from the HMD process tanks (insignificant activity) had inadvertently been left out of the actual emissions data presented in Table 1a of Application 0330040-036-AC. For the Departments convenience, a corrected copy of Table 1a is included in this application. The emissions for EU-041 were originally reported based on a test report that only sampled for HMD, and other VOC constituents were not reported. The discrepancy was discovered during process modeling for this project using AspenTech HYSYS Process Simulation Software. Results from the HYSYS process model agree with tested HMD levels. Emissions data presented in the application were obtained using the HYSYS process model.

The project will result in fewer components in VOC service in the HMD process. Therefore, there will be no increase in fugitive emissions. The HMD process is exempt from 40 CFR 60, Subpart VVa pursuant to 60.480a(d)(3): *If an affected facility produces heavy liquid chemicals only from heavy liquid feed or raw materials, then it is exempt from 40 CFR 60.482-1a through 60.482-11a.*

Emissions from affected emissions units will be tracked over the next ten years to ensure that significant emission rates are not exceeded.

### State Requirements

Rule 62-204.800, F.A.C., Federal Regulations Adopted by Reference
Rule 62-210.370, F.A.C., Annual Operating Report
Rule 62-210.650, F.A.C., Circumvention of Pollution Control Devices
Rule 62-210.700, F.A.C., Excess Emissions
Rule 62-212.300, F.A.C., General Preconstruction Review Requirements
Rule 62-212.400(12), F.A.C., Prevention of Significant Deterioration
Rule 62-213.202, F.A.C., Responsible Official
Rule 62-213.205, F.A.C., Annual Emissions Fee
Rule 62-296.320, F.A.C., General Pollutant Emission Limiting Standards
Rule 62-297.310, F.A.C., Compliance Test Requirements

### Federal NSPS Provisions

40 CFR 60, Subpart A, General Provisions
40 CFR 60, Subpart NNN, Volatile Organic Compound Emissions From SOCMI Distillation Operations
40 CFR 60, Subpart Kb, Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)

### Federal NESHAP Provisions

40 CFR 63, Subpart A, General Provisions
40 CFR 63, Subpart F, Standards for Organic HAP From the Synthetic Organic Chemical Manufacturing Industry

40 CFR 63, Subpart FFFF, Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Mfg
40 CFR 63, Subpart SS, Standards for Closed Vent Systems, Control Devices, Recovery Devices and Routing
40 CFR 63, Subpart UU, Standards for Equipment Leaks - Control Level 2 Standards
40 CFR 63, Subpart WW, Standards for Storage Vessels (Tanks) – Control Level 2
40 CFR 63, Subpart YY, Standards for Hazardous Air Pollutants for Source Categories: Generic MACT Standards

**Other Draft Permit Requirements**
The permittee is required to submit an annual report of emissions from those units affected by this project to demonstrate, for the next ten years, that the significant emissions rates that would trigger PSD have not been exceeded.

## 4. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. Howard Ard is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at 850.595.0622 or howard.ard@dep.state.fl.us.