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BUREAU OF
AIR REGULATION

November 1, 2010

Mr. Rick Bradburn
Air Program Administrator
Department of Environmental Protection
160 Governmental Center
Pensacola, FL 32502-5794

RE: Adipic Acid VOC Emission Study

Dear Mr. Bradburn:

As discussed during the September 17, 2010 meeting between Ascend Performance Materials (Ascend) and the Department, the AP-42 Factors used in calculating adipic acid VOC emissions are "E" rated and based upon limited data. The enclosed report reflects Ascend's comprehensive study to assess VOC emission data for the manufacture of adipic acid at the Pensacola facility.

As presented in the preliminary report submitted to the Department on September 24, 2010, Entec Services Inc. (Entec) conducted testing in support of this effort on September 28, 2010. Attached for the Department's review, in support of the 990 MAR adipic acid permit application, are three copies of the final report containing the Entec results. A separate copy of this submittal is being forwarded to Mr. Jeff Koerner.

If you have any questions regarding the information provided, please contact Roy Noble at (850) 968-8721 or by electronic mail at rwnobl@AscendMaterials.com.

Sincerely,

Timothy N. Montgomery
Chemicals & Utilities Plant Manager

Attachment

c: w/attached: Jeff Koerner, FDEP, Tallahassee, Fl

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AIR REGULATION

MSO : 15234

DateTime: 11/1/2010 10:50:02 AM

SHIP TO
Name: Florida Department of Environmental Protection
Address1: 2600 Blair Stone Road
Address2: M.S. 5500
Attn: Mr. Jeff Koerner
City: Tallahassee
State: FL
ZipCode: 32399-2400

Shipment Reason: Other
Other: Regulatory Correspondence
Shipping Type: Overnight
SapCostCenter: PEN93500
Freight Payment: Prepaid
Declared Value: 100.00

Requestor: Schulze, James K
ReqPhone: 968-7565
Supervisor: Clarke, Chuck
SuperPhone: 968-7118
Email: jkschu@ascendmaterials.com

ITEMS TO SHIP :

Item	Quantity	Value	Weight
1	1	100	2 lb

1 medium FedEX Box

ASCEND
PERFORMANCE MATERIALS

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AIR REGULATION

Hand Delivered

November 1, 2010

Mr. Rick Bradburn
Air Program Administrator
Department of Environmental Protection
160 Governmental Center
Pensacola, FL 32502-5794

Re: Adipic Acid Construction Permit Application

Dear Mr. Bradburn:

Enclosed are three copies of a construction permit application requesting authorization to increase allowable production of the Adipic Acid Unit. A fourth copy is being forwarded directly to Mr. Jeff Koerner.

Please note that the request contained herein reflects minor changes to the terms and conditions of Construction Permit 0330040-034-AC and related correspondence.

In relation to 0330040-034-AC, the proposed increase in emissions outlined in this request is less than 2 tons per year of any criteria pollutant, remaining less than corresponding Prevention of Significant Deterioration (PSD) major modification thresholds.

If you have any questions regarding the application, please contact Roy Noble at (850) 968-8721 or Jim Schulze at (850) 968-7565.

Very truly yours,

Timothy N. Montgomery
Chemicals & Utilities Plant Manager

Enclosures

copy w/application
Mr. Jeff Koerner, FDEP, Tallahassee, Fl

REPORT

AIR PERMIT APPLICATION FOR AREA II ADIPIC ACID

Ascend Performance Materials LLC
Pensacola Plant

Submitted To: Ascend Performance Materials LLC
3000 Old Chemstrand Road
Cantonment, FL 32533

Submitted By: Golder Associates Inc.
5100 W. Lemon Street, Suite 208
Tampa, FL 33609 USA

Distribution: **4 Copies – Ascend Performance Materials LLC**
4 Copies – FDEP
1 Copy – Golder Associates Inc.

October 2010

Project No. 10389626

A world of capabilities delivered locally

Golder Associates

Table of Contents

List of Tables

APPLICATION FORMS

Department of Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit:

- For any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- To establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial, revised, or renewal Title V air operation permit.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **Ascend Performance Materials LLC**	
2. Site Name: **Pensacola Plant**	
3. Facility Identification Number: **0330040**	
4. Facility Location... Street Address or Other Locator: **3000 Old Chemstrand Road** City: **Cantonment** County: **Escambia** Zip Code: **32533**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **Roy W. Noble, Environmental Specialist**
2. Application Contact Mailing Address... Organization/Firm: **Ascend Performance Materials LLC** Street Address: **P.O. Box 97** City: **Gonzalez** State: **FL** Zip Code: **32560-0097**
3. Application Contact Telephone Numbers... Telephone: (**850**) **968-8721** ext. Fax: ( ) -
4. Application Contact E-mail Address: **rwnobl@ascendmaterials.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	3. PSD Number (if applicable):
2. Project Number(s):	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

This application for air permit is being submitted to obtain: (Check one)

Air Construction Permit

- [X] Air construction permit.
- [ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).
- [ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

- [ ] Initial Title V air operation permit.
- [ ] Title V air operation permit revision.
- [ ] Title V air operation permit renewal.
- [ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.
- [ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

- [ ] Air construction permit and Title V permit revision, incorporating the proposed project.
- [ ] Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

- [ ] I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

Ascend is submitting this permit application to increase the permitted annual capacity for adipic acid production from 930 million pounds adipic acid (MAR) (Permit No. 0330040-034-AC) to 990 MAR based on a 12-month rolling total. This application is based on updated VOC emission factors for the Adipic Acid process. With these updated emission factors, Ascend submits this construction permit application demonstrating emission increases less than PSD significant thresholds with 990 MAR adipic acid production.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
002	Area II Adipic Acid/TRU/SCR II	AC1B	NA

Application Processing Fee

Check one: ☐ Attached - Amount: $______________ ☒ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name : **Timothy N. Montgomery, Chemical & Utilities Plant Manager**
2. Owner/Authorized Representative Mailing Address... Organization/Firm: **Ascend Performance Materials LLC** Street Address: **P.O. Box 97** City: **Gonzalez** State: **FL** Zip Code: **32560-0097**
3. Owner/Authorized Representative Telephone Numbers... Telephone: **(850) 968 - 7114** ext. Fax: ( ) -
4. Owner/Authorized Representative E-mail Address: tnmont@ascendmaterials.com
5. Owner/Authorized Representative Statement: *I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.* [signature] 11/1/10 Signature Date

APPLICATION INFORMATION

Application Responsible Official Certification

Complete if applying for an initial, revised, or renewal Title V air operation permit or concurrent processing of an air construction permit and revised or renewal Title V air operation permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable): ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C. ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively. ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official. ☐ The designated representative at an Acid Rain source or CAIR source.
3. Application Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
4. Application Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
5. Application Responsible Official E-mail Address:
6. Application Responsible Official Certification: *I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.* ________________ __________ Signature Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: **Kennard F. Kosky**
   Registration Number: **14996**
2. Professional Engineer Mailing Address...
   Organization/Firm: **Golder Associates Inc.****
   Street Address: **6026 NW 1st Place**
   City: **Gainesville** State: **FL** Zip Code: **32607**
3. Professional Engineer Telephone Numbers...
   Telephone: **(352) 336-5600** ext.**516** Fax: **(352) 336-6603**
4. Professional Engineer Email Address: **kkosky@golder.com**
5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here [ ], if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here [x], if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here [ ], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here [ ], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature ______________________ Date 10/28/10

(seal)

* Attach any exception to certification statement.
** **Board of Professional Engineers Certificate of Authorization #00001670**

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone 16 East (km) 476 North (km) 3385		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) 30/35/56 Longitude (DD/MM/SS) 87/15/01	
3. Governmental Facility Code: O	4. Facility Status Code: A	5. Facility Major Group SIC Code: 28	6. Facility SIC(s): 2869
7. Facility Comment :			

Facility Contact

1. Facility Contact Name: Roy W. Noble
2. Facility Contact Mailing Address... Organization/Firm: Ascend Performance Materials LLC Street Address: P.O. Box 97 City: Gonzalez State: FL Zip Code: 32560-0097
3. Facility Contact Telephone Numbers: Telephone: (850) 968-8721 ext. Fax: (850) 968-7220
4. Facility Contact E-mail Address: rwnobl@ascendmaterials.com

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Facility Primary Responsible Official E-mail Address:

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☒ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☒ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment:	

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
PM	A	N
PM_{10}	A	N
NO_x	A	N
SO_2	A	N
CO	A	N
VOC	A	N
HAP	A	N

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID's Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:
Not Applicable

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1.	Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [X] Attached, Document ID: **APM-FI-C1** [ ] Previously Submitted, Date:________
2.	Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [X] Attached, Document ID: **APM-FI-C2** [ ] Previously Submitted, Date:________
3.	Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [X] Attached, Document ID:**APM-FI-C3** [ ] Previously Submitted, Date:________

Additional Requirements for Air Construction Permit Applications

1.	Area Map Showing Facility Location: [ ] Attached, Document ID:______ [X] Not Applicable (existing permitted facility)
2.	Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL): [X] Attached, Document ID: **Attachment A**
3.	Rule Applicability Analysis: [X] Attached, Document ID: **Attachment A**
4.	List of Exempt Emissions Units: [ ] Attached, Document ID:______ [X] Not Applicable (no exempt units at facility)
5.	Fugitive Emissions Identification: [ ] Attached, Document ID:______ [X] Not Applicable
6.	Air Quality Analysis (Rule 62-212.400(7), F.A.C.): [ ] Attached, Document ID:______ [X] Not Applicable
7.	Source Impact Analysis (Rule 62-212.400(5), F.A.C.): [ ] Attached, Document ID:______ [X] Not Applicable
8.	Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.): [ ] Attached, Document ID:______ [X] Not Applicable
9.	Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.): [ ] Attached, Document ID:______ [X] Not Applicable
10.	Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): [ ] Attached, Document ID:______ [X] Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications – N/A

1. List of Exempt Emissions Units: ☐ Attached, Document ID:__________ ☐ Not Applicable (no exempt units at facility)	

Additional Requirements for Title V Air Operation Permit Applications – N/A

1. List of Insignificant Activities: (Required for initial/renewal applications only) ☐ Attached, Document ID:__________ ☐ Not Applicable (revision application)	
2. Identification of Applicable Requirements: (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought) ☐ Attached, Document ID:__________ ☐ Not Applicable (revision application with no change in applicable requirements)	
3. Compliance Report and Plan: (Required for all initial/revision/renewal applications) ☐ Attached, Document ID:__________ Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.	
4. List of Equipment/Activities Regulated under Title VI: (If applicable, required for initial/renewal applications only) ☐ Attached, Document ID:__________ ☐ Equipment/Activities Onsite but Not Required to be Individually Listed ☐ Not Applicable	
5. Verification of Risk Management Plan Submission to EPA: (If applicable, required for initial/renewal applications only) ☐ Attached, Document ID:__________ ☐ Not Applicable	
6. Requested Changes to Current Title V Air Operation Permit: ☐ Attached, Document ID:__________ ☐ Not Applicable	

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program – N/A

1.	Acid Rain Program Forms: Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)): ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________ ☐ Not Applicable (not an Acid Rain source) Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.): ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________ ☐ Not Applicable New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.): ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________ ☐ Not Applicable
2.	CAIR Part (DEP Form No. 62-210.900(1)(b)): ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________ ☐ Not Applicable (not a CAIR source)

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [1]
EU 002 – Area II Adipic Acid

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   Area II Adipic Acid Process Equipment/Product Synthesis/Refining/Raw Material Recovery

3. Emissions Unit Identification Number:
   EU 002 (Area II Adipic Acid)

4. Emissions Unit Status Code: **A**	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: **28**

8. Federal Program Applicability: (Check all that apply)
   ☐ Acid Rain Unit ☐ CAIR Unit

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Thermal Reduction Unit (TRU)** **Selective Catalytic Reduction (SCR I)** **Backup Selective Catalytic Reduction (SCR II)**	
2. Control Device or Method Code: **027/131, 139, 139**	

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: **98,000 lbs KA feed per hour**	
2. Maximum Production Rate: **990,000,000 lbs Adipic Acid per year**	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **52** weeks/year	 **7** days/week **8,760** hours/year
6. Operating Capacity/Schedule Comment: **KA = Cyclohexanone/Cyclohexanol Mixture**	

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:		2. Emission Point Type Code: **2**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **Nitric acid reaction and Cyclohexane oxidation off-gas are burned in the TRU.**		
5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **7** feet
8. Exit Temperature: **434**°F	9. Actual Volumetric Flow Rate: **98,000** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: **17** East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: **Based on September 28, 2010 Engineering Test.**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Adipic Acid Refining**		
2. Source Classification Code (SCC): **3-01-001-05**	3. SCC Units: **Tons of Product**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **495,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **990,000,000 lbs /yr / 2000 lb/ton = 495,000 tons per yr**		

Segment Description and Rate: Segment __ of __

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO			NS
NO_x	027/131	139	EL
VOC	131		NS
PM			NS
PM10			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOx**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **610** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **500 ppm 30-day rolling** Reference: **Permit 0330040-034-AC**	7. Emissions Method Code: **1**
8.a. Baseline Actual Emissions (if required): **524.9** tons/year	8.b. Baseline 24-month Period: From: **1/1/02** To: **12/31/03**
9.a. Projected Actual Emissions (if required): **610** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☒ 10 years
10. Calculation of Emissions: **See Attachment A, Table 4.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **ESCPSD**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **500 ppm 30-day rolling average, 610 TPY 12-Month Rolling Average**	4. Equivalent Allowable Emissions: lb/hour **610** tons/year
5. Method of Compliance: **NOx continuous monitoring system**	
6. Allowable Emissions Comment (Description of Operating Method): **Permit No. 0330040-034-AC.**	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8.a. Baseline Actual Emissions (if required): **11.6** tons/year	8.b. Baseline 24-month Period: From: **1/1/03** To: **12/31/04**
9.a. Projected Actual Emissions (if required): **15.95** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☒ 10 years
10. Calculation of Emissions: **See Attachment A, Table 4.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)
Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8.a. Baseline Actual Emissions (if required): **34.2** tons/year	8.b. Baseline 24-month Period: From: **1/1/04** To: **12/31/05**
9.a. Projected Actual Emissions (if required): **49.4** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☒ 10 years
10. Calculation of Emissions: **See Attachment A, Table 4.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8.a. Baseline Actual Emissions (if required): **19.04** tons/year	8.b. Baseline 24-month Period: From: **1/1/03** To: **12/31/04**
9.a. Projected Actual Emissions (if required): **25.95** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☒ 10 years
10. Calculation of Emissions: **See Attachment A, Table 4.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment: **F.A.C. 62-210.700 (1)**	

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: __ % Maximum Period of Excess Opacity Allowed: __min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

EMISSIONS UNIT INFORMATION
Section [1]
EU 002 – Area II Adipic Acid

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: **TECO** Model Number: **42C**	Serial Number:
5. Installation Date:	6. Performance Specification Test Date: **3/9/2010**
7. Continuous Monitor Comment: **TRU/SCR I Serial Number: 42C63868-341** **SCR II Serial Number: 42C63866-342**	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **APM-FI-C2** ☐ Previously Submitted, Date _____
2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: **APM-EU1-I1** ☐ Previously Submitted, Date _____
3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **APM-EU1-I2** ☐ Previously Submitted, Date _____
4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ☐ Previously Submitted, Date _____
   ☒ Not Applicable (construction application)
5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ☐ Previously Submitted, Date _____
   ☒ Not Applicable
6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: ____________
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ Previously Submitted, Date: __________
   Test Date(s)/Pollutant(s) Tested: ____________________
   ☐ To be Submitted, Date (if known): ____________
   Test Date(s)/Pollutant(s) Tested: ____________________
   ☒ Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.
7. Other Information Required by Rule or Statute:
   ☐ Attached, Document ID: ____________ ☒ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

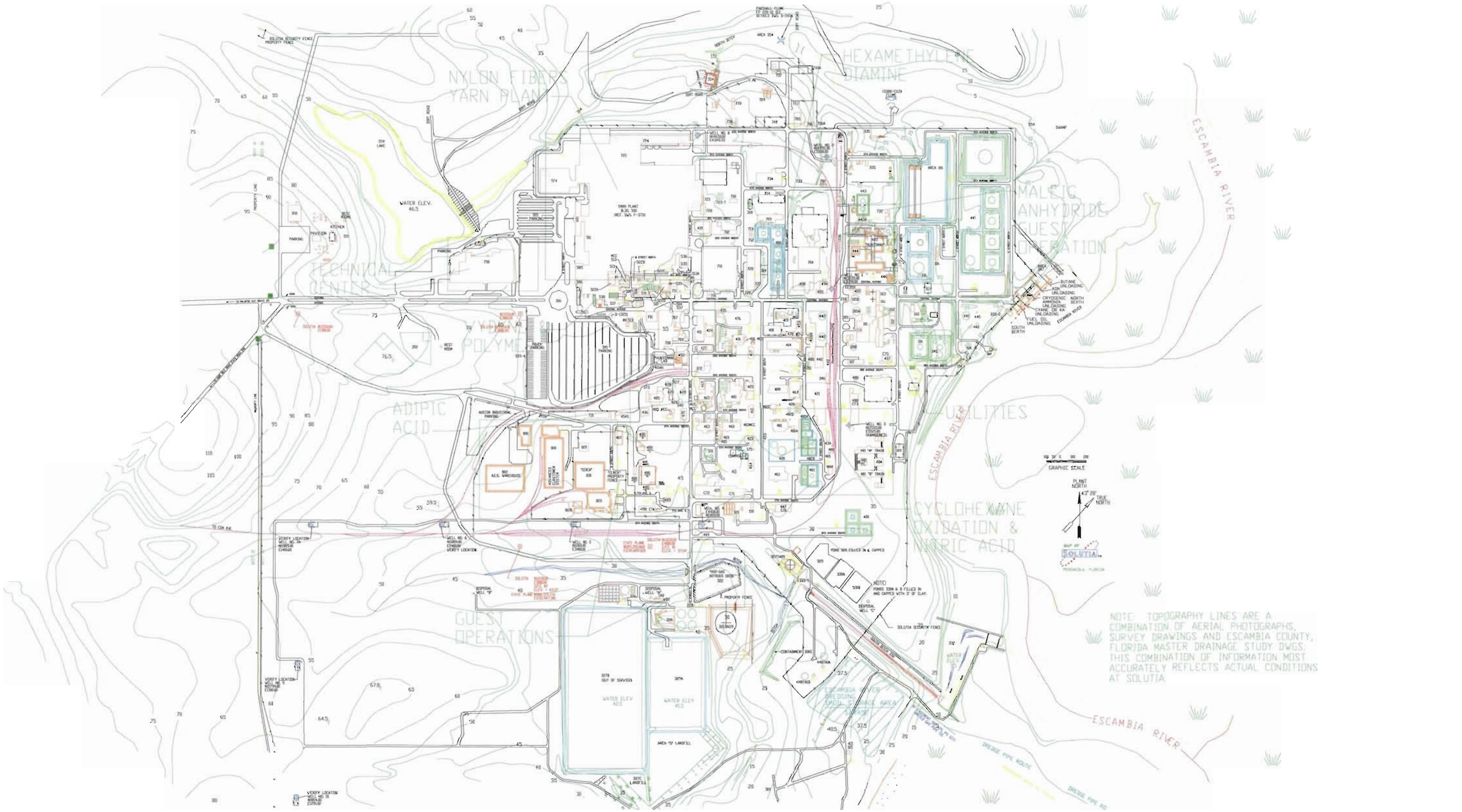
Additional Requirements for Air Construction Permit Applications – N/A

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: ____________ ☒ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ____________ ☒ Not Applicable	
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ____________ ☒ Not Applicable	

Additional Requirements for Title V Air Operation Permit Applications – N/A

1. Identification of Applicable Requirements: ☐ Attached, Document ID: ☐ Not Applicable	
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: ☐ Not Applicable	
3. Alternative Methods of Operation: ☐ Attached, Document ID: ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ____________ ☐ Not Applicable	

Additional Requirements Comment

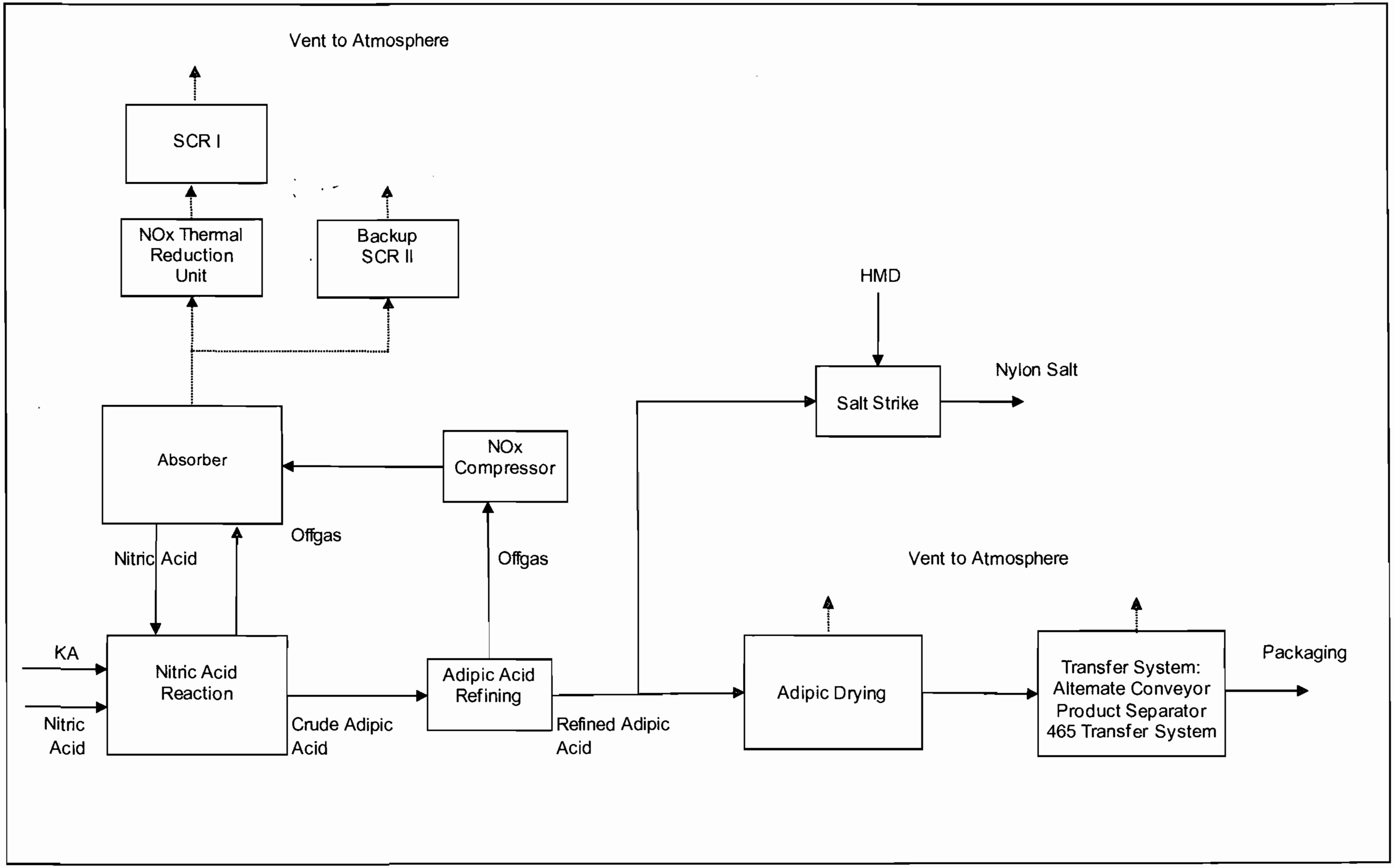


ATTACHMENT APM-FI-C1
Facility Plot Plan

Source: Golder, 2010.

Golder Associates

ATTACHMENT APM-FI-C2
Adipic Acid Process Flow Diagram



ATTACHMENT APM-FI-C3
Precautions to Prevent Emissions of Unconfined Particulate Matter

Reasonable precaution for control of unconfined emissions of particulate matter will be taken as appropriate and practical for activities such as vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrial related activities such as loading, unloading, storing or handling. Such precautions may include the following:

1. Paving and maintenance of roads, parking areas and yards;
2. Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing;
3. Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stockpiles and similar emission units;
4. Removal of particulate matter from roads and other paved areas under the control of Ascend to prevent re-entrainment, and from building or work areas to prevent particulate from becoming airborne;
5. Landscaping or planting of vegetation;
6. Use of hoods, fans, filters and similar equipment to contain, capture and/or vent particulate matter;
7. Confining abrasive blasting where possible; and
8. Enclosure or covering of conveyor systems.

ATTACHMENT APM-EU1-I1
Fuel Analysis

Gulf South Pipeline Company, LP 09/01/10 10:04:25
Houston, Texas PAGE 1
CHROMATOGRAPH REPORT
for 08/10

Chromatograph ID: 002417
Chromatograph Name: Solutia - Pensacola

Day	CO2	N2	Grav	BTU	Methane	Ethane	Propane	Ibutane	Nbutane	Ipentan	Npentan	C6
1	1.1327	0.6246	0.5811	1015.9679	96.1809	1.7087	0.2049	0.0288	0.0400	0.0148	0.0121	0.0319
2	1.0874	0.5677	0.5795	1016.3257	96.4639	1.5697	0.1790	0.0291	0.0369	0.0146	0.0116	0.0326
3	1.1831	0.6023	0.5805	1015.1542	96.3439	1.6176	0.1605	0.0247	0.0307	0.0128	0.0102	0.0307
4	1.0756	0.5708	0.5787	1015.2526	96.5287	1.5356	0.1565	0.0237	0.0293	0.0124	0.0097	0.0289
5	1.1243	0.5777	0.5795	1015.5956	96.4166	1.5621	0.1687	0.0256	0.0324	0.0135	0.0109	0.0340
6	1.1686	0.5871	0.5798	1015.2004	96.4032	1.5707	0.1627	0.0255	0.0324	0.0132	0.0104	0.0298
7	1.1825	0.5961	0.5801	1015.1321	96.3984	1.5952	0.1548	0.0247	0.0319	0.0134	0.0107	0.0303
8	1.2372	0.6401	0.5816	1015.2289	96.1008	1.7241	0.1711	0.0268	0.0342	0.0142	0.0112	0.0311
9	1.3286	0.6277	0.5840	1016.1456	95.8314	1.8902	0.1877	0.0305	0.0376	0.0158	0.0118	0.0343
10	1.2552	0.6071	0.5821	1015.7938	96.1166	1.7392	0.1813	0.0290	0.0360	0.0154	0.0119	0.0345
11	1.1699	0.6084	0.5807	1015.2771	96.3123	1.6126	0.1668	0.0282	0.0357	0.0157	0.0125	0.0385
12	1.2451	0.6283	0.5823	1015.8972	96.0295	1.7350	0.1813	0.0296	0.0372	0.0157	0.0122	0.0378
13	1.2578	0.6435	0.5827	1015.6261	96.0833	1.7612	0.1846	0.0309	0.0374	0.0157	0.0120	0.0364
14	1.2949	0.6795	0.5837	1015.2221	95.8093	1.8584	0.1860	0.0306	0.0378	0.0148	0.0110	0.0310
15	1.3326	0.6949	0.5853	1016.7560	95.5716	1.9449	0.2359	0.0448	0.0476	0.0178	0.0125	0.0326
16	1.3787	0.7569	0.5857	1015.3522	95.5278	1.9553	0.2212	0.0390	0.0439	0.0168	0.0127	0.0342
17	1.3409	0.7540	0.5860	1016.8376	95.4991	2.0275	0.2244	0.0380	0.0433	0.0164	0.0124	0.0351
18	1.2373	0.7165	0.5830	1014.7401	95.8502	1.8204	0.1803	0.0269	0.0343	0.0133	0.0107	0.0298
19	1.2141	0.6854	0.5825	1014.9667	95.9400	1.7994	0.1807	0.0258	0.0322	0.0128	0.0100	0.0275
20	1.1964	0.6480	0.5819	1015.2917	96.0196	1.7517	0.1848	0.0258	0.0325	0.0133	0.0104	0.0286
21	1.1890	0.6593	0.5811	1014.6858	96.1640	1.7094	0.1754	0.0249	0.0316	0.0127	0.0102	0.0286
22	1.2300	0.6411	0.5811	1014.2721	96.1881	1.6749	0.1652	0.0254	0.0306	0.0132	0.0102	0.0300
23	1.2477	0.5284	0.5808	1014.6876	96.2708	1.7035	0.1476	0.0231	0.0255	0.0118	0.0088	0.0277
24	1.2287	0.5170	0.5801	1014.9194	96.3552	1.7109	0.1419	0.0196	0.0229	0.0105	0.0081	0.0254
25	1.1533	0.5597	0.5812	1016.3820	96.1026	1.9023	0.1621	0.0222	0.0266	0.0110	0.0085	0.0249
26	1.2315	0.6526	0.5837	1016.8977	95.7568	2.0097	0.1927	0.0272	0.0349	0.0135	0.0105	0.0295
27	1.1962	0.6519	0.5828	1016.5111	95.8789	2.0153	0.1931	0.0256	0.0322	0.0128	0.0101	0.0284
28	1.1450	0.6163	0.5833	1019.2628	95.7916	2.0927	0.2262	0.0272	0.0346	0.0131	0.0104	0.0272
29	1.1077	0.6318	0.5813	1016.1537	96.1321	1.8020	0.1827	0.0247	0.0311	0.0131	0.0105	0.0287
30	1.1809	0.5243	0.5812	1016.0638	96.4000	1.6072	0.1947	0.0313	0.0373	0.0172	0.0133	0.0390
31	1.1513	0.5227	0.5801	1016.0387	96.4000	1.6712	0.1779	0.0285	0.0334	0.0150	0.0115	0.0349
Avg:	1.2098	0.6233	0.5819	1015.7303								

Remarks:

ATTACHMENT APM-EU1-I2
Detailed Description of Control Equipment

The John Zink flame reduction process or NO_x Thermal Reduction Unit (TRU) uses a reducing atmosphere to control the release of NO_x to the atmosphere.

The off-gas from the Adipic Acid Area enters the furnace along with the fuel, which is natural gas or ethane-rich gas. The NO_x is reduced to NO and N_2 at high temperatures in the furnace towers. Next, the gas enters the quench/re-oxidation chamber which is used to cool the gas and introduce air, so the NO and N_2 will not convert back to NO_x and NO. The off-gas from the cyclohexane oxidation process enters at the furnace quench chamber as a temperature controller as well as to be reoxidized in the re-oxidation chamber.

The re-oxidation chamber's function is to re-oxidize any excess fuel prior to combustion in the boiler. The remaining gas is then vented to the atmosphere.

ATTACHMENT A

1.0 INTRODUCTION

Ascend Performance Materials LLC (Ascend) owns and operates a nylon and intermediate chemical manufacturing facility located in Cantonment, Florida. This plant is approximately 20 kilometers (km) north of Pensacola on the Escambia River. Various chemicals, including adipic acid, nylon fibers, nylon resins, hexamethylene diamine, and maleic anhydride, are manufactured at the facility. The Pensacola plant is a major facility because the facility is one of the 28 listed sources and potential emissions of at least one regulated pollutant exceeds 100 tons per year (TPY). For minor modifications to a major facility, prevention of significant deterioration (PSD) does not apply for an increase in projected actual emissions not exceeding baseline plus the PSD significant emission rates.

Ascend is submitting this permit application to increase the permitted annual capacity for adipic acid production from 930 million pounds adipic acid (MAR) to 990 MAR based on a 12-month rolling total. No increases in production of downstream units are proposed from those authorized in Permit No. 030040-034-AC. While the proposed increase in adipic acid production will allow Ascend to simultaneously operate dry adipic and nylon polymerization at higher rates, the increase does not allow for maximum production of dry adipic and nylon simultaneously.

Ascend was recently issued a minor modification construction permit (Permit No. 030040-034-AC, Issue Date August 13, 2010) authorizing adipic production at an annual rate of 930 MAR. Subsequently, Ascend has conducted an emission assessment of the inlet and outlet of the TRU. Table 1 provides a summary of the inlet and outlet stack testing conducted on the TRU as well as the resulting control efficiency. While the stack testing resulted in control efficiencies of 99.9 and 99.3% for VOC and HCN, respectively, Ascend is estimating emissions for the proposed 990 MAR based on the more conservative control efficiencies of 99.5 and 99.0% for VOC and HCN. In addition to the stack testing Ascend has performed EPA Water 9 calculations on process associated storage tanks to determine VOC emissions for the entire adipic acid process. The updated and more accurate adipic acid emission data allows the production of 990 MAR adipic acid with similar annual emissions as provided in the 930 MAR application and the proposed project will remain minor modification under PSD rules.

2.0 PROJECT DESCRIPTION

For this permit application, Area II includes Emission Unit (EU) 002. In this area, a ketone and alcohol mixture (KA, cyclohexanone/cyclohexanol) is oxidized with nitric acid to produce an Adipic Acid solution. The solution is refined by chilling due to vacuum evaporation, forming Adipic Acid crystals at the bottom of the process vessel. The resulting slurry is centrifuged to remove water and form a wet cake. The wet cake is re-dissolved in pure water and the purified Adipic Acid solution is sent to the downstream Nylon Salt Strike or Drying and Product Loading operations.

The proposed increase in production from this permit revision will be accomplished through changes authorized in Permit No. 030040-034-AC. No additional methods of operation or physical changes are requested with this application. This application provides new information from the application of and Permit No. 030040-034-AC related only to Emission Unit 002, Adipic Acid Production. All other emission units and emission estimates provided for 930 MAR adipic acid remain unchanged for 990 MAR. Emission calculations for 990 adipic acid process are provided in the Chapter 3. A detailed discussion of the emission calculations is provided in Company Confidential Attachment B.

3.0 EMISSION EVALUATIONS - ADIPIC ACID - SYNTHESIS AND REFINING (EU 002)

Adipic Acid solution is produced when a ketone and alcohol mixture (KA, cyclohexanone/cyclohexanol) is oxidized with nitric acid. Emissions from EU-002 result from the reaction/refining operations and consist of NO_x, CO, VOC and PM. A control system including thermal reduction unit (TRU/SCR I) and SCR II (Backup SCR) is employed to reduce emissions of CO, VOC, and NO_x.

Ascend is proposing to increase the permitted annual capacity for adipic acid production from 930 million pounds adipic acid (MAR) to 990 MAR based on a 12-month rolling total. This production rate will be accomplished through changes authorized in Permit No. 030040-034-AC. The currently permitted maximum operating rate of 92,000 lbs/hr KA will be increased to maximum operating rate of 98,000 lbs/hr KA. The proposed KA feed rate is equivalent to 6.5% production increase from 930 MAR to 990 MAR. No physical changes are required for the KA feed rate increase.

Ascend has conducted an emission assessment of the inlet and outlet of the TRU. Based on the results of this testing, Ascend is updating the baseline VOC emissions for adipic acid as provided in Table 2. VOC and HCN emissions were measured and correlated to the off-gas rate during the testing resulting in two new emission factors (1) lb VOC per lb off-gas and (2) lb HCN per lb off-gas. To update the Baseline emissions from the TRU/SCR I, the annual measured off-gas for years 2004 and 2005 was multiplied by the corresponding emission factor and destruction efficiency to estimate annual emissions. Annual emissions also include the operation of SCR II, during which there is no control of VOC or HCN emission. The VOC calculations from the Adipic Acid Refining Tanks were also calculated using EPA Water 9. Total VOC baseline emissions include emissions (VOC and HCN) from Adipic TRU/SCR I, SCR II and Adipic Refining Tanks.

Emissions from 990 MAR were determined based on the projected off-gas flow rate associated with 990 MAR developed based on average off-gas flow rates and production. Table 3 provides the emission calculations for 990 MAR based on 1,680 hours of TRU downtime at the projected off-gas flowrate at 990 MAR (i.e. 60,200 lb/hr, shown in the table).

As was acknowledged in Permit No. 030040-034-AC, the emission calculations presented to demonstrate PSD regulatory applicability employ the comparison of baseline actual emissions to projected actual emissions methodology including a demand growth production rate equivalent to 850 MAR per 62-210.200(250)(c) F.A.C. for all regulated pollutants. As this project only impacts emission from Adipic Acid, only the detailed emissions for Adipic Acid (EU-002) are presented in Table 4. Also, presented in Table 4 are the total emission increases and PSD applicability comparison for the 930 Permit and the resulting changes to this PSD applicability analysis for 990 MAR as a result of the updated TRU emissions. Adipic Acid production at 990 MAR results in emission increase for CO, PM, PM_{10}, and VOC, of less than 2 TPY each over the currently permit 930 MAR production rate. All pollutants remain below PSD review thresholds.

Adipic Acid Production (EU-002) employs an emission control system including the TRU/SCR I and SCR II. The emission control system will be operated to maintain NO_x emission equal to those associated with the production of 850 MAR on an annual basis. As a result of exclusion of emissions associated with demand growth up to 850 MAR, the project will not increase NO_x emissions from EU-002 beyond any increased utilization due to product demand growth. The emission control system can achieve increased emission control necessary to maintain emissions equivalent to 850 MAR by one of two ways as follows:

- Adjust the operation of the TRU by combusting the NOx off gas to a lower level. The TRU controls NOx emissions by burning the off gas in a fuel rich environment. Should additional destruction be required, SCR I will be operated to further reduce the off gases from the TRU.
- Operation of the SCR II (Backup SCR) at lower emission set points required for compliance.

Ascend proposes to include an annual emission limit on NO_x from EU-002 equal to 610 TPY, on a 12-month rolling total, to avoid a Prevention of Significant Deterioration (PSD) significant increase in emissions. This limit results from reducing the projected NO_x emissions at 850 MAR by 42 tpy to account for ancillary NOx emissions associated with this project. No change is proposed to the NO_x concentration limit of 500 ppm, on a 30-day rolling average.

4.0 RULE APPLICABILITY

EU 002, Area II Adipic Acid Expansion, is subject to the following New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations:

Applicable Federal Regulations:

- NSPS Title 40 of the Code of Federal Regulation (40 CFR) 60 Subpart A, *General Provisions*.
- NSPS 40 CFR 60 Subpart VV, *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry*.
- NSPS 40 CFR 60 Subpart NNN, *Standards of Performance of Volatile Organic Compounds (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations*:
  - 60.660 Applicability and designation of affected facility.
  - 60.661 Definitions.
  - 60.662 Standards.
  - 60.663 Monitoring of emissions and operations.
  - 60.664 Test methods and procedures.
  - 60.665 Reporting and recordkeeping requirements.
  - 60.666 Reconstruction.
  - 60.667 Chemicals affected by subpart NNN.
  - 60.668 Delegation of authority.
- NESHAP 40 CFR 63, Subpart FFFF, *National Emission Standards for Miscellaneous Organic Manufacturing*.

The Project will meet the requirements of the applicable NSPS/NESHAP regulations.

4.0.1 PSD Review

Under federal and State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and a pre-construction permit issued. EPA has approved Florida's State Implementation Plan (SIP), which contains PSD regulations; therefore, PSD approval authority has been granted to the FDEP.

In 2006, Florida adopted the Federal NSR/PSD reform promulgated on 12/31/2002. The following is taken from the Florida Administrative Code.

> **"F.A.C. 62-210.200 (248) *"Projected Actual Emissions"*** – The maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a PSD pollutant in any one of the 5 years following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date, if the project involves increasing the emissions unit's design capacity or its potential to emit that PSD pollutant and full utilization of the unit would result in a significant emissions increase or a significant net

emissions increase at the major stationary source. One year is one 12-month period. In determining the projected actual emissions, the Department:

(a) Shall consider all relevant information, including historical operational data, the company's own representations, the company's expected business activity and the company's highest projections of business activity, the company's filings with the State or Federal regulatory authorities, and compliance plans or orders, including consent orders; and

(b) Shall include fugitive emissions to the extent quantifiable and emissions associated with startups and shutdowns; and

(c) Shall exclude that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions and that are also unrelated to the particular project including any increased utilization due to product demand growth; or

(d) In lieu of using the method set out in paragraphs (a) through (c) above, may be directed by the owner or operator to use the emissions unit's potential to emit, in tons per year."

The PSD applicability analysis based on past actual and future projected actual emissions is presented in Table 4. There are no project emission increases of regulated pollutants above PSD "significance" levels. Additionally, this project is not linked or enabled with other projects in the contemporaneous period. Thus, no contemporaneous credible increases or decreases are necessary to be considered. The project is therefore not a major modification under PSD regulations since the difference between baseline actual emissions including consideration of demand growth and projected actual emissions do not exceed the significant emission levels.

TABLES

Table 1. Summary of Adipic Acid VOC Emission Testing

Testing Source	NMVOC (lb/hr)	HCN (lb/hr)
TRU Inlet Adipic Acid	48.3	2.286
TRU Inlet HALCON Off Gas	813.8	-
TRU Outlet	0.654	0.014
% Reduction from Test Data	99.9	99.3
% Reduction Utilized for 990 MAR Emission Estimates[a]	**99.5**	**99.0**

[a] Lower TRU control efficiencies utilized in 990 MAR projections to provide a conservative analysis.
Source: ENTEC Services Inc. October 22, 2010
Testing was conducted for Total VOC (as propoane), methane (for NMVOC) and Hydrogen Cyanide (HCN) utilizing Methods 1, 2, 4, 18, and 25A.
NMVOC = Non-Methane Volatile Organic Compounds

Table 2. Updated Adipic Acid VOC Emissions Based on Emissions Testing

A. Baseline Emission Data Correction

Adipic Acid (Synthesis & Refining) (EU-002)

Baseline Year	AOR Data[a] TPY	Updated VOC[b]
2004	93.40	**33.56**
2005	88.61	**34.77**

[a] Emissions provided in the application for 930 MAR production

[b] Proposed emission correction for application for 990 MAR production

B. Summary of Baseline Emission Data Correction Calculations

Emission Factor Determination,Test Data Emission Rate per Off Gas Rate

	TRU Inlet Adipic Acid (lb/hr)	Off Gas Rate (lb/hr)	Emissions per Off Gas (lb/lb Off Gas)
VOC Emission Rate	48.3	53302	9.06E-04
HCN Emission Rate	2.286	53302	4.29E-05

Annual Emissions from Adipic TRU/SCR I

	Annual TRU Flow (lb/yr)	Emission Factors: VOC Emissions per Off Gas (lb/lb Off Gas)	Emission Factors: HCN Emissions per Off Gas (lb/lb Off Gas)	VOC Control Efficiency[a] (% Reduction)	HCN Control Efficiency[a] (% Reduction)	VOC Emissions[b] (TPY)	HCN Emissions[c] (TPY)
2004	420759873.6	9.06E-04	4.29E-05	99.5	99	**0.95**	**0.09**
2005	399585818	9.06E-04	4.29E-05	99.5	99	**0.91**	**0.09**

[a] ENTEC Services Inc. October 22, 2010

[b] VOC Emissions (tpy) = Annual TRU Flow (lb/yr) x Emission per Off Gas (lb/lb Off Gas) x (1 - VOC Control Efficiency/100) x ton/2000 lb

[b] HCN Emissions (tpy) = Annual TRU Flow (lb/yr) x Emission per Off Gas (lb/lb Off Gas) x (1 - HCN Control Efficiency/100) x ton/2000 lb

Annual Emissions from Adipic Backup SCR (SCR II)

	Annual SCR Feed[a] (lb/yr)	VOC + HCN Emissions per Off Gas (lb/lb Off Gas)	VOC Emissions[b] (TPY)
2004	67876166.9	9.49E-04	**32.21**
2005	70596872.3	9.49E-04	**33.50**

[a] Source: Ascend.

[b] Emissions of VOC are uncontrolled through the Backup SCR

Annual Emission from Adipic Refining Tanks

	Annual VOC Emission[a] (lb/yr)	VOC Emissions (TPY)
2004	608.3	**0.30**
2005	564.5	**0.28**

[a] Source: Ascend. Basis: EPA Water 9 Calculations, 0.0016 lb VOC / Ton Adipic Acid

Table 3. Projected Adipic Acid VOC Emissions Based on Emissions Testing (990 MAR)

Post Project Estimated VOC Emissions are as follows:

Projected Annual Emissions from Adipic TRU/SCR I

Annual TRU Flow[b] (lb/yr)	VOC Emissions per Off Gas (lb/lb Off Gas)	HCN Emissions per Off Gas (lb/lb Off Gas)	VOC Control Efficiency[a] (% Reduction)	HCN Control Efficiency[a] (% Reduction)	VOC Emissions (TPY)	HCN Emissions (TPY)
426214968	9.06E-04	4.29E-05	99.5	99	**0.97**	**0.09**

[a] ENTEC Services Inc. October 22, 2010
[b] Based 7080 hours per year and 60,200 pph average projected rate at 990 MAR.
[b] VOC Emissions (tpy) = Annual TRU Flow (lb/yr) x Emission per Off Gas (lb/lb Off Gas) x (1 - VOC Control Efficiency/100) x ton/2000 lb
[b] HCN Emissions (tpy) = Annual TRU Flow (lb/yr) x Emission per Off Gas (lb/lb Off Gas) x (1 - HCN Control Efficiency/100) x ton/2000 lb

Projected Annual Emissions from Adipic Backup SCR (SCR II) based on Control Device Operations

Annual SCR Feed[a] (lb/yr)	VOC + HCN Emissions per Off Gas (lb/lb Off Gas)	VOC Emissions[b] (TPY)
101135755	9.49E-04	**47.99**

[a] Based on 60,200 lb/hr x (8760 hr - 7080 hr) = 101135755 lb/yr
[b] Emissions of VOC are uncontrolled through the Backup SCR

Annual Emission from Adipic Acid Refining Tanks

Annual VOC Emission[a] (lb/yr)	VOC Emissions (TPY)
792	**0.40**

[a] Source: Ascend. Basis: EPA Water 9 Calculations
0.0016 lb VOC / Ton Adipic Acid

Total Annual Emissions for 990 MAR

Annual VOC Emission (TPY)
49.44

Table 4. Revised PSD Applicability Analysis - Adipic Acid 990 MAR Project. (Public Copy)

Source		Baseline Emissions (TPY)					Post-Project Emissions: Projected Emissions (TPY) up to 990 MAR					Baseline Emissions plus Demand Growth: Projected Emissions (TPY) up to 850 MAR					Project Emission Increase (Post-Project minus Baseline Emissions plus Demand Growth) (TPY)				
		CO	NOX	PM/PM10	SO2	VOC	CO	NOX	PM/PM10	SO2	VOC[a]	CO	NOX	PM/PM10	SO2	VOC	CO	NOX	PM/PM10	SO2	VOC
Adipic Acid (Synthesis & Refining) (EU-002)	2001	9.184	333.4	16.114																	
	2002	12.386	518.4	18.404				610.00					630.35					-20.35			
	2003	13.072	531.4	18.305			18.67	610.00	26.15			16.03	651.79	22.45			2.64	-41.79	3.70		
	2004	10.152	425.3	19.77		33.56	13.22		25.74		49.44	11.35		22.10		37.51	1.87		3.64		11.93
	2005	11.684	506.8	18.516		34.77					49.44					41.89					7.55
	2006	11.452	522.4	18.41																	
	2007	12.536	506.9	20.985																	
	2008	12.248	445.06	17.749																	
	2009	9.786	398.5	14.574																	

PSD Review Applicability for 990 MAR

	Baseline (TPY)	Demand Growth - 850 MAR (TPY)	Post-Project Emissions at 990 MAR (TPY)	Project Increase (TPY)	PSD Threshold
CO	552	499	512	13	100.00
NOx	1927	2331	2336	5	40.00
PM	312	418	424	6.77	25.00
PM10	312	418	424	6.77	15.00
SO2	3564	4605	4629	24	40.00
VOC	255.30	312.81	348.94	36.13	40.00

vs.

PSD Review Applicability for 930 MAR

	Baseline (TPY)	Demand Growth - 850 MAR (TPY)	Post-Project Emissions at 930 MAR (TPY)	Project Increase (TPY)	PSD Threshold
CO	552	499	511	12	100.00
NOx	1927	2331	2336	5	40.00
PM	312	418	423	5	25.00
PM10	312	418	423	5	15.00
SO2	3564	4605	4629	24	40.00
VOC	312.00	379.00	415.00	36.00	40.00

Emission Change from 930 to 990 MAR

	Emission Inc. (TPY)
CO	1.15
NOx	0.00
PM	1.77
PM10	1.77
SO2	0.00
VOC	0.13

[a] Based on 70 days of TRU downtime

Source: Ascend, 2010; Golder, 2010.

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ASCEND

PERFORMANCE MATERIALS

Pensacola Plant

Adipic Acid Unit

VOC Emissions Study

October 2010

ASCEND
PERFORMANCE MATERIALS

RECEIVED
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BUREAU OF
AIR REGULATION

November 1, 2010

Mr. Rick Bradburn
Air Program Administrator
Department of Environmental Protection
160 Governmental Center
Pensacola, FL 32502-5794

RE: Adipic Acid VOC Emission Study

Dear Mr. Bradburn:

As discussed during the September 17, 2010 meeting between Ascend Performance Materials (Ascend) and the Department, the AP-42 Factors used in calculating adipic acid VOC emissions are "E" rated and based upon limited data. The enclosed report reflects Ascend's comprehensive study to assess VOC emission data for the manufacture of adipic acid at the Pensacola facility.

As presented in the preliminary report submitted to the Department on September 24, 2010, Entec Services Inc. (Entec) conducted testing in support of this effort on September 28, 2010. Attached for the Department's review, in support of the 990 MAR adipic acid permit application, are three copies of the final report containing the Entec results. A separate copy of this submittal is being forwarded to Mr. Jeff Koerner.

If you have any questions regarding the information provided, please contact Roy Noble at (850) 968-8721 or by electronic mail at rwnobl@AscendMaterials.com.

Sincerely,

Timothy N. Montgomery
Chemicals & Utilities Plant Manager

Attachment

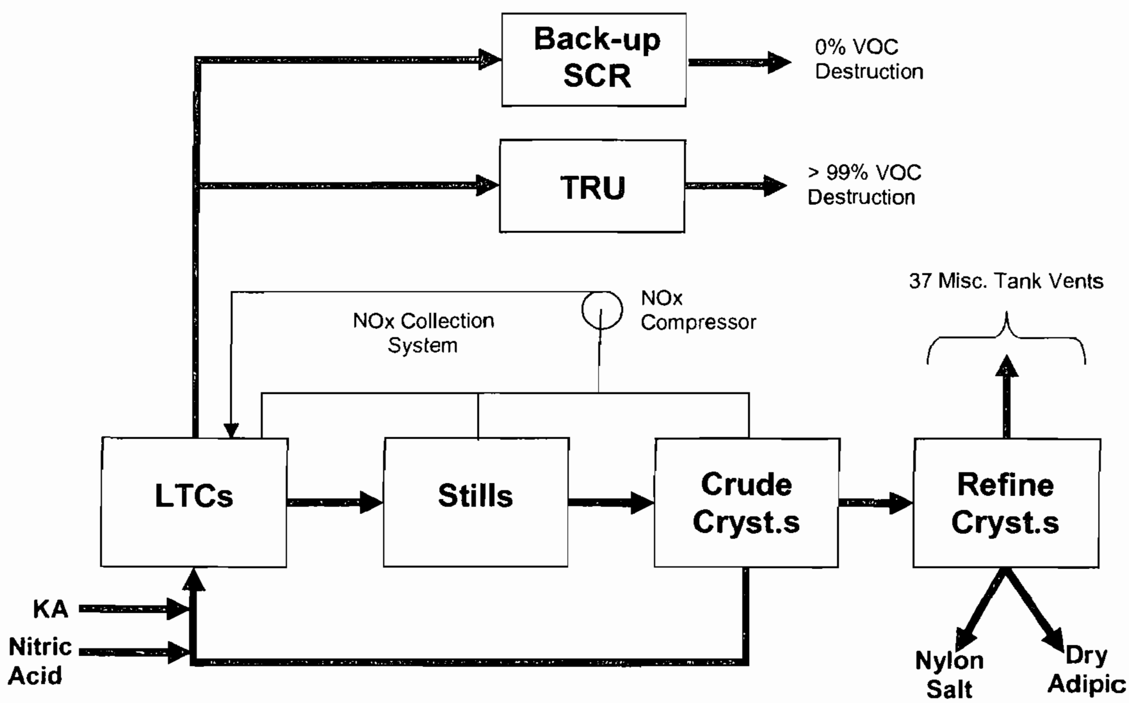
c: w/attached: Jeff Koerner, FDEP, Tallahassee, Fl

This report summarizes the work and calculations that Ascend Performance Materials (Ascend) has performed to determine VOC emissions in the manufacture of Adipic Acid.

On September 17, 2010 Ascend met with the Department to discuss upcoming permitting activities and describe an effort to improve emission calculation methods. Based upon previous testing data and low rating for the AP-42 emission factor for Adipic Acid, Ascend wanted to better determine actual emission data for the Pensacola site. This would allow Ascend to re-state baseline emission factors and calculate projected actual emission data associated with Adipic Acid as Ascend moves forward with non-PSD permitting activities. An initial report describing preliminary activities was submitted to the Department on September 24, 2010. This report describes the final results of that study.

Process Description:

As shown in the diagram below, the VOC emission streams from Ascend's adipic acid process consist of three components: (1) Thermal Reduction Unit (TRU), (2) Back-Up SCR (Selective Catalytic Reduction) and Refining, which includes crystallization and centrifugation steps.



The Ascend adipic acid production unit has two NOx control devices: (1) the TRU and (2) the Back-Up SCR. The TRU, however, also destroys VOCs in the adipic offgas stream (~99.5%). The Back-Up SCR, in contrast, has 0% VOC destruction. Both control devices are fed offgas from the oxidation reactions occurring in: (a) the Low Temperature Converters ("LTCs"), (b) the Concentrating Stills (which remove water from the process and concentrate the nitric acid for recovery and reuse), and (c) the initial adipic refining step.

The initial refining step is Crude Crystallization and Centrifugation ("Crudes"). Material from the Crude Feed Tank is fed to the Crude Crystallizers/Centrifuges. The vast majority of the nitric acid is separated from the adipic acid in this step and the nitric acid is returned upstream in the process for reuse. The adipic acid from the Crudes is dissolved in water and sent forward to the Refine Feed Tank. There are seven crude crystallizers and seven crude centrifuges along with associated equipment.

The second adipic acid refining step is referred to as Refined Crystallization / Centrifugation ("Refines"). There are 6 crystallizers, 8 centrifuges, and associated equipment in this step. Although the equipment in this second refining step vents to atmosphere, the VOC levels are very low due to the high degree of removal in the previous steps of the process. In the Concentrating Stills, all the process material is distilled under vacuum. In the Crude Crystallizers, the material is put through evaporative crystallization under vacuum. Only the solid adipic crystals are moved forward from the Crudes to the Refine Crystallization step. The product adipic acid from the Refines is then sent to the adipic dryers or to make nylon salt. Water from the Refines is sent to the Crude Crystallization / Centrifugation step for reuse.

Nitric containing tanks and vessels upstream of the second refining step (Refine Crystallization/Centrifugation) are vented to the NOx Collection System. This system uses a compressor to recycle these vents upstream to the LTCs with ultimate disposition in the TRU or Back-Up SCR.

Emission Factor Development:

Emissions Testing:
Ascend contracted with Entec Services, Inc. to perform testing on the inlets and outlet to the TRU. ENTEC Services performed the testing the week on September 28, 2010. This testing measured Halcon Off-gas VOCs fed to the TRU, the Adipic Acid Offgas VOCs fed to the TRU (which is also the feed to and exit from the Back-up SCR), and the exit of the TRU. All testing was performed utilizing Method 25A and an EPA approved modification of CT-033 to measure HCN for the Adipic Acid Off-gas to the TRU/SCR and the TRU exit. See Attachment 1 for the emission test report.

Method 25A depends on response factors relative to propane to be accurate. Low molecular weight aldehydes are known to have low response factors. From the process chemistry aldehydes (and ketones) are not expected. The process is designed to aggressively oxidize cyclohexanone and cyclohexanol to adipic acid. Thus based on process chemistry low molecular weight aldehydes are not expected.

Ascend has not performed any characterizations of the offgas at the inlet to the TRU or backup SCR. Offgas in various other locations has had some characterizations performed. The major components identified in offgas are higher molecular weight compounds. The seven major constituents that have been identified in various Adipic

Acid offgas streams are bicyclohexane, pentyl cyclohexane, cyclohexyl nitrate, butyl cyclohexane, pentyl nitrate, butyl nitrate and propyl cyclohexane. Note that these have not been measured at the inlets to the TRU but in offgas prior to nitric acid recovery. Based on process chemistry, dibasic (DBAs) and monobasic (MBAs) acids are present. Due to their low vapor pressures and high water solubilities, the DBAs and higher carbon number MBAs should be either condensed, absorbed in nitric acid recovery, or knocked out prior to the control devices. Low carbon number MBA impurities exist in very low concentrations and thus also remain in the liquid phase.

TRU:

Entec's sampling determined that the TRU Outlet emission rate was 0.65 pounds per hour (pph) VOC as Propane. It was further determined that the HCN emission rate was less than 0.014 pph. Based upon testing, it was determined that the TRU has an average of 99.9% VOC destruction rate for VOCs as propane and a 99.3% destruction efficiency for HCN. Both Adipic Acid and Cyclohexane Oxidation (Halcon) were operated above 90% of maximum rates during testing. Adipic Acid was operated at an annualized rate greater than 990 MAR Adipic Acid production.

The VOC inlet to the TRU from Adipic Acid was determined to be 48.34 pph VOC as propane and 2.286 pph HCN at an offgas flow rate of 53302.052 pph. The off gas flow rate was determined using a temperature and pressure corrected Annubar process flow meter meeting the calibration requirements of the 40 CFR 98 Greenhouse Gas Reporting rule. Emails documenting calibration are attached. Halcon VOC inlet to the TRU was 816.85 pph based on Method 25A and in process flow meters. (If one were to use the last complete compound specific analysis of the Halcon off gas conducted for Title V renewal in 2005, the calculated value based on process air flows would have been 820 pph VOC.)

Back-up SCR:

Based upon technology Ascend assumes 0% VOC destruction rate. Therefore the Adipic Acid inlet to the TRU is also the inlet and outlet of the backup SCR. Thus, Backup SCR emission rates are equal to the measured rate of the Adipic Acid Inlet.

Proposed Emission Calculations:

Emissions from the non-refining portions of Adipic Acid production would be calculated as follows. (See the next sections for emissions from Adipic Refining.) During testing the measured Adipic Acid process offgas feed to the TRU was 9.069×10^{-4} lbs VOC/lb offgas and HCN was 4.289×10^{-5} lbs HCN/lb Offgas. The pounds at the inlet of the TRU or Backup SCR would be calculated using these factors and the measured flows. The emissions from the Backup SCR would equal the inlet pounds. The pounds emitted from the TRU would equal the inlet pounds multiplied by (1 minus the destruction efficiency).

Adipic Refining:

Adipic Acid Refining is made up of 37 miscellaneous point source process vessels that vent to atmosphere. The remaining Adipic Acid tanks vent through the NOx collection system which in turn is routed through the TRU and/or Back-up SCR, whichever unit is on-line.

In discussions with Scott Steinsberger, Ph.D. of the testing firm DEECO, Inc., it was determined that the emissions from Adipic Refining are so low that they would not be able to be confirmed with existing stack testing and analytical methodology. Due to the low emissions, a minimum of 24 hours testing would be required without accounting for the saturated water vapor in the head space of the tank. This additional water would result in samples diluted with condensing water vapor and not allow sufficient sample concentration to be measured in the analytical equipment. Therefore, Ascend calculated the VOC emissions from each point source within Adipic Refining using the following method.

A liquid sample was taken from each of 37 point sources in Adipic Acid Refining to determine the liquid content each vessel. These point sources contain a single phase aqueous solution of various dibasic carboxylic acids (DBA's) and trace quantities of monobasic carboxylic acids (MBA's). The liquid samples were analyzed by plant STM 01529 to determine the concentration of the DBA's. (STM stands for Standard Test Method.) The MBA's were determined by a modified analysis and a % recovery was calculated. The lab report, Volatile Organic Acid Analysis is included in **Appendix A**. STM 01529 is Company Confidential and was previously submitted to the Department with the preliminary report dated September 24, 2010. Therefore; additional copies are not enclosed.

The following table shows an example of the DBA's, MBA's and other constituents in the Refine Feed Tank (RFT):

Water	62.48%
Nitric Acid	0.3%
Adipic Acid	37%
Glutaric Acid	0.12%
Succinic Acid	0.10%
Acetic Acid	Non-detectable
Propanoic (Proponic) Acid	Non-detectable
Butanoic (Butyric) Acid	54 ppm
Pentanoic Acid	83 ppm
Hexanoic Acid	79 ppm
Heptanoic Acid	99 ppm

EPA Modeling software was used to predict the concentration of the vapor space and calculate the VOC emissions at each point source. Calculations have been completed on 32 of the 37 sources and are shown in the table below. (The modeling and calculations are discussed after the table.) The remaining calculations will be performed and will be included in this study.

	Vessel ID	Vessel Description	VOC Emissions, lb/yr	
			@ 850 MAR	@ 1080 MAR
1	403TA 20	Absorber Feed Tank	15.5	19.6
2	403TA 50	Utility Tank (WML)	67.6	85.9
3	405TA 001	Refine Feed Tank	229.9	292.1
4	405VE 156A	405A Refine Suspension Tank	7.7	9.8
5	405VE 156B	405B Refine Suspension Tank	7.7	9.8
6	465TA 72	465 Regenerant Tank	13.5	17.2
7	465VE 156A	465A Refine Suspension Tank	7.7	9.8
8	465VE 156B	465B Refine Suspension Tank	7.7	9.8
9	485TA 321	Intermediate Solution Tank	52.2	66.3
10	403TA 136C	Dilution Water Tank (DAML)	2.9	3.7
11	405TA 358	405 Regenerant Tank	13.5	17.2
12	405TA 119	AMLF Tank	3.9	4.9
13	405TA 34A	405A AMLS Tank	<1	<1.2
14	405TA 34B	405B AMLS Tank	<1	<1.2
15	405TA 178B	405 WML Tank	23.2	29.5
16		405 Refine Seal Pot	<1	<1.2
17	465VE 41A	465A Crude Soln. Tank	18.4	23.3
18	465VE 41B	465B Crude Soln. Tank	18.4	23.3
19	465TA 178	465 WML Tank	62.8	79.8
20	485VE 41A	485A Crude Soln. Tank	9.7	12.3
21	485VE 41B	485B Crude Soln. Tank	9.7	12.3
22	485VE 41C	485C Crude Soln. Tank	8.7	11.1
23	485TA 126	485 Regenerant Tank	2	2.5
24	485TA 180	485 WML Tank	53.1	67.5
25	485HE 316	DTB Crystallizer Jet Condenser	< 1	< 1
26	485TA 153	Pinch Water Tank	<2	<2.5
27	485MS 348	DTB Condenser Seal Pot	<1	<1.2
28	485TA 178	UGA WML Tank	14.5	18.4
29	485TA 120	UGA Feed Tank	25.1	31.9
30	485VE 156C	UGA Suspension Tank	<2	<2.5
31	405SE 177A	405A Refine Centrifuge	<1	<1.2
32	405SE 177B	405B Refine Centrifuge	<1	<1.2
33	465SE 177A	465A Refine Centrifuge	<1	<1.2
34	465SE 177B	465B Refine Centrifuge	<1	<1.2
35	485SC 177C	UGA Centrifuge	<2	<2.5
36	485SC 177A	Intermediate Centrifuge	<2	<2.5
37	485SC 177A	Intermediate IST	<1	<1
Total Emissions, lbs/year:			**693**	**882**
Total Emissions, lb VOC/ Ton AA:			**0.0016**	

Modeling:

The EPA offers two tank VOC emission prediction tools: TANKS4 and WATER9. Each tool can predict emissions from fixed roof vertical atmospheric storage tanks.

TANKS4 is for concentrated (non-aqueous) organic liquids such as gasoline or concentrated mixtures of other organic liquids. Relative to vapor liquid equilibrium TANKS4 assumes ideal mixture behavior which follows Raoult's Law. The component vapor concentrations are calculated from the component vapor pressure and mole fraction in the liquid phase.

WATER9 was primarily written for wastewater simulation and is for solutions of organic liquids in water. It is best applied to dilute organic solutions. WATER9 predicts vapor concentrations based on Henry's Law using Henry's Law Coefficients. WATER9 also applies a non-ideality term, a UNIFAC activity coefficient, for each organic-water pair. Per the WATER9 manual, "WATER9 provides separate emission estimates for each individual compound that is identified as a constituent of the wastes. The emission estimates are based upon the properties of the compound and its concentration in the wastes. To obtain these emission estimates, the user must identify the compounds of interest and provide their concentrations in the wastes....Estimates of the total air emissions from the wastes are obtained by summing the estimates for the individual compounds."

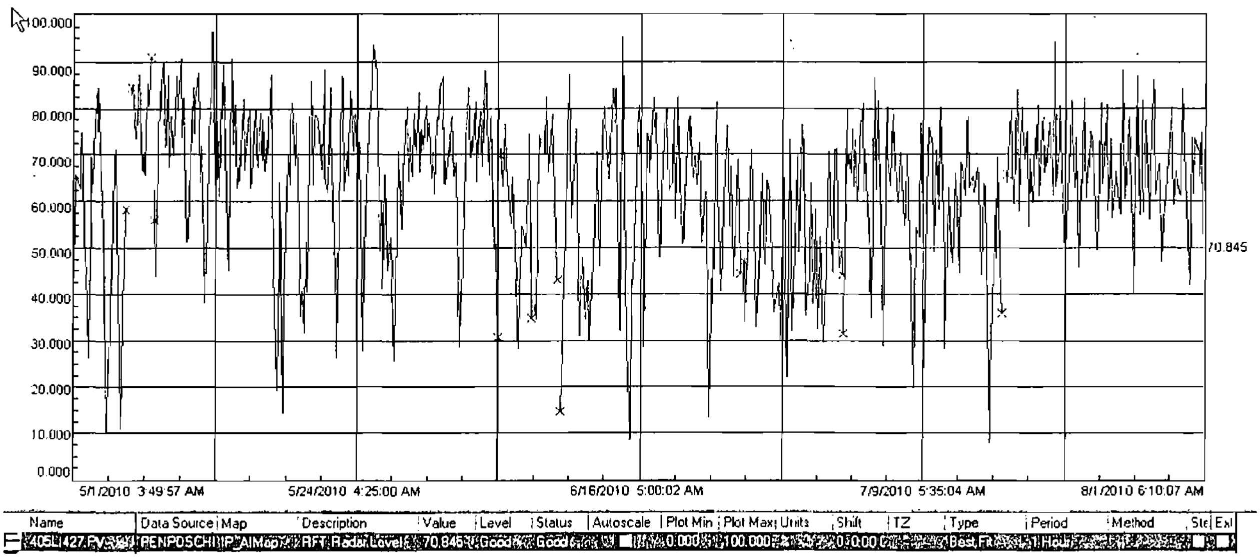
The aqueous solutions in Ascend's Adipic Acid Refining Tanks best fit the WATER9 VLE model assumptions with the slight exception of the relatively high concentration of adipic acid. Nevertheless, the mixture should fit the WATER9 assumptions better than TANKS4. (A comparison of results from both programs was made and is described in **Appendix B**, along with the physical properties for each component.)

Both programs calculate emission losses from two sources: working induced losses from liquid level swings and breathing/standing losses from vapor expansion due to temperature swings in the vapor space. The two sources of emissions were calculated and combined for the total VOC emission of the vent sources.

Working Loss Calculations:

Ascend analyzed level data for each vent source to model working losses. The level data from Ascend's data historian was downloaded into an Excel spreadsheet as 15 minute average data for a recent three month period. The equivalent change in wall height between each 15 minute data point was calculated and the cumulative change in liquid height for level increases was calculated for the three month period. The EPA emissions software requires that the tank be simulated as operating between two fixed levels. For modeling purposes, calculations were made to determine the average high and low operating levels of each tank.

As an example, the Refine Feed Tank (RFT) level (405LI427) for a three month period is shown here with an assumed average high operating level of 70% and average low operating level of 40%:



Based upon tank dimensions, this correlates to a span of 6.9 ft. (2.1 m) and a working volume of 2.7e+4 gallons.

For the time period and calculated span of 6.9 ft.:
Total number of turnovers = 1502 ft. / 6.9 ft = 220.2
Turnovers per day = 220.2 turnovers / 91 days = 2.42
Average residence/storage time = 1 / 2.42 = 0.413 days

A tank turnover factor is defined and calculated by the program for use in the working loss calculations. The working loss equation in WATER9 is:

$$L_W = 2.40 \times 10^{-5} M_V \cdot P^* \cdot V \cdot N \cdot K_N \cdot K_C \qquad (3\text{-}4)$$

where

L_W = working losses, lb/yr

M_V = molecular weight of vapor in storage tank, lb/lb mol

P^* = true vapor pressure at bulk liquid conditions, psia

N = number of turnovers per year (dimensionless)

N = $\dfrac{\text{total throughput per year (gal)}}{\text{tank capacity, } V \text{ (gal)}}$

V = tank capacity, gal

K_N = turnover factor, dimensionless (for turnovers for turnovers > 36, $K_N = \dfrac{180 + N}{6N}$)

K_C = product factor, dimensionless for crude oil, K_C = 0.84; for all other organic liquids, K_C = 1).

The selection of the level swing span has some effect on the working loss calculation. It appears that greater working capacities (higher spans) result in slightly higher working loss estimates at the same throughputs:

Refine Feed Tank Simulation – Working Loss		
Max Level	70% (16.1 ft)	70% (16.1 ft)
Min Level	40% (9.2 ft)	55% (12.65 ft)
Span	6.9 ft	3.45 ft
Turnovers per day	2.42	4.84
Residence Time	0.413	0.207
Est. VOC Emissions	**140 lb/yr**	**129 lb/yr**

Breathing Loss Calculations:

WATER9 assumes each tank is un-insulated and has no temperature control. It predicts breathing losses based on temperature swings from ambient conditions alone per the following equation:

$$L_B = 2.26 \times 10^{-2} M_V \left(\frac{P^*}{P_A - P^*}\right)^{0.68} D^{1.73} H^{0.51} \Delta T^{0.5} F_P \, C \, K_C \quad (3\text{-}5)$$

where

L_B = fixed-roof breathing loss, lb/yr

M_V = molecular weight of vapor in tank, lb/lb mol

P^* = true vapor pressure at bulk liquid conditions, psia

P_A = average atmospheric pressure at tank location, psia

D = tank diameter, ft

H = average vapor space height, ft (assumed to be one-half of tank height)

ΔT = average ambient diurnal temperature change, °F (20 °F assumed as a typical value)

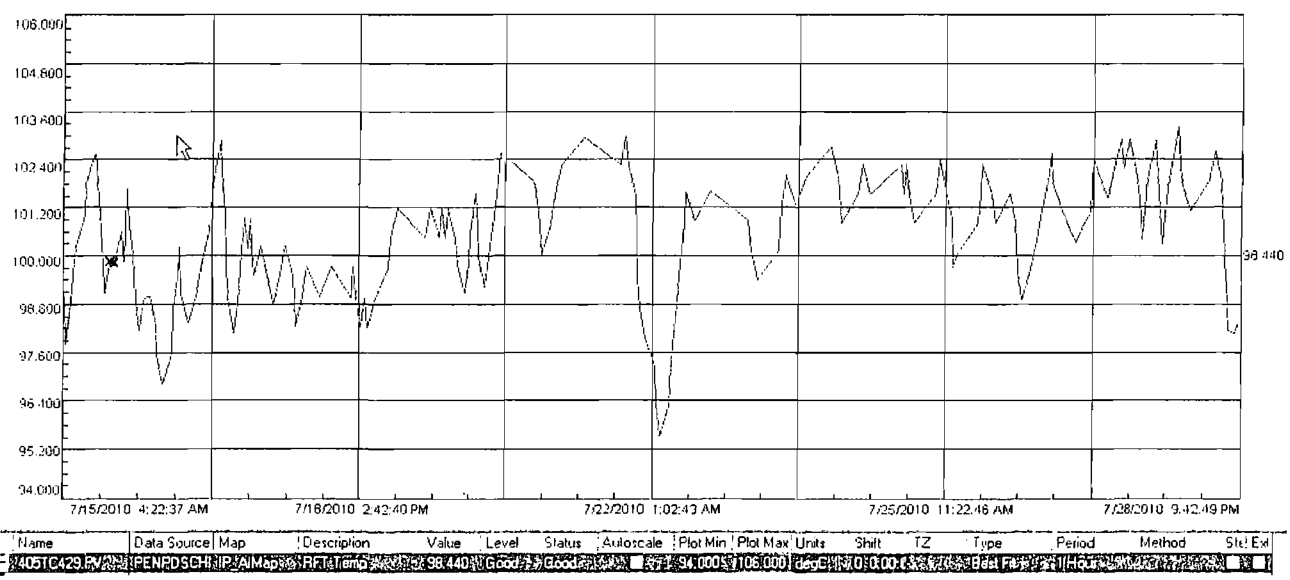
F_P = paint factor, dimensionless (see Table 3-3)

C = adjustment factor for small diameter tanks, dimensionless (for diameter ≥ 30 ft, C = 1; for diameter < 30 ft,

C = 0.0771 D − 0.0013 D² − 0.1334)

K_C = product factor, dimensionless (for crude oil, K_C=0.65, for all other organic liquids, K_C = 1.0).

As an example, the RFT is an insulated heated tank. It is not affected by diurnal ambient temperature swings. However, there are process temperature swings which will result in breathing losses through the tank vent. The temperature for two weeks in July 2010 is shown:



In calculating the breathing losses, assume the typical/average daily temperature variability at the liquid surface is +/- 1.0 deg C. WATER9 is only capable of calculating breathing losses indirectly from diurnal ambient temperature swings. TANKS4 does display the calculated liquid surface temperatures which result from input ambient swings in unheated tanks. To generate a one degree swing in liquid surface temperature in TANKS4, a +/- 1.8 deg C swing in ambient temperature is required.

Simulating the RFT in WATER9 as an un-insulated/unheated storage tank with a +/- 1.8 deg C ambient swing, the program predicts a breathing loss of 69 lb/yr. The total VOC emission loss is therefore working plus breathing losses, 140 + 69 = 209 lbs VOC/year. To be more conservative a +/- 2 deg daily liquid temperature swing was assumed for calculations. This increased the breathing losses in the RFT to 98 and the total VOC emission loss to 238 lbs VOC/year.

TANKS4 loss estimates versus WATER9:

The RFT was simulated in TANKS4 by specifying the water component as an organic liquid with its associated vapor pressure curve. All components were modeled using Raoults Law. The predicted annual VOC emissions were much lower than WATER9:

RFT VOC Losses, lb/year

	WATER9	TANKS4
Working Losses:	140	1.0
Breathing Losses:	98	0.35
Total Losses:	238	1.35

Similarly, TANKS4 was used to calculate emissions from two other tanks with higher emission levels calculated in WATER9. The emissions were once again much lower in TANKS4, therefore the assumption was made that utilizing WATER9 data would be the more conservative approach for calculating the refining VOC emissions.

Tank ID	Tank Description	WATER9, lb/yr	TANKS4, lb/yr
405TA001	Refine Feed Tank	238	1.35
403TA50	Utility Tank (WML)	70	0.11
465TA178	465 WML Tank	65	0.34

Appendix A

ASCEND
PERFORMANCE MATERIALS

Analytical Sciences Group
Pensacola

Tel: (850) 968-8163
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Date: 07/20/2010
Date Completed: 09/20/2010
From: George Hayman
To: Greg Bush, Amy Dyer, Roy Noble
cc: Patrick O'Neal, Ben Womack
Subject: Volatile Organic Acid Analysis
NBP #:

Background:

This analysis is an attempt to estimate the amount of volatile organic acids which are given off to the atmosphere as a byproduct of Adipic Acid Refining. The current factor being used is 0.5lb / Ton. Monobasic acids (MBA's) from C2 through C7, as well as Dibasic acids (DBA's) from C4 through C6, were analyzed in process stream samples submitted by Michelle Shotts.

Summary & Conclusions:

Recoveries of all analytes were reasonable in all samples. For use in determining concentrations in plant streams I would recommend adjusting results for those compounds which had less than 100% recovery. These results should be useful in estimating VOC emissions due to Volatile Organic Acids.

Experimental:

Samples were collected from various points in the process in 250ml bottles with minimal headspace. Those samples with adipic acid precipitates were placed in a steam bath until the precipitate was in solution. The samples were then analyzed by STM01529 for the DBA's. A 25 ul aliquot of sample was derivatized with the silanizing agent used for the DBA's and analyzed for MBA's by Gas Chromatography. The MBA samples were analyzed neat and a 500ul aliquot was added to 500ul of an MBA standard. A 25ul aliquot of this solution was then derivatized and analyzed and a % recovery calculated for all MBA's.

Calibration:

For the MBA analysis, four levels of standards were prepared as an aqueous solution. A 25ul aliquot of each standard was derivatized and analyzed by GC/FID. All data was collected and analyzed utilizing ATLAS chromatography software. A linear regression was then performed utilizing the ATLAS software. All compounds exhibited reasonably linear behavior. The coefficient of determination (r squared) for the MBA's is as follows. Acetic acid r sq.=0.9997. Propanoic acid r sq.=0.9995. Butanoic acid r sq.=0.9994. Pentanoic acid r sq.=0.9981. Hexanoic acid r sq.=0.9997. Heptanoic acid r sq.=0.9985. For the Dibasic acids a single point calibration was performed per Ascend STM01529, and linearity through the origin was assumed for all compounds. An aliquot of the mid level standard was derivatized and analyzed with each set of samples received to ensure that the initial calibration remained valid. This aliquot was analyzed at the beginning and end of each set of samples as they were run.

Cont. Cal. Ver.

7/22/2010 8:53

Compound	True Value	Calculated Value	% Difference
Acetic acid	642.95	661.10	2.82
Propionic acid	630.50	639.24	1.39
Butanoic acid	584.75	590.70	1.02
Pentanoic acid	573.45	571.75	0.30
Hexanoic acid	557.00	580.92	4.29
Heptanoic acid	600.35	620.55	3.36

7/22/2010 15:48

Compound	True Value	Calculated Value	% Difference
Acetic acid	642.95	634.75	1.28
Propionic acid	630.50	643.22	2.02
Butanoic acid	584.75	592.08	1.25

Pentanoic acid	573.45	572.46	0.17
Hexanoic acid	557.00	568.68	2.10
Heptanoic acid	600.35	599.18	0.19

7/22/2010
23:54

Compound	True Value	Calculated Value	% Difference
Acetic acid	642.95	651.78	1.37
Propionic acid	630.50	643.01	1.98
Butanoic acid	584.75	590.82	1.04
Pentanoic acid	573.45	568.01	0.95
Hexanoic acid	557.00	575.19	3.27
Heptanoic acid	600.35	587.54	2.13

7/23/2010 9:58

Compound	True Value	Calculated Value	% Difference
Acetic acid	642.95	631.85	1.73
Propionic acid	630.50	623.35	1.13
Butanoic acid	584.75	575.51	1.58
Pentanoic acid	573.45	555.36	3.15
Hexanoic acid	557.00	557.35	0.06
Heptanoic acid	600.35	558.34	7.00

7/23/2010
16:55

Compound	True Value	Calculated Value	% Difference
Acetic acid	642.95	610.26	5.09

Propionic acid	630.50	630.33	0.03
Butanoic acid	584.75	583.76	0.17
Pentanoic acid	573.45	557.94	2.70
Hexanoic acid	557.00	555.68	0.24
Heptanoic acid	600.35	566.22	5.69

7/30/2010 8:55

Compound	True Value	Calculated Value	% Difference
Acetic acid	642.95	643.17	0.03
Propionic acid	630.50	628.97	0.24
Butanoic acid	584.75	578.98	0.99
Pentanoic acid	573.45	556.19	3.01
Hexanoic acid	557.00	549.44	1.36
Heptanoic acid	600.35	583.94	2.73

7/30/2010
12:25

Compound	True Value	Calculated Value	% Difference
Acetic acid	642.95	624.05	2.94
Propionic acid	630.50	627.27	0.51
Butanoic acid	584.75	575.28	1.62
Pentanoic acid	573.45	545.78	4.83
Hexanoic acid	557.00	548.12	1.59
Heptanoic acid	600.35	532.16	11.36

Results & Discussion:

See images and table below.

Compound	LPST(ppm)	LPST+STD 1:1 (ppm)	LPST+STD % REC
Acetic acid	284.45	812	103
Propionic acid	421.1	866.38	103
Butanoic acid	1095	1147.46	101
Pentanoic acid	746	978.14	97
Hexanoic acid	134	666.35	107
Heptanoic acid	n.d.	652.36	109

Compound	CAGA(ppm)	CAGA+STD 1:1 (ppm)	CAGA+STD % REC
Acetic acid	48.78	669.74	100.4
Propionic acid	n.d.	637.53	101
Butanoic acid	44.26	596.5	98
Pentanoic acid	81.4	608.24	99
Hexanoic acid	58.77	575.98	98
Heptanoic acid	83.69	649.01	101

Compound	AMLF(ppm)	AMLF+STD 1:1 (ppm)	AMLF+STD % REC
Acetic acid	34.441	831.227	126
Propionic acid	28.016	841.317	130
Butanoic acid	65.725	775.984	126
Pentanoic acid	111.888	782.235	124
Hexanoic acid	58.897	735.475	125
Heptanoic acid	135.49	844.274	126

Compound	AMLF(%)
Succinic	5.86
Glutaric	19.35
Adipic	4.11

Compound	RFD(ppm)	RFD+STD 1:1 (ppm)	RFT+STD % REC
Acetic acid	n.d.	549.964	86
Propionic acid	n.d.	537.583	85
Butanoic acid	44.58	504.504	83
Pentanoic acid	66.459	482.564	80
Hexanoic acid	64.604	482.646	82
Heptanoic acid	80.484	516.432	81

Compound	RFT(%)
Succinic	0.10
Glutaric	0.12
Adipic	37.24

Compound	405A REF(ppm)	REF+STD 1:1 (ppm)	Ref+STD % REC
Acetic acid	n.d.	561.073	87
Propionic acid	19.991	548.17	86
Butanoic acid	n.d.	514.036	88
Pentanoic acid	n.d.	498.835	87
Hexanoic acid	51.977	501.763	86
Heptanoic acid	81.585	553.187	86

Compound	405A REF(%)
Succinic	0.10
Glutaric	0.13
Adipic	36.16

Compound	403 WML(ppm)	WML+STD 1:1 (ppm)	WML+STD % REC
Acetic acid	n.d.	553.981	86
Propionic acid	24.622	544.19	85
Butanoic acid	45.192	508.458	84
Pentanoic acid	63.711	486.934	80
Hexanoic acid	62.756	483.454	82
Heptanoic acid	80.282	526.713	82

Compound	403 WML(%)
Succinic	0.08
Glutaric	0.08
Adipic	21.11

Compound	403 AFT(ppm)	AFT+STD 1:1 (ppm)	AFT+STD % REC

Compound	403 AFT(%)

				Compound	
Acetic acid	365.512	796.195	96	Succinic	0.04
Propionic acid	496.115	839.737	96	Glutaric	0.22
Butanoic acid	1282.811	1192.794	97	Adipic	0.37
Pentanoic acid	1031.167	1048.492	96		
Hexanoic acid	237.171	640.528	95		
Heptanoic acid	81.925	644.255	100		

Compound	IXDAML (ppm)	DAML+STD 1:1 (ppm)	DAML+STD % REC	Compound	1XDAML (%)
Acetic acid	26.145	649.637	99	Succinic	4.37
Propionic acid	24.687	637.778	99	Glutaric	13.63
Butanoic acid	66.652	604	98	Adipic	2.89
Pentanoic acid	92.694	588.271	95		
Hexanoic acid	59.109	577.653	98		
Heptanoic acid	79.764	631.793	99		

Compound	405 REGEN (ppm)	REGN+STD 1:1 (ppm)	REGN+STD % REC	Compound	405 REGEN (%)
Acetic acid	536.629	939.088	103	Succinic	0.08
Propionic acid	544.732	922.399	102	Glutaric	0.09
Butanoic acid	1147.145	1187.939	103	Adipic	0.43
Pentanoic acid	746.964	948.255	100		
Hexanoic acid	129.97	623.416	100		
Heptanoic acid	81.457	619.406	97		

Compound	405 REFINE (ppm)	REFN+STD 1:1 (ppm)	REFN+STD % REC	Compound	405 REFINE (%)
Acetic acid	n.d.	637.925	99	Succinic	0.06

				Compound	
Propionic acid	24.177	624.503	97	Glutaric	0.05
Butanoic acid	45.602	575.342	95	Adipic	0.65
Pentanoic acid	65.272	555.178	92		
Hexanoic acid	64.172	561.645	95		
Heptanoic acid	79.995	557.595	87		

Compound	UGA WML (ppm)	WML+STD 1:1 (ppm)	WML+STD % REC	Compound	UGA WML (%)
Acetic acid	n.d.	655.728	102	Succinic	0.08
Propionic acid	20.947	647.117	101	Glutaric	0.05
Butanoic acid	n.d.	599.033	102	Adipic	12.98
Pentanoic acid	n.d.	573.737	100		
Hexanoic acid	n.d.	575.352	103		
Heptanoic acid	80.788	634.224	99		

Compound	403 REGEN (ppm)* *=Resample	REGN+STD 1:1 (ppm)	REGN+STD % REC	Compound	403 REGEN (%)
Acetic acid	367.616	805.499	97	Succinic	0.03
Propionic acid	486.114	847.913	97	Glutaric	0.11
Butanoic acid	1234.238	1166.012	97	Adipic	0.33
Pentanoic acid	960.515	995.932	95		
Hexanoic acid	210.428	618.988	93		
Heptanoic acid	105.602	598.84	92		

Compound	403 WML (ppm)* *=Resample	AFT+STD 1:1 (ppm)	AFT+STD % REC	Compound	403 WML (%)
Acetic acid	n.d.	649.782	101	Succinic	0.08
Propionic acid	n.d.	640.89	102	Glutaric	0.06
Butanoic acid	n.d.	588.131	101	Adipic	26.09

Pentanoic acid	n.d.	518.021	90			
Hexanoic acid	58.233	403.434	69			
Heptanoic acid	79.987	408.27	64			

Compound	UGAFEED (ppm)	FEED+STD 1:1 (ppm)*	FEED+STD % REC	*dil. 1:1 wth b.s.H2O	Compound	UGAFEED (%)
Acetic acid	n.d.	367.614	114		Succinic	0.08
Propionic acid	n.d.	358.298	114		Glutaric	0.05
Butanoic acid	n.d.	325.723	111		Adipic	57.65
Pentanoic acid	n.d.	280.754	98			
Hexanoic acid	65.227	201.315	68			
Heptanoic acid	86.962	199.812	62			

Compound	UGA SUSP (ppm)	SUSP+STD 1:1 (ppm)*	REGN+STD % REC	*dil. 1:1 wth b.s.H2O	Compound	UGA SUSP %)
Acetic acid	536.629	340.505	75		Succinic	0.08
Propionic acid	19.546	337.969	106		Glutaric	0.04
Butanoic acid	n.d.	314.347	108		Adipic	38.55
Pentanoic acid	n.d.	290.751	101			
Hexanoic acid	n.d.	242.271	87			
Heptanoic acid	n.d.	256.224	85			

Compound	485B CRUDE (ppm)	CRDE+STD 1:1 (ppm)*	CRDE+STD % REC	*dil. 1:1 wth b.s.H2O	Compound	485B CRUDE (%)
Acetic acid	25.408	336.807	103		Succinic	0.07
Propionic acid	n.d.	350.011	111		Glutaric	0.06
Butanoic acid	n.d.	325.825	111		Adipic	47.46
Pentanoic acid	58.759	292.2	97			
Hexanoic acid	59.422	237.188	81			

Heptanoic acid	79.505	226.471	71			

Compound	DTBSLPT (ppm)	DTBSLPT+STD 1:1 (ppm)	FEED+STD % REC
Acetic acid	n.d.	605.993	94
Propionic acid	23.378	605.672	94
Butanoic acid	45.99	563.2	93
Pentanoic acid	64.465	543.464	90
Hexanoic acid	66.984	551.6	93
Heptanoic acid	78.858	546.194	85

Compound	DTBSLPT (%)
Succinic	none detected
Glutaric	none detected
Adipic	0.03

Compound	IUGASOLN (ppm)*	SOLN+STD 1:1 (ppm)	SOLN+STD % REC	*liquid sampled as received
Acetic acid	n.d.	628.655	98	
Propionic acid	n.d.	618.952	98	
Butanoic acid	n.d.	570.61	98	
Pentanoic acid	n.d.	524.498	91	
Hexanoic acid	53.069	480.906	86	
Heptanoic acid	79.298	490.666	82	

Compound	IUGA IST (ppm)*	IUGA IST+STD 1:1 (ppm)	IUGA IST+STD % REC	*liquid sampled as received
Acetic acid	n.d.	651.573	101	
Propionic acid	21.204	648.971	101	
Butanoic acid	47.016	599.638	99	
Pentanoic acid	67.244	577.524	95	
Hexanoic acid	66.181	580.979	98	
Heptanoic acid	79.549	613.124	96	

Compound	IUGASOLN	SOLN+STD 1:1	SOLN+STD	*heated until	Compound	IUGASOLN

	(ppm)*	(ppm)	% REC	adipic is in solution		(%)
Acetic acid	n.d.	755.31	117		Succinic	none detected
Propionic acid	n.d.	740.982	118		Glutaric	none detected
Butanoic acid	n.d.	676.891	116		Adipic	49.67
Pentanoic acid	n.d.	617.945	108			
Hexanoic acid	52.108	540.379	97			
Heptanoic acid	81.924	563.161	94			

Compound	IUGA 1st (ppm)*	IUGA 1ST+STD 1:1 (ppm)	IUGA 1ST+STD % REC	*heated until adipic is in solution	Compound	IUGA 1st (%)
Acetic acid	n.d.	795.136	124		Succinic	none detected
Propionic acid	24.523	781.862	124		Glutaric	none detected
Butanoic acid	46.771	708.381	121		Adipic	60.49
Pentanoic acid	68.025	645.212	113			
Hexanoic acid	66.997	572.397	103			
Heptanoic acid	82.3	594.864	99			

Compound	AMLS 1st (ppm)	AMLS 1ST+STD 1:1 (ppm)	AMLS 1ST+STD % REC		Compound	AMLS 1st (%)
Acetic acid	n.d.	646.442	100.1		Succinic	13.97
Propionic acid	46.953	645.226	99		Glutaric	17.32
Butanoic acid	201.931	672.701	98		Adipic	4.01
Pentanoic acid	314.576	704.28	96			
Hexanoic acid	119.879	619.393	100			
Heptanoic acid	n.d.	634.948	106			

STM-01529 as written incorporates the use of an internal standard for use in compensating for matrix effects on the derivatization and subsequent quantitation of the dibasic acids, which are typically present at percent levels. The mono basic acids were expected to be present at ppm levels. This precluded diluting the samples with an internal standard solution prior to derivatization and analysis. To compensate for matrix effects on derivatization and analysis, all samples prepared for the analysis of mono basic acids were analyzed neat and spiked with the compounds of interest. Where the recovery was less than 100%, it was assumed that this was due to incomplete derivatization and the results were adjusted by dividing the result for that analyte by the decimal percent recovery. Where the result was greater than 100% it was decided to use the result from the neat sample with no adjustment. All spiked samples were prepared by diluting 500ul of sample with 500ul of standard. The standard had the following concentrations of analytes:

Acetic acid:1285.9ppm
Propanoic acid:1261.0ppm
Butanoic acid:1169.5ppm
Pentanoic acid: 1146.9ppm
Hexanoic acid:1114.0ppm
Heptanoic acid: 1200.7ppm

The calculation for % recovery is:

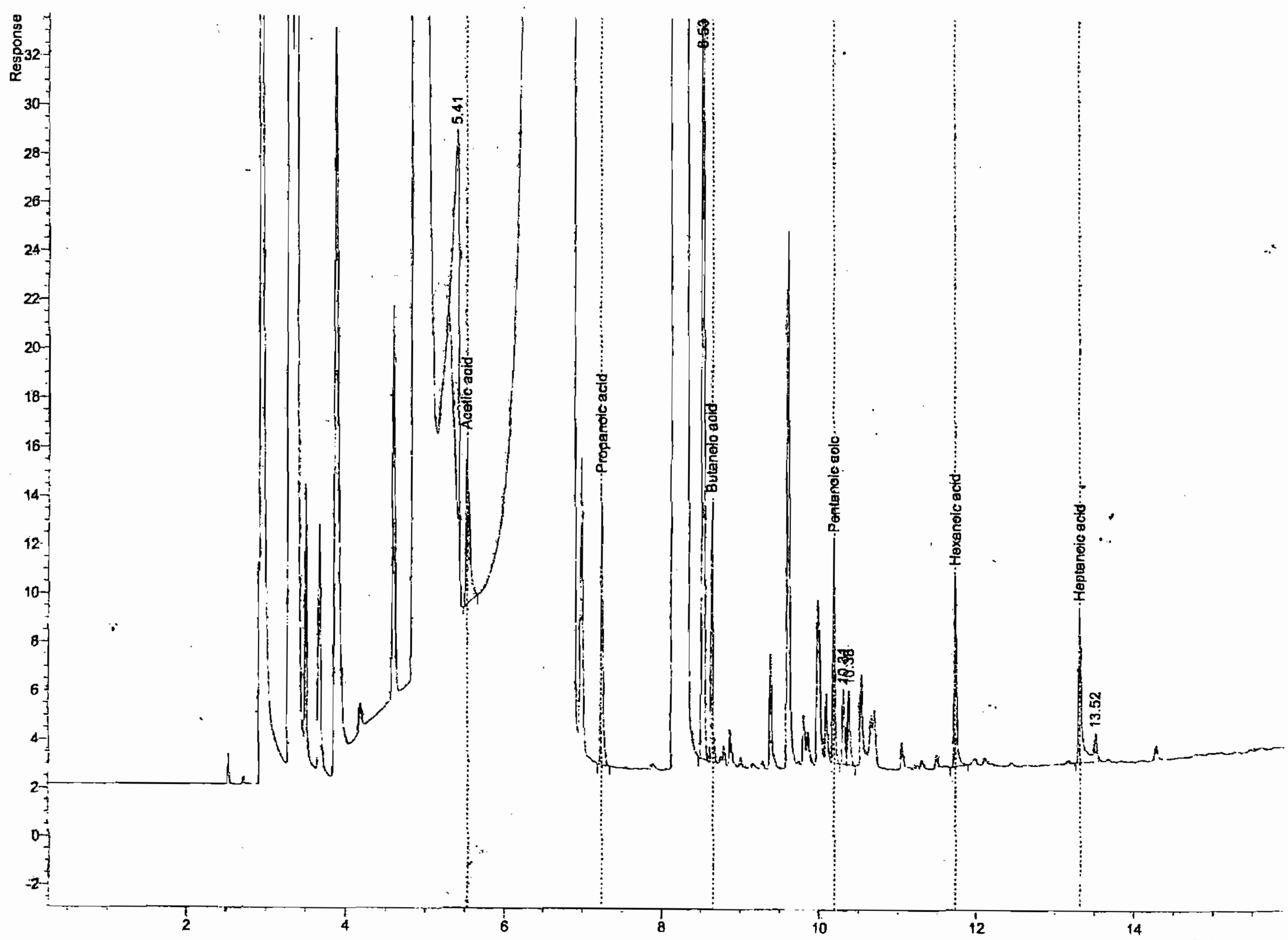
$$\% = \frac{\text{spike sample result} \times 100}{(0.5 \times \text{neat result}) + (0.5 \times \text{standard conc})}$$

Chromatograms

~500ppm Continuing Calibration Standard

500PPM MBA's (2,1)
Acquired Friday, July 30, 2010 8:55:02 AM

Chrom_Bench8,A2DCH27.mba_der_Jul302010_0705,2.1,1

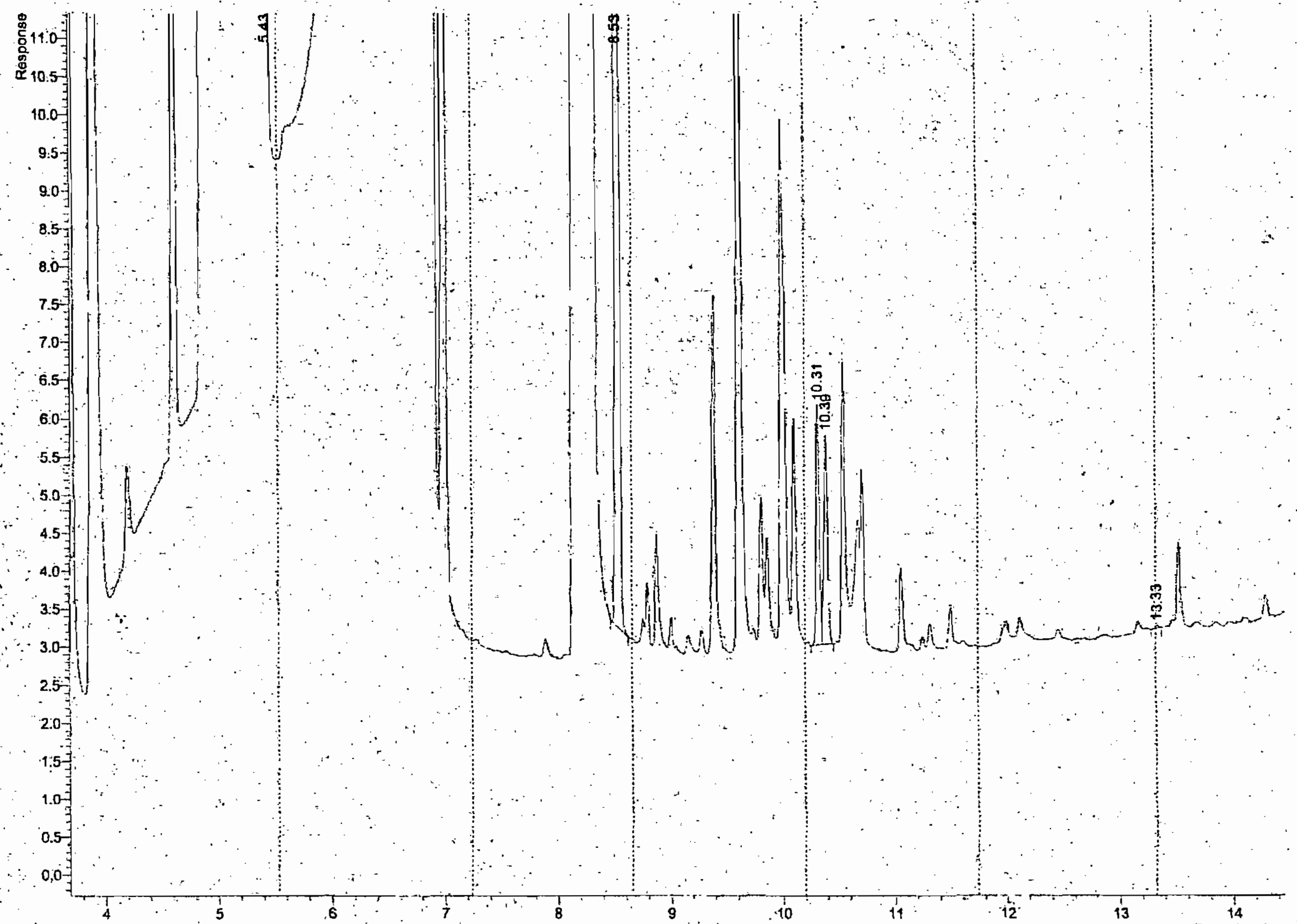


14

Reagent Blank

blnk-1 MBA's. (1.1)
Acquired Friday, July 30, 2010 8:20:14 AM

Chrom_Bench6;A2DCH27.mba_der_Jul302010_0705,1,1,1



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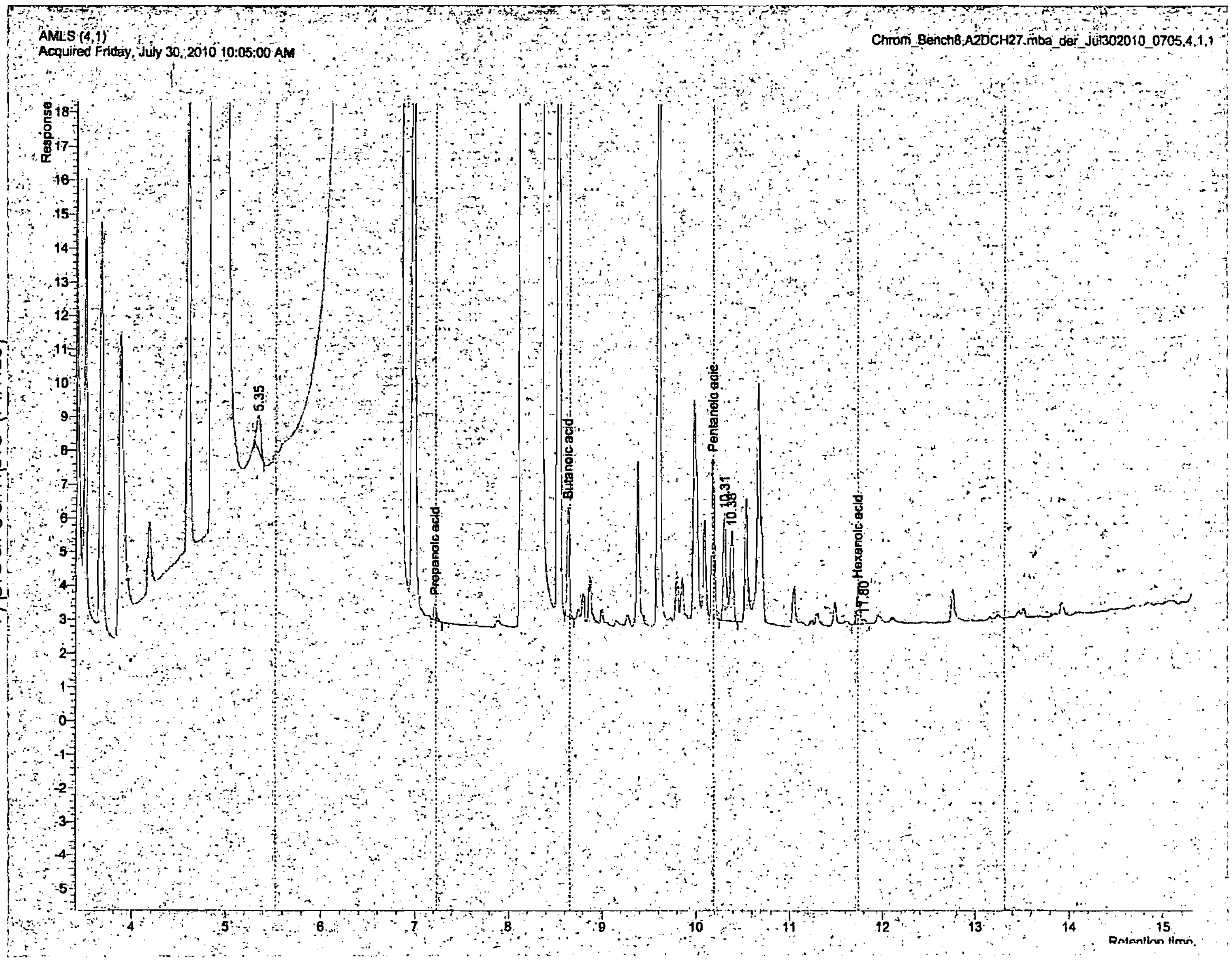
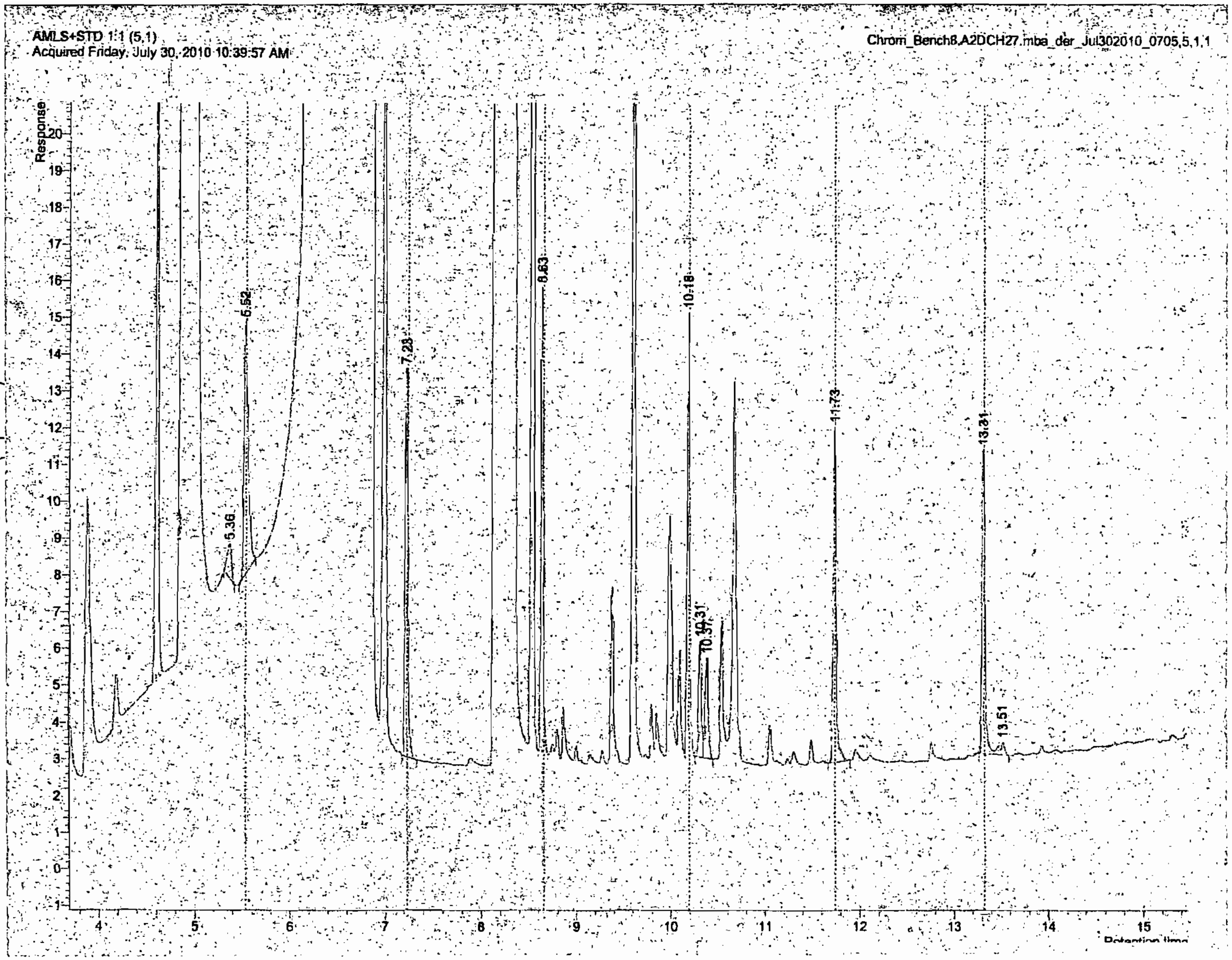
Typical Sample (AMLS)



16

Sample +
Standard(Spike)



Appendix B

WATER9 Summary of Adipic Refine Feed Tank VOC Emissions

WASTEWATER TREATMENT SUMMARY I   09-23-2010   11:53:27

Project C:\Program Files\Wastewater treatment models\refinefeedtank 7/29/2010 2:51:16 PM

COMPOUND	RATE (g/s)	Fraction Air	Removal	Exit	Adsorb	error	emissions
ACETIC ACID	2.88E-23	.99	.	.0003	0.0000	0.0000	(9.07E-22 Mg/yr)
HEXANEDIOIC ACID (adipic acid)	1.61E-04	.	.	1.	0.0000	0.0000	(5.09E-03 Mg/yr)
BUTYRIC ACID	1.06E-04	.00	.	.9993	0.0000	0.0000	(3.36E-03 Mg/yr)
PENTANEDIOIC ACID (glutaric acid)	1.21E-06	.	.	1.	0.0000	0.0000	(3.83E-05 Mg/yr)
HEXANOIC ACID	3.34E-04	.00	.	.9985	0.0000	0.0000	(1.05E-02 Mg/yr)
PROPANOIC ACID	2.88E-23	.99	.	.0004	0.0000	0.0000	(9.07E-22 Mg/yr)
BUTANDIOIC ACIC (succinic acid)	4.78E-07	.	.	1.	0.0000	0.0000	(1.51E-05 Mg/yr)
PENTANOIC ACID	6.00E-04	.00	.	.9975	0.0000	0.0000	(1.89E-02 Mg/yr)
HEPTANOIC ACID	2.22E-03	.00	.	.9922	0.0000	0.0000	(6.99E-02 Mg/yr)

TOTAL ALL COMPOUNDS   3.42E-03 g/s air emissions

TOTAL ALL COMPOUNDS   1.08E-01 Mg/yr air emissions

WATER9 Detailed Output of Adipic Acid in Refine Feed Tank

```
 DETAILED CALCULATIONS at Unit 1 def.storage tank
Type: storage tank
  Project C:\Program Files\Wastewater treatment models\refinefeedtank
  7/29/2010 2:51:16 PM  11:58:32
COMPOUND: HEXANEDIOIC ACID (adipic acid)

Type of unit is storage tank
1 Description of unit                    1     def.storage tank
2 Wastewater temperature   (C)                 98.5
3 Open surface area of tank  (m2)              0
4 Density of liquid in tank (g/cc)             1.07
5 tank waste Mwt, water=18                     18
6 unit storage time (days)                     0.41
7 tank paint factor                            1
8 tank diameter (m)                            7.86
9 tank vapor space height (m)                  4
10 diurnal temp. change (deg.C)                7.2
11 tank height (m)                             2.1
12 oil in composite wastewater (wt. %)         0
19 pH                                          0

Properties of HEXANEDIOIC ACID (adipic acid) at 98.5 deg.C (209.3 deg.F)
   hl= 2.558e-08 atm-m3/mol      vp= 0.014274 mmHg (2.761e-04 psia)
       0.001421 y/x
       8.393e-07 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 8.526e-06 cm2/s  dv= 0.096907 cm2/s
The oil corrected aqueous HL is 1.421e-03 (y/x)
The concentration in the tank inlet is 3.7e+05 ppmw
The flowrate of liquid is 2.876e-03 M3/s
liquid flowrate (from tank holding) is 2.876e-03 M3/s
The total loading of the compound is 3.59e+10 g/yr.
The working volume is 1.019e+02 m3 (2.692e+04  gal)
The mass lost per turnover is 2.372e-06 Mg/turnover
The vapor pressure of the compound in solution is .000276 psia.
MWT = 146.1    dia= 25.8  ft.
Breathing:  Lb = 0.0000102 * MWT * (p / (14.7 - p)) ^ 0.68 * dia ^ 1.73
mass emissions= Lb * h ^ 0.51 * dt ^ 0.5 * Fp * c   Mg/yr
c = .99    h= 13.1  ft.
dt = 12.96 deg.F    Fp= 1.
mass emissions= 33.36E-04   Mg/yr
The temperature in the tank is 98.5 deg.C
The type of liquid is  Aqueous matrix
The concentration in the liquid waste is 3.7e+05 g/m3
The fraction in the oil is .
The vapor pressure (p) is 2.761e-04  psia(1.427e-02  mmHg)
The fraction of the compound in the oil phase is ..
The residence time in the tank is .41 days.
   unit storage time (days)                  0.41
   Tank turnover factor                      0.20037
   Tank working loss (fraction)              5.88e-08
   Tank breathing loss  (fraction)           9.29e-08
   Open tank volatilization loss             0.
   concentration in headspace (ppmv)         1.878e-05
   fraction of compound in oil phase         0.
   TOTAL FRACTION VOLATILIZED                1.517e-07
   FRACTION BIOLOGICALLY REMOVED             0.
   TOTAL AIR EMISSIONS  (g/s)                1.615e-04
                     (Mg/year)               0.005092
   EMISSION FACTOR  (g/cm2-s)                3.327e-10
   UNIT EXIT CONCENTRATION (ppmw)            3.7e+05
```

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	Area II Refine Feed Tank	
City:	Pensacola	
State:	Florida	
Company:	Ascend	
Type of Tank:	Vertical Fixed Roof Tank	
Description:		
Tank Dimensions		
Shell Height (ft):		20.00
Diameter (ft):		25.79
Liquid Height (ft) :		6.90
Avg. Liquid Height (ft):		6.90
Volume (gallons):		26,963.41
Turnovers:		883.00
Net Throughput(gal/yr):		23,808,693.06
Is Tank Heated (y/n):	Y	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Roof Color/Shade:	White/White	
Roof Condition:	Good	
Roof Characteristics		
Type:	Dome	
Height (ft)		0.00
Radius (ft) (Dome Roof)		31.00
Breather Vent Settings		
Vacuum Settings (psig):		0.00
Pressure Settings (psig)		0.00

Meterological Data used in Emissions Calculations: Pensacola, Florida (Avg Atmospheric Pressure = 14.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Area II Refine Feed Tank - Vertical Fixed Roof Tank
Pensacola, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Aqueous Adipic Solution	All	209.30	205.70	212.90	209.30	13.0263	12.1104	13.9993	18.0006			26.81	
Adipic Acid						0.0003	0.0002	0.0003	146.1400	0.3724	0.0000	146.14	Option 2: A=8.358, B=2813.07, C=177.2
Butanoic Acid						1.8215	1.6885	1.9635	88.0000	0.0001	0.0000	88.00	Option 2: A=8.064, B=2263.39, C=273.16
Glutaric Acid						0.0037	0.0033	0.0042	132.0000	0.0012	0.0000	132.00	Option 2: A=6.9478, B=2093.11, C=174.66
Heptanoic Acid						0.0815	0.0716	0.0926	130.0000	0.0001	0.0000	130.00	Option 2: A=7.175, B=1536, C=136
Hexanoic Acid						0.1838	0.1654	0.2041	116.0000	0.0001	0.0000	116.00	Option 2: A=9.4775, B=3158.9, C=273.16
Pentanoic Acid						0.8961	0.8083	0.9915	102.0000	0.0001	0.0000	102.00	Option 2: A=6.0825, B=879.77, C=100.7
Succinic Acid						0.0265	0.0234	0.0301	118.0000	0.0010	0.0000	118.00	Option 2: A=10.35, B=3794, C=273
Water						13.9897	13.0061	15.0347	18.0000	0.6251	1.0000	18.00	Option 2: A=8.1077, B=1750.3, C=235

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Area II Refine Feed Tank - Vertical Fixed Roof Tank
Pensacola, Florida

Annual Emission Calcaulations	
Standing Losses (lb):	9,172.6604
Vapor Space Volume (cu ft):	7,588.6366
Vapor Density (lb/cu ft):	0.0327
Vapor Space Expansion Factor:	1.1182
Vented Vapor Saturation Factor:	0.0907
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	7,588.6366
Tank Diameter (ft):	25.7900
Vapor Space Outage (ft):	14.5268
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	6.9000
Roof Outage (ft):	1.4268
Roof Outage (Dome Roof)	
Roof Outage (ft):	1.4268
Dome Radius (ft):	31.0000
Shell Radius (ft):	12.8950
Vapor Density	
Vapor Density (lb/cu ft):	0.0327
Vapor Molecular Weight (lb/lb-mole):	18.0006
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	13.0263
Daily Avg. Liquid Surface Temp. (deg. R):	668.9700
Daily Average Ambient Temp. (deg. F):	67.6708
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	668.9700
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,384.3333
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	1.1182
Daily Vapor Temperature Range (deg. R):	7.2000
Daily Vapor Pressure Range (psia):	1.8890
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	13.0263
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	12.1104
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	13.9993
Daily Avg. Liquid Surface Temp. (deg R):	668.9700
Daily Min. Liquid Surface Temp. (deg R):	665.3700
Daily Max. Liquid Surface Temp. (deg R):	672.5700
Daily Ambient Temp. Range (deg. R):	17.6917
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.0907
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	13.0263
Vapor Space Outage (ft):	14.5268
Working Losses (lb):	26,669.4981
Vapor Molecular Weight (lb/lb-mole):	18.0006
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	13.0263
Annual Net Throughput (gal/yr.):	23,808,693.0644
Annual Turnovers:	883.0000
Turnover Factor:	0.2006
Maximum Liquid Volume (gal):	26,963.4123
Maximum Liquid Height (ft):	6.9000
Tank Diameter (ft):	25.7900
Working Loss Product Factor:	1.0000
Total Losses (lb):	35,842.1584

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

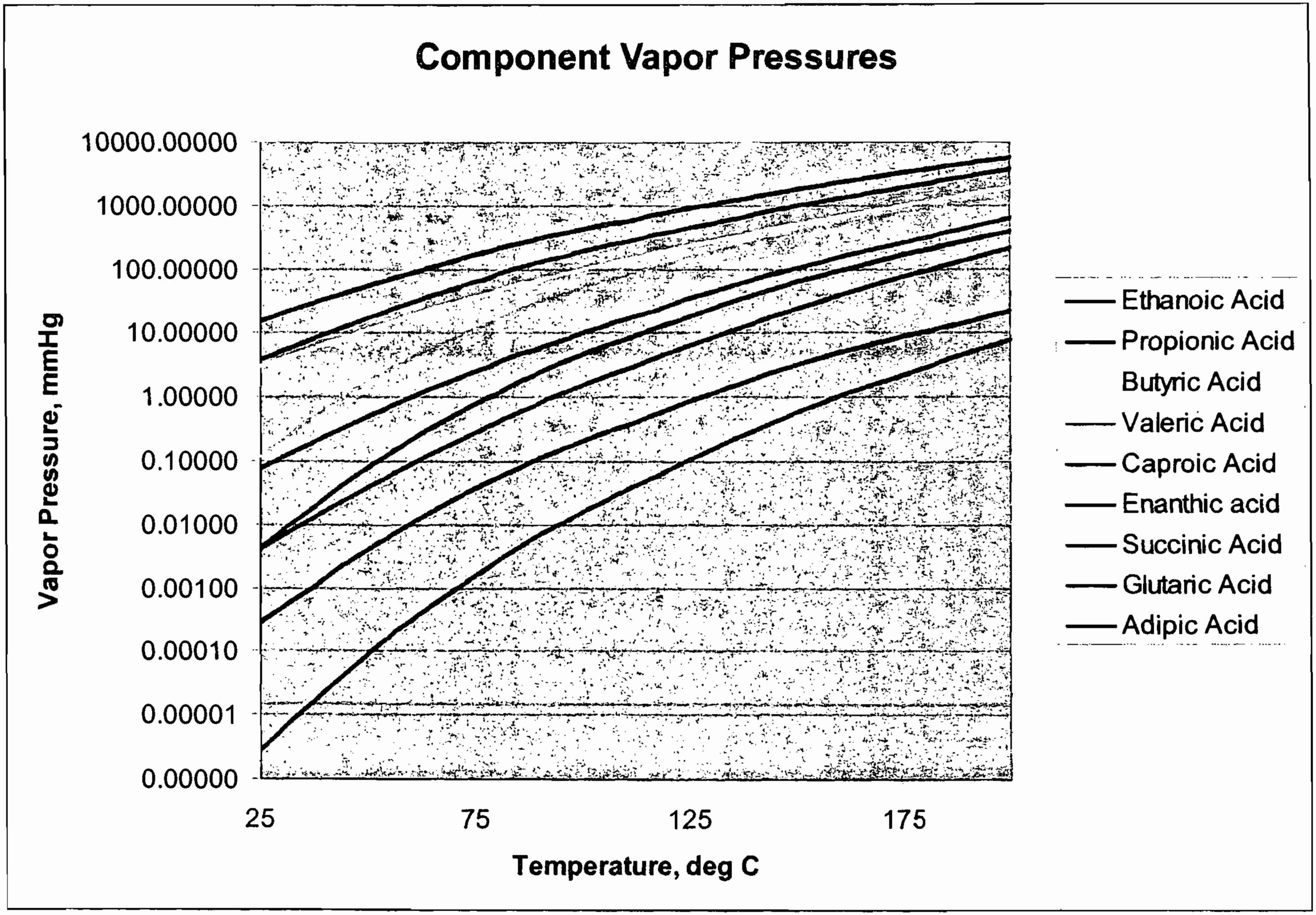
Area II Refine Feed Tank - Vertical Fixed Roof Tank
Pensacola, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Aqueous Adipic Solution	26,669.50	9,172.66	35,842.16
Adipic Acid	0.31	0.11	0.42
Water	26,668.50	9,172.32	35,840.81
Glutaric Acid	0.01	0.00	0.02
Succinic Acid	0.08	0.03	0.11
Heptanoic Acid	0.02	0.01	0.03
Hexanoic Acid	0.04	0.02	0.06
Pentanoic Acid	0.23	0.08	0.31
Butanoic Acid	0.30	0.10	0.40

Adipic VOC Emission Simulation Physical Property Data

	IUPAC Name	Common Name	MW	Henry's Law Constant HI (atm*m3/mol)	K (y/x) @25C	UNIFAC Activity Coeff.in Water
C2	Acetic Acid	Ethanoic Acid	60	1.19E-06	0.06609	3.5
C3	Propanoic Acid	Propionic Acid	74	4.59E-07	0.0255	9.1
C4	Butanoic Acid	Butyric Acid	88	1.08E-06	0.06	24.7
C5	Pentanoic Acid	Valeric Acid	102	4.54E-07	0.02525	68.5
C6	Hexanoic Acid	Caproic Acid	116	7.14E-07	0.03968	192.5
C7	Heptanoic Acid	Enanthic acid	130	6.48E-07	0.036	545
C4	Butanedioic Acid	Succinic Acid	118	3.33E-12	1.85E-07	3.25
C5	Pentanedioic Acid	Glutaric Acid	132	5.00E-12	2.78E-07	6.78
C6	Hexanedioic Acid	Adipic Acid	146	5.00E-12	2.78E-07	15.1

	IUPAC Name	Common Name	MW	VP@25C	Antoine Coeff.'s: (P=mmHg, T=C)		
				mm Hg	A	B	C
C2	Acetic Acid	Ethanoic Acid	60	15.4	7.387	1533.3	222.3
C3	Propanoic Acid	Propionic Acid	74	3.5	7.6258	1678.86	213.328
C4	Butanoic Acid	Butyric Acid	88	0.84	8.064204	2263.39	273.16
C5	Pentanoic Acid	Valeric Acid	102	0.196	6.0825	879.77	100.7
C6	Hexanoic Acid	Caproic Acid	116	0.044	9.4775	3158.9	273.16
C7	Heptanoic Acid	Enanthic acid	130	0.0107	7.175	1536	136
C4	Butanedioic Acid	Succinic Acid	118	0.00418	10.35	3794	273
C5	Pentanedioic Acid	Glutaric Acid	132	0.000291359	6.9478	2093.11	174.66
C6	Hexanedioic Acid	Adipic Acid	146	2.79E-06	8.358	2813.066	177.2



Component Vapor Pressures
10000.00000
1000.00000
100.00000
10.00000
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
0.00000
25
75
125
175
Temperature, deg C
Vapor Pressure, mmHg
Ethanoic Acid
Propionic Acid
Butyric Acid
Valeric Acid
Caproic Acid
Enanthic acid
Succinic Acid
Glutaric Acid
Adipic Acid

Detailed Component Physical Property Summary for WATER9:

PROPERTIES OF ACETIC ACID at 25 deg.C

```
 The following compound properties are estimated.

Type of compound       O
density  (g/cc)                                  1.05
molecular weight                                  60.05
diffusion coef. water (cm2/s)                     1.2e-05
diffusion coef. air  (cm2/s)                      0.113
vapor pressure (mm Hg)                            15.4
Henry's law constant (atm-m3/mol)                 1.19e-06   y/x= 0.06609
   Reference for Henry's law: DIPPR911
vapor pressure temp. coefficients                 7.387    1533.313    222.309
The enthalpy of vaporization 177.146 cal/cc.
zero order biorate constant (mg/g-hr)             14.
first order biorate constant (l/g-hr)             0.98
octanol water partition coefficient               -0.31
solubility ppmw 1.e+06
the UNIFAC activity coef. in water at 25 deg. C is 3.50551
The water solubility estimated from the activity coefficient (25 C) is
8.161e+05
The activity coefficient in octanol at 25 deg. C is 0.88639
UNIFAC code    2111[000000000
CAS code    64-19-7
          The estimated vapor pressure is  15.352 mm Hg.
```

PROPERTIES OF PROPANOIC ACID at 25 deg.C

```
 The following compound properties are estimated.

 The density is estimated from the default values.
 The octanol water partition coef. is estimated from the UNIFAC method.
 The biorate Kmax is estimated from the default.
 The liquid diffusion coef. is estimated from the correlation.
 The vapor diffusion coef. is estimated from the correlation.
Type of compound       O
density  (g/cc)                                  0.97
molecular weight                                  74.08
diffusion coef. water (cm2/s)                     1.12e-05
diffusion coef. air  (cm2/s)                      0.0973
vapor pressure (mm Hg)                            3.53
Henry's law constant (atm-m3/mol)                 4.59e-07   y/x= 0.0255
   Reference for Henry's law: Servant (1991)
vapor pressure temp. coefficients                 7.6258    1678.86    213.328


The enthalpy of vaporization 156.171 cal/cc.
zero order biorate constant (mg/g-hr)             17.56
first order biorate constant (l/g-hr)             0.17394
octanol water partition coefficient               0.28965
solubility ppmw 3.7e+05
the UNIFAC activity coef. in water at 25 deg. C is 9.115
```

The water solubility estimated from the activity coefficient (25 C) is 5.287e+05
The activity coefficient in octanol at 25 deg. C is 0.82387
UNIFAC code 311121[0000000
CAS code 79-09-4
The estimated vapor pressure is 3.8076 mm Hg.

PROPERTIES OF BUTYRIC ACID at 25 deg.C

The following compound properties are estimated.

The octanol water partition coef. is estimated from the UNIFAC method.
The biorate Kmax is estimated from the default.
The liquid diffusion coef. is estimated from the correlation.
The vapor diffusion coef. is estimated from the correlation.

Type of compound 0			
density (g/cc)	0.958		
molecular weight	88.1		
diffusion coef. water (cm2/s)	1.e-05		
diffusion coef. air (cm2/s)	0.0845		
vapor pressure (mm Hg)	0.84		
Henry's law constant (atm-m3/mol)	1.08e-06	y/x= 0.06	
Reference for Henry's law: DIPPR911			
vapor pressure temp. coefficients	8.0642	2263.39	273.16
The enthalpy of vaporization 112.627 cal/cc.			
zero order biorate constant (mg/g-hr)	17.56		
first order biorate constant (1/g-hr)	0.25431		
octanol water partition coefficient	0.72377		

solubility ppmw 5.62e+04
the UNIFAC activity coef. in water at 25 deg. C is 24.723
The water solubility estimated from the activity coefficient (25 C) is 2.72e+05
The activity coefficient in octanol at 25 deg. C is 0.79874
UNIFAC code 311221[0000000
CAS code 107-92-6
The estimated vapor pressure is 2.9716 mm Hg.

PROPERTIES OF PENTANOIC ACID at 25 deg.C

The following compound properties are estimated.

The octanol water partition coef. is estimated from the UNIFAC method.
The biorate Kmax is estimated from the default.
The liquid diffusion coef. is estimated from the correlation.
The vapor diffusion coef. is estimated from the correlation.
The solubility is estimated from the vapor pressure and Henry's law.

Type of compound		
density (g/cc)	0.939	
molecular weight	102.14	
diffusion coef. water (cm2/s)	9.1e-06	
diffusion coef. air (cm2/s)	0.0737	
vapor pressure (mm Hg)	0.196	
Henry's law constant (atm-m3/mol)	4.545e-07	y/x= 0.02525
Reference for Henry's law: Khan 1995 M S		

vapor pressure temp. coefficients 6.0825 879.77 100.7
The enthalpy of vaporization 199.361 cal/cc.
zero order biorate constant (mg/g-hr) 15.3
first order biorate constant (l/g-hr) 0.37182
octanol water partition coefficient 1.15789
solubility ppmw 5.796e+04
the UNIFAC activity coef. in water at 25 deg. C is 68.539
The water solubility estimated from the activity coefficient (25 C) is 1.097e+05
The activity coefficient in octanol at 25 deg. C is 0.79155
UNIFAC code 311321[0000000
CAS code 109-52-4
The estimated vapor pressure is .12084 mm Hg.

PROPERTIES OF HEXANOIC ACID at 25 deg.C

The following compound properties are estimated.

The biorate Kmax is estimated from the default.
The liquid diffusion coef. is estimated from the correlation.
The vapor diffusion coef. is estimated from the correlation.

Type of compound	O			
density (g/cc)	0.9265			
molecular weight	116.06			
diffusion coef. water (cm2/s)	8.36e-06			
diffusion coef. air (cm2/s)	0.0646			
vapor pressure (mm Hg)	0.0435			
Henry's law constant (atm-m3/mol)	7.142e-07	y/x= 0.03968		
Reference for Henry's law: Khan 1995 M S				
vapor pressure temp. coefficients	9.478	3158.9	273.16	

The enthalpy of vaporization 115.396 cal/cc.

zero order biorate constant (mg/g-hr) 17.56
first order biorate constant (l/g-hr) 0.72433
octanol water partition coefficient 1.92
solubility ppmw 1.1e+04
the UNIFAC activity coef. in water at 25 deg. C is 192.476
The water solubility estimated from the activity coefficient (25 C) is 3.993e+04
The activity coefficient in octanol at 25 deg. C is 0.7946
UNIFAC code 311421[0000000
CAS code 142-62-1
The estimated vapor pressure is .076 mm Hg.

PROPERTIES OF HEPTANOIC ACID at 25 deg.C

The following compound properties are estimated.

The biorate Kmax is estimated from the default.
The liquid diffusion coef. is estimated from the correlation.
The vapor diffusion coef. is estimated from the correlation.
Type of compound
density (g/cc) 0.918

```
molecular weight                                 130.2
diffusion coef. water (cm2/s)                    7.76e-06
diffusion coef. air  (cm2/s)                     0.0564
vapor pressure (mm Hg)                           0.0107
Henry's law constant (atm-m3/mol)                6.48e-07   y/x= 0.036
   Reference for Henry's law: SRC estimated 2000
vapor pressure temp. coefficients                7.175    1536.    136.
The enthalpy of vaporization 165.394 cal/cc.
zero order biorate constant (mg/g-hr)            15.3
first order biorate constant (l/g-hr)            1.12186
octanol water partition coefficient              2.42
solubility ppmw 2820.
the UNIFAC activity coef. in water at 25 deg. C is 544.948
The water solubility estimated from the activity coefficient (25 C) is
1.455e+04
The activity coefficient in octanol at 25 deg. C is 0.80419
UNIFAC code    311521[0000000
CAS code    111-14-8
          The estimated vapor pressure is  .0043092 mm Hg.
```

PROPERTIES OF BUTANDIOIC ACIC (succinic acid) at 25 deg.C

```
 The following compound properties are estimated.

 The biorate Kmax is estimated from the default.
 The liquid diffusion coef. is estimated from the correlation.
 The vapor diffusion coef. is estimated from the correlation.
Type of compound       O
density  (g/cc)                                 1.552
molecular weight                                 118.09
diffusion coef. water (cm2/s)                    1.12e-05
diffusion coef. air  (cm2/s)                     0.0794
vapor pressure (mm Hg)                           0.00418
Henry's law constant (atm-m3/mol)                3.334e-12   y/x= 1.852e-07
   Reference for Henry's law: Saxena 1996 E S
vapor pressure temp. coefficients                10.348    3794.    273.
The enthalpy of vaporization 228.416 cal/cc.
zero order biorate constant (mg/g-hr)            17.56
first order biorate constant (l/g-hr)            0.0805
octanol water partition coefficient              -0.59
solubility ppmw 8.32e+04
the UNIFAC activity coef. in water at 25 deg. C is 3.25264
The water solubility estimated from the activity coefficient (25 C) is
9.932e+05
The activity coefficient in octanol at 25 deg. C is 2.36042
UNIFAC code    2222[000000000
CAS code    110-15-6
          The estimated vapor pressure is  .0041268 mm Hg.
```

PROPERTIES OF PENTANEDIOIC ACID (glutaric acid) at 25 deg.C

```
 The following compound properties are estimated.
```

The density is estimated from the default values.
The octanol water partition coef. is estimated from the UNIFAC method.
The biorate Kmax is estimated from the default.
The liquid diffusion coef. is estimated from the correlation.
The vapor diffusion coef. is estimated from the correlation.

Type of compound O			
density (g/cc)	0.97		
molecular weight	132.13		
diffusion coef. water (cm2/s)	7.95e-06		
diffusion coef. air (cm2/s)	0.0568		
vapor pressure (mm Hg)	2.9e-04		
Henry's law constant (atm-m3/mol)	5.e-12	y/x= 2.778e-07	
Reference for Henry's law: Saxena 1996 E	S		
vapor pressure temp. coefficients	6.94783	2093.118	174.66
The enthalpy of vaporization 154.339 cal/cc.			
zero order biorate constant (mg/g-hr)	17.56		
first order biorate constant (1/g-hr)	0.13763		
octanol water partition coefficient	0.022041		

solubility ppmw 6.4e+05
the UNIFAC activity coef. in water at 25 deg. C is 6.77828
The water solubility estimated from the activity coefficient (25 C) is 8.883e+05
The activity coefficient in octanol at 25 deg. C is 1.75829
UNIFAC code 2322[000000000
CAS code 110-94-1
The estimated vapor pressure is .00029108 mm Hg.

PROPERTIES OF HEXANEDIOIC ACID (adipic acid) at 25 deg.C

The following compound properties are estimated.

The biorate Kmax is estimated from the default.

Type of compound O			
density (g/cc)	1.37		
molecular weight	146.14		
diffusion coef. water (cm2/s)	6.84e-06		
diffusion coef. air (cm2/s)	0.0659		
vapor pressure (mm Hg)	2.79e-06		
Henry's law constant (atm-m3/mol)	5.e-12	y/x= 2.778e-07	
Reference for Henry's law: Saxena 1996 E	S		
vapor pressure temp. coefficients	8.358	2813.066	177.2
The enthalpy of vaporization 258.418 cal/cc.			
zero order biorate constant (mg/g-hr)	17.56		
first order biorate constant (1/g-hr)	0.14479		
octanol water partition coefficient	0.08		

solubility ppmw 3.08e+04
the UNIFAC activity coef. in water at 25 deg. C is 15.143
The water solubility estimated from the activity coefficient (25 C) is 6.771e+05
The activity coefficient in octanol at 25 deg. C is 1.40414
UNIFAC code 2422[000000000
CAS code 124-04-9
The estimated vapor diffusion coefficient is .0578 cm2/s
The estimated vapor pressure is .0000027892 mm Hg.

Tank Details:

Vessel ID	405TA 001
Vessel Description	Refine Feed Tank
Height	25' 0"
Diameter	25' 9 9/16"
Fluid Density	66.765
Horizontal/Vertical	Vertical
Roof Type	Fixed
Roof Height	31' spherical radius
Bottom Head	Flat
100% Liquid Height on vessel	22.4'
0% Liquid Height on Vessel	0"
Level Tag	405LI432.PV
Average Tank Throughput (kpph)	400
Insulated?	Yes
Shell Color	
Temperature Controlled?	Yes
Heated/Cooled	Heated
Temperature Range (°C)	94 - 103
Temperature Tag	405TC429.PV
Atmospheric/Pressurized	Atmospheric
Operating Pressure	Atmospheric
Conservation Vent Setting	None

Attachment 1

ENTEC Services Inc.

Pollution Control System Evaluation and Source Emissions Testing

ENGINEERING EMISSIONS FACTOR STUDY

ON THE

ADIPIC ACID OFFGAS – TRU INLET, TRU OUTLET, AND HALCON OFFGAS – TRU INLET

SEPTEMBER 28, 2010
PROJECT No.: 510156

Prepared for

ASCEND PERFORMANCE MATERIALS, LLC

P.O. Box 97
Cantonment, Florida

ENTEC SERVICES, INC.

16-D Commerce Avenue
Hueytown, Alabama 35023
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ENTEC Services Inc.

Pollution Control System Evaluation and Source Emissions Testing

ENGINEERING EMISSIONS FACTOR STUDY

ON THE

ADIPIC ACID OFFGAS – TRU INLET, TRU OUTLET, AND HALCON OFFGAS – TRU INLET

ASCEND PERFORMANCE MATERIALS, LLC

CONDUCTED ON
SEPTEMBER 28, 2010

I certify that I have personally examined and am familiar with the information contained herein. Based on my inquiries of the individuals immediately responsible for obtaining the information, I believe the contents of this report deliverable to be true, accurate, and complete, to the best of my knowledge.

Entec Project No. 510156

Report Submitted: October 28, 2010

Completed By:

Chuck Duncan III
Project Manager

Reviewed By:

Troy Burrows
QA / QC Manager

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1.0 EXECUTIVE SUMMARY

Entec Services, Inc. performed an Engineering Emissions Factor Study on the Adipic Acid Offgas – TRU Inlet, TRU Outlet, and Halcon Offgas – TRU Inlet. The testing was performed at Ascend Performance Materials manufacturing facility located in Cantonment, Florida on September 28, 2010.

The Engineering Emissions Factor Study was conducted by Mr. Chuck Duncan, Mr. Gabby Smith, Mr. Lalan Kirby, Mr. Benny Grant, Mr. Stewart Meadows and Mr. Ben Rogers of Entec Services, Inc. Representing Ascend Performance Materials, LLC was Mr. Roy Noble who coordinated emissions testing with control room production activity.

2.0 SUMMARY OF TEST RESULTS

The engineering emissions factor study was conducted for total VOCs, methane (to adjust the VOCs) and Hydrogen Cyanide (HCN) utilizing US EPA methods 1, 2, 4, 18 and 25A as contained in 40 CFR Part 60, Appendix A and Conditional Test Method CTM-033.

No difficulties or problems were encountered during the sampling. The emissions test summaries on the following pages gives a detailed summary of each test run.

NOTE: A CTM-designated method is one that has been evaluated by the Agency (USEPA) and may be applicable to one or more categories of stationary sources. The EPA confidence in a method included in this category is based upon review of various technical information including, but not limited to, field and laboratory validation studies; EPA understanding of the most significant quality assurance (QA) and quality control (QC) issues; and EPA confirmation that the method addresses these QA/QC issues sufficiently to identify when the method may not be acquiring representative data. The method's QA/QC procedures are required as a condition of applicability. For modifications to the method approved by EPA for this project, see report Section 4.4.

Table 2-1
Emissions Summary

Test Performed For: **Ascend**
Cantonment, Florida

Testing Performed By:
North Carolina Division

Source(s) Tested: **ADIPIC ACID OFFGAS - TRU INLET**
Test Condition: **Engineering Emissions Factor Study**
Test(s) Performed: **HCN and VOC**

Project Manager:
Mr. Chuck Duncan

Run Number	Run 1	Run 2	Run 3	Average
Date of Run	9/28/10	9/28/10	9/28/10	-
Emission Test Run Time Began - Ended	0930-1030	1245-1345	1515-1615	-
Control Room Data / Adipic Acid KA feed rate / kpph	**86.32**	**89.91**	**89.99**	**88.74**
Oxygen Concentration, %	14.2	14.4	16.4	15.0
Carbon Dioxide Concentration, %	8.2	6.6	4.6	6.5
Stack Temperature, °F	200	200	200	200
Moisture Content, % volume	8.40	6.90	9.68	8.33

Flows used were from process flow meters (temperature and pressure compensated Annubar flow meter) calibrated per the manufacturer's specifications.

Table 2-2
Emissions Summary

ASCEND MATERIALS
Cantonment, Florida
ADIPIC ACID OFFGAS - TRU INLET

	Run 1	Run 2	Run 3
Date of Run	9/28/2010	9/28/2010	9/28/2010
Start Time	9:30	12:45	15:15
End Time	11:50	14:02	16:27
TRU Feed Flow (pph)	51,911.5	53,985.2	54009.45
TRU Off Gas MW (lb/lb Mol)	35.154	35.453	35.11
TRU Molar Feed Flow (lb/mol/hr)	1476.7	1522.7	1538.5
Propane measured (ppm wet basis)	740.97	728.91	706.53
Methane (ppm)	1.59	1.48	1.57
Propane to C1 and Subtract Methane	2221.31	2185.24	2118.02
Propane Corrected for Methane ppm	740.44	728.41	706.01
Propane calculated (lb-moles/hr)	1.09	1.11	1.09
MW Propane	44.096	44.096	44.096
VOC as Propane (pph)	48.21	48.91	47.90

HCN Results

	Run 1	Run 2	Run 3
HCN (total ug)	56,008	50,978	54,395
HCN MW	27.03	27.03	27.03
Vm DSCF	26.788	28.126	28.244
Vstd liters	758.552	796.440	799.781
HCN (ppmdv)	65.71	56.96	60.53
Percent Moisture	8.40%	6.90%	9.68%
TRU Molar Feed Flow (lb-mol/hr)	1476.7	1522.7	1538.5
TRU Molar Feed Flow Dry (lb-mol/hr)	1352.65	1417.66	1389.54
HCN Calculated (lb-moles/hr)	0.0889	0.0808	0.0841
MW HCN	27.03	27.03	27.03
HCN (PPH)	2.403	2.183	2.273

ppm=(ug/MW)/(Vstd liters/GC)
GC = 24.056

Table 2-3

Emissions Summary

Test Performed For:	**Ascend Materials**	**Testing Performed By:**
	Cantonment, Florida	**North Carolina Division**
Source(s) Tested:	**331 TRU OUTLET**	**Project Manager:**
Test Condition:	**Engineering Emissions Factor Study**	**Mr. Charles Duncan**
Test(s) Performed:	**HCN and VOC**	

Run Number	Run 1	Run 2	Run 3	Average
Date of Run	9/28/10	9/28/10	9/28/10	-
Emission Test Run Time Began - Ended	0930-1150	1245-1402	1715-1827	-
Control Room Data / Adipc Acid KA feed rate / kpph	**86.32**	**89.91**	**89.99**	**88.74**
Oxygen Concentration, %	6.0	6.0	6.0	6.0
Carbon Dioxide Concentration, %	12.0	12.0	12.0	12.0
Isokinetic Sampling Rate, %	95.23	89.26	102.34	95.61
Stack Temperature, °F	422	428	434	428
Moisture Content, % volume	30.43	24.85	29.99	28.42
Stack Gas Velocity, F/S	37.05	37.03	39.26	37 78
Stack Gas Flow, SCFM	50,848	50,491	53,188	51,509
Stack Gas Flow, ACFM	84,542	84,495	89,578	86,205
Volumetric Flow Rate, DSCFM	35,375	37,942	37,240	36,852
Hydrogen Cyanide concentration @ Std. Conditions **, MG/DSCF	0.00346	0.00336	0.00164	0.00277
VOC's as propane Gas Concentration, LBS/DSCF*	7.11070E-07	9.73715E-08	1.03787E-07	3 04076E-07
Hydrogen Cyanide emissions **, LB/HR	0.01617	0.01689	0.00810	0.01352
VOC's as Propane Emissions, LB/HR	1.50924	0.22167	0.23190	0.65427

* Methane non-detect on TRU Outlet @ 0.5 ppm. No correction made.

** All Hydrogen Cyanide Values are non detectable.

Table 2-4
Emissions Summary

ASCEND MATERIALS
Cantonment, Florida
HALCON OFFGAS - TRU INLET

	Run 1	Run 2	Run 3
Date of Run	9/28/2010	9/28/2010	9/28/2010
Start Time	9:30	12:45	15:15
End Time	11:50	14:02	16:27
HALCON Off Gas (pph)	61,300.0	60,420.9	62,066.0
Halcon Off Gas MC (lb/lb Mol)	29.064	29.064	29.064
Halcon Molar Feed Flow (lb-mol/hr)	2109.1	2078.9	2135.5
Propane measured (ppm wet basis)	8770.81	8930.99	8666.09
Methane (ppm)	98.3	96	98.2
Propane to C1 subtract Methane	26214.13	26696.97	25900.07
Propane Corrected for Methane ppm	8738.04	8898.99	8633.36
Propane calculated (lb-moles/hr)	18.43	18.50	18.44
MW Propane	44.096	44.096	44.096
VOC as Propane (pph)	812.7	815.8	813.0

3.0 PROCESS DESCRIPTION

The purpose of the TRU/SCR1 was to reduce emissions of NO, NO_2, N_2O and VOCs from Area II and Area I. The heat of reaction was then used to produce 650 psig steam. The off-gas from Area II (Adipic Acid) was introduced into the two parallel plenums, where it was mixed with natural gas at temperatures greater than 2300°F in a fuel rich environment in order to reduce NO_x and N_2O to nitrogen. The fuel rich environment was necessary to ensure that all oxygen containing compounds (NO, NO_2, N_2O, O_2, and CO) were converted to CO_2, H_2O and N_2. Air and natural gas were also mixed in the Primary burners to create a stable pilot flame available for the Secondary burners. Once the material leaves the plenums and enters the #1 Tower (first half of the furnace), Area I Halcon off-gas was injected along with water for destruction and temperature control.

At the exit of Tower #2 (second half of the furnace), water was added to quench the material from greater than 2000°F to less than 1900°F; air was added to burn the remaining combustibles, primarily the excess natural gas. This step ensures that there was no reformation of NO_x due to thermal NO_x generation. After re-oxidation, the material is used to produce 650 psig steam utilizing a waste heat recovery boiler. Process temperatures were then dropped from approximately 1700°F at the Boiler inlet to 450°F out the vent stack. The TRU/SCR1 was operated above 90% production capacity for the duration of the testing.

The locations of the sampling points for VOC sampling were as follows:

- Adipic Off Gas to the TRU/SCR1 located on the common exit of the 4 Reactor (Low Temperature Converter) off-gas Recovery systems and the compressors (10" line)
- Halcon off-gas to the TRU located on the inlet to the TRU (8" line)
- TRU/SCR1 Exit Stack (83.5" stack)

The Adipic Acid off-gas may also be sent to the Backup SCR (SCR II) which controls NO_x but does not control VOCs.

4.0 REFERENCE METHOD TEST PROCEDURES

Gaseous emission rates were determined using EPA Methods 1-4, 18, 25A, and 033 EPA 40 CFR, Part 60, Appendix A. Calibration and quality assurance procedures of EPA 40 CFR, Part 60, Appendix A for all methods, and the "Quality Assurance Handbook for Air Pollution Measurement System" Volume III Stationary Source-Specific Methods were followed throughout the duration of the field and laboratory testing. The most current version for each method (as described in the Federal Register) was used.

4.1 EPA METHOD 1 - TRAVERSE POINT LAYOUT

For Information on stack dimensions, traverse points, distance to disturbance and other relevant data, refer to the drawing presented in Figure 4-1, "Stack Drawing and Traverse Point Location".

4.2 EPA METHOD 2 - VELOCITY

The velocity of the gas stream was determined according to EPA Reference Method 2 by reading the instantaneous velocity head with an inclined manometer at each sampling point with a calibrated S-type pitot. The stack pressure was measured with the static side of an S-type pitot tube. A calibrated pyrometer was used to measure stack temperature at each sampling point.

All test data, worksheets, and spreadsheets presenting the calculations are included in Appendix A, B, and C. Calibration procedures for the velocity equipment are located in Section 7.0 of this report. Pitot tube, thermocouple, and other measurement device calibration worksheets used for the test series are presented in Appendix G.

4.3 EPA METHOD 4 - MOISTURE CONTENT – (IMPINGERS)

The moisture content of the vent gas stream was determined by extracting a gaseous sample at a known and regulated rate through a glass condenser train consisting of 4 glass impingers connected in series with leak free glass u-tube connectors. The gas sample was extracted through the impinger train (maintained below 68° F in an ice bath) with a vacuum pump and the volume of gas sampled was measured with a calibrated dry gas meter. The moisture collected during the test run was measured gravimetrically with an analytical balance with a tolerance of 0.1 g. The volume of gas drawn was corrected to dry standard conditions.

The dry gas meter and thermocouple calibration forms are contained in Appendix G. A block diagram of the EPA Reference Method 4 sampling train can be seen in Figure 4-1.

4.4 EPA METHOD 18 – MEASUREMENT OF METHANE EMISSIONS BY GAS CHROMATOGRAPHY (BAG TECHNIQUE)

Tedlar bags were utilized to collect samples of stack gas to be analyzed for methane by gas chromatography. In this procedure, bags are filled by evacuating the rigid air-tight container holding the bags. Both container and bag are leak-checked prior to sample collection. The flow rate on the sampling pump was set so that the final bag volume was no greater than 80% of the bag capacity. After allowing sufficient time to purge the line several times, the vacuum line was connected to the bag and evacuated until the rotameter indicated no flow. Then the valve was opened for the bag to accept stack gas and sampling was completed, keeping the rate proportional to the stack velocity. Analysis was completed by an accredited laboratory sub-contractor.

4.5 CTM 033 - SAMPLING AND ANALYSIS HYDROGEN CYANIDE

Gaseous and particulate pollutants are withdrawn from the stack isokinetically (HCN highly soluble in water droplets which may be present in combustion sources, especially following wet scrubbers) and collected in a multi component all-glass sampling train consisting of a heated probe, a heated filter, two impingers containing 0.1N sodium hydroxide (NaOH), an empty impinger, and an impinger containing silica gel. Hydrogen cyanide present in the stack gas stream reacts with the NaOH to form a cyanide ion, which is retained in the alkaline solution until analyzed by ion chromatography.

Interferences

High concentrations of acidic gases, including carbon dioxide, may lower the pH of the sodium hydroxide solution. As the pH decreases, the ability of the solution to retain hydrogen cyanide also decreases. The performance of the method depends on maintaining a high pH (>12) in the absorbing solution. To this end, small quantities of a pH monitoring solution (alizarin yellow) are added to each of the first two impingers. This will change the color of the NaOH solution to pink/rose. As the pH decreases, the solution becomes clear and eventually yellows. At this point, sampling should be suspended and the impingers either recovered and fresh reagent added or additional reagent added to the catch. Normal leak-check requirements apply when changing components in the sampling train.

EPA Approved Modifications

Source conditions at some locations (inlet = > 400 ppm HCN, >30 psi) required modifications to the basic sampling train that were approved in advance by EPA and documented in an e-mail received from Ms. Rachel Agnew included:

1) Increasing the concentration of the absorbing solution from 0.1N to 6.0N
2) Increasing the volume in the impingers
   a. This was accomplished by using a 1-liter impinger in position #1 containing 700 ml of 6.0N NaOH and following it with two standard Greenburg-Smith impingers each containing 400 ml.

The e-mail referenced above is contained in Appendix E.

Figure 4-1
Entec Services, Inc

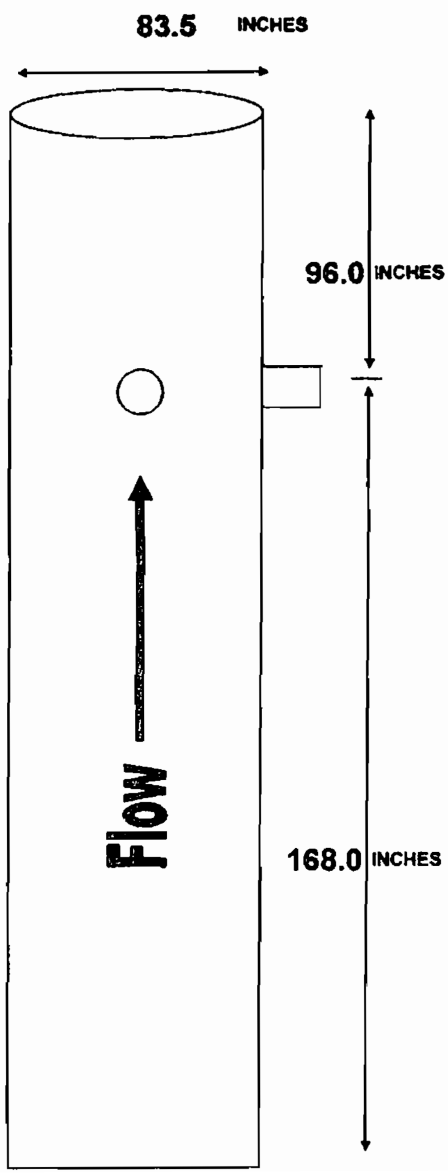
16 D Commerce Ave. Hueytown, AL 35023

STACK DRAWING & TRAVERSE POINT LOCATION

Client: **Ascend Materials** Job No. : **510156**

Source: **331 TRU OUTLET** Input By: **Ben Rogers**

Type of Traverse: Velocity (V) or Particulate (P):		**P**	**Port Type**	**Nipple**	**Port Diameter**	**5**
Stack Diameter, Inches:	**83.5**		**Stack Area, Ft^2:**			**38.028**
Stack Height, feet:	**125**		**Number of Ports:**			**2**
Stack Properties:	**Inches**	**Duct Diameters**	**Length of Port, inches:**			**6.00**
Upstream From Flow Disturbance (A):	**96.0**	**1.15**	**Total Number of Traverse Points:**			**24**
Downstream From Flow Disturbance (B):	**168.0**	**2.01**	**Number of Points per port / traverse:**		**12**	**12**

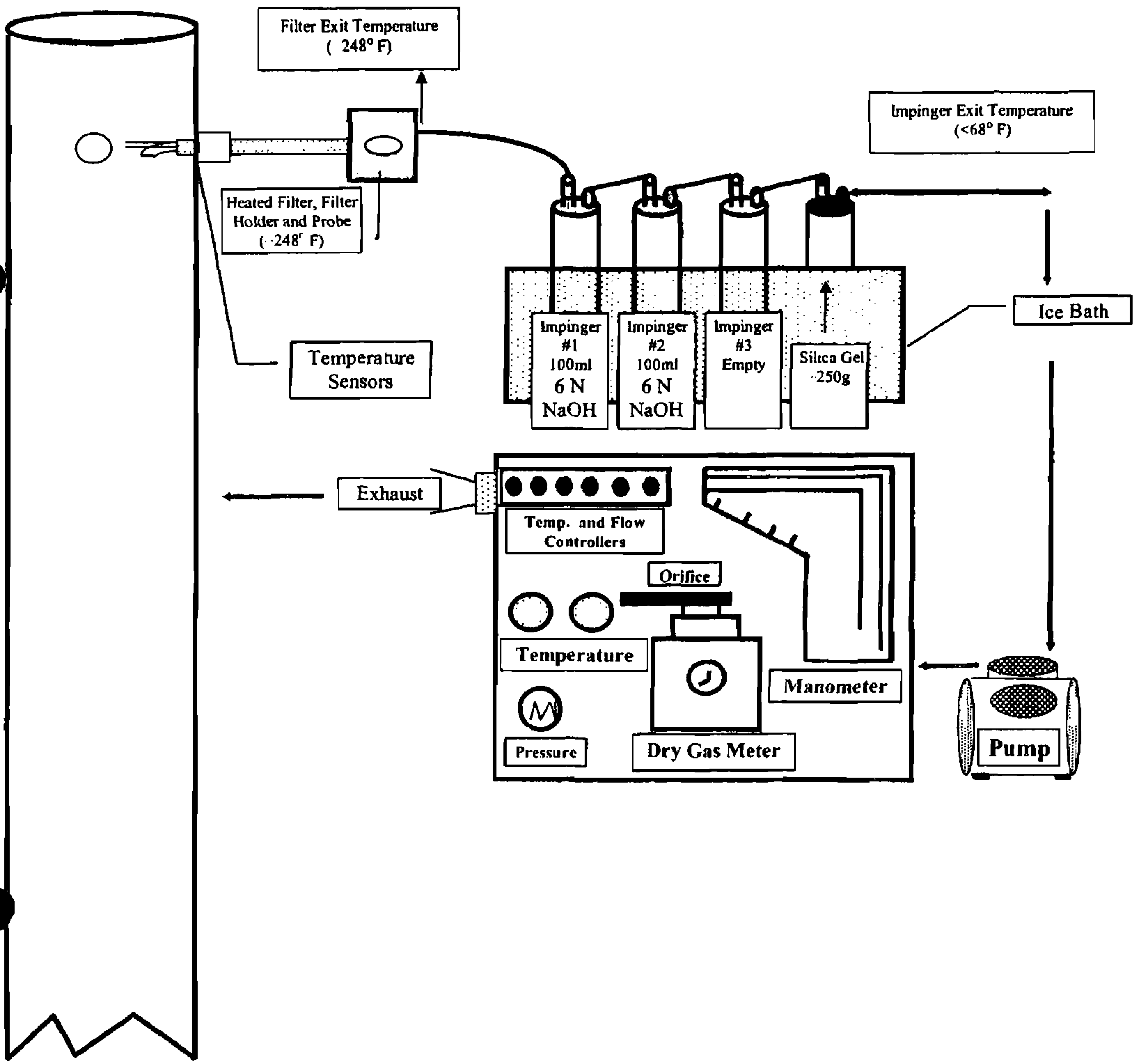


Point No.	Inside Stack Inches	Outside Nipple Inches
1	1.8	7.8
2	5.6	11.6
3	9.9	15.9
4	14.8	20.8
5	20.9	26.9
6	29.7	35.7
7	53.8	59.8
8	62.6	68.6
9	68.7	74.7
10	73.6	79.6
11	77.9	83.9
12	81.7	87.7

* Adjusted points diameter > 24" no point closer than 1.0 inch
* Adjusted points diameter ≤ 24" no point closer than 0.5 inch

Stack Diameters between 12-24 inches minimum points are 8 ; 4 points per port if the 8 / 2 diameters downstream and upstream criteria is met.

Figure 4-2
CTM 033 HCN Sampling Train
(NaOH Configuration)



5.0 CONTINUOUS EMISSION MONITORING PROCEDURES

Stack gas emissions of THC were measured with continuous emission monitors by U.S. EPA Reference Test Methods 25A. All instrumentation field data collected during the testing, calculations, and photocopies of the analyzer data acquisition printouts are included in the Appendix A-2.

Calibration error was calculated between the known calibration gas concentration and the concentration exhibited by the monitor. The monitor zero and upscale calibration drift was determined before each test period with known calibration gas standards. A sampling system bias check was conducted by introducing calibration gas standards through the sampling system and correlating monitor response against the known reference gas cylinder concentration. Results of the instrument calibration error, calibration drift, and bias system measurements were recorded on Data Acquisition System. The system bias check was performed after each test run.

5.1 SAMPLING SYSTEMS CEMS

Samples were extracted from the gas stream and transported to the test trailer through a heated sample line that was heated to a temperature between 250 and 275 degrees Fahrenheit. The gas samples for total hydrocarbons were transported directly to the flame ionization detector.

5.2 DATA ACQUISITION

Concentration values were collected using data acquisition systems. The data was recorded every fifteen-seconds and then averaged for each sixty-second interval. Each minute average was then averaged for the duration of each test run. The minute averages for each run are located in Appendix L of this report.

5.3 EPA METHOD 25A - TOTAL HYDROCARBON --- MODEL 300

Total hydrocarbons were continuously measured using a California Analytical Model 300 flame ionization detector. A sample was extracted from the source being tested through a heated sample line and pumped into a flame ionization detector. An electrometer coupled with a potentiometer recorder detected the increase in ion intensity resulting from the introduction into a hydrogen flame of a sample of air containing organic compounds. The analyzer was calibrated using propane. The analyzer has a digital readout, as well as 0-10 volt output terminals. The full scale of the instrument was set at 100 ppm throughout the duration of the test period. Test results were reported as propane. Bag samples were taken during the testing to be analyzed for Methane by Method 18 to correct the VOC's to non-methane hydrocarbons.

Table 5-3 presents a detailed technical specification list for the California Analytical Model 300 hydrocarbon monitor.

TABLE 5-3

TECHNICAL SPECIFICATIONS OF CALIFORNIA ANALYTICAL INSTRUMENTS HYDROCARBON MONITOR

Manufacturer	California Analytical
Model Number	Model 300 HFID
Detection Principle	Flame Ionization Detector
Ranges	0-10, 0-30, 0-100, 0-300, 0-1,000, 0-3,000, 0-10,000, and 0-30,000 ppm
Precision	+/- 0.5 ppm of full scale
Response Time	90% full scale in 1.5 seconds
Zero Drift	< 1% of full scale in 24 hours
Span Drift	< 1% of full scale in 24 hours
Sample Flow Rate	3.0 liters per minute
Zero Noise Level	< 0.5% of full scale
Linearity	< 1 % of full scale for all ranges

Source: California Analytical

5.4 EPA METHOD 25A - TOTAL HYDROCARBON --- MODEL 600

Total hydrocarbons were continuously measured using a California Analytical Model 600 flame ionization detector. A sample was extracted from the source being tested through a heated sample line and pumped into a flame ionization detector. An electrometer coupled with a potentiometer recorder detected the increase in ion intensity resulting from the introduction into a hydrogen flame of a sample of air containing organic compounds. The analyzer was calibrated using propane. The analyzer has a digital readout, as well as 0-10 volt output terminals. The full scale of the outlet instrument was set at 100 ppm throughout the duration of the test period. The full scale of the inlet instrument was set at 1000 ppm throughout the duration of the test period. Test results were reported as propane. Bag samples were taken during the testing to be analyzed for Methane to correct the VOC's to non-methane hydrocarbons.

Table 5-4 presents a detailed technical specification list for the California Analytical Model 600 hydrocarbon monitor.

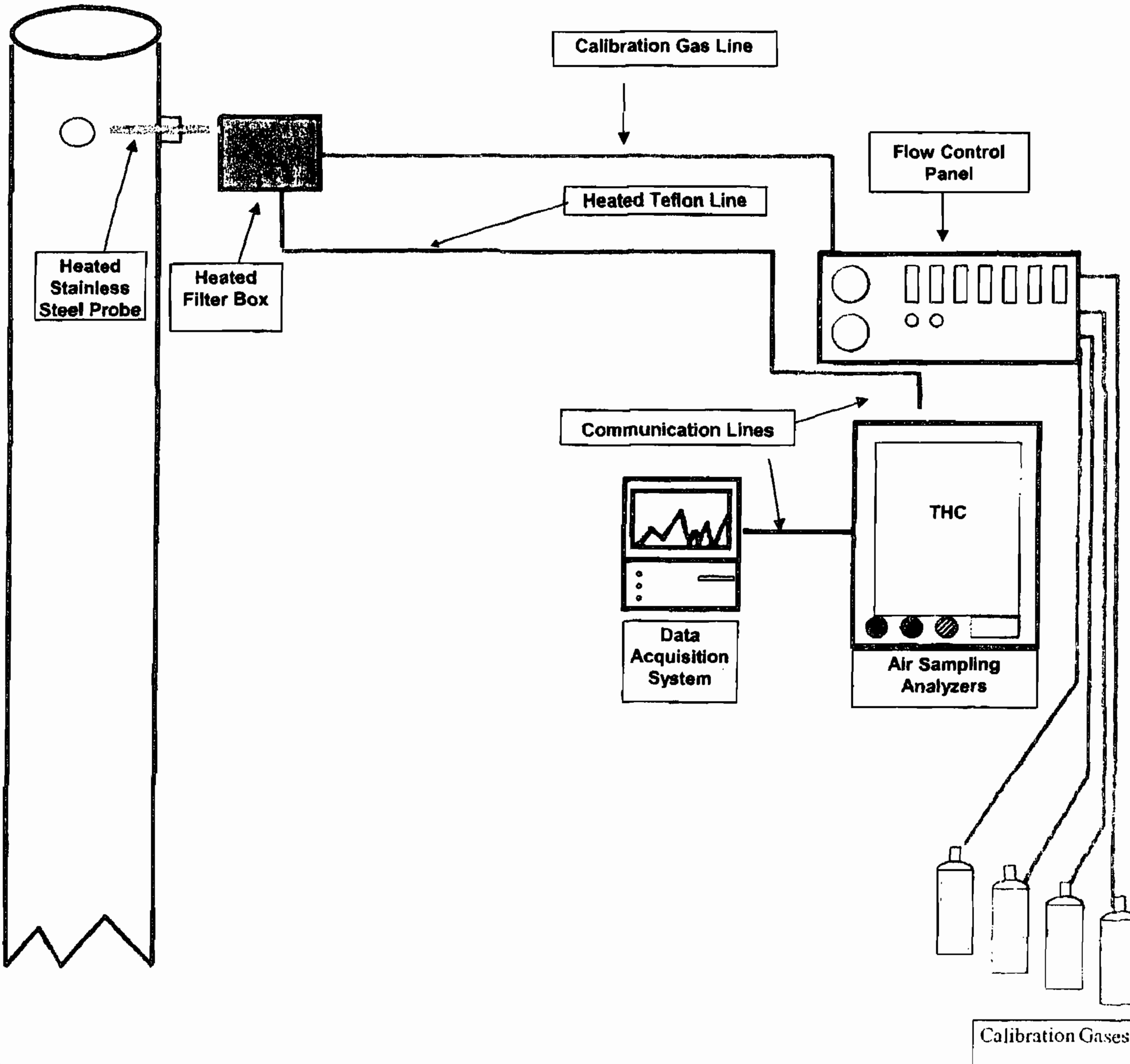
TABLE 5-4

TECHNICAL SPECIFICATIONS OF CALIFORNIA ANALYTICAL INSTRUMENTS HYDROCARBON MONITOR

Manufacturer	California Analytical
Model Number	Model 600 MHFID
Detection Principle	Flame Ionization Detector
Ranges	0-3 ppm to 3% C.
Precision	+/- 0.5 ppm of full scale
Response Time	90% full scale in 1.0 seconds
Zero Drift	< 1% of full scale in 24 hours
Span Drift	< 1% of full scale in 24 hours
Sample Flow Rate	3.0 liters per minute
Zero Noise Level	< 0.5% of full scale
Linearity	<0.5 % of full scale for all ranges

Source: California Analytical

Figure 5-1
THC Emissions Sampling Train
Method 25A



6.0 QA / QC PROCEDURES

Specific Quality Assurance / Quality Control (QA / QC) procedures were adhered to during this test project to provide valid and scientifically defensible data. For any environmental field and laboratory measurement, a degree of uncertainty exists in the data due to inherent limitations of the measurement systems employed. Entec Services, Inc. objective of the QA / QC program is to produce data of known precision, accuracy, representation, completeness and comparability. The objective in this test project was to determine compliance with applicable air permit requirements. The following section details all QC procedures followed during the sampling activities.

6.1 METHODS 1 AND 2 - VELOCITY / VOLUMETRIC FLOW RATE

Volumetric flow rates were determined during each test run. The following QC steps were adhered to during these tests:

- The type S pitot tube was carefully examined before its initial use to verify that the face openings of the tube were aligned within the specifications of Method 2.
- The type S pitot tube was measured and data recorded on a standard form which is included in the Calibrations Appendix section of this report. A baseline coefficient value of 0.84 was assigned to the pitot tube.
- Since the type S pitot tube was part of an assembly, additional measurements were taken and recorded on another form which is included in the Calibrations Appendix section of this report. The components were placed such that the aerodynamic interference effects were eliminated and the type S pitot tube remained with an assigned baseline value of 0.84.
- The S type pitot tube was permanently marked on each leg.
- After completion of the testing, a check was made of the face opening alignment and the intercomponent spacing of the assembly. No changes were noticed; therefore it was assumed that the coefficient of the assembly had not changed.
- After completion of the testing, the stack temperature device was checked against an N.I.S.T. traceable thermometer and agreed within ± 2°F (EMC Approved Alternate Test Method ALT-011).
- The barometer was calibrated with a mercury barometer and the form is included in the Calibrations Appendix section of this report.

6.2 METHOD 4 - MOISTURE DETERMINATION

Stack gas moisture content (B_{ws}) was determined by dividing the mass of moisture collected by the impingers and silica gel impinger by the standardized volume of gas sampled. The following QC steps were adhered to during these tests:

- The leak rate of the sampling system did not exceed 4% of the average sampling rate or 0.20 cfm to insure the accuracy of the volume of gas sampled.
- Before each series of tests, thermocouple readings for the meter temperature, probe temperature and silica gel impinger exit temperature were checked against an N.I.S.T. traceable thermometer.

6.3 METHOD 18 – METHANE BY GC

Methane concentrations of the stack gas were determined by gas chromatography by an accredited sub-contractor. The following QC steps were completed Entec and the sub-contractor.

- The Tedlar bags and rigid container were determined to be leak free prior to sampling.
- The Tedlar bags were filled to no more than 80% of bag capacity.
- The samples were kept out of direct sunlight.
- A spike and recovery was successfully completed by the sub-contract laboratory.

6.4 METHOD 25A - TOTAL HYDROCARBONS

The total gaseous organic concentrations were determined using EPA Reference Method 25A. A sample of the flue gas was extracted from the gas stream during each test. The sample was delivered to analyzer and was analyzed on a wet basis with an FID gas analyzer. Teflon bag samples were taken for separate methane analysis. The following QC steps were adhered to during these tests:

- In accordance with EPA Method 25A a four-point (i.e., zero, low, mid, and high-range) analyzer calibration error check was conducted on the reference analyzer within two hours prior to initiating the compliance testing. These checks were conducted (after final calibration adjustments were made) by injecting the calibration gases through the sampling system and recorded the responses.
- The low and mid range gases were recorded to within 5% of each of the bottle values.
- A response time was calculated before the testing.
- Zero and mid level calibration checks were performed both before and after each test run in order to quantify reference measurement system calibration drift. During these checks, the

calibration gases were introduced into the sampling system at the probe outlet so that they were analyzed in the same manner as the flue gas samples.

- The zero drift was less than $\pm$ 3% of the span gas over the period of the test series.
- The calibration drift was less than $\pm$ 3% of the span gas over the period of the test series.

6.5 HYDROGEN CYANIDE BY CTM-033

Stack gas concentrations of Hydrogen Cyanide (HCN) were determined by Conditional Test Method (CTM) 033. The following QC steps were completed.

- 6.0N NaOH was substituted for 0.1N to allow for higher inlet concentrations.
- A pH indicator was utilized to assist in the monitoring of acidity on the outlet; elevated inlet levels precluded this option.
- Higher volumes of absorbing solutions were utilized (700 ml in a 1-liter impinger and 400 ml in each of 2 standard GS impingers).
- An impinger study was conducted by spiking a known concentration of HCN (1009 ug) and determining recovery (99.5%-70% to 130% required).
- A matrix spike was successfully completed (111% Recovery-70% to 130% required).
- A duplicate matrix spike was successfully completed (110% Recovery).
- Two lab control spikes were successfully completed (111% and 112% Recovery)

7.0 CALIBRATION PROCEDURES

All of the emission testing equipment used was calibrated according to the procedures outlined in the EPA CFR 40, Part 60, Appendix "A" and the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, EPA-600/4-77-027b.

7.1 TYPE-S PITOT TUBE

The pitot tubes used for flow velocity measurement were checked for dimensions to verify a pitot coefficient C_p of 0.84. Documentation of the calibration and calibration check for dimensional measurements has been provided.

7.2 THERMOCOUPLES

Each temperature sensor (stack gas, dry gas meter, and impinger exit) and readout was calibrated at a minimum of two points over the anticipated range of use against a NIST-traceable stainless steel thermometer. All sensors/readouts were calibrated prior to field sampling. Stack gas thermocouples agreed within 1.5% (expressed in °R) of the reference thermometer through out the entire calibration range. Dry gas meter thermocouples agreed within ±5.4° F and impinger exit thermocouples agreed within ±2° F. Documentation has been provided.

7.3 DRY GAS METER

Dry gas meters were fully calibrated against a set of calibrated orifices. After assembly and leak checking, the console's pump was allowed to run for 15-minutes to warm up the dry gas meter and pump. For a pre-test full calibration, data was collected at five (5) orifice manometer (ΔH) settings of approximately: 0.32, 0.67, 1.2, 2.0, and 3.9 inches of H_2O. Gas volumes of at least 5 ft^3 were used at all the orifice settings and critical vacuums were obtained at all of the calibration points. The individual gas meter correction factors (y_i) were calculated for each orifice setting and averaged. The method requires that each of the individual correction factors fall within ±2% of the average correction factor, or the meter be cleaned, adjusted or repaired and recalibrated. The orifice pressure differential ($\Delta H_@$) that equates to 0.75 cfm of air at 68° F and 29.92 inches Hg was calculated and along with the average correction factor (y) was marked on the meter console.

For the post-test calibration the alternative Method 5 post-test calibration procedures were used (Emission Measurement Center Approved Alternative Method ALT-009). Prior to the initial run, a y-factor check was performed to ensure that the meter was operating according to the original calibration to within 3% of the original y-factor.

APPENDIX A

RAW TEST DATA

ADIPIC ACID OFFGAS - TRU INLET

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Ascend		
PLANT LOCATION:	Cantonment, Florida		
SOURCE(S) NAME(S):	TRU Inlet		
SOURCE(S) SHAPE:	Circular		
TEST PERFORMED:	HCN and VOC		
REFERENCE METHOD TESTS:	Sample Location	EPA Method	1
	Moisture Content	EPA Method	4
	HCN	EPA Method	033
PROJECT MANAGER	Mr. Chuck Duncan		
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr Lalan Kirby		
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Benny Grant		
OWNER'S REPRESENTATIVE:	Mr. Roy Noble		
DATES TESTS CONDUCTED:	09/28/10 09/28/10 09/28/10		
ENTEC PROJECT NUMBER:	510156		

Note: Sampling on the Halcon Offgas to the TRU Inlet was limited to VOC's by Method 25A and Methane by Method 18.

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

INPUT TEST DATA

Client: **Ascend** Job No.: **510156**

Source: **TRU Inlet** Data Input By: **Dan McCombs**

Field Data	Symbol	Units	Test Data			
Run Number	-	-	1	2	3	AVERAGE
Test Date	-	-	09/28/10	09/28/10	09/28/10	
Emission Test Run Time Began - Ended	-	Military Time	0930-1030	1245-1345	1515-1615	
Sampling Time	θ	minutes	60	60	60	60
Stack Area	A_s	Ft^2	0.545	0.545	0.545	
Barometric Pressure	P_{bar}	in. Hg	30.10	30.10	30.10	30.10
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	0.987	0.987	0.987	0.987
Meter Delta H @	ΔH@	in. H_20	1.857	1.857	1.857	1.857
Meter Volume	V_m	dcf	27.803	29.803	30.229	29.278
Meter Temperature	t_m	°F	85.0	96.4	102.0	94.5
Avg. Orifice Delta H	ΔH	in. H_20	0.81	0.81	0.81	0.81
Impingers Weight Gain (Moisture)	W_{imp}	grams	39.6	37.3	56.8	44.6
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	12.6	7.0	7.5	9.0

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

CALCULATED TEST DATA

Client: **Ascend** Job No.: **510156**

Source: **TRU Inlet** Data Input By: **Dan McCombs**

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	09/28/10	09/28/10	09/28/10	
Emission Test Run Time Began - Ended		-	Military Time	0930-1030	1245-1345	1515-1615	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	In. Hg	30.10	30.10	30.10	30.10
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	In. Hg	30.16	30.16	30.16	30.16
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	26.788	28.126	28.244	27.719
4a. Standard Volume of Water Vapor Condensed	$= 0.04706 * W_{imp}$	$V_{wc(std)}$	scf	1.864	1.755	2.673	2.097
4b. Standard Volume of Water Collected in Silica Gel	$= 0.04715 * W_{sg}$	$V_{wsg(std)}$	scf	0.594	0.330	0.354	0.426
5. Moisture Fraction	$= (V_{wc(std)} + V_{wsg(std)}) / (V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.0840	0.0690	0.0968	0.0833
Post Meter Orifice Cal. **(EMC ALT-009 Yqa)**		Y_{qa}		1.0661	1.0091	1.0039	1.0264
% Difference, **(Calibration must be within 5% of original Y-factor)**							-3.99%

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

Client: **Ascend** Test Date: **9/28/2010**

Source: **TRU Inlet** Run Number: **1**

PARTICULATE FIELD DATA, EPA METHOD 5

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
Single point			0.81	200	77
Single point			0.81		80
Single point			0.81		82
Single point			0.81		84
Single point			0.81		85
Single point			0.81		86
Single point			0.81		87
Single point			0.81		87
Single point			0.81		88
Single point			0.81		88
Single point			0.81		88
Single point			0.81		88
K-Factor					
			0.81	200.0	85.0

Entec Services, Inc.

Plant: Ascend
Pensacola FL
Site: TRU Inlet

Date: 9-28-10

Run No.: 1

Time: 0930
1030

Moisture	Initial	Final	Totals
Impinger No. 1	See Recovery Sheet		
Impinger No. 2			
Impinger No. 3	See Attached		
Silica Gel			

Analyst: L.K

Assistant:

Orsat / Fyrite / ENTEC CEMS - Analysis:				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 510156

Barometric Pressure: 30.10

Stack Pressure:

Stack Diameter: 10

K Factor: n/a

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	n/a	n/a
Average:		

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.000 Vacuum 5

Pitot Check Pre: Positive — Negative —

Post-Test: Volume @ 0.000 Vacuum 4

Pitot Check Post: Positive — Negative —

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	998.903			
Initial:	971.100			
Net:				

Total: 27.803 Cubic Ft.

Equipment Checklist:
Meter Box ID: NC-3 ES
Delta H @: 1.857
Y - Factor: 0.987
Probe ID: —
CP Value: —
Liner Material: —
Hot Box ID: NC HB1
Filter Exit ID: —
Impinger Outlet ID: NC GN 4
Filter ID: 3046
Fyrite ID: —
Acetone Lot No: —

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
A-1 Single	5	973.2	NA	0.81	NA	NA	254	61	NA	77	6	
/	10	975.7					253	59		80	5	
/	15	977.8					253	53		82	5	
/	20	980.1					252	51		84	5	
/	25	982.4					253	50		85	5	
/	30	985.1					252	50		86	5	
/	35	987.2					254	50		87	5	
/	40	989.5					252	50		87	5	
/	45	991.8					255	51		88	5	
/	50	994.2					253	51		88	5	
/	55	996.5					253	52		88	5	
/	60	998.903					254	53		88	5	
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Field Notes:

Method

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

Client:	**Ascend**	Test Date:	**9/28/2010**
Source:	**TRU Inlet**	Run Number:	**2**

PARTICULATE FIELD DATA, EPA METHOD 5

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
Single point			0.81	200	91
Single point			0.81		91
Single point			0.81		92
Single point			0.81		94
Single point			0.81		96
Single point			0.81		97
Single point			0.81		98
Single point			0.81		99
Single point			0.81		99
Single point			0.81		100
Single point			0.81		100
Single point			0.81		100
K-Factor					
0.00			**0.81**	**200.0**	**96.4**

Entec Services, Inc.

Plant: Ascend
Pensacola, Fl.
Site: TRU Inlet
Date: 9-28-10
Run No.: 2
Time: 1245
1347

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2	See Recovery Sheet		
Impinger No. 3			
Silica Gel			

Analyst: L.K
Assistant: B.G

Orsat / Fyrite / ENTEC CEMS - Analysis:				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 510156
Barometric Pressure: 30.10
Stack Pressure:
Stack Diameter: 10
K Factor: NA

Nozzle Calibrations:	Pre-Test:	Post-Test:
	NA	NA
Average:		

Probe & Pitot Leak Checks:

	Volume @	Vacuum
Pre-Test:	0.000	5
Post-Test:	0.000	5

Pitot Check Pre:	
Positive	—
Negative	—

Pitot Check Post:	
Positive	—
Negative	—

Equipment Checklist:

Meter Box ID:	NC 3.85
Delta H @:	1.857
Y - Factor:	0.987
Probe ID:	—
CP Value:	—
Liner Material:	Teflon
Hot Box ID:	NC HB 1
Filter Exit ID:	—
Impinger Outlet ID:	NC GN 4
Filter ID:	3046
Fyrite ID:	—
Acetone Lot No:	—

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	1028.903			
Initial:	999.100			
Net:				

Total: 29.803 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
A / Single	5	1001.4	NA	0.85	NA	NA	253	61	NA	91	7	
/	10	1003.5					248	54		91	9	
/	15	1006.0					254	50		92	9	
/	20	1008.5					260	49		94	9	
/	25	1010.9					262	49		96	9	
/	30	1013.3					260	49		97	9	
/	35	1015.8					254	49		98	9	
/	40	1018.2					261	51		99	8	
/	45	1020.6					254	51		99	8	
/	50	1022.9					254	47		100	8	
/	55	1025.5					261	46		100	8	
/	60	1028.903					262	46		100	5	
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Field Notes:

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

Client:	**Ascend**	Test Date:	**9/28/2010**
Source:	**TRU Inlet**	Run Number:	**3**

PARTICULATE FIELD DATA, EPA METHOD 5

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
Single point			0.81	200	94
Single point			0.81		97
Single point			0.81		100
Single point			0.81		101
Single point			0.81		102
Single point			0.81		103
Single point			0.81		103
Single point			0.81		104
Single point			0.81		105
Single point			0.81		105
Single point			0.81		105
Single point			0.81		105
K-Factor					
0.00			**0.81**	**200.0**	**102.0**

Entec Services, Inc.

Plant: Ascend
Pensacola, Fl
Site: TRU Inlet
Date: 9-28-10
Run No.: 3
Time: 1515 – 1615

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2	See Recovery Sheet		
Impinger No. 3			
Silica Gel			

Analyst: L.K
Assistant: B.G

Orsat / Fyrite / ENTEC CEMS - Analysis:				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 510156
Barometric Pressure: 30.10
Stack Pressure:
Stack Diameter: 10
K Factor: N/A

Nozzle Calibrations:
Pre-Test: N/A
Post-Test: N/A
Average:

Probe & Pitot Leak Checks:
Pre-Test: Volume @ 0.004 Vacuum 5
Pitot Check Pre: Positive — Negative —
Post-Test: Volume @ 0.003 Vacuum 5
Pitot Check Post: Positive — Negative —

Equipment Checklist:
Meter Box ID: NC-3-ES
Delta H @: 1.857
Y - Factor: 0.987
Probe ID: —
CP Value: —
Liner Material: Teflon
Hot Box ID: NC HB 1
Filter Exit ID: —
Impinger Outlet ID: NC 6N 4
Filter ID: 3046
Fyrite ID: —
Acetone Lot No: —

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	59.829			
Initial:	29.600			
Net:				

Total: 30.229 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
A Single	5	32.0	N/A	0.88	N/A	N/A	260	59	N/A	94	8	
/	10	34.5		0.90			254	49		97	8	
/	15	37.0		0.90			255	48		100	8	
/	20	39.5		0.88			270	47		101	8	
/	25	42.0		0.89			252	46		102	8	
/	30	44.5		0.88			260	47		103	8	
/	35	47.0		0.89			256	48		103	8	
/	40	49.6		0.89			256	48		104	8	
/	45	52.1		0.90			258	46		105	8	
/	50	54.7		0.90			253	46		105	8	
/	55	57.2		0.90			254	47		105	8	
/	60	59.829		0.90			259	47		105	8	
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Field Notes:

Method 23

APPENDIX B

RAW TEST DATA AND EMISSION CALCULATION

TRU OUTLET

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Ascend Materials		
PLANT LOCATION:	Cantonment, Florida		
SOURCE(S) NAME(S):	331 TRU OUTLET		
SOURCE(S) CONDITION:	Annual Compliance Testing		
SOURCE(S) SHAPE:	Circular		
PROBE WASH CHEMICAL:	Acetone		
TEST PERFORMED:	HCN and VOC		
REFERENCE METHOD TESTS:	Sample Location	EPA Method	1
	Volumetric Flow	EPA Method	2
	Moisture Content	EPA Method	4
	HCN	EPA Method	033
PROJECT MANAGER	Mr. Charles Duncan		
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Gabby Smith		
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Ben Rogers		
OWNER'S REPRESENTATIVE:	Mr. Roy Noble		
DATES TESTS CONDUCTED:	09/28/10 09/28/10 09/28/10		
ENTEC PROJECT NUMBER:	510156		

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

INPUT TEST DATA

Client: **Ascend Materials** Job No.: **510156**

Source: **331 TRU OUTLET** Data Input By: **B Rodgers**

Field Data	Symbol	Units	Test Data			
Run Number	-	-	1	2	3	AVERAGE
Test Date	-	-	09/28/10	09/28/10	09/28/10	
Emission Test Run Time Began - Ended	-	Military Time	0930-1150	1245-1402	1715-1827	
Sampling Time	θ	minutes	60	60	60	60
Stack Area	A_s	Ft^2	38.028	38.028	38.028	
Barometric Pressure	P_{bar}	in. Hg	30.09	30.09	30.09	30.09
Stack Static Pressure	P_g	in. H_20	-0.20	-0.20	-0.20	-0.20
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	0.977	0.977	0.977	0.977
Meter Delta H @	$\Delta H@$	in. H_20	1.765	1.765	1.765	1.765
Nozzle Diameter	D_n	inches	0.315	0.315	0.315	0.315
Meter Volume	V_m	dcf	29.945	30.435	34.382	31.587
Meter Temperature	t_m	°F	80.9	86.8	89.3	85.6
Avg. Orifice Delta H	ΔH	in. H_20	0.73	0.74	0.96	0.81
Impingers Weight Gain (Moisture)	W_{imp}	grams	256.6	196.2	288.2	247.0
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	10.7	7.0	7.9	8.5
Oxygen Concentration, dry basis	O_2	%	6.0	6.0	6.0	6.0
VOC Concentration as propane, wet basis	VOC	ppm	4.32	1.13	1.29	2.25
Avg. Sq. Rt. of Delta P	$(\text{sqrt}\ \Delta P)_{avg}$	$(\text{in. } H_20)^{1/2}$	0.490	0.494	0.516	0.500
Stack Temperature	t_s	°F	422.1	427.8	433.5	427.8
Hydrogen Cyanide, mg **	m_{HCN}	mg	0.0994	0.0973	0.0535	0.0834

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

CALCULATED TEST DATA

Client: **Ascend Materials** Job No.: **510166**

Source: **331 TRU OUTLET** Data Input By: **B Rodgers**

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	09/28/10	09/28/10	09/28/10	
Emission Test Run Time Began - Ended		-	Military Time	0930-1150	1245-1402	1715-1827	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	30.08	30.08	30.08	30.08
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	in. Hg	30.14	30.14	30.16	30.15
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	28.762	28.917	32.539	30.072
4a. Standard Volume of Water Vapor Condensed	$= 0.04706 * W_{imp}$	$V_{wc(std)}$	scf	12.076	9.233	13.563	11.624
4b. Standard Volume of Water Collected in Silica Gel	$= 0.04715 * W_{sg}$	$V_{wsg(std)}$	scf	0.505	0.330	0.372	0.402
5. Moisture Fraction	$= (V_{wc(std)} + V_{wsg(std)}) / (V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.3043	0.2485	0.2999	0.2842
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32*(O_2) + 0.44*(CO_2) + 0.28*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.160	30.160	30.160	30.160
10. Molecular Weight Of Stack Gas, wet basis	$= M_d*(1-B_{ws}) + 18.0*(B_{ws})$	M_s	g/g-mole	26.460	27.138	26.514	26.704
11. Average Stack Gas Velocity	$= 85.49*C_p*(\text{sqrt } \Delta P)_{avg}*\text{SQRT}((T_s)/(P_s*M_w))$	v_s	ft/s	37.05	37.03	39.26	37.782
12. Stack Gas Flow @ Stack Conditions	$= 60*v_s*A_s$	Q_a	acfm	84,542	84,495	89,578	86,205
13. Stack Gas Flow @ Standard Conditions	$= Q_a*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	50,848	50,491	53,188	51,509
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_a*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{std}	dscfm	35,375	37,942	37,240	36,852
15. Hydrogen Cyanide concentration @ Std. Conditions **	$= m_{HCN}/V_{m(std)}$	c_s	mg/dscf	0.00346	0.00336	0.00164	0.00277
16. VOC's as propane Gas Concentration	$= C_{gas} / (1-Bws) * MW / 385.1 \times 10^6$	C_{voc}	lbs/dscf	7.11E-07	9.74E-08	1.04E-07	3.04E-07
21. Hydrogen Cyanide emissions **	$= (60/453590)*c_s*Q_{sd}$	PMR	lb/hr	0.016	0.017	0.008	0.014
21. VOC's as Propane Emissions	$= C_{voc} * Q_{std} * 60$	VOC-lb/hr	lb/hr	1.51	0.22	0.23	0.65
22. Volume collected through nozzle	$= T_s/P_s*[0.002669*V_{lc} + V_m*Y*P_m/T_m]$	V_n	acf	68.744	64.402	78.279	70.475
24. Isokinetic Sampling Rate, Percent	$= 100*Vn / (60*v_s*A_n*\theta)$	I	%	95.23	89.28	102.34	95.61
Post Meter Orifice Cal. (EMC ALT-009 Yqa)		Y_{qa}		0.9527	0.9506	0.9641	0.9558
% Difference. (Calibration must be within 5% of original Y-factor)							2.17%

** All Hydrogen Cyanide Values are non detectable.

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

Client:	**Ascend Materials**	Test Date:	**9/28/2010**
Source:	**331 TRU OUTLET**	Run Number:	**1**

PARTICULATE FIELD DATA, EPA METHOD 5

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	0.24	0.4899	0.72	429	77
1-2	0.27	0.5196	0.81	429	78
1-3	0.28	0.5292	0.84	429	79
1-4	0.27	0.5196	0.81	429	80
1-5	0.27	0.5196	0.81	429	80
1-6	0.28	0.5292	0.84	429	81
1-7	0.27	0.5196	0.81	429	81
1-8	0.28	0.5292	0.84	426	82
1-9	0.26	0.5099	0.78	427	82
1-10	0.26	0.5099	0.78	427	82
1-11	0.21	0.4583	0.63	423	82
1-12	0.14	0.3742	0.42	350	82
2-1	0.23	0.4796	0.69	427	78
2-2	0.24	0.4899	0.72	429	80
2-3	0.25	0.5000	0.75	429	80
2-4	0.26	0.5099	0.78	430	81
2-5	0.25	0.5000	0.75	431	82
2-6	0.29	0.5385	0.87	432	82
2-7	0.28	0.5292	0.84	432	82
2-8	0.26	0.5099	0.78	429	82
2-9	0.23	0.4796	0.69	428	82
2-10	0.22	0.4690	0.66	425	82
2-11	0.14	0.3742	0.42	424	82
2-12	0.14	0.3742	0.42	358	82
K-Factor					
2.99	**0.24**	**0.4901**	**0.73**	**422.1**	**80.9**

Entec Services, Inc.

Plant: Ascend
Pensacola, FL
Site: 331 TRU Outlet
Date: 9/28/10
Run No.: 1
Time: 9:30
11:50

Moisture	Initial	Final	Totals
Impinger No. 1	1728.5	See Attached	
Impinger No. 2	1074.1		
Impinger No. 3	1104.8		
Silica Gel			

Analyst: BR
Assistant: AL

Orsat / Fyrite / ENTEC CEMS - Analysis:

				Average:
O2:				6.0
CO2:				12.0
CO:				
N2:				

Job No.: 510156
Barometric Pressure: 30.09
Stack Pressure: -.20
Stack Diameter: 83.5"
K Factor: 2.99

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	.315	.315
	.315	.315
	.315	.315
Average:	.315	.315

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.001 Vacuum 5"
Pitot Check Pre: Positive ✓ Negative ✓
Post-Test: Volume @ 0.001 Vacuum 5"
Pitot Check Post: Positive ✓ Negative ✓

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	628.197	643.973		
Initial:	612.973	629.252		
Net:	15.224	14.721		

Total: 29.945 Cubic Ft.

Equipment Checklist:
Meter Box ID: NC Apex B
Delta H @: 1.765
Y - Factor: .977
Probe ID: NC97A
CP Value: .84
Liner Material: Glass
Hot Box ID: NC482
Filter Exit ID: N/A
Impinger Outlet ID: CN-1
Filter ID: 03047
Fyrite ID: N/A
Acetone Lot No:

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
A / 1	0	612.973	.24	.72	429	152	115	67	N/A	77	3	
/ 2	2.5	614.222	.27	.81	429	186	153	65		78	4	
/ 3	5	615.503	.28	.84	429	222	193	63		79	4	
/ 4	7.5	616.825	.27	.81	429	248	221	58		80	4	
/ 5	10	618.149	.27	.81	429	260	240	55		80	4	
/ 6	12.5	619.455	.28	.84	429	282	261	53		81	4	
/ 7	15	620.775	.27	.81	~~263~~ 424	263	259	53		81	4	
/ 8	17.5	622.094	.28	.84	~~257~~ 426	257	257	52		82	4	
/ 9	20	623.436	.26	.78	427	264	245	51		82	4	
/ 10	22.5	624.749	.26	.78	427	246	260	52		82	4	
/ 11	25	~~625.784~~ 626.016	.21	.63	423	242	243	53		82	4	
/ 12	27.5	627.301	.14	.42	350	241	252	53		82	4	
B / 1	0	629.252	.23	.69	427	204	172	61		78	4	
/ 2	2.5	630.448	.24	.72	429	235	194	55		80	4	
/ 3	5	631.684	.25	.75	429	238	216	52		80	4	
/ 4	7.5	632.951	.26	.78	430	259	232	51		81	4	
/ 5	10	634.253	.25	.75	431	248	257	51		82	4	
/ 6	12.5	635.532	.29	.87	432	243	264	51		82	5	
/ 7	15	636.893	.28	.84	432	243	255	51		82	5	
/ 8	17.5	638.240	.26	.78	429	238	254	55		82	5	
/ 9	20	639.538	.23	.69	428	243	247	52		82	5	
/ 10	22.5	640.769	.22	.66	425	248	259	53		82	4	
/ 11	25	641.883	.14	.42	424	247	256	55		82	4	
/ 12	27.5	642.995	.14	.42	~~[illegible]~~ 358	239	260	56		82	4	
/	30	643.973										

Field Notes:

Method 023 Field Data Sheet

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

Client:	**Ascend Materials**	Test Date:	**9/28/2010**
Source:	**331 TRU OUTLET**	Run Number:	**2**

PARTICULATE FIELD DATA, EPA METHOD 5

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	0.24	0.4899	0.72	428	82
1-2	0.24	0.4899	0.72	432	84
1-3	0.26	0.5099	0.78	433	85
1-4	0.26	0.5099	0.78	434	85
1-5	0.26	0.5099	0.78	435	86
1-6	0.29	0.5385	0.87	435	86
1-7	0.25	0.5000	0.75	433	86
1-8	0.26	0.5099	0.78	433	87
1-9	0.24	0.4899	0.72	432	87
1-10	0.23	0.4796	0.69	431	87
1-11	0.18	0.4243	0.54	428	87
1-12	0.12	0.3464	0.36	367	87
2-1	0.24	0.4899	0.72	434	85
2-2	0.28	0.5292	0.84	435	86
2-3	0.28	0.5292	0.84	436	87
2-4	0.26	0.5099	0.78	435	88
2-5	0.27	0.5196	0.81	436	88
2-6	0.29	0.5385	0.87	435	88
2-7	0.29	0.5385	0.87	434	88
2-8	0.28	0.5292	0.84	433	88
2-9	0.28	0.5292	0.84	432	89
2-10	0.26	0.5099	0.78	431	89
2-11	0.21	0.4583	0.63	429	89
2-12	0.15	0.3873	0.45	377	89
K-Factor					
2.99	**0.25**	**0.4944**	**0.74**	**427.8**	**86.8**

Entec Services, Inc.

Plant: Ascend
Pensacola, FL
Site: 331 TRU Outlet

Date: 9/28/10

Run No.: 2

Time: 12:45
14:02

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3			
Silica Gel			

see attached

Analyst: BR

Assistant: AT

Orsat / Fyrite / ENTEC CEMS - Analysis:				Average:
O2:				6.0
CO2:				12.0
CO:				
N2:				

Job No.: 510156

Barometric Pressure: 30.09

Stack Pressure: -.20

Stack Diameter: 83.5"

K Factor: 2.99

Nozzle Calibrations:	Pre-Test:	Post-Test:
	.315	.315
	.315	.315
	.315	.315
Average:	.315	.315

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.000 Vacuum 5"
Pitot Check Pre: Positive ✓ Negative ✓

Post-Test: Volume @ 0.000 Vacuum 5"
Pitot Check Post: Positive ✓ Negative ✓

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	660.253	676.005		
Initial:	645.341	660.482		
Net:	14.912	15.523		

Total: 30.435 Cubic Ft.

Equipment Checklist:
Meter Box ID: NC Apex B
Delta H @: 1.765
Y - Factor: .977
Probe ID: NC97A
CP Value: .84
Liner Material: Glass
Hot Box ID: NC HB2
Filter Exit ID: N/A
Impinger Outlet ID: GN-1
Filter ID: 03047
Fyrite ID: N/A
Acetone Lot No:

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
B 1 1	0	645.341	.24	.72	428	254	224	65	N/A	82	3	
1 2	2.5	646.636	.24	.72	432	252	232	57		84	4	
1 3	5	647.892	.26	.78	433	258	238	54		85	4	
1 4	7.5	649.196	.26	.78	434	262	250	52		85	4	
1 5	10	650.503	.26	.78	435	254	248	51		86	4	
1 6	12.5	651.783	.29	.87	435	250	256	51		86	4	
1 7	15	653.154	.25	.75	433	256	254	52		86	4	
1 8	17.5	654.444	.26	.78	433	247	248	53		87	4	
1 9	20	655.749	.24	.72	432	250	252	53		87	4	
1 10	22.5	657.003	.23	.69	431	257	255	53		87	4	
1 11	25	658.239	.18	.54	428	255	264	54		87	4	
1 12	27.5	659.335	.12	.36	367	250	251	55		87	4	
A 1 1	0	660.482	.24	.72	434	252	242	59		85	4	
1 2	2.5	661.719	.28	.84	435	252	248	55		86	4	
1 3	5	663.056	.28	.84	436	256	235	55		87	4	
1 4	7.5	664.407	.26	.78	435	244	238	54		88	4	
1 5	10	665.711	.27	.81	436	249	252	54		88	4	
1 6	12.5	667.047	.29	.87	435	247	247	54		88	4	
1 7	15	668.413	.29	.87	434	253	247	55		88	4	
1 8	17.5	669.779	.28	.84	433	256	254	55		88	4	
1 9	20	671.133	.28	.84	432	260	254	56		89	4	
1 10	22.5	672.470	.26	.78	431	258	257	57		89	4	
1 11	25	673.791	.21	.63	429	254	260	58		89	4	
1 12	27.5	674.975	.15	.45	377	252	254	60		89	4	
1	30	676.005										

Field Notes:

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

Client: **Ascend Materials** Test Date: **9/28/2010**

Source: **331 TRU OUTLET** Run Number: **3**

PARTICULATE FIELD DATA, EPA METHOD 5

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	0.26	0.5099	0.94	432	85
1-2	0.27	0.5196	0.97	434	88
1-3	0.27	0.5196	0.97	434	89
1-4	0.29	0.5385	1.04	435	89
1-5	0.26	0.5099	0.94	435	89
1-6	0.31	0.5568	1.12	436	89
1-7	0.31	0.5568	1.12	436	90
1-8	0.31	0.5568	1.12	436	90
1-9	0.30	0.5477	1.08	435	90
1-10	0.30	0.5477	1.08	436	90
1-11	0.28	0.5292	1.01	435	90
1-12	0.25	0.5000	0.90	434	90
2-1	0.25	0.5000	0.90	428	86
2-2	0.25	0.5000	0.90	431	88
2-3	0.26	0.5099	0.94	434	89
2-4	0.26	0.5099	0.94	435	90
2-5	0.28	0.5292	1.01	436	90
2-6	0.31	0.5568	1.12	436	90
2-7	0.30	0.5477	1.08	436	90
2-8	0.26	0.5099	0.94	435	90
2-9	0.25	0.5000	0.90	433	90
2-10	0.22	0.4690	0.79	432	90
2-11	0.21	0.4583	0.76	430	90
2-12	0.17	0.4123	0.61	420	90
K-Factor					
3.60	**0.27**	**0.5165**	**0.96**	**433.5**	**89.3**

Entec Services, Inc.

Plant: Ascend
Pensacola, FL

Site: 331 TRU outlet

Date: 9/28/10

Run: # 3

Stack Diameter: 83.5"

Time: 17:15 / 18:27

K Factor: ~~2.49~~ 3.6

Job Number: 510156

Moisture	Initial	Final	Totals
Impinger # 1			
Impinger # 2			
Impinger # 3		See attached	
Silica Gel			
Totals			

Analyst: BR

Assistant: AI

Orsat / Fyrite Gas Analysis:				Average:
CO2:				6.0
O2:				12.0
CO:				
N2:				

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	.315	.315
	.315	.315
	.315	.315
Average:	.315	.315

Barometric Pressure: 30.09

Stack Pressure: -.20

Probe & Pitot Leak Checks:

	Volume @	Vacuum	Pitot Check	
Pre-Test:	0.000	5"	Positive ✓	Negative ✓
Post-Test:	0.000	5"	Positive ✓	Negative ✓

Equipment Checklist:
- Meter Box ID: W Apex B
- Delta H @: 1.765
- Y - Factor: .997
- Probe ID: NC97A
- CP Value: .84
- Liner Material: Glass
- Hot Box ID: NCHB2
- Impinger Outlet ID: GN-2
- Sample Line ID: —
- Filter ID: 03047
- Acetone Lot #:

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	694.710	711.555		
Initial:	677.102	694.781		
Net:	17.608	16.774		

Total: 34.382 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter In (Avg.)	Meter Out (GPA)	Vacuum
A 1 1	0	677.102	.26	.94	432	253	233	58	N/A	85		4
1 2	2.5	678.513	.27	.97	434	253	236	55		88		4
1 3	5	679.953	.27	.97	434	252	238	53		89		4
1 4	7.5	681.399	.29	1.04	435	251	245	52		89		4
1 5	10	682.888	.26	.94	435	250	248	52		89		4
1 6	12.5	684.318	.31	1.12	436	250	250	53		89		4
1 7	15	685.818	.31	1.12	436	247	253	55		90		4
1 8	17.5	687.323	.31	1.12	436	247	256	55		90		4
1 9	20	688.823	.30	1.08	435	248	258	58		90		4
1 10	22.5	690.321	.30	1.08	436	248	260	56		90		4
1 11	25	691.822	.28	1.01	435	244	259	56		90		4
1 12	27.5	693.299	.25	.90	434	245	258	57		90		4
B 1 1	0	694.781	.25	.90	428	243	252	58		86		4
1 2	2.5	696.175	.25	.90	431	247	260	52		88		4
1 3	5	697.572	.26	.94	434	247	253	51		89		4
1 4	7.5	699.006	.26	.94	435	241	256	52		90		4
1 5	10	700.432	.28	1.01	436	246	257	52		90		4
1 6	12.5	701.897	.31	1.12	436	244	249	53		90		4
1 7	15	703.401	.30	1.08	436	247	253	53		90		4
1 8	17.5	704.896	.26	.94	435	251	252	54		90		4
1 9	20	706.330	.25	.90	433	247	252	55		90		4
1 10	22.5	707.754	.22	.79	432	252	257	55		90		4
1 11	25	709.073	.21	.76	430	246	258	55		90		4
1 12	27.5	710.374	.17	.61	420	250	257	55		90		4
1	30	711.555										

Field Notes:

APPENDIX C

OPERATIONAL AND PRODUCTION DATA

Production Data

The following information was received from Mr. Roy Noble of Ascend Performance Materials, LLC for the testing performed at their facility in *Cantonment*, Florida on September 28, 2010.

Process Data

Start Time	End Time	TRU Feed Flow (pph) from Adipic	Adipic Average TRU Off Gas MW (lb/lb mol)	Adipic TRU Molar Feed Flow (lb mol/hr)	Halcon Air Feed Flow (pph) Process	Halcon OffGas to TRU (pph)	Average Halcon Off Gas Flow (lb mol/hr)
9/28/2010 9:30	9/28/2010 11:50	51,911.5	35.394	1,466.7	76,152.9	61,300.0	2,109.1
9/28/2010 12:45	9/28/2010 14:02	53,985.2	35.543	1,518.9	76,201.4	60,420.9	2,078.9
9/28/2010 15:15	9/28/2010 16:27	54,009.5	35.474	1,522.5	76,168.4	62,066.0	2,135.5

Adipic Acid KA feed (operating) rates were:

Run 1 86.32 kpph
Run 2 89.91 kpph
Run 3 89.99 kpph

APPENDIX D

CHAIN OF CUSTODY AND LABORATORY REPORTING

Imp 2 - 400 mL 6N NaOH
Imp 3 - 400 mL 6N NaOH
Imp 4 - Empty

*Color Indicator does not work on Inlet

ENTEC SERVICES, INC.

SAMPLE RECOVERY DATA SHEET

Client / Location: Ascend / Pensacola, FL Sampling Date(s): 9/28/10

Run No.: 1 Recovery Date: 9/28/10 Recovered By: [illegible]

Impingers	1 (H2O)	2	3	4	5	6	Silica Gel
Final Wt.	1731.2	1085.1	1065.9	616.8			917.1
Initial Wt.	1712.7	1072.8	1064.3	609.3			904.5
Net Weight	18.5	12.3	1.6	7.5			12.6

Whole sample pH 13.7
Moisture Imp.: 39.9 Grams Moisture Gel.: 12.6 Grams
Description of Impinger Contents: #1,2,3 - yellow #4 - orange
Description of Particulate on Filter: Clear Sealed: Y N
Silica Gel Color: blue Percent Spent: 5 %
Filter I.D. Number: 3046 Filter Container No.: N/A
Probe Rinse Container No.: N/A Liquid Level Marked / Sealed: Y N
Impinger Contents Container No.: R1-Imp-In Liquid Level Marked / Sealed: Y N

Run No.: 2 Recovery Date: 9/28/10 Recovered By:

Impingers	1	2	3	4	5	6	Silica Gel
Final Wt.	1733.8	1077.7	1055.8	632.8			924.1
Initial Wt.	1715.2	1078.2	1061.1	608.3			917.1
Net Weight	18.6	-.5	-5.3	24.5			7.0

Whole sample pH 13.7
Moisture Imp.: 37.3 Grams Moisture Gel.: 7.0 Grams
Description of Impinger Contents: Clear
Description of Particulate on Filter: Clear Sealed: Y N
Silica Gel Color: Blue orange Percent Spent: 15 %
Filter I.D. Number: 3046 Filter Container No.: N/A
Probe Rinse Container No.: N/A Liquid Level Marked / Sealed: Y N
Impinger Contents Container No.: R2-Imp-In Liquid Level Marked / Sealed: Y N

Run No.: 3 Recovery Date: Recovered By:

Impingers	1	2	3	4	5	6	Silica Gel
Final Wt.	1745.7	1073.5	1046.2	670.6			931.6
Initial Wt.	1726.3	1072.5	1065.2	615.2			924.1
Net Weight	19.4	1.0	-19.0	55.4			7.5

Whole sample pH
Moisture Imp.: 56.8 Grams Moisture Gel.: 7.5 Grams
Description of Impinger Contents: Clear, "fuzzy"
Description of Particulate on Filter: Clear Sealed: Y N
Silica Gel Color: Blue orange Percent Spent: 30 %
Filter I.D. Number: 3046 Filter Container No.: N/A
Probe Rinse Container No.: N/A Liquid Level Marked / Sealed: Y N
Impinger Contents Container No.: R3-Imp-In Liquid Level Marked / Sealed: Y N

BLANKS: Probe Rinse: N/A Impinger: ✓ Filter: N/A

Project No.: 510156

5517 KU Outlet

Imp 2 - 400mL 6N NaOH
Imp 3 - 400mL 6N NaOH
Imp 4 - Empty

ENTEC SERVICES, INC.
SAMPLE RECOVERY DATA SHEET

Client / Location: Ascend / Pensacola, FL   Sampling Date(s): 9/28/10

Run No.: 1   Recovery Date: 9/28/10   Recovered By: [signature]

Impingers	pH 13	2	3	4	5	6	Silica Gel
Final Wt.	1952.5	1071.4	1064.9	651.1			864.
Initial Wt.	1728.5	1074.1	1104.8	575.9			853.9
Net Weight	224.0	-2.7	-39.9	75.2			10.

Whole sample pH 13.5

Moisture Imp.: 256.6 Grams   Moisture Gel.: 10.7 Grams

Description of Impinger Contents: #1,2,3 pink #4 orange

Description of Particulate on Filter: Clean   Sealed: Y N

Silica Gel Color: Blue   Percent Spent: 5 %

Filter I.D. Number: 3047   Filter Container No.: n/a

Probe Rinse Container No.: n/a   Liquid Level Marked / Sealed: Y N

Impinger Contents Container No.: R-1 Imp Out   Liquid Level Marked / Sealed: Y N

Run No.: 2   Recovery Date: 9/28/10   Recovered By: [signature]

Impingers	1	2	3	4	5	6	Silica Gel
Final Wt.	1918.3	1081.1	1110.8	575.9			871.6
Initial Wt.	1745.4	1069.2	1100.0	~~575.3~~			864.6
Net Weight	172.9 ~~172.9~~	11.9	10.8	0.6			7.0

Whole Sample pH 13.7

Moisture Imp.: 196.2 Grams   Moisture Gel.: 7.0 Grams

Description of Impinger Contents: 196.2 #1 clear, #2,3,4 gel like

Description of Particulate on Filter: clean   Sealed: Y N

Silica Gel Color: blue orange   Percent Spent: 10 %

Filter I.D. Number: 3047   Filter Container No.:

Probe Rinse Container No.:   Liquid Level Marked / Sealed: Y N

Impinger Contents Container No.: R2-Imp out   Liquid Level Marked / Sealed: Y N

Run No.: 3   Recovery Date: 9/28/10   Recovered By: [signature]

Impingers	1	2	3	4	5	6	Silica Gel
Final Wt.	1953.3	1106.5	576.9	626.5			879.5
Initial Wt.	1730.7	1092.1	576.1 ~~1020~~	576.1			871.6
Net Weight	222.6	14.4	.8	50.4			7.9

whole sample pH 13.7

Moisture Imp.: 288.2 Grams   Moisture Gel.: 7.9 Grams

Description of Impinger Contents: #1 clear #2,3,4 gel like

Description of Particulate on Filter: Clean   Sealed: Y N

Silica Gel Color: blue orange   Percent Spent: 20 %

Filter I.D. Number: 3047   Filter Container No.:

Probe Rinse Container No.: n/a   Liquid Level Marked / Sealed: Y N

Impinger Contents Container No.: R3-Imp out   Liquid Level Marked / Sealed: Y N

BLANKS: Probe Rinse: NA   Impinger: ✓   Filter: NA

Project No.: 510156

APPENDIX E

QA / QC DOCUMENTS

ENTEC SERVICES, INC
FIELD QA / QC CHECKLIST

CLIENT: Ascend LOCATION: Pensacola, FL

SOURCE TESTED: 331 TRU OutLET TYPE CONTROL DEVICE: TRU

PERMIT NUMBER: ______ PERMIT LIMITS: ______

TEST METHODS USED: 057 MODIFICATIONS TO METHOD: ______

CONTROL AGENCY: ______ ON SITE REPRESENTATIVE: ______

ENTEC PERSONNEL: Bo Rogers PLANT CONTACT: Steve Heckt / Roy Noble

		YES	NO
1.	Was **Calibration Data** on site? (Methods 1-5 / CEMS CAL Gas)	✓	
2.	Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	✓	
3.	Was a 10-minute **Meter Orifice Check** performed? Results of check -2.7%	✓	
4.	Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	✓	
5.	Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	✓	
6.	Was previous test data on source used to determine **K factor**?		✓
7.	Was **Probe & Hot Box Temperatures** maintained at 248 +/- 25° F? If not, explain ______	N/A	
8.	Was **Filter Outlet Temperature** maintained at 248 +/- 25° F? If not, explain ______	N/A	
9.	Was **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading ____% Ambient CO2 Reading ____%	N/A	
10.	Was **Tedlar Gas Sampling Bags** used? If not, explain ______ Were they leak-checked? (Y) or N	✓	
11.	Were **Pitot Leak Checks** performed & recorded on each field data sheet? Pitot inspected? (Y) or N - Noted Visual Defects? N	✓	
12.	Was **Meter Leak Checks** performed & recorded on each field date sheet?	✓	
13.	Was **Nozzle Diameter** measured & recorded on each field data sheet? Nozzle inspected? (Y) or N Noted Visual Defects? N	✓	
14.	Was **Silica Gel Verified,** and recorded for each test run? Percentage Used during test - Run No.'s 1: 5 2: 10 3: 20	✓	
15.	Was **Acetone Lot Number** verified and recorded on Field Data Sheet	N/A	

Signature (Test Team Leader): [signature] Date: 9/23/10

As required: Control room data supplied by: ______ via on-site, email, or fax.

Revision 1 – August 2005 DLB

ENTEC SERVICES, INC
FIELD QA / QC CHECKLIST

CLIENT: Ascend LOCATION: Pensacola, FL
SOURCE TESTED: TRU Inlet TYPE CONTROL DEVICE: ______
PERMIT NUMBER: On File PERMIT LIMITS: On File
TEST METHODS USED: 303 MODIFICATIONS TO METHOD: Single Point
CONTROL AGENCY: ______ ON SITE REPRESENTATIVE: ______
ENTEC PERSONNEL: L. Kirby / PLANT CONTACT: Roy Noble

		YES		NO
1.	Was **Calibration Data** on site? (Methods 1-5 / CEMS CAL Gas)	✓		
2.	Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	–	N/A	–
3.	Was a 10-minute **Meter Orifice Check** performed? Results of check Pass	✓		
4.	Were **Temperatures Verified** w/ NIST Traceable Thermometer?			
5.	Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	–	N/A	–
6.	Was previous test data on source used to determine **K factor**?	–	N/A	–
7.	Was **Probe & Hot Box Temperatures** maintained at 248 +/– 25° F? If not, explain ______	✓		
8.	Was **Filter Outlet Temperature** maintained at 248 +/– 25° F? If not, explain ______	–	N/A	–
9.	Was **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading ______% Ambient CO2 Reading ______%	–	N/A	–
10.	Was **Tedlar Gas Sampling Bags** used? If not, explain ______ Were they leak-checked? Y or N	–	N/A	–
11.	Were **Pitot Leak Checks** performed & recorded on each field data sheet? Pitot inspected? Y or N - Noted Visual Defects? ______	–	N/A	–
12.	Was **Meter Leak Checks** performed & recorded on each field date sheet?	✓		
13.	Was **Nozzle Diameter** measured & recorded on each field data sheet? Nozzle inspected? Y or N Noted Visual Defects? ______	–	N/A	–
14.	Was **Silica Gel Verified,** and recorded for each test run? Percentage Used during test - Run No.'s 1: 5 2: 15 3: 30	✓		
15.	Was **Acetone Lot Number** verified and recorded on Field Data Sheet	–	N/A	–

Signature (Test Team Leader): [signature] Date: 9-28-10

As required: Control room data supplied by Roy Noble via on-site, email, or fax

ENTEC SERVICES, INC
FIELD QA / QC CHECKLIST
Method 25A - Total Gaseous Hydrocarbons

CLIENT: Ascend LOCATION: Gonzalez, FL

SOURCE TESTED: TRU IN, TRU out, Halcon TYPE CONTROL DEVICE: Thermal Reduction Unit

TEST METHODS USED: 25A MODIFICATIONS TO METHOD: None

	YES	NO
1 Was valid **Certificate of all Protocol 1 calibration gases** on site?	✓	
2 Was Air used as the balance gas for **all Protocol 1 calibration gases** on site?	✓	
3 Was the **High-level gas** equivalent to 80 to 90 % of span value ?	✓	
4 Was the **Mid-level gas** equivalent to 45 and 55 % of the span value ?	✓	
5 Was the **Low-level gas** equivalent to 25 and 35 % of the span value ?	✓	
6 Was the **Zero-level gas** < 0.1 % of the span value ?	✓	
7 Was the sample kept above the dew point by heating prior to the analyzer ?	✓	
8 Was the **Analyzer Calibration Error** within +/-5 % of the bottle values ?	✓	
9 Was the **System Response Time** Calculated during the initial sampling system bias check?	✓	
What was the average System Response Time ? ______ Seconds Inlet - [illegible] secs, Outlet/min 10 sec, Halcon - 20 secs		
10 Was the **Drift** within +/-3 % of the calibration span for the zero and upscale gases ?	✓	
11 Was the sampling system **purged** > 2 times the system response time before each test run?	✓	
12 Were all data points recorded in at least **1 minute averages**?	✓	
13 Was the **average concentration** for each run < the calibration span ?	✓	

Signature (Test Team Leader): [signature] Date: 9/20/10

ENTEC SERVICES, INC.
METER ORIFICE AND TEMPERATURE CHECKS

Client: Ascend
Location: Pensacola, Fl.
Source: TRU Inlet
Date: 9-27-2010

Meter Box Number: NC 3 ES
Original ΔH@ : 1.857 Y: 0.987
Calibration Date: 12-7-2009
Barometric Pressure: 30.00 " Hg

RUN METER FOR EXACTLY 10.0 MINUTES

Orifice Manometer Reading ΔH equal to ΔH @	Dry Gas Volume, ft³		Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Readings:	**Initial**	**Final**	**Initial**	**Final**
ΔH @ = 1.857	963.000	970.924	95	98
	Total Volume:	7.924	**Average:**	96.5

V_m= Volume of Dry Gas Meter

T_m= Average Temperature of Dry Gas Meter in degrees Rankin (+460)

P_{Barm} = Barometric Pressure

$$Y_c = 10/V_m \times \sqrt{\{0.0319 \times T_m/P_{Barm}\}}$$

$$= 10/(7.924) \times \sqrt{\{0.0319 \times (556.5)/(30.00)\}}$$

$$= (1.262) \times (0.769) = 0.971$$

Is Y_c < +/- 3% of Original Y ? Yes

Meter Calibration % Difference 2.53 %

Thermocouple Check: NIST Traceable ID 91205005 **Expiration** 10-27-2011

Thermocouples / I.D.	Ambient Temp. °F	Reference Temp. °F	Acceptance Range	OK?
Stack (Post Required) /	n/A	n/A	+/- 7.5°	
Probe /	n/A	n/A	+/- 5.4°	
Filter Box / NCHB1	83	82	+/- 5.4°	✓
Filter Exit /	n/A	n/A	+/- 2.0°	
Meter Outlet /	85	83	+/- 5.4°	✓
Impinger Exit / NCGN4	83	83	+/- 2.0°	✓
Other /			+/- 5.4°	

Field Checks Performed By (Signature): [signature] [signature]

ENTEC SERVICES, INC.
METER ORIFICE AND TEMPERATURE CHECKS

Client: Ascend   Location: Pensacola, FL

Date: 9/27/10   Barometric Pressure: 30.06 " Hg

Meter Box Number: NC Apex B   Original Y: .977

Original ΔH@ : 1.765   Bi-Annual Calibration Date: 12/7/09

RUN METER FOR EXACTLY 10.0 MINUTES

Orifice Manometer Reading ΔH equal to ΔH @	Dry Gas Volume, ft³		Dry Gas Meter Inlet Temperature, °F		Dry Gas Meter Outlet Temperature, °F	
Dry Gas Meter Readings:	**Initial**	**Final**	**Initial**	**Final**	**Initial**	**Final**
	600.505	608.004	71	76	71	76
Total Volume:		7.499	**Average:**	73.5	**Average:**	73.5

V_m= Volume of Dry Gas Meter

T_m= Average Temperature of Dry Gas Meter in degrees Rankin (+460)

P_{Barm} = Barometric Pressure

$$Y_c = 10/V_m \times \sqrt{\{0.0319 \times T_m/P_{Barm}\}}$$

= 10/(7.499) x √{ 0.0319 x (~~73.5~~ 533.5)/(30.06)}

= (1.33) x ( ) = 1.003

Is Y_c < +/- 3% of Original Y ? +2.70% Yes

Thermocouple Check (all temperatures are in °F) NIST Traceable ID S/N 91205005

Thermocouples / I.D.	Ambient Temp.	Reference Temp.	Acceptance Range	OK?
Stack (Post Required) /	78 / 82	79 / 83	+/- 7.5°	✓
Probe /	78	77	+/- 5.4°	✓
Filter Box /	75	75	+/- 5.4°	✓
Filter Exit /	73	74	+/- 2.0°	✓
Meter Outlet /	72	73	+/- 5.4°	✓
Impinger Exit /	72	73	+/- 2.0°	✓
Other /			+/- 5.4°	

Field Checks Performed By (Signature): [signature]

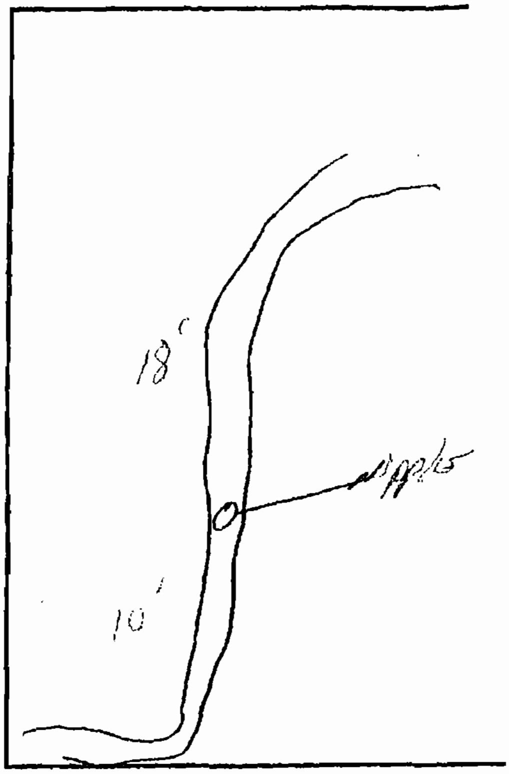
Revision 1   September 2005 DLB

ENTEC SERVICES, INC
TRAVERSE POINT LOCATIONS FOR CIRCULAR DUCTS

Facility: Ascend

Location: Gonzalez, FL

Source ID: TRU Inlet



SAMPLING DIAGRAM

STACK DIMENSIONS

Inside of FAR wall to OUTSIDE of nipple (DISTANCE A) = 20 Inches

Inside of NEAR wall to OUTSIDE of nipple (DISTANCE B) = 10 Inches

STACK DIAMETER (A - B) = 10 Inches

DISTURBANCES FROM SAMPLE PORTS

Nearest UPSTREAM Disturbance: bend

Distance 18' Inches — Diameters

Nearest DOWNSTREAM Disturbance: bend

Distance 10' Inches — Diameters

Port Type: nipple

MINIMUM NUMBER OF TRAVERSE POINTS: Single Point

Port Diameter Size: 3"

1 Traverse Point Number	2 Fraction of Duct Diameter	3 Stack I.D. (A - B)	4 Product of Columns 2 + 3	5 Nipple Length Distance B	6 Traverse Point Location (Columns 4 + Columns 5)
N/A	N/A	N/A	N/A	N/A	N/A

Checked By:

[signature] 9/28/10
Personnel (Signature/Date)

[signature] 9/28/10
Team Leader (Signature/Date)

EPA METHOD 1
TRAVERSE POINT LOCATIONS FOR CIRCULAR DUCTS

Stack Name: 331 TRU Outlet
Facility: Ascend
Location: Pensacola, FL

Inside of FAR wall to OUTSIDE of nipple (DISTANCE A) = 89.5 inches

Inside of NEAR wall to OUTSIDE of nipple (DISTANCE B) = 6 inches

STACK DIAMETER (A - B) = 83.5 inches

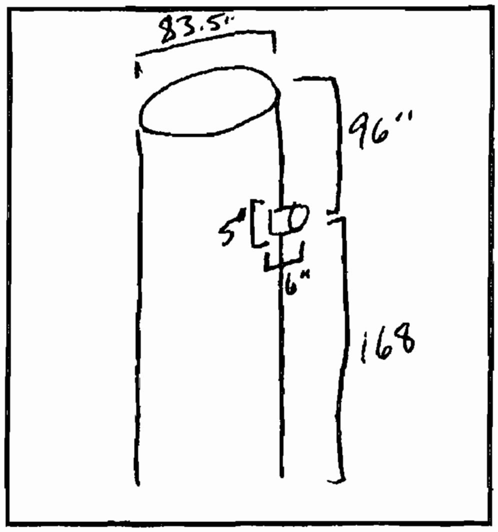


DIAGRAM OF SAMPLING LOCATION

FROM SAMPLE PORTS

Nearest UPSTREAM Disturbance

Distance 96" inches 1.15 Diameters

Nearest DOWNSTREAM Disturbance

Distance 168" Inches* 2.01 Diameters

MINIMUM NUMBER OF TRAVERSE POINTS 24

Personnel: Ben Rogers Date: 9/27/10

1 Traverse Point Number	2 Fraction of Stack I.D.	3 Stack I.D. (A - B)	4 Product of Columns 2 and 3	5 Nipple Length Distance B	6 Traverse Distance (4 + 5)
1	2.1	83.5"	1.8	6"	7.8
2	6.7	↓	5.6	↓	11.6
3	11.8		9.9		15.9
4	17.7		14.8		20.8
5	25.0		20.9		26.9
6	35.6		29.7		35.7
7	64.4		53.8		59.8
8	75.0		62.6		68.6
9	82.3		68.7		74.7
10	88.2		73.6		79.6
11	93.3		77.9		83.9
12	97.9	↓	81.7	↓	87.7

Checked By: [signature] 9/27/10 — Personnel (Signature/Date)

[signature] 9/30/10 — Team Leader (Signature/Date)

Traverse Point Location Circular

ENTEC Services, Inc.

16 D Commerce Ave, Hueytown, AL 35023

Preliminary Traverse & Cyclonic Flow Verification

Client: Ascend Materials | Test Date: 09/28/10

Source: 331 TRU OUTLET | Run No.: Preliminary Test

Traverse Point	Delta P	Sq. Rt. Delta P	Null Reading (Angle)	Stack Temp. (°F)
1-1	0.280	0.5292	0	439
1-2	0.260	0.5099	1	442
1-3	0.280	0.5292	1	444
1-4	0.300	0.5477	0	445
1-5	0.320	0.5657	2	446
1-6	0.330	0.5745	0	447
1-7	0.340	0.5831	3	447
1-8	0.350	0.5916	1	447
1-9	0.350	0.5916	1	446
1-10	0.330	0.5745	5	445
1-11	0.270	0.5196	3	445
1-12	0.180	0.4243	2	420
2-1	0.280	0.5292	1	440
2-2	0.310	0.5568	2	444
2-3	0.310	0.5568	3	446
2-4	0.330	0.5745	1	454
2-5	0.340	0.5831	5	452
2-6	0.350	0.5916	5	448
2-7	0.350	0.5916	5	447
2-8	0.320	0.5657	6	447
2-9	0.290	0.5385	3	445
2-10	0.280	0.5292	3	445
2-11	0.240	0.4899	4	443
2-12	0.140	0.3742	5	418
Average	**0.30**	**0.5426**	**2.58**	**443.4**

Note: Based on the preliminary traverse the flow is not considered cyclonic

ENTEC SERVICES, INC.
VELOCITY TRAVERSE FORM

Plant: Ascend Project No.: 570156
Source: 331 TRU Outlet Stack I.D., (inches): 83.5
Date: 9/27/10 Barometric Press., in. Hg. 30.06 Ambient Temperature: 82
Pitot ID: NC 97A Pitot C_P: .84 Temperature Device: 9R05005

Run No.	Time			Run No.	Time		Run No.	Time	
Port / Point	ΔP, in.H_2O	Temp. °F	Deg. from 90° to Null	Port / Point	ΔP, in.H_2O	Temp. °F	Port / Point	ΔP, in.H_2O	Temp. °F
A 1	.28	439	0						
2	.26	442	1						
3	.28	444	1						
4	.30	445	0						
5	.32	446	2						
6	.33	447	0						
7	.34	447	3						
8	.35	447	1						
9	.35	446	1						
10	[illegible]	445	5						
11	.29	445	3						
12	.18	420	2						
B 1	.28	440	1						
2	.31	444	2						
3	.31	446	3						
4	.33	454	1						
5	.34	452	5						
6	.35	448	5						
7	.35	447	5						
8	.32	447	6						
9	.29	445	3						
10	.28	445	3						
11	.24	443	4						
12	.14	418	5						
AVG				AVG			AVG		

Pitot Leak Check		O2		Pitot Leak Check		O2		Pitot Leak Check		O2	
Pre Test	R ✓ S ✓	CO2		Pre Test	R S	CO2		Pre Test	R S	CO2	
Post Test	R ✓ S ✓	Static Pressure		Post Test	R S	Static Pressure		Post Test	R S	Static Pressure	
% Moisture		-.20		% Moisture				% Moisture			
Wet Bulb	Dry Bulb	Checked By		Wet Bulb	Dry Bulb	Checked By		Wet Bulb	Dry Bulb	Checked By	
		BPR									

Keith Poole

From: keithpoole@carolina.rr.com
Sent: Friday, October 22, 2010 8:03 AM
To: Keith Poole
Subject: Fw: HCN Info Requested

Sent from my Verizon Wireless BlackBerry

From: "Chuck Duncan" <CDuncan@entecservices.com>
Date: Fri, 22 Oct 2010 06:32:12 -0500
To: <Agnew.Rachel@epamail.epa.gov>
Cc: Dan McCombs<DMcCombs@entecservices.com>; <keithpoole@carolina.rr.com>; Lynn Beane<LBeane@entecservices.com>; Troy Burrows<TBurrows@entecservices.com>
Subject: RE: HCN Info Requested

Rachel,

Thanks for all of your help and quick response both times!

Regards,

Chuck

***Charles F. Duncan**, QSTI, SES Hall of Fame Member*

Carolina Area Manager - RTP Area, NC

ENTEC Services Inc.
Pollution Control System Evaluation and Source Emissions Testing

* Baton Rouge, LA * Birmingham, AL * Mobile, AL * Raleigh (RTP), NC *

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1.919.267.9691 (office)
1.919.244.7777 (cell)
1.919.267.9692 (fax)

From: Agnew.Rachel@epamail.epa.gov [mailto:Agnew.Rachel@epamail.epa.gov]
Sent: Friday, October 22, 2010 6:30 AM
To: Chuck Duncan
Cc: Chuck Duncan; Dan McCombs; keithpoole@carolina.rr.com; Lynn Beane; Troy Burrows
Subject: Re: HCN Info Requested

Hi Chuck,

Regarding your question about CTM-033:

EPA realizes there is an issue with maintaing a pH of greater than or equal to 12. I am currently revising the method to address this issue.
It was recommended to you that you use 6.0N sodium hydroxide (NaOH), rather than 0.1N as specified in the method. This is fine. The higher normality is recommended to ensure that the pH doesn't drop below 12 by the end of the test. The revised method will require the use of 6.0N NaOH solution.

You also mentioned that you used higher volumes in the impingers and that is fine too. Maintaining the pH throughout the test is the important factor.

Let me know if you have any other questions.

Thanks!
Rachel

U.S. Environmental Protection Agency
Measurement Policy Group
OAR/OAQPS/SPPD
Research Triangle Park, NC
Ph: 919-541-0328 Fax: 919-541-3207

From: "Chuck Duncan" <CDuncan@entecservices com>
To: Rachel Agnew/RTP/USEPA/US@EPA
Cc: "Dan McCombs" <DMcCombs@entecservices.com>, <keithpoole@carolina.rr.com>. "Chuck Duncan" <CDuncan@entecservices.com>, "Troy Burrows" <TBurrows@entecservices.com>, "Lynn Beane" <LBeane@entecservices.com>
Date: 10/21/2010 10:52 PM
Subject: HCN Info Requested

Hello Ms. Agnew,

We are working on completing the final report for Ascend (Pensacola) as discussed for the HCN Unit which was tested utilizing a alternate approach with 6N NaOH in the first 3 impingers (1500ml) as suggested similar to the utility MACT testing approach. We had to use a large (l liter) impinger followed by 2 standard G.S. impingers during the testing. We were able to maintain the pH requirements but we realized that 500 ml would not work in normal size impingers due to carry over. We tested with 700 ml in the first impinger followed by 400 ml in each of the following 2 impingers. In completing the final report would want to include your original email discussing this issue but I have been unable to find since I may have answered via phone and can not find any records of this.

Please re-forward this email if you have a copy or any additional comments that may support our testing approach as previously discussed. I would be more than willing to discuss in detail the testing program for future reference and ideas to improve sampling technique in unique sampling conditions (i.e. - high pressure, high concentration, high interference) we experienced. As a note we conducted an impinger efficiency on the source at approximately 400 ppm of HCN. We would suggest the total amount of NaOH impingers be reduced during future evaluation of this method.

Please let me know if you can help.

Regards,

Chad

Charles F. Duncan, *QSTI, SES Hall of Fame Member*

Carolina Area Manager - RTP Area, NC

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APPENDIX F

CALIBRATIONS

VOC Calibration Data

Client: **Ascend Materials**

Source: **TRU INLET**

	Gas Value	Actual	%Error	Required
ZERO	0	3.8	0.36	2% of span
LOW	250.4	253.1	1.08	5% of gas value
MID	405.8	411.7	1.45	5% of gas value
HIGH	949.1	945.2	0.41	5% of gas value
SPAN	1044.01			110% of High gas value

	Actual		Response		%Error		Required
	Zero	High	Zero	High	Zero	High	
Run 1	3.8	945.2	5.2	948.5	0.13	0.32	3% of span
Run 2	3.8	945.2	3.2	953.5	0.06	0.8	3% of span
Run 3	3.8	945.2	3	948.2	0.08	0.29	3% of span

Data By: **Gabby Smith** **9/28/2010**

VOC CALIBRATION DATA

Client: **Ascend Materials**

Source: **TRU OUTET**

	Gas Value	Actual	%Error	Required
ZERO	0	0.3	0.54	2% of span
LOW	14.9	15	0.67	5% of gas value
MID	29.7	29.5	0.67	5% of gas value
HIGH	50.7	50.4	0.59	5% of gas value
SPAN	55.8			110% of High gas value

	Actual		Response		%Error		Required
	Zero	Low	Zero	Low	Zero	Low	
Run 1	0.3	15	0	15	0.52	0	3% of span
Run 2	0.3	15	0.4	15.4	0.18	0.72	3% of span
Run 3	0.3	15	0	15.3	0.52	0.52	3% of span

Data By: **S Meadows** **9/28/2010**

VOC Calibration Data

Client: **Ascend Materials**

Source: **HALCON**

	Gas Value	Actual	%Error	Required
ZERO	0	3	0.02	2% of span
LOW	4,944	4,956.9	0.26	5% of gas value
MID	8,472	8,451.7	0.24	5% of gas value
HIGH	14,700	14,681.6	0.13	5% of gas value
SPAN	16,170			110% of High gas value

	Actual		Response		%Error		Required
	Zero	Mid	Zero	Mild	Zero	Mild	
Run 1	3	8,451.7	14.0	8,488.0	0.07	0.22	3% of span
Run 2	3	8,451.7	14.3	8,439.5	0.07	0.08	3% of span
Run 3	3	8,451.7	4.8	8,476.4	0.01	0.15	3% of span

Data By: **S Meadows** **9/28/2010**

CONTROL BOX CALIBRATION FORM

Model No.: **NC Apex B**

Control Box ID.: **A-1**

Calibration Date: **12/07/09**

Barometric Pressure: **29.91**

Signature of Operator: **cd4**

Theoretical Critical Vacuum: **15.000**

Orifice ΔH Setting (in. H_2O)	Dry Gas Meter Readings: Gas Meter Volume: Initial Vm ft^3	Final Vm ft^3	Total Vm ft^3	Gas Meter Temperature: Inlet Initial	Inlet Final	Outlet Initial	Outlet Final	Avg	Critical Orifice Readings: Serial No. ID	Coeff. No.	Maintained Orifice Vacuum	Ambient Temperature: Initial	Final	Avg.	Run Time θ (Min)
0.28	490.961	494.070	3.109	55.0	54.0	55.0	54.0	54.5	40	0.2352	26.0	51.0	52.0	51.5	10.00
1.15	494.070	500.054	5.984	54.0	55.0	54.0	55.0	54.5	55	0.4536	24.0	51.0	52.0	51.5	10.00
0.62	500.054	504.563	4.509	55.0	55.0	55.0	55.0	55.0	48	0.3420	25.0	52.0	52.0	52.0	10.00
3.70	504.563	515.260	10.697	55.0	62.0	55.0	62.0	58.5	73	0.8107	20.0	52.0	53.0	52.5	10.00
2.00	515.260	523.228	7.968	58.0	61.0	58.0	61.0	59.5	63	0.6042	22.0	53.0	53.0	53.0	10.00

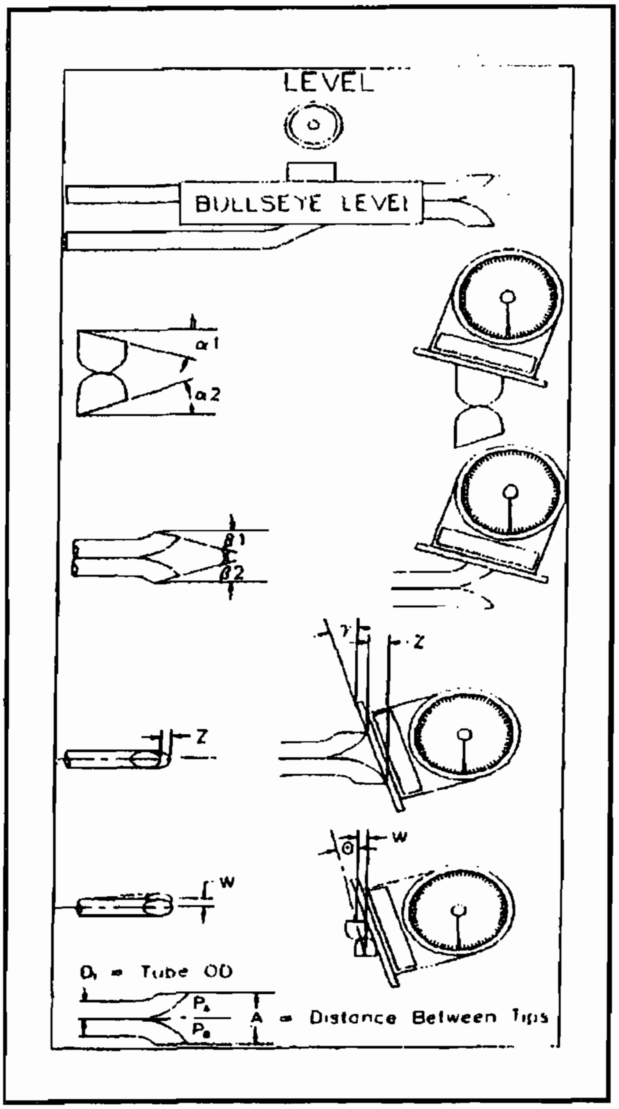
Orifice ΔH (in. H_2O)	Volumes Corrected Standard Conditions, ft^3: Dry Gas Meter	Orifice Device	Control Box Correction Factors: Y - Meter Factor	tolerance	ΔH@ - Orifice Factor	tolerance
0.28	3.190	3.111	0.975	-0.002	1.653	-0.112
1.15	6.154	5.999	0.975	-0.002	1.833	0.068
0.62	4.626	4.521	0.977	0.001	1.734	-0.031
3.70	10.984	10.711	0.975	-0.001	1.837	0.072
2.00	8.132	7.979	0.981	0.005	1.768	0.003
		Average:	**0.977**		**1.765**	

Maintained Orifice Vacuum - Actual vacuum must be greater than 2 in. Hg than the *Theoretical Critical Vacuum* .

Y = Ratio of reading of orifice device to dry test meter; tolerance for individual values ±0.02 from average.

Delta H@ - Orifice pressure differential that equates to 0.75 cfm of air @ 68 °F and 29.92 inches of mercury, acceptable tolerance for individual values ±0.20 from average

TYPE S PITOT TUBE INSPECTION DATA SHEET



Parameter	Value	Allowable Range
Assembly Level?	Yes	Yes
Holes Damaged?	No	No
Obstructed?	No	No
$\alpha 1$	0	$-10° < \alpha 1 < +10°$
$\alpha 2$	0	$-10° < \alpha 2 < +10°$
$\beta 1$	0	$-5° < \beta 1 < +5°$
$\beta 2$	0	$-5° < \beta 2 < +5°$
γ	90	
θ	90	
A	.965	for 1/4" OD, 0.526 to 0.750 for 3/8" OD, 0.788 to 1.125
$Z = A \sin \gamma$	0	$Z = \leq 0.125"$
$W = A \sin \theta$	0	$W = \leq 0.031"$
P_A	.483	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
P_B	.483	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
$P_A - P_B$	0	-0.063 to 0.063"
D_T	.375	0.188 to 0.375"
Thermocouple Cal.	59	Reference temp.
Thermocouple Cal.	57	Probe Thermocouple

Certification

I certify that the Type S pitot tube/probe ID **# NC- 97A** meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor C_p of 0.84

Certified and Calibrated By: Lalan R. Kirby

Date Certified: 12/4/2008

Initial Calibration

ENTEC Services, Inc.

16-D Commerce Ave.Hueytown, Alabama 35023

Calibration Date: 8/25/2010 Calibrated by: Lalan Kirby

Thermocouple Calibrations

Entec Services ID Number	Temperature Source	**Reference Temperature	Thermocouple Temperature	Difference Degrees F	Within Tolerance
TC-1	ambient	89	90	-1	Yes
TC-2	ambient	89	90	-1	Yes
TC-3	ambient	89	90	-1	Yes
TC-4	ambient	89	91	2	Yes
TC-6	ambient	90	90	0	Yes
TC-7	ambient	90	92	2	Yes
TC-8	ambient	90	91	1	Yes
TC-11	ambient	91	90	1	Yes
TC-12	ambient	92	92	0	Yes
TC-13	ambient	92	92	0	Yes
TC-14	ambient	92	90	2	Yes
TC-15	ambient	90	91	1	Yes
TC-16	ambient	91	91	0	Yes
TC-17	ambient	91	90	1	Yes
TC-19	ambient	90	92	2	Yes
TC-20	ambient	92	90	2	Yes
TC-21	ambient	92	90	2	Yes
TC-22	ambient	91	90	1	Yes
TC-23	ambient	91	92	1	Yes
TC-24	ambient	91	92	1	Yes
TCS - 1	ambient	91	92	1	Yes
TCS - 2	ambient	92	91	1	Yes
TCS - 3	ambient	92	91	1	Yes
TCS - 4	ambient	92	90	2	Yes
TCS - 5	ambient	92	90	2	Yes
TCS - 7	ambient	91	90	1	Yes
TSC -8	ambient	91	92	1	Yes
TSC -9	ambient	91	91	0	Yes
TSC -10	ambient	90	92	2	Yes
TSC -11	ambient	90	92	2	Yes
TSC -12	ambient	90	91	1	Yes
TSC -13	ambient	92	91	1	Yes
TSC -14	ambient	91	91	0	Yes
TSC -15	ambient	91	91	0	Yes
TSC - 16	ambient	91	90	1	Yes
Fluke Hand Held 1	ambient	91	92	1	Yes
Fluke Hand Held 2	ambient	91	91	0	Yes
Fluke Hand Held 3	ambient	91	91	0	Yes

Temperature tolerance within +/- 2° F of acceptable ranges for all thermocouples.

**** Note: NIST Traceable Digital Thermometer Serial Number 101564424 was used as reference temperature**

ENTEC Services, Inc.

16-D Commerce Ave.Hueytown, Alabama 35023

Calibration Date: 8/31/2010 Calibrated by: Lalan Kirby

Hot Box Thermocouple Calibrations

Entec Services ID Number	Temperature Source	**Reference Temperature	Thermocouple Temperature	Difference Degrees F	Within Tolerance
HOTBOX 1	ambient	88	89	-1	Yes
HOTBOX 2	ambient	88	90	-2	Yes
HOTBOX 3	ambient	88	89	-1	Yes
HOTBOX 4	ambient	88	89	-1	Yes
HOTBOX 5	ambient	88	89	-1	Yes
HOTBOX 6	ambient	88	88	0	Yes
HOTBOX 7	ambient	88	87	1	Yes
HOTBOX 8	ambient	88	89	-1	Yes
HOTBOX 9	ambient	88	90	-2	Yes
HOTBOX 10	ambient	88	89	-1	Yes
HOTBOX 11	ambient	88	88	0	Yes
HOTBOX 12	ambient	88	88	0	Yes
HOTBOX 13	ambient	88	89	-1	Yes
HOTBOX 14	ambient	88	88	0	Yes

Temperature tolerance within +/- 2 ° F of acceptable ranges for all thermocouples.

**** Note: NIST Traceable Digital Thermometer Serial Number 101564424 was used as reference temperature**

ENTEC Services, Inc.

16-D Commerce Ave.Hueytown, Alabama 35023

Calibration Date: 8/24/2010 Calibrated by: Lalan Kirby

Gooseneck Thermocouple Calibrations

Entec Services ID Number	Temperature Source	**Reference Temperature	Thermocouple Temperature	Difference Degrees F	Within Tolerance
GN-1	ambient	89	88	1	Yes
GN-2	ambient	89	89	0	Yes
GN-3	ambient	89	89	0	Yes
GN-4	ambient	89	87	2	Yes
GN-5	ambient	90	90	0	Yes
GN-6	ambient	90	90	0	Yes
GN-7	ambient	90	88	2	Yes
GN-8	ambient	90	89	1	Yes
GN-9	ambient	90	89	1	Yes
GN-10	ambient	90	88	2	Yes
GN-11	ambient	90	89	1	Yes
GN-12	ambient	89	87	2	Yes
GN-13	ambient	89	88	1	Yes
GN-14	ambient	90	90	0	Yes
GN-15 (Mini HB	ambient	90	88	2	Yes
GN-16 (Mini HB)	ambient	90	88	2	Yes
GN-17	ambient	90	88	2	Yes
GN-18 (Mini HB)	ambient	89	89	0	Yes
GN-19 (Mini HB)	ambient	89	89	0	Yes
GN-20 (Mini HB)	ambient	90	89	1	Yes
GN-21	ambient	90	88	2	Yes
GN-22 (Mini HB)	ambient	90	88	2	Yes
GN-23	ambient	90	88	2	Yes
GN-24	ambient	90	88	2	Yes

Temperature tolerance within +/- 2° F of acceptable ranges for all thermocouples.

**** Note: NIST Traceable Digital Thermometer Serial Number 101584424 was used as reference temperature**

ENTEC Services, Inc.

16-D Commerce Ave. Hueytown, Alabama 35023

Calibration Date: 12/17/2009 **Calibrated by:** Lalan Kirby

Annual Barometer Calibrations

Entec Services ID Number	Reference Barometer Reading	Barometer Reading	Pre-adjusted Variation	Barometer Adjusted?	Post-adjusted Barometer Reading	Post-adjusted Variation	Barometer Tolerance (0.1 ±mm Hg) ?
Lalan's Forester Watch	29.88	29.90	-0.02	No	29.90	-0.02	Yes
Lab 20328697	29.88	29.89	-0.01	No	29.89	-0.01	Yes
La Crosse (1)	29.88	29.88	0.00	No	29.88	0.00	Yes
La Crosse (2)	29.88	29.88	0.00	No	29.88	0.00	Yes
Davis Instruments	29.88	29.90	-0.02	No	29.90	-0.02	Yes

*** Reference Barometer Procedures and Calculations made using Entec's Princo Instruments Model No. 469 Metallic Mercury Barometer**

Calibrated By: Lalan Kirby

APPENDIX G

GAS CERTIFICATES

23

Praxair
5700 South Alameda Street
Los Angeles, CA 900[illegible]
Telephone: (323) 585[illegible]
Facsimile: (323) 585[illegible]

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER [illegible] INSTRUMENTS   P.O NUMBER [illegible]

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
[illegible]	[illegible]	SA 19962	[illegible]

ANALYZER READINGS

R = REFERENCE STANDARD   *Z = ZERO GAS*   *C = GAS CANDIDATE*

1. COMPONENT   ANALYZER MAKE-MODEL-S/N: HP 5890 Series II S/N [illegible]

ANALYTICAL PRINCIPLE: GC Therm[illegible]   LAST CALIBRATION DATE: 05/[illegible]/98

FIRST ANALYSIS DATE: 6/10/98   SECOND ANALYSIS DATE:

Z	R	C [illegible]	CONC	.473	Z	R	C	CONC.	
R	Z	C [illegible]	CONC	.472	R	Z	C	CONC.	
Z		R [illegible]	CONC.	1.477	Z	C	R	CONC.	
U/M		MEAN TEST ASSAY		1.474	G/M [illegible]			MEAN TEST ASSAY	

THIS CYLINDER NO. [illegible]   CERTIFIED CONCENTRATION

HAS BEEN CERTIFIED ACCORDING TO SECTION [illegible]

OF TRACEABILITY PROTOCOL NO. [illegible]

PROCEDURE [illegible]

CERTIFIED ACCURACY [illegible] NIST TRACEABLE

CYLINDER PRESSURE [illegible] PSIG

CERTIFICATION DATE [illegible]

EXPIRATION DATE [illegible] TERM [illegible]

ANALYZED BY [signature]   CERTIFIED BY [signature]

[illegible]

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

DocNumber: 00000017403

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

CHEROKEE INSTRUMENTS

Praxair Order Number: 09584360-00
Customer P. O. Number: 02364894
Customer Reference Number: WA9A3

Fill Date:
Part Number: EV AIPR8500E-AS
Lot Number: 109910008
Cylinder Style & Outlet: AS 590
Cylinder Pressure & Volume: 2000 psi 140 cu ft

Certified Concentration:

Expiration Date:	**5/11/2012**		
Cylinder Number:	**CC 120994**		**Analytical Uncertainty.**
8472 ppm	**PROPANE**		**± 1 %**
Balance	**AIR**		

NOx ppm = N/A   NOX Values for Reference Only

Certification Information: *Certification Date:* 5/8/2009 *Term.* 36 Months *Expiration Date:* 5/11/2012

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: (R=Reference Standard Z=Zero Gas C=Gas Candidate)

1 . Component: PROPANE

Requested Concentration	8500 ppm
Certified Concentration:	8472 ppm
Instrument Used:	HP 5890 Series II - S/N 3310A48
Analytical Method:	G.C./Flame Ionization
Last Multipoint Calibration:	4/10/2009

Reference Standard Type:	GMS
Ref Std. Cylinder #:	CC 163608
Ref Std Conc	1.01 %
Ref Std Traceable to SRM #:	vs. 2647a
SRM Sample #	104-4-B
SRM Cylinder #	FF 70607

First Analysis Data: **Date:** 5/8/2009

Z: 0	**R:** 62870	**C:** 52792	**Conc:**	8409			
R: 62493	**Z:** 0	**C:** 52109	**Conc**	8439			
Z: 0	**C:** 51835	**R:** 61881	**Conc**	8475			

UOM: ppm **Mean Test Assay.** 8472 ppm

Second Analysis Data: **Date:**

Z: 0	**R:** 0	**C:** 0	**Conc:**	0
R: 0	**Z:** 0	**C:** 0	**Conc:**	0
Z: 0	**C:** 0	**R:** 0	**Conc:**	0

UOM: uV.s **Mean Test Assay:** 0 uV.s

Analyzed by
Keesuk Kim

Certified by:
Nelson Ma

18

PRAXAIR

Praxair Distribution Mid-Atlantic
145 Shimersville Rd.
Bethlehem, PA 18015
Telephone: (610) 317-1698
Facsimile: (610) 758-8382

DocNumber: 000000847

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR
1510 HAWKINS AVE
SANFORD NC 273300

Praxair Order Number: 02009416
Customer P. O. Number: cherokee order - S
Customer Reference Number: LD288

Fill Date: 11/19/2009
Part Number: AI PR5000E-AS
Lot Number: NA
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft

Certified Concentration:

Expiration Date:	**11/24/2012**		NIST Traceable
Cylinder Number:	**SA9557**		Analytical Uncertainty:
4944 ppm	**PROPANE**		**± 1 %**
Balance	**AIR**		

Certifcation Information: *Certification Date:* 11/24/2009 *Term:* 36 Months *Expiration Date:* 11/24/2012

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: PROPANE

Requested Concentration: 5000 ppm
Certified Concentration: 4944 ppm
Instrument Used: VARIAN 3300 INST 023 (PROPANE)
Analytical Method: FID
Last Multipoint Calibration: 11/9/2009

Reference Standard Type: SRM
Ref. Std. Cylinder #: XF0004658
Ref. Std. Conc: 4927 PPM
Ref. Std. Traceable to SRM #: 2648a
SRM Sample #:
SRM Cylinder #:

First Analysis Data: Date: 11/24/2009

Z: 0	R: 4926	C: 4949	Conc: 4949
R: 4927	Z: 0	C: 4939	Conc: 4939
Z: 0	C: 4943	R: 4928	Conc: 4943

UOM: PPM Mean Test Assay: 4944 PPM

Second Analysis Data: Date:

Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0

UOM: PPM Mean Test Assay: 0 PPM

Analyzed by:

John Pribish

Certified by: M.S. 11/30/09

Melissa Santana

APPENDIX H

SAFETY

ENTEC Services

Pollution Control System Evaluation and Source Emissions Testing

DAILY PROJECT SAFETY MEETING FORM

(Toolbox Safety Meeting)

Date: 9/28/10 Job No. 510156 Plant: Ascend

Meeting Coordinator: C Duncan Job Title: Ops Mgr

Topic of Safety Meeting: Chemical Handling

Information Discussed: Hand and Eye protection, pressure Awareness

Required PPE: (Check Required)

- ✓ Hard Hat
- ✓ Steel Toed Boots
- ✓ Safety Glasses
- ✓ Ear Plugs
- ✓ Gloves / Hot Gloves
- ___ Safety Harness or Fall Protection
- ___ Special Clothing (Blues / Greens / Tyvex)
- ___ CO Personnel Monitor
- ___ Respirator (w/ PM or Gas Cartridges)
- ___ Long Sleeve Shirt
- ___ Other Requirements; (List as needed) ___

Attendees: Name (Print)	Signature
1) C Duncan	[signature]
2) G Smith	[signature]
3) D Rodgers	[signature]
4) S Meadows	[signature]
5) A Ames	[signature]
6) L Kirby	[signature]
7) B Grant	[signature]
8)	
9)	

Facility required additional safety training prior to entering site: (Yes) or No

✓ Video ✓ Safety Class ___ Literature ___ Training Class (MSHA)

Rev 3: -3-06

APPENDIX I

QSTI CERTIFICATIONS

SOURCE EVALUATION SOCIETY

SES

Qualified Source Testing Individual

LET IT BE KNOWN THAT

CHARLES F. DUNCAN III

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 12TH DAY OF MAY 2009 AND EFFECTIVE UNTIL MAY 11TH, 2014

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

APPLICATION NO. 2009-343

Peter S. Pakalnis, QSTI/QSTO Review Board

Karen D. Kajiya-Mills, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

1995

SOURCE EVALUATION SOCIETY

SES

Qualified Source Testing Individual

LET IT BE KNOWN THAT

CHARLES F. DUNCAN III

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 12TH DAY OF MAY 2009 AND EFFECTIVE UNTIL MAY 11TH, 2014

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Karen D. Kajiya-Mills, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2009-343

SOURCE EVALUATION SOCIETY

SES

Qualified Source Testing Individual

LET IT BE KNOWN THAT

FLAVEL D. SMITH II

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 8TH DAY OF JULY 2009 AND EFFECTIVE UNTIL JULY 7TH, 2014

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

APPLICATION NO. 2009-352

Karen D. Kajiya-Mills, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

SOURCE EVALUATION SOCIETY

SES

Qualified Source Testing Individual

LET IT BE KNOWN THAT

FLAVEL D. SMITH II

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 8TH DAY OF JULY 2009 AND EFFECTIVE UNTIL JULY 7TH, 2014

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2009-352

SOURCE EVALUATION SOCIETY

SES

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TROY M. BURROWS

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 20TH DAY OF FEBRUARY 2008 AND EFFECTIVE UNTIL FEBRUARY 19TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

Leroy F. Owens, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2008-113

SOURCE EVALUATION SOCIETY

SES

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TROY M. BURROWS

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 20TH DAY OF FEBRUARY 2008 AND EFFECTIVE UNTIL FEBRUARY 19TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

Leroy P. Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

APPLICATION NO. 2008-113

APPENDIX J

HAND CALCULATIONS

NOMENCLATURE

A_s	Cross-sectional area of stack, square feet
A_n	Cross-sectional area of nozzle, square feet
ACFM	Actual cubic feet of gas per minute at stack conditions
B_{ws}	Proportion by volume of water vapor in gas stream
C_s	Particulate concentration in stack gas, gr/dscf
C_a	Particulate concentration in stack gas, gr/acf
C_p	Pitot tube coefficient
ΔH	Pressure drop across orifice meter, inches water
ΔP	Velocity head of stack gas, inches water
dscf	Cubic feet of dry gas corrected to standard conditions
K_p	Constant (85.49)
M_n	Total particulate matter collected, mg
M_d	Molecular weight of stack gas; dry basis, lb/lb-mole
M_s	Molecular weight of stack gas; wet basis, lb/lb-mole
I	Percent of isokinetic sampling
P_{bar}	Barometric pressure, inches mercury
P_g	Stack static pressure, inches of water
P_m	Barometric pressure of dry gas meter, in. mercury
PMR	Particulate mass rate, pounds/hour
P_s	Absolute stack gas pressure, inches mercury
P_{std}	Barometric pressure, standard conditions, 29.92 inches Hg
Q_a	Volumetric flow rate, actual conditions, ACF/min
Q_s	Volumetric flow rate, standard conditions, scf/min
Q_{std}	Volumetric flow rate, dry standard conditions, dscf/min
TB_{ws}	Theoretical water vapor in the gas stream based on saturated stack conditions, proportion by volume (dimensionless)
TV_{lc}	Theoretical volume of water collected based on saturated stack conditions, ml
TV_{wstd}	Theoretical volume of water vapor in the gas sample based on saturated stack conditions, corrected to standard temperature and pressure, scf
T_m	Absolute average dry gas meter temperature, degree R (460)
T_s	Absolute average stack gas temperature, degree R (460)
T_{std}	Absolute temperature at standard conditions, 528 R
Θ	Total sampling time, minutes
V_{lc}	Total volume collected in impingers and silica gel, gr
V_m	Volume of gas sampled through gas meter, cubic feet
V_n	Volume collected at stack conditions through nozzle, ACF
V_{ma}	Stack gas volume sampled, ACF
V_{mstd}	Volume of gas sampled through gas meter, cubic feet
V_s	Average stack gas velocity, feet/sec
V_{wcstd}	Volume of water vapor in gas sampled from impingers, standard cubic feet
V_{wsgstd}	Volume of water vapor in gas sampled from silica gel, standard cubic feet
W_{imp}	Total volume collected in impingers, gr
W_{sg}	Total volume collected in silica gel, gr
Y	Dry gas meter calibration factor

TEST CALCULATIONS
TRU OUTLET – RUN NO. 1
510156 ASCEND PERFORMANCE MATERIALS, LLC

EQUATIONS

1. $P_s = P_{bar} + (P_g/13.6) =$ (30.09) + (−.2 /13.6) = 30.0753

2. $P_m = P_{bar} + (\Delta H/13.6) =$ (30.09) + (.73 /13.6) = 30.1437

3. $V_{mstd} = 17.64 * V_m * Y * (P_m/T_m) =$ 17.64*(29.945)*(.977)*(30.1437 / 540.9) = 28.761

4a. $V_{wc(std)} = 0.04706 * W_{imp}$ = 0.04706*(256.6) = 12.076

4b. $V_{wsg(std)} = 0.04715 * W_{sg}$ = 0.04715*(10.7) = .505

5. $B_{ws} = V_{wstd}/(V_{mstd} + V_{wstd})$ =(12.581)/(28.761 + 12.581) = .3043

9. $M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28((100-(\%CO_2 + \%O_2))$
   = 0.44(12) + 0.32(6) + 0.28[100-(12 + 6)] = 30.16

10. $M_s = M_d (1 - B_{ws}) + 18 B_{ws} =$ (30.16)*(1- .3043)+18(.3043) = 26.46

11. $V_s = 85.49 * C_p * \sqrt{\Delta P} * \sqrt{[T_s / (M_s * P_s)]}$
    = 85.49*(0.84)*(.4961)*√[(882.1 /(26.46)(30.0753))] = 37.05

12. $Q_a = V_s * A_s * 60$ = (37.0542743)(38.028)(60) = 84,546

13. $Q_s = Q_a * (528/T_s)*(P_s/29.92) =$ (84545.9967)*(528/ 882.1)*(30.0753 /29.92) = 50,870

14. $Q_{std} = Q_a (1 - B_{ws}) * (528/T_s)*(P_s/29.92) =$ (84545.996)(1- .3043)*(528/ 882.1)*(30.0753 /29.92) = 35,39

15. $C_s = 0.01543 * (M_n/ V_{mstd}) =$ 0.01543*(.0994 / 28.761) = .0001

21. $PMR = C_s * Q_{std} (60/7000)$ = (.000053327)*(35390)*(60/7000) = .016

22. $V_n = T_s/P_s * \{(0.002669) V_{lc} + (V_m * Y * P_m)/T_m)\}$
    = (882.1/30.0753)*{(0.002669)(267.3)+(29.945)(.977)(30.1437)/(540.9)} = 68.744

23. $C_a = 0.01543 * (M_n/ V_n)$ = 0.01543*(.0994 / 68.7441596) = .00002

24. $I = V_n 100/(60 * \Theta * V_s * A_n)$ = (68.744155)100 / (60)(60)(37.05427)(.00054119) = 95.22

NOMENCLATURE FOR METHOD 25A

$C_{measwet}$	= Organic concentration as measured as propane wet, ppm v/v
$C_{measdry}$	= Organic concentration as measured as propane dry, ppm v/v
C_c	= Organic concentration as carbon, ppm v/v
C lbs/hr	**= Organic concentration as carbon, lbs/hr**
C_{cwet}	= Concentration as measured, wet
K	**= Carbon equivalent correction factor**

K = 2 for ethane
K = 3 for propane
K = 4 for butane

MW	=	Molecular weight of Carbon, which is equal to 12.01
MW	**=**	**Molecular weight of Propane, which is 44.10**
385.1×10^6	=	Conversion factor

EQUATIONS FOR METHOD 25A

TRU OUTLET – RUN NO. 1

510156 ASCEND PERFORMANCE MATERIALS, LLC

C_{cdry} = $C_{cwet}/(1-B_{ws})$

= (4.3)/(1- .3043) = 6.18

16. VOC lbs/dscf = (C_{cdry} or $C_{measdry}$) x MW / 385.1×10^6

= (6.18) x (44.1)/(385.1×10^6) = $7.08 \cdot 10^{-7}$

21. C lbs/hr = VOC lbs/dscf x DSCFM x 60

= ($7.08 \cdot 10^{-7}$) x (35,375) x (60) = 1.5

APPENDIX K

VOC RAW DATA

APPENDIX K.1

VOC RAW DATA

TRU INLET

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm	
1	9/28/2010	7:49:55	14.4	initial cal
1	9/28/2010	7:50:54	16.3	
1	9/28/2010	7:51:55	13.5	
1	9/28/2010	7:52:54	10	
1	9/28/2010	7:53:55	1.7	
1	9/28/2010	7:54:55	706.2	
1	9/28/2010	7:55:54	945.2	initial high
1	9/28/2010	7:56:55	389	
1	9/28/2010	7:57:54	411.7	initial mid
1	9/28/2010	7:58:55	302.4	
1	9/28/2010	7:59:54	253.1	initial low
1	9/28/2010	8:00:55	194.6	
1	9/28/2010	8:01:55	8.8	
1	9/28/2010	8:02:54	6.7	
1	9/28/2010	8:03:55	5.9	
1	9/28/2010	8:04:54	5.6	
1	9/28/2010	8:05:55	5.2	
1	9/28/2010	8:06:54	4.7	
1	9/28/2010	8:07:55	4.7	
1	9/28/2010	8:08:55	4.6	
1	9/28/2010	8:09:54	3.9	
1	9/28/2010	8:10:55	3.8	
1	9/28/2010	8:11:54	3.8	initial zero
1	9/28/2010	8:12:55	3.8	
1	9/28/2010	8:13:54	3.8	
1	9/28/2010	8:14:55	3.8	
1	9/28/2010	8:15:55	3.8	
1	9/28/2010	8:16:54	3.8	
1	9/28/2010	8:17:55	3.8	
1	9/28/2010	8:18:54	3.8	
1	9/28/2010	8:19:55	3.9	
1	9/28/2010	8:20:54	3.9	
1	9/28/2010	8:21:55	3.9	
1	9/28/2010	8:22:55	3.9	
1	9/28/2010	8:23:54	4	
1	9/28/2010	8:24:55	4	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm
1	9/28/2010	8:25:54	4
1	9/28/2010	8:26:55	4
1	9/28/2010	8:27:54	4
1	9/28/2010	8:28:54	4
1	9/28/2010	8:29:55	3.9
1	9/28/2010	8:30:54	3.9
1	9/28/2010	8:31:55	3.9
1	9/28/2010	8:32:54	4
1	9/28/2010	8:33:55	4
1	9/28/2010	8:34:54	4
1	9/28/2010	8:35:54	3.9
1	9/28/2010	8:36:55	3.9
1	9/28/2010	8:37:54	3.8
1	9/28/2010	8:38:55	3.8
1	9/28/2010	8:39:54	3.8
1	9/28/2010	8:40:55	3.8
1	9/28/2010	8:41:55	3.8
1	9/28/2010	8:42:54	3.8
1	9/28/2010	8:43:55	3.8
1	9/28/2010	8:44:54	3.8
1	9/28/2010	8:45:55	3.8
1	9/28/2010	8:46:54	3.8
1	9/28/2010	8:47:55	3.8
1	9/28/2010	8:48:55	3.8
1	9/28/2010	8.49:54	3.8
1	9/28/2010	8:50:55	3.7
1	9/28/2010	8:51:54	3.7
1	9/28/2010	8:52:55	3.8
1	9/28/2010	8:53:54	3.8
1	9/28/2010	8:54:55	3.8
1	9/28/2010	8:55:55	3.7
1	9/28/2010	8:56:54	3.7
1	9/28/2010	8:57:55	3.7
1	9/28/2010	8:58:54	3.7
1	9/28/2010	8:59:55	3.7
1	9/28/2010	9:00:54	3.7

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm	
1	9/28/2010	9:01:55	3.8	
1	9/28/2010	9:02:55	3.8	
1	9/28/2010	9:03:54	3.8	
1	9/28/2010	9:04:55	3.8	
1	9/28/2010	9:05:54	3.8	
1	9/28/2010	9:06:55	58.3	
1	9/28/2010	9:07:55	593.2	
1	9/28/2010	9:08:55	706.1	
1	9/28/2010	9:09:55	715.2	
1	9/28/2010	9:10:54	719.7	
1	9/28/2010	9:11:55	722.7	
1	9/28/2010	9:12:54	725.7	
1	9/28/2010	9:13:55	727.6	
1	9/28/2010	9:14:55	729.9	
1	9/28/2010	9:15:54	731.9	
1	9/28/2010	9:16:55	733.1	
1	9/28/2010	9:17:54	733.2	
1	9/28/2010	9:18:55	733.6	
1	9/28/2010	9:19:54	734.4	
1	9/28/2010	9:20:55	734.8	
1	9/28/2010	9:21:55	733.7	
1	9/28/2010	9:22:54	735.6	
1	9/28/2010	9:23:55	734.9	
1	9/28/2010	9:24:54	739.7	
1	9/28/2010	9:25:55	742.4	
1	9/28/2010	9:26:54	742.1	
1	9/28/2010	9:27:55	742.6	
1	9/28/2010	9:28:55	745	
1	9/28/2010	9:29:54	744.4	
1	9/28/2010	9:30:55	744.3	start run 1
1	9/28/2010	9:31:54	743.1	
1	9/28/2010	9:32:55	741.1	
1	9/28/2010	9:33:54	740.2	
1	9/28/2010	9:34:55	740.8	
1	9/28/2010	9:35:55	743.2	
1	9/28/2010	9:36:54	745.6	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm
1	9/28/2010	9:37:55	745.2
1	9/28/2010	9:38:54	745.6
1	9/28/2010	9:39:55	745.4
1	9/28/2010	9:40:54	744.9
1	9/28/2010	9:41:54	737.1
1	9/28/2010	9:42:55	737
1	9/28/2010	9:43:54	742.5
1	9/28/2010	9:44:55	739.8
1	9/28/2010	9:45:54	739.6
1	9/28/2010	9:46:55	737.6
1	9/28/2010	9:47:54	745.5
1	9/28/2010	9:48:54	746.1
1	9/28/2010	9:49:55	745.9
1	9/28/2010	9:50:54	750.5
1	9/28/2010	9:51:55	752.8
1	9/28/2010	9:52:54	752.7
1	9/28/2010	9:53:55	749.8
1	9/28/2010	9:54:55	747.8
1	9/28/2010	9:55:54	747.9
1	9/28/2010	9:56:55	747.4
1	9/28/2010	9:57:54	746
1	9/28/2010	9:58:55	746.3
1	9/28/2010	9:59:54	747.2
1	9/28/2010	10:00:55	747.6
1	9/28/2010	10:01:55	746.4
1	9/28/2010	10:02:54	746.3
1	9/28/2010	10:03:55	743.1
1	9/28/2010	10:04:54	744.2
1	9/28/2010	10:05:55	742.9
1	9/28/2010	10:06:54	741
1	9/28/2010	10:07:55	739
1	9/28/2010	10:08:55	736
1	9/28/2010	10:09:54	737.2
1	9/28/2010	10:10:55	738.6
1	9/28/2010	10:11:54	738.1
1	9/28/2010	10:12:55	737.7

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

	Run	Date	Time	TRU INLET THC ppm	
	1	9/28/2010	10:13:54	738.3	
	1	9/28/2010	10:14:55	738.8	
	1	9/28/2010	10:15:55	738.1	
	1	9/28/2010	10:16:54	737.1	
	1	9/28/2010	10:17:55	737.1	
	1	9/28/2010	10:18:54	735.3	
	1	9/28/2010	10:19:55	735.8	
	1	9/28/2010	10:20:54	735.7	
	1	9/28/2010	10:21:55	734.4	
	1	9/28/2010	10:22:55	732.7	
	1	9/28/2010	10:23:54	732.6	
	1	9/28/2010	10:24:55	731.6	
	1	9/28/2010	10:25:54	730.9	
	1	9/28/2010	10:26:55	730.3	
	1	9/28/2010	10:27:54	730.4	
	1	9/28/2010	10:28:55	730.7	
	1	9/28/2010	10:29:55	731.2	end run 1
Average	**Run 1**			**740.9666667**	
	1	9/28/2010	10:30:54	733.3	
	1	9/28/2010	10:31:55	739	run 1 cal
	1	9/28/2010	10:32:54	775.9	
	1	9/28/2010	10:33:55	948.5	high
	1	9/28/2010	10:34:55	945.6	
	1	9/28/2010	10:35:54	337.3	
	1	9/28/2010	10:36:55	5.2	zero
	1	9/28/2010	10:37:54	14.2	
	1	9/28/2010	10:38:55	41.3	
	1	9/28/2010	10:39:54	47.8	
	1	9/28/2010	10:40:55	54.1	
	1	9/28/2010	10:41:55	59	
	1	9/28/2010	10:42:54	64.3	
	1	9/28/2010	10:43:55	68.8	
	1	9/28/2010	10:44:54	69.9	
	1	9/28/2010	10:45:55	70.8	
	1	9/28/2010	10:46:54	72.5	
	1	9/28/2010	10:47:55	74.8	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm
1	9/28/2010	10:48:55	77.6
1	9/28/2010	10:49:54	76.8
1	9/28/2010	10:50:55	76.9
1	9/28/2010	10:51:54	77.9
1	9/28/2010	10:52:55	78.1
1	9/28/2010	10:53:54	78.6
1	9/28/2010	10:54:55	79.9
1	9/28/2010	10:55:55	81.1
1	9/28/2010	10:56:54	83.8
1	9/28/2010	10:57:55	82.1
1	9/28/2010	10:58:54	81.6
1	9/28/2010	10:59:55	81.4
1	9/28/2010	11:00:54	81.9
1	9/28/2010	11:01:54	82.1
1	9/28/2010	11:02:55	82.5
1	9/28/2010	11:03:54	82.4
1	9/28/2010	11:04:55	81.9
1	9/28/2010	11:05:54	82.5
1	9/28/2010	11:06:55	82.1
1	9/28/2010	11:07:55	81.7
1	9/28/2010	11:08:54	80.6
1	9/28/2010	11:09:55	79.3
1	9/28/2010	11:10:54	77.7
1	9/28/2010	11:11:55	76.4
1	9/28/2010	11:12:54	77.2
1	9/28/2010	11:13:55	78.2
1	9/28/2010	11:14:55	78.2
1	9/28/2010	11:15:54	77.6
1	9/28/2010	11:16:55	78.5
1	9/28/2010	11:17:54	86.1
1	9/28/2010	11:18:55	78
1	9/28/2010	11:19:54	76.4
1	9/28/2010	11:20:55	80.9
1	9/28/2010	11:21:55	77.7
1	9/28/2010	11:22:54	75.7
1	9/28/2010	11:23:55	76.1

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm
1	9/28/2010	11:24:54	76.9
1	9/28/2010	11:25:55	76.3
1	9/28/2010	11:26:54	77.6
1	9/28/2010	11:27:55	76.3
1	9/28/2010	11:28:55	75.4
1	9/28/2010	11:29:54	75.4
1	9/28/2010	11:30:55	75
1	9/28/2010	11:31:54	76.8
1	9/28/2010	11:32:55	78.3
1	9/28/2010	11:33:54	79.5
1	9/28/2010	11:34:55	76.7
1	9/28/2010	11:35:55	75.4
1	9/28/2010	11:36:54	75
1	9/28/2010	11:37:55	74.6
1	9/28/2010	11:38:54	80.3
1	9/28/2010	11:39:55	75.5
1	9/28/2010	11:40:54	75.1
1	9/28/2010	11:41:55	76.4
1	9/28/2010	11:42:55	76.9
1	9/28/2010	11:43:54	75.9
1	9/28/2010	11:44:55	75.7
1	9/28/2010	11:45:54	74.3
1	9/28/2010	11:46:55	73.6
1	9/28/2010	11:47:54	73.8
1	9/28/2010	11:48:54	75.1
1	9/28/2010	11:49:55	75.2
1	9/28/2010	11:50:54	75.4
1	9/28/2010	11:51:55	76.2
1	9/28/2010	11:52:54	75.9
1	9/28/2010	11:53:55	77
1	9/28/2010	11:54:55	76.5
1	9/28/2010	11:55:54	73.9
1	9/28/2010	11:56:55	72
1	9/28/2010	11:57:54	71.3
1	9/28/2010	11:58:55	71
1	9/28/2010	11:59:54	72.4

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm
1	9/28/2010	12:00:55	74.9
1	9/28/2010	12:01:55	75.6
1	9/28/2010	12:02:54	75.7
1	9/28/2010	12:03:55	74.6
1	9/28/2010	12:04:54	73.1
1	9/28/2010	12:05:55	73.4
1	9/28/2010	12:06:54	73.1
1	9/28/2010	12:07:55	69.5
1	9/28/2010	12:08:55	72.5
1	9/28/2010	12:09:54	73.6
1	9/28/2010	12:10:55	73.3
1	9/28/2010	12:11:54	72.7
1	9/28/2010	12:12:55	71.9
1	9/28/2010	12:13:54	72.4
1	9/28/2010	12:14:55	73.7
1	9/28/2010	12:15:55	73.4
1	9/28/2010	12:16:54	71.5
1	9/28/2010	12:17:55	71.4
1	9/28/2010	12:18:54	70.8
1	9/28/2010	12:19:55	68.7
1	9/28/2010	12:20:54	69.5
1	9/28/2010	12:21:55	70.1
1	9/28/2010	12:22:55	69.4
1	9/28/2010	12:23:54	69.4
1	9/28/2010	12:24:55	67.7
1	9/28/2010	12:25:54	64.8
1	9/28/2010	12:26:55	64.6
1	9/28/2010	12:27:55	65
1	9/28/2010	12:28:54	64.8
1	9/28/2010	12:29:55	64.9
1	9/28/2010	12:30:54	65.8
1	9/28/2010	12:31:55	66.6
1	9/28/2010	12:32:54	71.2
1	9/28/2010	12:33:55	68.4
1	9/28/2010	12:34:55	68.6
1	9/28/2010	12:35:54	67.9

ASCEND MATERIALS

Cantonment, Florida

VOC ppm Values

Method 25A

Run	Date	Time	TRU INLET THC ppm	
1	9/28/2010	12:36:55	66.6	
1	9/28/2010	12:37:54	65.5	
1	9/28/2010	12:38:55	64.6	
1	9/28/2010	12:39:54	65	
1	9/28/2010	12:40:55	64.9	
1	9/28/2010	12:41:55	64.5	
1	9/28/2010	12:42:54	66	
1	9/28/2010	12:43:55	64.2	
1	9/28/2010	12:44:54	64.9	
1	9/28/2010	12:45:55	64.8	
1	9/28/2010	12:46:54	282.3	
1	9/28/2010	12:47:55	721.6	
2	9/28/2010	12:48:55	726.3	start run 2
2	9/28/2010	12:49:54	727.9	
2	9/28/2010	12:50:55	728.5	
2	9/28/2010	12:51:54	729.4	
2	9/28/2010	12:52:55	729.6	
2	9/28/2010	12:53:54	730.6	
2	9/28/2010	12:54:55	729.3	
2	9/28/2010	12:55:55	729.8	
2	9/28/2010	12:56:54	717.7	
2	9/28/2010	12:57:55	728	
2	9/28/2010	12:58:54	725.9	
2	9/28/2010	12:59:55	726.5	
2	9/28/2010	13:00:54	723.9	
2	9/28/2010	13:01:54	725.1	
2	9/28/2010	13:02:55	726	
2	9/28/2010	13:03:54	726.7	
2	9/28/2010	13:04:55	728	
2	9/28/2010	13:05:54	729.3	
2	9/28/2010	13:06:55	730	
2	9/28/2010	13:07:54	729.7	
2	9/28/2010	13:08:54	728.5	
2	9/28/2010	13:09:55	728.1	
2	9/28/2010	13:10:54	728.2	
2	9/28/2010	13:11:55	727.7	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm	
2	9/28/2010	13:12:54	730.3	
2	9/28/2010	13:13:55	731.2	
2	9/28/2010	13:14:55	731.5	
2	9/28/2010	13:15:54	731.3	
2	9/28/2010	13:16:55	730.3	
2	9/28/2010	13:17:54	728.4	
2	9/28/2010	13:18:55	728.2	
2	9/28/2010	13:19:54	727.8	
2	9/28/2010	13:20:55	727	
2	9/28/2010	13:21:55	726.7	
2	9/28/2010	13:22:54	727.4	
2	9/28/2010	13:23:55	730.4	
2	9/28/2010	13:24:54	730.1	
2	9/28/2010	13:25:55	729.8	
2	9/28/2010	13:26:54	728.6	
2	9/28/2010	13:27:55	729	
2	9/28/2010	13:28:55	729.5	
2	9/28/2010	13:29:54	727.6	
2	9/28/2010	13:30:55	727.3	
2	9/28/2010	13:31:54	726.1	
2	9/28/2010	13:32:55	724.7	
2	9/28/2010	13:33:54	723.8	
2	9/28/2010	13:34:55	725.4	
2	9/28/2010	13:35:55	727.3	
2	9/28/2010	13:36:54	729.7	
2	9/28/2010	13:37:55	730.8	
2	9/28/2010	13:38:54	732.2	
2	9/28/2010	13:39:55	732.2	
2	9/28/2010	13:40:54	731.9	
2	9/28/2010	13:41:55	732.7	
2	9/28/2010	13:42:55	733	
2	9/28/2010	13:43:54	734.1	
2	9/28/2010	13:44:55	734.3	
2	9/28/2010	13:45:54	733.8	
2	9/28/2010	13:46:55	734.6	
2	9/28/2010	13:47:55	734.7	end run 2

ASCEND MATERIALS

Cantonment, Florida

VOC ppm Values

Method 25A

	Run	Date	Time	TRU INLET THC ppm	
Average	Run 2			728.9066667	
	2	9/28/2010	13:48:54	735.2	
	2	9/28/2010	13:49:55	734.9	
	2	9/28/2010	13:50:54	544.5	
	2	9/28/2010	13:51:55	493.1	
	2	9/28/2010	13:52:54	61.7	
	2	9/28/2010	13:53:55	194	
	2	9/28/2010	13:54:55	243.9	
	2	9/28/2010	13:55:54	152.8	run 2 cal
	2	9/28/2010	13:56:55	156.3	
	2	9/28/2010	13:57:54	158.5	
	2	9/28/2010	13:58:55	162.8	
	2	9/28/2010	13:59:54	155.1	
	2	9/28/2010	14:00:55	151.2	
	2	9/28/2010	14:01:55	151.2	
	2	9/28/2010	14:02:54	153.5	
	2	9/28/2010	14:03:55	152	
	2	9/28/2010	14:04:54	126	
	2	9/28/2010	14:05:55	3.2	zero
	2	9/28/2010	14:06:54	40.2	
	2	9/28/2010	14:07:55	873.3	
	2	9/28/2010	14:08:55	939.4	
	2	9/28/2010	14:09:54	953.5	high
	2	9/28/2010	14:10:55	249.1	
	2	9/28/2010	14:11:54	103.8	
	2	9/28/2010	14:12:55	83.2	
	2	9/28/2010	14:13:54	74	
	2	9/28/2010	14:14:55	72.7	
	2	9/28/2010	14:15:55	71.6	
	2	9/28/2010	14:16:54	74	
	2	9/28/2010	14:17:55	73.8	
	2	9/28/2010	14:18:54	73.3	
	2	9/28/2010	14:19:55	75.3	
	2	9/28/2010	14:20:55	76.5	
	2	9/28/2010	14:21:54	76.7	
	2	9/28/2010	14:22:55	74	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm
2	9/28/2010	14:23:54	71.6
2	9/28/2010	14:24:55	70.2
2	9/28/2010	14:25:54	71.2
2	9/28/2010	14:26:55	72
2	9/28/2010	14:27:55	73.7
2	9/28/2010	14:28:54	73.9
2	9/28/2010	14:29:55	73.5
2	9/28/2010	14:30:54	76.6
2	9/28/2010	14:31:55	77.8
2	9/28/2010	14:32:54	79
2	9/28/2010	14:33:55	76.7
2	9/28/2010	14:34:55	78.6
2	9/28/2010	14:35:54	78.8
2	9/28/2010	14:36:55	76.9
2	9/28/2010	14:37:54	76.6
2	9/28/2010	14:38:55	75.8
2	9/28/2010	14:39:54	75.4
2	9/28/2010	14:40:55	77.8
2	9/28/2010	14:41:55	75.2
2	9/28/2010	14:42:54	76
2	9/28/2010	14:43:55	441.4
2	9/28/2010	14:44:54	687.1
2	9/28/2010	14:45:55	704.2
2	9/28/2010	14:46:54	707.1
2	9/28/2010	14:47:55	707
2	9/28/2010	14:48:55	709.3
2	9/28/2010	14:49:54	709.1
2	9/28/2010	14:50:55	709.4
2	9/28/2010	14:51:54	712.6
2	9/28/2010	14:52:55	713.2
2	9/28/2010	14:53:54	708.7
2	9/28/2010	14:54:55	709.1
2	9/28/2010	14:55:55	710.8
2	9/28/2010	14:56:54	711.8
2	9/28/2010	14:57:55	712.1
2	9/28/2010	14:58:54	712.8

ASCEND MATERIALS

Cantonment, Florida

VOC ppm Values

Method 25A

Run	Date	Time	TRU INLET THC ppm	
2	9/28/2010	14:59:55	714.6	
2	9/28/2010	15:00:54	714.1	
2	9/28/2010	15:01:55	716.3	
2	9/28/2010	15:02:55	716.2	
2	9/28/2010	15:03:54	716.2	
2	9/28/2010	15:04:55	716.6	
2	9/28/2010	15:05:54	716.6	
2	9/28/2010	15:06:55	716.4	
2	9/28/2010	15:07:54	716.8	
2	9/28/2010	15:08:54	717.2	
2	9/28/2010	15:09:55	717.1	
2	9/28/2010	15:10:54	717	
2	9/28/2010	15:11:55	716.8	
2	9/28/2010	15:12:54	718.3	
2	9/28/2010	15:13:55	716.9	
3	9/28/2010	15:14:55	717.4	start run 3
3	9/28/2010	15:15:54	720.5	
3	9/28/2010	15:16:55	723.1	
3	9/28/2010	15:17:54	722.3	
3	9/28/2010	15:18:55	718.6	
3	9/28/2010	15:19:54	709.7	
3	9/28/2010	15:20:55	704.2	
3	9/28/2010	15:21:55	707.6	
3	9/28/2010	15:22:54	699.4	
3	9/28/2010	15:23:55	710.4	
3	9/28/2010	15:24:54	705.7	
3	9/28/2010	15:25:55	707.8	
3	9/28/2010	15:26:54	710.2	
3	9/28/2010	15:27:55	709.4	
3	9/28/2010	15:28:55	708.5	
3	9/28/2010	15:29:54	713.7	
3	9/28/2010	15:30:55	710.2	
3	9/28/2010	15:31:54	708.3	
3	9/28/2010	15:32:55	706.6	
3	9/28/2010	15:33:54	706.3	
3	9/28/2010	15:34:55	707.3	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Run	Date	Time	TRU INLET THC ppm
3	9/28/2010	15:35:55	707.6
3	9/28/2010	15:36:54	709.1
3	9/28/2010	15:37:55	709.5
3	9/28/2010	15:38:54	709.6
3	9/28/2010	15:39:55	709.1
3	9/28/2010	15:40:55	707.8
3	9/28/2010	15:41:54	706.2
3	9/28/2010	15:42:55	707
3	9/28/2010	15:43:54	706.5
3	9/28/2010	15:44:55	704.6
3	9/28/2010	15:45:54	704.1
3	9/28/2010	15:46:55	705.9
3	9/28/2010	15:47:55	704.8
3	9/28/2010	15:48:54	704.2
3	9/28/2010	15:49:55	704.9
3	9/28/2010	15:50:54	706.7
3	9/28/2010	15:51:55	705.6
3	9/28/2010	15:52:54	706.2
3	9/28/2010	15:53:55	706.1
3	9/28/2010	15:54:55	705.6
3	9/28/2010	15:55:54	705.1
3	9/28/2010	15:56:55	703.4
3	9/28/2010	15:57:54	701.9
3	9/28/2010	15:58:55	700.5
3	9/28/2010	15:59:54	701.7
3	9/28/2010	16:00:55	701.2
3	9/28/2010	16:01:55	701.5
3	9/28/2010	16:02:54	701.3
3	9/28/2010	16:03:55	700.8
3	9/28/2010	16:04:54	701.4
3	9/28/2010	16:05:55	702.1
3	9/28/2010	16:06:54	702
3	9/28/2010	16:07:55	702
3	9/28/2010	16:08:55	701.2
3	9/28/2010	16:09:54	701.2
3	9/28/2010	16:10:55	700.3

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

	Run	Date	Time	TRU INLET THC ppm	
	3	9/28/2010	16:11:54	701.7	
	3	9/28/2010	16:12:55	703.6	
	3	9/28/2010	16:13:54	700.6	end run 3
Average	**Run 3**			**706.53**	
	3	9/28/2010	16:14:55	678.9	
	3	9/28/2010	16:15:55	791.5	run 3 cal
	3	9/28/2010	16:16:54	942.6	
	3	9/28/2010	16:17:55	948.2	high
	3	9/28/2010	16:18:54	7.4	
	3	9/28/2010	16:19:55	3	zero
	3	9/28/2010	16:20:54	111.5	
	3	9/28/2010	16:21:54	120.5	
	3	9/28/2010	16:22:55	91.2	
	3	9/28/2010	16:23:54	76.3	
	3	9/28/2010	16:24:55	69.3	
	3	9/28/2010	16:25:54	69.9	
	3	9/28/2010	16:26:55	72.5	
	3	9/28/2010	16:27:55	74.4	
	3	9/28/2010	16:28:54	75.3	
	3	9/28/2010	16:29:55	75.6	
	3	9/28/2010	16:30:54	77.6	
	3	9/28/2010	16:31:55	81	
	3	9/28/2010	16:32:54	81.8	
	3	9/28/2010	16:33:55	82.4	
	3	9/28/2010	16:34:55	82.1	
	3	9/28/2010	16:35:54	81.3	
	3	9/28/2010	16:36:55	81.6	
	3	9/28/2010	16:37:54	82.6	
	3	9/28/2010	16:38:55	83.6	
	3	9/28/2010	16:39:54	83.2	

Test Run 1 End

Test Run 1 Begin. STRATA Version 1.2
Operator: Gabby Smith

APPENDIX K.2

VOC RAW DATA

TRU OUTLET AND HALCON

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
9/28/2010 7:12	7.5	36.0	
9/28/2010 7:13	-0.5	14409.4	
9/28/2010 7:14	1.4	14681.6	initial high
9/28/2010 7:15	1.8	14301.7	
9/28/2010 7:16	1.1	7908.4	
9/28/2010 7:17	2.5	8422.3	
9/28/2010 7:18	1.1	8440.4	
9/28/2010 7:19	1.7	8451.7	initial mid
9/28/2010 7:20	-0.1	4956.9	initial low
9/28/2010 7:21	0	4956.5	
9/28/2010 7:22	1.7	4951.7	
9/28/2010 7:23	1.8	3.0	initial zero
9/28/2010 7:24	-0.9	0.9	
9/28/2010 7:25	-0.9	4.6	
9/28/2010 7:26	-0.6	4.8	
9/28/2010 7:27	0.1	1.1	
9/28/2010 7:28	-1.2	0.1	
9/28/2010 7:29	-1.3	1.3	
9/28/2010 7:30	0.2	0.8	
9/28/2010 7:31	0.2	0.6	
9/28/2010 7:32	49	-0.4	
9/28/2010 7:33	50.4	0.0	
9/28/2010 7:34	50.4	0.8	
9/28/2010 7:35	0.6	0.5	
9/28/2010 7:36	0.3	0.3	
9/28/2010 7:37	0.3	0.4	initial zero
9/28/2010 7:38	50.1	0.6	
9/28/2010 7:39	50.4	0.4	
9/28/2010 7:40	50.4	0.6	initial high
9/28/2010 7:41	50.5	0.9	
9/28/2010 7:42	30.6	1.3	
9/28/2010 7:43	29.5	-0.4	initial mid
9/28/2010 7:44	3.2	0.9	
9/28/2010 7:45	32.2	1.2	
9/28/2010 7:46	29.4	0.9	
9/28/2010 7:47	21.2	0.8	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
9/28/2010 7:48	15	0.5	initial low
9/28/2010 7:49	15	0.6	
9/28/2010 7:50	14.9	-0.4	
9/28/2010 7:51	15	1.3	
9/28/2010 7:52	0.4	1.2	
9/28/2010 7:53	0.3	1.3	
9/28/2010 7:54	0.3	0.5	
9/28/2010 7:55	1.8	118.0	
9/28/2010 7:56	1.8	37.5	
9/28/2010 7:57	144.4	8279.1	
9/28/2010 7:58	144.4	8479.1	
9/28/2010 7:59	144.4	13.8	
9/28/2010 8:00	140	3.2	
9/28/2010 8:01	6.7	-8.6	
9/28/2010 8:02	3.1	1.3	
9/28/2010 8:03	2	1.1	
9/28/2010 8:04	1.4	0.5	
9/28/2010 8:05	15.8	0.8	
9/28/2010 8:06	14.9	0.0	
9/28/2010 8:07	14.9	0.3	
9/28/2010 8:08	0.7	4.2	
9/28/2010 8:09	0.1	4.0	
9/28/2010 8:10	0.7	4.1	
9/28/2010 8:11	1.3	4.5	
9/28/2010 8:12	1.7	4.0	
9/28/2010 8:13	1.5	4.8	
9/28/2010 8:14	1.1	27.5	
9/28/2010 8:15	1.9	8668.3	
9/28/2010 8:16	1.1	8673.7	
9/28/2010 8:17	1.2	8693.0	
9/28/2010 8:18	1.5	8687.6	
9/28/2010 8:19	2	8687.4	
9/28/2010 8:20	1	8651.5	
9/28/2010 8:21	1.1	8665.6	
9/28/2010 8:22	1	8672.4	
9/28/2010 8:23	1.6	8661.3	

ASCEND MATERIALS

Cantonment, Florida

VOC ppm Values

Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
9/28/2010 8:24	3.9	8658.6	
9/28/2010 8:25	1.8	8690.0	
9/28/2010 8:26	1	8685.5	
9/28/2010 8:27	0.9	8660.1	
9/28/2010 8:28	0.9	8668.7	
9/28/2010 8:29	2	8690.5	
9/28/2010 8:30	2.4	8705.2	start run 1
9/28/2010 8:31	2.7	8707.5	
9/28/2010 8:32	4	8684.5	
9/28/2010 8:33	4.6	8700.3	
9/28/2010 8:34	5.6	8704.4	
9/28/2010 8:35	10.8	8669.1	
9/28/2010 8:36	9.9	8667.2	
9/28/2010 8:37	8	8672.2	
9/28/2010 8:38	6.7	8700.9	
9/28/2010 8:39	6.2	8685.4	
9/28/2010 8:40	5.6	8674.6	
9/28/2010 8:41	5.1	8685.6	
9/28/2010 8:42	4.3	8709.1	
9/28/2010 8:43	4.1	8697.0	
9/28/2010 8:44	4.4	8734.8	
9/28/2010 8:45	4.1	8707.3	
9/28/2010 8:46	6.5	8729.6	
9/28/2010 8:47	6.2	8725.0	
9/28/2010 8:48	5.1	8710.1	
9/28/2010 8:49	4.1	8694.6	
9/28/2010 8:50	4.6	8723.7	
9/28/2010 8:51	4.4	8720.5	
9/28/2010 8:52	3.8	8700.7	
9/28/2010 8:53	4.1	8724.9	
9/28/2010 8:54	5.8	8711.2	
9/28/2010 8:55	5.2	8714.3	
9/28/2010 8:56	4.8	8711.2	
9/28/2010 8:57	5.3	8697.9	
9/28/2010 8:58	4.8	8723.0	
9/28/2010 8:59	4.6	8723.0	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

	Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
	9/28/2010 9:00	3.9	8702.8	
	9/28/2010 9:01	4.3	8727.3	
	9/28/2010 9:02	3.5	8735.9	
	9/28/2010 9:03	3.9	8742.8	
	9/28/2010 9:04	3.6	8766.6	
	9/28/2010 9:05	3.7	8793.9	
	9/28/2010 9:06	3.5	8788.6	
	9/28/2010 9:07	3.3	8841.3	
	9/28/2010 9:08	3.6	8838.1	
	9/28/2010 9:09	3.2	8834.8	
	9/28/2010 9:10	3.4	8839.7	
	9/28/2010 9:11	3.3	8844.6	
	9/28/2010 9:12	3.2	8850.9	
	9/28/2010 9:13	3.2	8860.8	
	9/28/2010 9:14	3.5	8857.9	
	9/28/2010 9:15	3.6	8874.5	
	9/28/2010 9:16	3.4	8857.6	
	9/28/2010 9:17	3.1	8866.5	
	9/28/2010 9:18	3.8	8862.0	
	9/28/2010 9:19	3.7	8863.9	
	9/28/2010 9:20	3.3	8866.0	
	9/28/2010 9:21	3	8867.0	
	9/28/2010 9:22	3.2	8872.7	
	9/28/2010 9:23	3.8	8896.0	
	9/28/2010 9:24	2.8	8866.4	
	9/28/2010 9:25	2.6	8887.5	
	9/28/2010 9:26	2.6	8893.1	
	9/28/2010 9:27	2.5	8884.5	
	9/28/2010 9:28	2.9	8878.1	
	9/28/2010 9:29	2.9	8843.0	end run 1
Average: Run 1		**4.320861111**	**8770.8**	
	9/28/2010 9:30	2.8	8854.4	
	9/28/2010 9:31	2.4	8862.7	
	9/28/2010 9:32	2.3	8875.5	
	9/28/2010 9:33	2.4	8893.5	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
9/28/2010 9:34	2.2	8905.7	
9/28/2010 9:35	0.4	8903.5	
9/28/2010 9:36	0.3	8924.0	run 1 cal
9/28/2010 9:37	0	8946.7	zero
9/28/2010 9:38	10.5	8940.3	
9/28/2010 9:39	13.9	8958.6	
9/28/2010 9:40	14.7	8965.6	
9/28/2010 9:41	14.8	8973.3	
9/28/2010 9:42	15	8956.8	low
9/28/2010 9:43	0.8	723.8	
9/28/2010 9:44	1.9	21.1	
9/28/2010 9:45	2.3	14.0	Zero
9/28/2010 9:46	2	8488.2	
9/28/2010 9:47	2.2	8488.0	Mid Cal
9/28/2010 9:48	2.2	8497.8	
9/28/2010 9:49	1.9	8514.1	
9/28/2010 9:50	1.8	184.1	
9/28/2010 9:51	1.8	6775.5	
9/28/2010 9:52	2.7	8961.4	
9/28/2010 9:53	2.7	8949.3	
9/28/2010 9:54	1.5	8932.8	
9/28/2010 9:55	1.9	8956.2	
9/28/2010 9:56	1.4	8968.8	
9/28/2010 9:57	1.1	8972.3	
9/28/2010 9:58	1.2	8950.2	
9/28/2010 9:59	1.8	8939.4	
9/28/2010 10:00	1.3	8951.0	
9/28/2010 10:01	0.9	8959.8	
9/28/2010 10:02	1.3	8982.9	
9/28/2010 10:03	1	8953.0	
9/28/2010 10:04	0.9	8968.0	
9/28/2010 10:05	1.4	8986.8	
9/28/2010 10:06	1.1	8995.0	
9/28/2010 10:07	0.8	8954.5	
9/28/2010 10:08	1	8977.3	
9/28/2010 10:09	1.1	9005.5	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm
9/28/2010 10:10	0.9	8954.9
9/28/2010 10:11	1	8992.0
9/28/2010 10:12	0.9	8991.5
9/28/2010 10:13	0.9	9005.6
9/28/2010 10:14	1	8981.5
9/28/2010 10:15	1	8981.8
9/28/2010 10:16	1	9003.5
9/28/2010 10:17	1.2	8998.0
9/28/2010 10:18	1.2	8985.1
9/28/2010 10:19	1.1	9018.3
9/28/2010 10:20	0.7	9027.6
9/28/2010 10:21	0.5	9011.5
9/28/2010 10:22	0.6	9016.6
9/28/2010 10:23	0.6	9017.5
9/28/2010 10:24	0.4	9011.0
9/28/2010 10:25	0.5	9005.2
9/28/2010 10:26	0.4	8996.5
9/28/2010 10:27	0.3	8967.4
9/28/2010 10:28	0.4	8971.3
9/28/2010 10:29	0.3	8971.5
9/28/2010 10:30	0.3	8992.7
9/28/2010 10:31	0.4	8936.4
9/28/2010 10:32	0.4	8931.2
9/28/2010 10:33	0.3	8952.4
9/28/2010 10:34	0.4	8947.1
9/28/2010 10:35	1.1	8920.3
9/28/2010 10:36	1.1	8917.5
9/28/2010 10:37	1	8907.8
9/28/2010 10:38	1.1	8932.9
9/28/2010 10:39	1.1	8944.3
9/28/2010 10:40	0.2	8917.9
9/28/2010 10:41	0.3	8881.5
9/28/2010 10:42	15.4	8896.8
9/28/2010 10:43	15.1	8892.1
9/28/2010 10:44	15.4	8930.1
9/28/2010 10:45	0.6	8915.2

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm
9/28/2010 10:46	0.5	8919.7
9/28/2010 10:47	0.9	8937.5
9/28/2010 10:48	1.1	8949.9
9/28/2010 10:49	1.1	8957.3
9/28/2010 10:50	1.3	8941.9
9/28/2010 10:51	1.2	8965.8
9/28/2010 10:52	1	8998.3
9/28/2010 10:53	1	9031.1
9/28/2010 10:54	0.9	8998.6
9/28/2010 10:55	0.8	8947.9
9/28/2010 10:56	0.7	8966.2
9/28/2010 10:57	0.7	8956.9
9/28/2010 10:58	0.6	8976.9
9/28/2010 10:59	0.7	8981.0
9/28/2010 11:00	0.8	9002.6
9/28/2010 11:01	1	9000.5
9/28/2010 11:02	0.9	8985.3
9/28/2010 11:03	1	9007.4
9/28/2010 11:04	0.9	9008.2
9/28/2010 11:05	0.8	9009.5
9/28/2010 11:06	0.8	8987.9
9/28/2010 11:07	0.9	8975.2
9/28/2010 11:08	0.8	8960.9
9/28/2010 11:09	0.8	8988.0
9/28/2010 11:10	0.8	8973.6
9/28/2010 11:11	0.8	8981.7
9/28/2010 11:12	0.8	8999.3
9/28/2010 11:13	0.8	8981.1
9/28/2010 11:14	0.8	8974.3
9/28/2010 11:15	0.8	8994.7
9/28/2010 11:16	0.8	8993.4
9/28/2010 11:17	0.8	8972.5
9/28/2010 11:18	0.9	8974.9
9/28/2010 11:19	0.8	8979.4
9/28/2010 11:20	0.7	8979.2
9/28/2010 11:21	0.7	8975.0

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
9/28/2010 11:22	0.6	8961.6	
9/28/2010 11:23	0.6	8993.5	
9/28/2010 11:24	0.6	8993.4	
9/28/2010 11:25	0.6	8976.0	
9/28/2010 11:26	0.5	8964.9	
9/28/2010 11:27	0.6	8977.5	
9/28/2010 11:28	0.6	8967.4	
9/28/2010 11:29	0.5	8964.2	
9/28/2010 11:30	0.5	8989.4	
9/28/2010 11:31	0.5	8977.1	
9/28/2010 11:32	0.5	8958.7	
9/28/2010 11:33	0.6	8971.5	
9/28/2010 11:34	0.6	8998.5	
9/28/2010 11:35	0.5	8970.5	
9/28/2010 11:36	0.6	8965.3	
9/28/2010 11:37	0.6	8988.9	
9/28/2010 11:38	0.5	8994.3	
9/28/2010 11:39	0.6	9011.5	
9/28/2010 11:40	0.5	8986.4	
9/28/2010 11:41	0.5	8963.5	
9/28/2010 11:42	0.5	8979.4	
9/28/2010 11:43	0.6	8982.1	
9/28/2010 11:44	0.6	8948.3	
9/28/2010 11:45	0.5	8935.9	start run 2
9/28/2010 11:46	0.5	8908.3	
9/28/2010 11:47	0.5	8945.4	
9/28/2010 11:48	0.5	8955.9	
9/28/2010 11:49	0.5	8930.8	
9/28/2010 11:50	0.5	8941.3	
9/28/2010 11:51	0.5	8933.9	
9/28/2010 11:52	0.5	8949.6	
9/28/2010 11:53	0.5	8941.6	
9/28/2010 11:54	0.5	8959.6	
9/28/2010 11:55	0.4	8915.3	
9/28/2010 11:56	0.5	8927.0	
9/28/2010 11:57	0.4	8939.3	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm
9/28/2010 11:58	0.5	8977.8
9/28/2010 11:59	0.4	8946.0
9/28/2010 12:00	0.6	8937.1
9/28/2010 12:01	0.5	8970.0
9/28/2010 12:02	0.9	8979.7
9/28/2010 12:03	0.4	8941.2
9/28/2010 12:04	0.3	8966.5
9/28/2010 12:05	1.5	8978.2
9/28/2010 12:06	1.5	8972.2
9/28/2010 12:07	1.5	8973.6
9/28/2010 12:08	1.5	8972.7
9/28/2010 12:09	1.4	8967.8
9/28/2010 12:10	1.4	8930.1
9/28/2010 12:11	1.5	8961.4
9/28/2010 12:12	1.5	8975.3
9/28/2010 12:13	1.5	8982.4
9/28/2010 12:14	1.5	8992.7
9/28/2010 12:15	1.4	8976.7
9/28/2010 12:16	1.4	8957.3
9/28/2010 12:17	1.5	8945.2
9/28/2010 12:18	1.4	8950.4
9/28/2010 12:19	1.3	8929.9
9/28/2010 12:20	1.3	8947.9
9/28/2010 12:21	1.4	8941.5
9/28/2010 12:22	1.4	8913.0
9/28/2010 12:23	1.4	8917.1
9/28/2010 12:24	1.4	8949.3
9/28/2010 12:25	1.3	8910.5
9/28/2010 12:26	1.4	8903.5
9/28/2010 12:27	1.3	8898.1
9/28/2010 12:28	1.4	8925.6
9/28/2010 12:29	1.5	8900.0
9/28/2010 12:30	1.5	8897.4
9/28/2010 12:31	1.7	8893.5
9/28/2010 12:32	1.5	8929.0
9/28/2010 12:33	1.4	8899.4

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

	Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
	9/28/2010 12:34	1.4	8890.5	
	9/28/2010 12:35	1.4	8875.7	
	9/28/2010 12:36	1.4	8889.4	
	9/28/2010 12:37	1.4	8897.1	
	9/28/2010 12:38	1.3	8865.2	
	9/28/2010 12:39	1.4	8871.0	
	9/28/2010 12:40	1.3	8872.6	
	9/28/2010 12:41	1.3	8889.4	
	9/28/2010 12:42	1.3	8864.8	
	9/28/2010 12:43	1.4	8882.3	
	9/28/2010 12:44	1.3	8872.4	end run 2
Average Run 2		**1.13175**	**8931.0**	
	9/28/2010 12:45	1.3	8872.9	
	9/28/2010 12:46	1.3	8863.8	
	9/28/2010 12:47	1.3	8856.2	
	9/28/2010 12:48	1.3	8855.4	
	9/28/2010 12:49	0.6	8855.6	
	9/28/2010 12:50	0.4	8845.2	Zero
	9/28/2010 12:51	0.5	8839.7	
	9/28/2010 12:52	0.5	8856.2	
	9/28/2010 12:53	15.5	8875.5	
	9/28/2010 12:54	15.4	8866.7	Low cal
	9/28/2010 12:55	15.4	8862.0	
	9/28/2010 12:56	15.5	8851.2	
	9/28/2010 12:57	1.9	8878.7	
	9/28/2010 12:58	2.7	72.6	
	9/28/2010 12:59	2.7	23.8	
	9/28/2010 13:00	2.8	17.9	
	9/28/2010 13:01	2.7	14.3	Zero
	9/28/2010 13:02	2.7	8418.9	
	9/28/2010 13:03	2.8	8417.7	
	9/28/2010 13:04	2.7	8439.5	Mid Cal
	9/28/2010 13:05	2.7	8424.9	
	9/28/2010 13:06	2.1	8769.1	
	9/28/2010 13:07	1.4	8802.4	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm
9/28/2010 13:08	1.6	8808.6
9/28/2010 13:09	1.3	8783.1
9/28/2010 13:10	1.2	8799.8
9/28/2010 13:11	1.2	8807.9
9/28/2010 13:12	1.5	8818.4
9/28/2010 13:13	1.4	8782.6
9/28/2010 13:14	1.2	8782.8
9/28/2010 13:15	1.1	8765.1
9/28/2010 13:16	1	8774.9
9/28/2010 13:17	0.9	8779.3
9/28/2010 13:18	0.9	8761.4
9/28/2010 13:19	0.9	8758.8
9/28/2010 13:20	0.8	8770.1
9/28/2010 13:21	0.8	8780.7
9/28/2010 13:22	0.9	8738.6
9/28/2010 13:23	0.9	8708.3
9/28/2010 13:24	0.9	8713.0
9/28/2010 13:25	0.9	8752.3
9/28/2010 13:26	1	8741.7
9/28/2010 13:27	1	8718.2
9/28/2010 13:28	0.9	8728.2
9/28/2010 13:29	1	8747.3
9/28/2010 13:30	1	8749.1
9/28/2010 13:31	1	8771.9
9/28/2010 13:32	1.1	8751.4
9/28/2010 13:33	1.3	8732.6
9/28/2010 13:34	1.3	8712.6
9/28/2010 13:35	1.4	8733.3
9/28/2010 13:36	1.4	8727.8
9/28/2010 13:37	1.4	8704.2
9/28/2010 13:38	1.4	8704.9
9/28/2010 13:39	1.4	8734.6
9/28/2010 13:40	1.3	8735.4
9/28/2010 13:41	1.2	8695.5
9/28/2010 13:42	1.2	8710.9
9/28/2010 13:43	1.2	8729.4

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
9/28/2010 13:44	1.3	8724.3	
9/28/2010 13:45	1.3	8725.6	
9/28/2010 13:46	1.2	8701.1	
9/28/2010 13:47	1.2	8737.1	
9/28/2010 13:48	1.2	8730.9	
9/28/2010 13:49	1.2	8730.4	
9/28/2010 13:50	1.3	8714.9	
9/28/2010 13:51	1.3	8695.2	
9/28/2010 13:52	1.3	8726.2	
9/28/2010 13:53	1.3	8703.1	
9/28/2010 13:54	1.2	8706.3	
9/28/2010 13:55	1.2	8695.0	
9/28/2010 13:56	1.2	8703.4	
9/28/2010 13:57	1.3	8706.4	
9/28/2010 13:58	1.3	8707.0	
9/28/2010 13:59	1.3	8678.2	
9/28/2010 14:00	1.3	8686.1	
9/28/2010 14:01	1.3	8684.7	
9/28/2010 14:02	1.3	8690.6	
9/28/2010 14:03	1.3	8655.0	
9/28/2010 14:04	1.3	8678.5	
9/28/2010 14:05	1.3	8659.4	
9/28/2010 14:06	1.4	8692.7	
9/28/2010 14:07	1.6	8680.3	
9/28/2010 14:08	1.4	8697.3	
9/28/2010 14:09	1.3	8677.1	
9/28/2010 14:10	1.2	8677.6	
9/28/2010 14:11	1.3	8687.7	
9/28/2010 14:12	2.5	8698.7	
9/28/2010 14:13	1.2	8670.3	
9/28/2010 14:14	1.2	8686.1	
9/28/2010 14:15	1.2	8683.9	start run 3
9/28/2010 14:16	1.2	8705.1	
9/28/2010 14:17	1.3	8690.9	
9/28/2010 14:18	1.3	8671.6	
9/28/2010 14:19	1.3	8695.0	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm
9/28/2010 14:20	1.3	8686.0
9/28/2010 14:21	1.3	8704.8
9/28/2010 14:22	1.3	8709.5
9/28/2010 14:23	1.3	8695.4
9/28/2010 14:24	1.3	8671.3
9/28/2010 14:25	1.4	8706.4
9/28/2010 14:26	1.3	8719.4
9/28/2010 14:27	1.3	8696.2
9/28/2010 14:28	1.3	8695.6
9/28/2010 14:29	1.4	8705.9
9/28/2010 14:30	1.6	8714.5
9/28/2010 14:31	1.5	8715.7
9/28/2010 14:32	1.5	8682.9
9/28/2010 14:33	1.4	8672.5
9/28/2010 14:34	1.3	8685.0
9/28/2010 14:35	1.3	8652.0
9/28/2010 14:36	1.3	8649.1
9/28/2010 14:37	1.3	8649.3
9/28/2010 14:38	1.4	8630.9
9/28/2010 14:39	1.3	8644.5
9/28/2010 14:40	1.3	8628.2
9/28/2010 14:41	1.5	8651.4
9/28/2010 14:42	1.4	8628.3
9/28/2010 14:43	1.3	8585.7
9/28/2010 14:44	1.6	8601.5
9/28/2010 14:45	1.3	8625.7
9/28/2010 14:46	1.3	8616.8
9/28/2010 14:47	1.3	8614.4
9/28/2010 14:48	1.3	8638.4
9/28/2010 14:49	1.4	8628.3
9/28/2010 14:50	1.3	8669.5
9/28/2010 14:51	1.3	8656.4
9/28/2010 14:52	1.2	8674.4
9/28/2010 14:53	1.2	8683.6
9/28/2010 14:54	1.2	8679.4
9/28/2010 14:55	1.2	8698.5

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

	Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
	9/28/2010 14:56	1.3	8696.8	
	9/28/2010 14:57	1.3	8660.2	
	9/28/2010 14:58	1.3	8640.8	
	9/28/2010 14:59	1.2	8670.3	
	9/28/2010 15:00	1.3	8689.1	
	9/28/2010 15:01	1.2	8678.2	
	9/28/2010 15:02	1.2	8657.2	
	9/28/2010 15:03	1.2	8695.4	
	9/28/2010 15:04	1.2	8709.0	
	9/28/2010 15:05	1.2	8683.2	
	9/28/2010 15:06	1.2	8629.4	
	9/28/2010 15:07	1.2	8655.4	
	9/28/2010 15:08	1.2	8680.3	
	9/28/2010 15:09	1.2	8659.4	
	9/28/2010 15:10	1.2	8625.3	
	9/28/2010 15:11	1.2	8640.2	
	9/28/2010 15:12	1.1	8654.3	
	9/28/2010 15:13	1.1	8648.7	
	9/28/2010 15:14	1.1	8661.5	end run 3
Average Run 3		**1.29475**	**8666.1**	
	9/28/2010 15:15	1.1	8671.7	
	9/28/2010 15:16	1.1	8645.2	
	9/28/2010 15:17	1.1	8617.7	
	9/28/2010 15:18	1.2	8539.1	
	9/28/2010 15:18	1.1	1052.4	run 3 cal
	9/28/2010 15:19	1.1	43.4	
	9/28/2010 15:20	1.2	25.3	
	9/28/2010 15:21	1.2	20.7	
	9/28/2010 15:22	1.1	17.4	
	9/28/2010 15:22	1.2	8476.4	mid range
	9/28/2010 15:23	1.2	8485.3	
	9/28/2010 15:24	1.2	8493.3	
	9/28/2010 15:25	1.2	8496.9	
	9/28/2010 15:26	1.2	50.6	
	9/28/2010 15:27	1.2	8.5	

ASCEND MATERIALS
Cantonment, Florida
VOC ppm Values
Method 25A

Date/Time	TRU OUTLET THC-1 ppm	HALCON THC-2 ppm	
9/28/2010 15:28	1	7.9	
9/28/2010 15:29	0.7	5.2	Zero
9/28/2010 15:30	0.5	6.7	
9/28/2010 15:31	0.3	5.1	
9/28/2010 15:32	0.1	4.9	
9/28/2010 15:32	0	4.1	zero
9/28/2010 15:33	-0.1	5.4	
9/28/2010 15:34	0.5	4.9	
9/28/2010 15:35	0.5	4.5	
9/28/2010 15:36	15.3	7.5	mid range
9/28/2010 15:38	15.5	5.8	
9/28/2010 15:39	15.6	5.0	
9/28/2010 15:40	1.4	4.2	
9/28/2010 15:41	1.3	3.9	
9/28/2010 15:42	1.6	3.2	
9/28/2010 15:43	1.8	3.7	

Noble, Roy W

From: Shotts, Michelle L
Sent: Tuesday, October 26, 2010 2:10 PM
To: Noble, Roy W
Subject: FW: TRU NOx Flow

Michelle L Shotts
Ascend Performance Materials
Office: (850) 968-8624
Cell: (850) 418-0557
Fax: (850) 968-7848
Michelle.L.Shotts@AscendMaterials.com

From: Shotts, Michelle L
Sent: Monday, August 23, 2010 4:25 PM
To: Noble, Roy W
Cc: Shotts, Michelle L
Subject: TRU NOx Flow

Roy,

Below is the data on the TRU NOx Flow annubar calibrations:

23-Mar-2010	Initial installation/replacement of the original pressure transmitter (Type 3095)	
23-Aug-2010	Calibration Check	
	FT (DP)	0 - 159.2" H2O - as found no shift in cailbration from March
	TT	0 - 100 C - as found no shift in calibration from March
	PT	0 - 30 psig - as found no shift in calibration from March

Michelle L Shotts
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Michelle.L.Shotts@AscendMaterials.com

Noble, Roy W

From: Shotts, Michelle L

Sent: Tuesday, October 26, 2010 3:43 PM

To: Noble, Roy W

Subject: TRU Flow Transmitter Calibration Checks.

Attachments: GHG TRU Flow Aug 2010.JPG; 331IFL103TRUNOxFlowannubarcalibrations3-23-2010_20101026203840.727_X.doc

Attachments from SAP work orders

Michelle L Shotts
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Michelle.L.Shotts@AscendMaterials.com

Below is the data on the TRU NOx Flow annubar calibrations:

23-Mar-2010 Initial installation/replacement of the original pressure transmitter (Type 3095) - Original
Calibration Check

FT (DP)	0 - 159.2" H_2O -	original calibration
TT	0 - 100 C -	original calibration
PT	0 - 30 psig -	original calibration

Order	12564308	*Order type*	ROU Routine Maintenance
Description	E&I..Ck Calibration on 331FT 103		
Start date	08/23/2010	*Notification*	21530450
End date	08/23/2010	*Reported by*	MLSHOT
inWrkCenter	M425E 1720		
MaintPlan		*MaintItem*	
Priority	C	S/D Complementary	*MaintActType* ROU
MaintPlanGroup	M02 Area 2	*Planning plant*	1720
Revision No.	331TRU	331 TRU shutdown	
FunctLocation	PN-ADP-N331-VE120	-IFL103	NOX GAS FLOW LOOP
Equipment	30319692	Mass Flow Transmitter	
Tech ID Number		*Sort field*	331FT-103

Status REL PCNF PRT MANC NMAT PRC SETC *Location* PENSACOLA *Room*

Sup.Ord. No.

Sup.Ord. Stat.

E&I..Ck Calibration on 331FT 103
E&I..Check calibration (do not adjust) on the pressure, temperature and DP associated with the NOx Flow to the TRU. This is a mid year check to attempt to use this information in negotiating with the EPA on calibration check frequency. Please give results to Michelle upon completion and document on this ticket.

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ermit	PSM Process Safety Mgmt. Compliance		
peration	**0010**	**E&I..Ck Calibration on 331FT 103**	
Work center	M425E 1720	Electrical -- Area II	
CompConfNo.	7632676		
Work	4.0 H		
Duration	2.0 H	*Number*	2

End of report

Flow 0-159.2" wc
Temp 0-100°C
PT 0-30 psi

B-C