

**Louisiana Department of Environmental Quality (LDEQ)  
Office of Environmental Services**

**STATEMENT OF BASIS**

**Rhodia, Inc.  
Sulfuric Acid Plant  
Baton Rouge, East Baton Rouge Parish, Louisiana  
Agency Interest Number: 1314  
Activity Number: PER20070006  
Proposed Permit Number: 0840-00033-V2**

**I. APPLICANT**

**Company:**  
Rhodia, Inc.  
1275 Airline Hwy  
Baton Rouge, Louisiana 70805

**Facility:**  
Rhodia, Inc.  
1275 Airline Hwy  
Baton Rouge, East Baton Rouge Parish, Louisiana  
Approximate UTM coordinates are 673.9 kilometers East and 3376.3 kilometers North, Zone 15

**II. FACILITY AND CURRENT PERMIT STATUS**

Sulfuric Acid Plant  
Rhodia receives spent sulfuric acid and hazardous waste fuels from off-site sources and recovers the sulfur and energy values in its industrial furnaces, forming fresh sulfuric acid. The sulfuric acid production process begins with treatment of the feed streams in the industrial furnace. Liquids are sprayed using atomizers into the combustion chamber. Normal operating conditions are 2 to 4% excess furnace oxygen and furnace temperature between 1800°F and 2200°F at the furnace discharge. Furnace residence time is approximately three seconds. The feed streams are producing steam for process use. Gas from the waste heat boiler is further cooled and cleaned in the gas scrubbing system. This system includes spray scrubbing and wet electrostatic precipitators to remove acid mist and particulate emissions.

Cooling systems reduce the gas temperature from 600°F to 100°F. The wet gas is then dried through counter-current packed flow columns circulating ≥93% sulfuric acid. Dry gas is heated to 800°F before the sulfur dioxide is converted to sulfur trioxide using catalyst. Because the conversion step to sulfur trioxide is exothermic,

**Rhodia, Inc.**  
**Sulfuric Acid Plant**  
**Baton Rouge, East Baton Rouge Parish, Louisiana**  
**Agency Interest Number: 1314**

the hot exhaust gas is used to heat up the incoming feed by cross-current heat exchange.

Sulfur trioxide from the converter enters a countercurrent packed absorption tower. Strong sulfuric acid absorbs and hydrolyzes the sulfur trioxide to sulfuric acid. The demisters are the final pollution control device, removing primarily sulfuric acid mist generated in the acid tower. The demisters also capture any remaining HCl and particulate emissions.

The preceding process description pertains to Unit No. 1. The Unit No. 2 process is slightly different. After the drying step, the gas enters a second sulfur burning furnace, followed by a hot gas filter. This added step heats the gas, affording a second occasion for combustion. Unit No. 2 has over twice the capacity of Unit No. 1. Equipment is sized proportionately, with Unit No. 2 having a longer residence time.

Waste Storage

Seven tanks have been constructed specifically for the storage of hazardous waste. These seven tanks are located in the truck and rail unloading facility and operate under a nitrogen pad. A positive pressure vent system is tied into Unit No. 2 or to the TS Vapor Combustor to burn all fumes and vapors.

Package Boiler

The package boiler provides backup and supplemental steam production to Units No. 1 and No. 2. It is rated for 80,000 lbs/hr steam production with a heat input of 106 MMBtu/hr and is permitted for an annual average heat input of 50 MMBtu/hr. It is fired with natural gas only and is equipped with low-NOx burners and a continuous flue gas oxygen analyzer.

Rental Boiler

The rental boiler provides backup steam production to Units No. 1 and No. 2 and the package boiler. It is fired with natural gas only and has a maximum firing rate of 133 MMBtu/hr but is limited to a 12-month rolling average firing rate of 10.4 MMBtu/hr per 40 CFR 60.44b(j)(2).

Rhodia Inc is a designated Part 70 source. The Part 70 permits which have been issued to the facility include:

| <b>Permit No.</b> | <b>Unit or Source</b> | <b>Date Issued</b> |
|-------------------|-----------------------|--------------------|
| 0840-00033-V1     | Sulfuric Acid Plant   | March 14, 2007     |
| 2184-V1           | Cathyval Plant        | September 4, 2007  |

**Rhodia, Inc.**  
**Sulfuric Acid Plant**  
**Baton Rouge, East Baton Rouge Parish, Louisiana**  
**Agency Interest Number: 1314**

### **III. PROPOSED PROJECT/PERMIT INFORMATION**

#### **Application**

A permit application was submitted on October 5, 2007 requesting a Part 70 operating permit modification for the Sulfuric Acid Plant. An addendum was submitted on October 6, 2008. The application was subsequently revised with the submittal on April 8, 2009.

#### **Project**

As part of Rhodia's consent decree for the Baton Rouge facility, Rhodia will install packed bed scrubbers on Sulfuric Acid Unit No. 1 and Unit No. 2 to control SO<sub>2</sub> emissions, which will be reduced by more than 10,000 TPY by the completion of Phase III of the project. Also as part of the consent decree, the Environmental Protection Agency (EPA) agreed to allow the Sulfuric Acid Plant to undergo an expansion project. This project will allow the facility to increase its total Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>) production from 2,200 tons/day to 2,800 tons/day. Specifically, the capacity of Sulfuric Acid Unit No.1 (EPN 3) will increase from 700 tons/day to 900 tons/day of sulfuric acid, and the capacity of Sulfuric Acid Unit No. 2 (EPN 2) will increase from 1,500 tons/day to 1,900 tons/day. The capacity increase will be accomplished with a series of debottlenecking projects.

In addition to the emission changes resulting from the abatement/debottlenecking project, Rhodia is requesting the following changes with this permit renewal/modification.

- Create a new emissions cap, Cap-Comb, for overall combustion emissions from the Rental Boiler, Sulfuric Acid Unit No. 1, and Sulfuric Acid Unit No. 2;
- Create Process Groups to better manage speciation of toxic air pollutants;
- Add Treatment Services Sumps (EPN M3) into the Title V Permit;
- Incorporate requirements of Rhodia's consent decree into the Title V Permit;
- Reconcile certain emission rates based on new guidance regarding rounding and maximum hourly emission rates;
- Replace Unit 1 cooling tower (EPN M1b) due to structural integrity concerns. The new tower is of similar design and identical capacity and emissions;
- Revise PM<sub>10</sub> emissions to include sulfuric acid mist emissions;
- Add a new caustic tank as an insignificant activity;
- Incorporate an insignificant case-by-case activity (approved June 2008) into the permit's GCXVII emissions;

**Rhodia, Inc.**  
**Sulfuric Acid Plant**  
**Baton Rouge, East Baton Rouge Parish, Louisiana**  
**Agency Interest Number: 1314**

- Revise metals emission rates for consistency with the BIF permit. This change results in 9 TAP metals being permitted above their respective minimum emission rates (MERs) per LAC 33:III.Chapter 51;
- Revise emissions for GCXVII activity regarding stack washings;
- Incorporate three new permit shield requests; and
- Reconcile hydrogen sulfide emissions from the sulfur feed tank in light of data collected at a similar Houston facility.

The revised application submitted on April 8, 2009 adjusted projected sulfuric acid mist emissions and incorporated an updated PSD analysis.

**Proposed Permit**

Permit 0840-00033-V2 will be the renewal/modification of Part 70 operating permit 0840-00033-V1 for the Sulfuric Acid Plant.

**Permitted Air Emissions**

Estimated emissions in tons per year are as follows:

| Pollutant                   | Before    | After    | Change   |
|-----------------------------|-----------|----------|----------|
| PM <sub>10</sub>            | 7.13      | 54.52*   | +47.39   |
| SO <sub>2</sub> (Phase I)   | 12,482.61 | 12449.35 | -33.26   |
| SO <sub>2</sub> (Phase II)  | 12449.35  | 4725.98  | -7723.37 |
| SO <sub>2</sub> (Phase III) | 4725.98   | 1077.79  | -3648.19 |
| NO <sub>x</sub>             | 284.63    | 115.58   | -169.05  |
| CO                          | 109.08    | 95.43    | -13.65   |
| VOC                         | 25.84     | 26.16    | +0.32    |

\*Includes sulfuric acid mist

Phase I is effective from issuance of this permit through December 31, 2010.

Phase II is effective from January 1, 2011 through April 30, 2012.

Phase III becomes effective on May 1, 2012.

Total HAP emissions are capped under 8.92 TPY.

**IV REGULATORY ANALYSIS**

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit.

**Rhodia, Inc.  
Sulfuric Acid Plant  
Baton Rouge, East Baton Rouge Parish, Louisiana  
Agency Interest Number: 1314**

**Applicability and Exemptions of Selected Subject Items**

See section XI table 2 of permit.

**Prevention of Significant Deterioration/Nonattainment Review**

This application was reviewed for compliance with the Louisiana Part 70 operating permit program, Louisiana Air Quality Regulations, New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAP). Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR) do not apply.

A Prevention of Significant Deterioration (PSD) and Non-Attainment New Source Review (NNSR) analysis was conducted to determine if the proposed modification is above the threshold values for a Significant Net Increase per LAC 33:III.504.L, 504.M, and 509. NO<sub>x</sub> emissions from the proposed project will increase less than 25 tons/year, but more than the non-attainment new source review (NNSR) significance level of 5 tons/year. A netting analysis was required; however, no credible change occurred during the contemporaneous period. Therefore, the project increase is less than the Major Modification Significant Net Increase of 25 tons/year, so NNSR is not required. The proposed net increase in emissions, on a baseline actual-to-projected actual basis, along with the Significant Net Increase thresholds are listed below in Table 1 (below and in the briefing sheet).

The PSD analysis for NO<sub>x</sub>, Sulfuric Acid Mist, and PM<sub>10</sub> uses a Baseline Actual Emissions (BAE) to Projected Actual Emissions (PAE) approach which excludes those emissions from the PAE for Sulfuric Acid Unit No. 1 and Unit No. 2 emissions that could have been accommodated during the baseline period and that are unrelated to the proposed project (per LAC 33:III.509).

**TABLE 1: PROPOSED NET INCREASE COMPARED TO THE SIGNIFICANT NET INCREASE THRESHOLDS**

| <b>Pollutant</b> | <b>Projected Actual Emissions (tpy)</b> | <b>Post-Project Potential to Emit (tpy)</b> | <b>Additional Emissions Capable of Accommodating</b> | <b>Baseline Actual Emissions (tpy)</b> | <b>Delta (tpy)</b> | <b>Significant Net Increase (tpy)</b> | <b>Above Threshold? (Yes/No)</b> |
|------------------|---|---|--|--|--------------------|---------------------------------------|----------------------------------|
| PM <sub>10</sub> | 41.29 <sup>1</sup>                      | 51.10                                       | 4.19   | 26.40                                  | 14.89              | 15                                    | No                               |
| SO <sub>2</sub>  | 1075.00                                 | 1075.00                                     | N/A  | 8279.51                                | -7204.51           | 40                                    | No                               |
| NO <sub>x</sub>  | 72.75 <sup>1</sup>                      | 91.98                                       | 9.11   | 48.55                                  | 24.20              | 25                                    | No                               |
| CO               | 51.20                                   | 51.20                                       | N/A  | 19.03                                  | 32.17              | 100                                   | No                               |
| VOC              | 8.58                                    | 8.58  | N/A  | 4.30                                   | 4.28               | 25                                    | No                               |

**Rhodia, Inc.  
Sulfuric Acid Plant  
Baton Rouge, East Baton Rouge Parish, Louisiana  
Agency Interest Number: 1314**

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|--------------------|---|---|--|--|--------------------|---------------------------------------|----------------------------------|
| Lead               | 0.01                                    | 0.01  | N/A  | 0.0008                                 | 0.0092             | 0.6                                   | No                               |
| Sulfuric Acid Mist | 33.10 <sup>1</sup>                      | 41.90                                       | 4.19   | 26.40                                  | 6.70               | 7.0                                   | No                               |

<sup>1</sup>The projected actual emissions exclude those emissions which the units were capable of accommodating during the baseline period per LAC 33:III.509.

NOTE: Even though the Post-Project Potential to Emit emissions are utilized as permitting limits, if the actual emissions exceed the Projected Actual Emissions such that the Significant Net Increase is met or exceeded, then a PSD Initial application and a Title V Modification application shall be submitted to LDEQ within 180 days.

This facility is a major source of criteria pollutants. The facility is also a major source of Toxic Air Pollutants (TAPs) under LAC 33:III.Chapter 51. The Sulfuric Acid Plant is not a major source of Hazardous Air pollutants (HAPs); however, wastewater and wastewater residuals from facilities subject to 40 CFR 63 Subpart G and other MACT standards or NSPS may be treated at the facility. Therefore, the Sulfuric Acid Plant complies with any applicable provisions of these MACT/NSPS standards.

**Streamlined Equipment Leak Monitoring Program**

For the Treatment Services Fugitive Emission (EQ FUG-TS), per the Louisiana Fugitive Emission Program Consolidation Guidelines (see specific requirement 223 in permit 0840-00033-V1), Rhodia follows a streamlined fugitive monitoring program with the Louisiana MACT Determination for non-HON sources as the most stringent program. With this permit modification, Rhodia is reducing site-wide permitted emissions of all class I and II TAPs present in source FUG-TS below their MERs. Thus, LA non-HON MACT no longer applies. However, Rhodia is voluntarily choosing to continue to comply with the LA non-HON MACT since the program is already in place. A permit shield was requested to ensure that voluntarily complying with LA non\_HON MACT still ensures compliance with the underlying programs that were consolidated (40 CFR 264 Subpart BB and 40 CFR 61 Subpart V.)

**MACT Requirements**

The Louisiana Air Toxics Program (LA MACT) requires a major source emitting any Class I or II pollutant at a rate that exceeds the minimum emission rate for that pollutant to demonstrate compliance with the Maximum Achievable Control Technology (MACT) standards. Additionally, the Louisiana Air Toxics Program requires a major source emitting any Class I, II, or III toxic air pollutant greater than

**Rhodia, Inc.  
Sulfuric Acid Plant  
Baton Rouge, East Baton Rouge Parish, Louisiana  
Agency Interest Number: 1314**

the minimum emission rate for that pollutant to determine its status of compliance with the applicable ambient air standard (AAS) defined for the pollutant.

The Sulfuric Acid Plant is subject to the Maximum Achievable Control Technology (MACT) standards when accepting wastewater and wastewater residuals from facilities subject to 40 CFR 63 Subpart G and other MACT standards.

The Toxic Air Pollutants which are metals have MACT determined to be compliance with the more stringent BIF permit feed limits.

The requirements that are applicable to each source in the application are detailed in the regulatory applicability tables.

**Air Quality Analysis**

See section III of the permit.

**General Condition XVII Activities**

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

**Insignificant Activities**

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

**V. PERMIT SHIELD**

Per 40 CFR 70.6(f) and LAC 33:III.507.I, permit shields have been determined for the proposed permit. The details of the permit shield are given in the Permit Shield section of the proposed permit.

**VI. PERIODIC MONITORING**

All periodic monitoring is conducted in accordance with state and federal regulations. See the Specific Requirements Section of the proposed permit for monitoring requirements.

**Rhodia, Inc.**  
**Sulfuric Acid Plant**  
**Baton Rouge, East Baton Rouge Parish, Louisiana**  
**Agency Interest Number: 1314**

## VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H<sub>2</sub>S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C (“Prevention of Significant Deterioration of Air Quality”) and D (“Nonattainment New Source Review”).

Nitrogen Oxides (NO<sub>x</sub>) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH<sub>4</sub>), Ethane (C<sub>2</sub>H<sub>6</sub>), Carbon Disulfide (CS<sub>2</sub>)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: ≥ 10 tons per year of any toxic air pollutant; ≥ 25 tons of total toxic air pollutants; and ≥ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM<sub>10</sub> – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

**Rhodia, Inc.**  
**Sulfuric Acid Plant**  
**Baton Rouge, East Baton Rouge Parish, Louisiana**  
**Agency Interest Number: 1314**

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO<sub>2</sub>) – An oxide of sulfur.

Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.