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TIBY vol 5

TPC Group
Houston Operations

TEL 713.477.9211
FAX 713.475.6008

8600 Park Place Boulevard, Houst
www.tpcgrp.com

RECEIVE

SEP 18 2013

Air/Toxics & Inspection
Coordination Branch
6EN-A

September 16, 2013

CERTIFIED MAIL NO.:
7012 3460 0000 9248 9045
RETURN RECEIPT REQUESTED

Texas Commisson on Environmental Quality
Office of the Chief Clerk
Attn: Notice Team
MC 105
12100 Park 35 Circle
Austin, TX 78753

Re: NSR Permit 22052 (Dock) — 2nd Public Notice
TPC Group, LLC, Houston, Harris County,
Texas Customer Reference Number:
CN603624289 Regulated Entity Number:
RN100219526

To Whom It May Concern:

Please find enclosed a completed TCEQ Form 20244 for closure of the public notice for the above referenced permit.

If you have any questions, please do not hesitate to contact Paula Dollar at (713) 740-3006 or via email at paula.dollar@tpcgrp.com.

Sincerely,

Greg Berwick
Environmental Manager

cc:

Texas Commissoin on Environmental Quality
Air Permit Divison
Attn: Ms. Cheryl Cavone
12100 Park Place Circle
Austin, Texas 78753

Air Section Manager
Texas Commission on Environmental Quality
5425 Polk Avenue, Suite
Houston, Texas 77023-1486

Arturo Blanco
City of Houston
Bureau Chief of Air Quality Control
Health and Human Services
7411 Park Place Blvd. Room 108
Houston, Texas 77087-4441

Bob Allen
Harris County
Environmental Public Health Division
101 South Richey Street, Suite G
Pasdena, Texas 77506-1023

Environmental Protection Agency
Air Permit Division
1445 Ross Avenue
Dallas, Texas 75202-2733

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name: TPC Group LLC	
Site or Facility Name: TPC Group LLC, Houston Operations	
TCEQ Account Number (if applicable): HG-0562-P	Permit Number: 22052
Regulated Entity Number (RN): 100219526	Customer Number (CN): 60362428

All applicants must **complete all applicable** portions of this form. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days <u>after the end</u> of the designated comment period.** For more information regarding public notice, refer to the instructions in the public notice package.

Alternative Language Checklist

I have contacted the appropriate school district.	☒ Yes ☐ No
School District: Houston Independent School District	Phone Number: 713-556-6961
Person Contacted: Mr. Ricardo Avila	Date: 11/14/2012
Is a bilingual education program (BEP) required by the Texas Education Code in the district?	☒ Yes ☐ No

If answer is "NO," skip to first question in verification box on next page.
(Note: A BEP is different from "English as a Second Language" (ESL) program; and Elementary/Middle schools that only offer ESL will not trigger notice in an alternative language.)

Notice in an alternative language is required if a BEP **is required** in the District, and **one** of the following conditions is met:

1. students in the elementary or middle school nearest the facility are enrolled in a program at that school;	☒ Yes ☐ No
2. students from the elementary or middle school nearest the facility attend a BEP at another location; or	☐ Yes ☒ No
3. the school district that otherwise would be required to provide a BEP has been granted an exception from the requirements to provide the program, as provided for in 19 Texas Administrative Code 89.1207(a).	☐ Yes ☒ No

If the answer is "NO" to **1, 2, and 3 above**, then alternative language notice **is not required**.

The name of the elementary school nearest to the proposed or existing facility is:

Ruckell Elementary School (BEP Program), 5201 Vinett, Houston, TX 77017

The name of the middle school nearest to the proposed or existing facility is:

Dead Middle School (ESL Program), 2500 Broadway, Houston, TX 77012

The following language(s) is/are utilized in the bilingual program:

Spanish		

If notice in an alternative language is required, then applicants must publish atlernative language notice(s) and post alternative language sign(s), as outlined in the *Instructions for Notice* and certify compliance with those requirements on this form.

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name: TPC Group LLC	
Site or Facility Name: TPC Group LLC, Houston Operations	
TCEQ Account Number (if applicable): HG-0562-P	Permit Number: 22052
Regulated Entity Number (RN): 100219526	Customer Number (CN): 603624289
For more information regarding public notice, refer to the instructions in the public notice package.	

Alternative Language Verification

1. A BEP is required by the Texas Education Code in the area addressed by this permit application and is subject to alternative language public notice requirements. **If "NO," skip 2 through 6 and complete signature, title, date, and name of applicant.**	☒ Yes ☐ No
2. The applicant has conducted a diligent search for a newspaper or publication of general circulation in both the municipality and county in which the facility is located (or proposed to be located).	☒ Yes ☐ No
3. A newspaper or publication **could not be found** in any of the alternative language(s) in which notice is required.	☐ Yes ☒ No
4. The publishers of the **newspaper listed below refused to publish the notice** as requested, **and** another newspaper or publication in the same language and of general circulation **could not be found** in the municipality or county in which the facility is located (or proposed to be located).	☐ Yes ☐ No ☒ N/A
Newspaper:	Language:
5. Proof of publication of the newspaper **alternative language** notice(s) and the requested affidavits have been sent to the TCEQ.	☒ Yes ☐ No
6. Alternative language signs were posted as required by the TCEQ.	☐ Yes ☐ No

This form must be signed and dated by a designated representative acting on behalf of the applicant after the end of the designated comment period. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days after the end of the designated comment period.** The TCEQ will not accept this form if submitted prior to that date.

Verified by *(signature)*:	
Applicant: TPC Group LLC, Houston Operations	
Title: Interim Environmental Manager	Date: 9/16/2013

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name: TPC Group LLC	
Site or Facility Name: TPC Group LLC, Houston Operations	
TCEQ Account Number (if applicable): HG-0562-P	Permit Number: 22052
Regulated Entity Number(RN): 100219526	Customer Number (CN): 60362489
For more information regarding public notice, refer to the instructions in the public notice package.	
New Source Review Permit Notice Verification (Complete this section, if applicable)	
Required signs (for 1st notice) were posted in accordance with the regulations and instructions of the TCEQ.	☒ Yes ☐ No
Proof of publication of the newspaper notices and the requested affidavits have been furnished in accordance with the regulations and instructions of the TCEQ.	☒ Yes ☐ No
Notice of Receipt of Application and Intent to Obtain Permit (1st Notice):	
A copy of the administratively complete air quality application, and any revisions, were available for review and copying at the public place indicated below throughout the duration of the public comment period.	☒ Yes ☐ No
The public place indicated below provides public access to the internet (for PSD, nonattainment, or FCAA 112(g) Permit).	☒ Yes ☐ No ☐ N/A
Notice of Application and Preliminary Decision (2nd Notice, if applicable):	
A copy of the complete air quality application (including any subsequent revisions to the application), executive director's preliminary decision (which includes the draft permit), the preliminary determination summary and air quality analysis (if applicable), are available for review and copying at the public place indicated below from the first day after newspaper publication, and will remain available until either: (1) the TCEQ acts on the application; or (2) the application is referred to the State Office of Administrative Hearings (SOAH) for hearing	☒ Yes ☐ No
Name of Public Place: Park Place Regional Library	
Address of Public Place: 8145 Park Place Blvd.	
City: Houston / State: Texas	ZIP Code: 77017
This form must be signed and dated by a designated representative acting on behalf of the applicant <u>after the end</u> of the designated comment period. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days after the end of the designated comment period.** The TCEQ will not accept this form if submitted prior to that date.	
Verified by *(signature)*: Greg Bhuiyan	
Applicant: TPC Group LLC, Houston Operations	
Title: Interim Environmental Manager	Date: 9/16/2013

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name:	
Site or Facility Name:	
TCEQ Account Number (if applicable):	Permit Number:
Regulated Entity Number (RN):	Customer Number (CN):
For more information regarding public notice, refer to the instructions in the public notice package.	
Federal Operating Permit (Title V) Notice Verification (Complete this section, if applicable)	
I verify that the required signs were posted in accordance with the regulations and instructions of the TCEQ.	☐ Yes ☐ No
I verify that proof of publication of the newspaper notices and the requested affidavits have been furnished in accordance with the regulations and instruction of the TCEQ.	☐ Yes ☐ No
I verify that a copy of the complete air quality application (including any subsequent revisions to the application) and draft permit were available for review and copying at the public place indicated below throughout the duration of the public comment period.	☐ Yes ☐ No
Name of Public Place:	
Address of Public Place:	
City: State:	ZIP Code:
This form must be signed and dated by a designated representative acting on behalf of the applicant <u>after the end</u> of the designated comment period. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days <u>after the end</u> of the designated comment period.** The TCEQ will not accept this form if submitted prior to that date.	
Verified by *(signature)*:	
Applicant:	
Title:	Date:

PRINT FORM RESET FORM

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TPC Group
Houston Operations

TEL 713.477.9211
FAX 713.475.6008

8600 Park Place Boulevard, Houston, Texas 77017
www.tpcgrp.com

RECEIVE

SEP 16 2013

Air/Toxics & Inspection Coordination Branch
6EN-A

September 12, 2013

CERTIFIED MAIL NO.:
7012 3460 0000 9248 9045
RETURN RECEIPT REQUESTED

TCEQ, Office of the Chief
Clerk Office of the Chief
Clerk, MC 105 12100
Park 35 Circle
Attn: Notice Team
Austin, TX 78753

Re: NSR Permit 22052 (Dock) — 2nd Public Notice
TPC Group, LLC, Houston, Harris County,
Texas Customer Reference Number:
CN603624289 Regulated Entity Number:
RN100219526

To Whom It May Concern:

Please find enclosed a completed TCEQ Form 20244 for closure of the public notice for the above referenced permit.

If you have any questions, please do not hesitate to contact me at (713) 740-3006 or via email at paula.dollar@tpcgrp.com.

Sincerely,

Greg Berwick
Environmental Manager

cc:

Texas Commissoin on Environmental Quality Air Permit Divison Attn: Ms. Cheryl Cavone 12100 Park Place Circle Austin, Texas 78753	CERTIFED MAIL NO.: 7012 3460 0000 9248 9038 RETURN RECEIPT REQUESTED
Air Section Manager Texas Commission on Environmental Quality 5425 Polk Avenue, Suite Houston, Texas 77023-1486	CERTIFIED MAIL NO.: 7012 3460 0000 9248 9021 RETURN RECEIPT REQUESTED
Arturo Blanco City of Houston Bureau Chief of Air Quality Control Health and Human Services 7411 Park Place Blvd. Room 108 Houston, Texas 77087-4441	CERTIFIED MAIL NO.: 7012 3460 0000 9248 9014 RETURN RECEIPT REQUESTED
Bob Allen Harris County Environmental Public Health Division 101 South Richey Street, Suite G Pasdena, Texas 77506-1023	CERTIFIED MAIL NO.: 7012 3460 0000 9248 9007 RETURN RECEIPT REQUESTED
Environmental Protection Agency Air Permit Division 1445 Ross Avenue Dallas, Texas 75202-2733	CERTIFIED MAIL NO.: 7012 3460 0000 9248 8994 RETURN RECEIPT REQUESTED

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name: TPC Group LLC	
Site or Facility Name: TPC Group LLC, Houston Operations	
TCEQ Account Number (if applicable): HG-0562-P	Permit Number: 22052
Regulated Entity Number (RN): 100219526	Customer Number (CN): 603624289

All applicants must **complete all applicable** portions of this form. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days after the end of the designated comment period**. For more information regarding public notice, refer to the instructions in the public notice package.

Alternative Language Checklist

I have contacted the appropriate school district.		☐ Yes ☐ No
School District: Houston Independent School District	Phone Number: 713-556-6961	
Person Contacted: Mr. Ricardo Avila	Date: 11/14/2012	
Is a bilingual education program (BEP) required by the Texas Education Code in the district?		☒ Yes ☐ No

If answer is "NO," skip to first question in verification box on next page.
(Note: A BEP is different from "English as a Second Language" (ESL) program; and Elementary/Middle schools that only offer ESL will not trigger notice in an alternative language.)

Notice in an alternative language is required if a BEP **is required** in the District, and **one** of the following conditions is met:

1. students in the elementary or middle school nearest the facility are enrolled in a program at that school;	☒ Yes ☐ No
2. students from the elementary or middle school nearest the facility attend a BEP at another location; or	☐ Yes ☒ No
3. the school district that otherwise would be required to provide a BEP has been granted an exception from the requirements to provide the program, as provided for in 19 Texas Administrative Code 89.1207(a).	☐ Yes ☒ No

If the answer is "NO" to **1, 2, and 3 above**, then alternative language notice **is not required**.

The name of the elementary school nearest to the proposed or existing facility is:

Ruckell Elementary School (BEP Program), 5201 Vinett, Houston, TX 77017

The name of the middle school nearest to the proposed or existing facility is:

Dead Middle School (ESL Program), 2500 Broadway, Houston, TX 77012

The following language(s) is/are utilized in the bilingual program:

Spanish		

If notice in an alternative language is required, then applicants must publish alternative language notice(s) and post alternative language sign(s), as outlined in the *Instructions for Notice* and certify compliance with those requirements on this form.

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name: TPC Group LLC	
Site or Facility Name: TPC Group LLC, Houston Operations	
TCEQ Account Number (if applicable): HG-0562-P	Permit Number: 22052
Regulated Entity Number (RN): 100219526	Customer Number (CN): 603624289
For more information regarding public notice, refer to the instructions in the public notice package.	

Alternative Language Verification

1. A BEP is required by the Texas Education Code in the area addressed by this permit application and is subject to alternative language public notice requirements. **If "NO," skip 2 through 6 and complete signature, title, date, and name of applicant.**	☒ Yes ☐ No
2. The applicant has conducted a diligent search for a newspaper or publication of general circulation in both the municipality and county in which the facility is located (or proposed to be located).	☒ Yes ☐ No
3. A newspaper or publication **could not be found** in any of the alternative language(s) in which notice is required.	☐ Yes ☒ No
4. The publishers of the **newspaper listed below refused to publish the notice** as requested, **and** another newspaper or publication in the same language and of general circulation **could not be found** in the municipality or county in which the facility is located (or proposed to be located).	☐ Yes ☐ No ☒ N/A
Newspaper:	Language:
5. Proof of publication of the newspaper **alternative language** notice(s) and the requested affidavits have been sent to the TCEQ.	☒ Yes ☐ No
6. Alternative language signs were posted as required by the TCEQ.	☒ Yes ☐ No

This form must be signed and dated by a designated representative acting on behalf of the applicant <u>after the end</u> of the designated comment period. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days after the <u>end of the</u> designated comment period.** The TCEQ will not accept this form if submitted prior to that date.

Verified by *(signature)*: [signature]	
Applicant: TPC Group LLC, Houston Operations	
Title: INTERIM ENVIRONMENTAL MGR.	Date: 9/12/13

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name: TPC Group LLC	
Site or Facility Name: TPC Group LLC, Houston Operations	
TCEQ Account Number (if applicable): HG-0562-P	Permit Number: 22052
Regulated Entity Number(RN): 100219526	Customer Number (CN): 603624289
For more information regarding public notice, refer to the instructions in the public notice package.	
New Source Review Permit Notice Verification (Complete this section, if applicable)	
Required signs (for 1st notice) were posted in accordance with the regulations and instructions of the TCEQ.	☐ Yes ☐ No
Proof of publication of the newspaper notices and the requested affidavits have been furnished in accordance with the regulations and instructions of the TCEQ.	☐ Yes ☐ No
Notice of Receipt of Application and Intent to Obtain Permit (1st Notice):	
A copy of the administratively complete air quality application, and any revisions, were available for review and copying at the public place indicated below throughout the duration of the public comment period.	☐ Yes ☐ No
The public place indicated below provides public access to the internet (for PSD, nonattainment, or FCAA 112(g) Permit).	☐ Yes ☐ No ☐ N/A
Notice of Application and Preliminary Decision (2nd Notice, if applicable):	
A copy of the complete air quality application (including any subsequent revisions to the application), executive director's preliminary decision (which includes the draft permit), the preliminary determination summary and air quality analysis (if applicable), are available for review and copying at the public place indicated below from the first day after newspaper publication, and will remain available until either: (1) the TCEQ acts on the application; or (2) the application is referred to the State Office of Administrative Hearings (SOAH) for hearing	☒ Yes ☐ No
Name of Public Place: Park Place Regional Library	
Address of Public Place: 8145 Park Place Blvd.	
City: Houston / State: Texas	ZIP Code: 77017
This form must be signed and dated by a designated representative acting on behalf of the applicant after the end of the designated comment period. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days after the end of the designated comment period.** The TCEQ will not accept this form if submitted prior to that date.	
Verified by *(signature)*: Guy Bhuiyan	
Applicant: TPC Group LLC, Houston Operations	
Title: INTERIM ENVIRONMENTAL MANAGER	Date: 9/12/13

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name:	
Site or Facility Name:	
TCEQ Account Number (if applicable):	Permit Number:
Regulated Entity Number (RN):	Customer Number (CN):
For more information regarding public notice, refer to the instructions in the public notice package.	

Federal Operating Permit (Title V) Notice Verification
(Complete this section, if applicable)

I verify that the required signs were posted in accordance with the regulations and instructions of the TCEQ.	☐ Yes ☐ No
I verify that proof of publication of the newspaper notices and the requested affidavits have been furnished in accordance with the regulations and instruction of the TCEQ.	☐ Yes ☐ No
I verify that a copy of the complete air quality application (including any subsequent revisions to the application) and draft permit were available for review and copying at the public place indicated below throughout the duration of the public comment period.	☐ Yes ☐ No

Name of Public Place:		
Address of Public Place:		
City:	State:	ZIP Code:

This form must be signed and dated by a designated representative acting on behalf of the applicant <u>after the end</u> of the designated comment period. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days <u>after the end</u> of the designated comment period.** The TCEQ will not accept this form if submitted prior to that date.

Verified by *(signature)*:	
Applicant:	
Title:	Date:

PRINT FORM RESET FORM

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TPC Group
Houston Operations

TEL 713.477.9211
FAX 713.475.6008

8600 Park Place Boulevard, Houston, Texas 77017
www.tpcgrp.com

RECEIVE

MAY 10 2013

Air/Toxics & Inspection
Coordination Branch
6EN-A

May 8, 2013

CERTIFIED MAIL NO.:
7005 3110 0003 2210 4661
RETURN RECEIPT REQUESTED

TCEQ, Office of the Chief Clerk
Office of the Chief Clerk, MC 105
12100 Park 35 Circle
Attn: Notice Team
Austin, TX 78753

Re: NSR Permit 46307 – 2nd Public Notice
TPC Group, LLC, Houston, Harris County, Texas
Customer Reference Number: CN603624289
Regulated Entity Number: RN100219526

To Whom It May Concern:

Please find enclosed a completed TCEQ Form 20244 for closure of the public notice for the above referenced permit. The public notice comment period began on March 31, 2013, and ended on April 30, 2013.

If you have any questions, please do not hesitate to contact me at (713) 475-7474 or via email at Carolyn.Bogany@tpcgrp.com

Sincerely,

Carolyn C. Bogany

Carolyn Bogany
Environmental Manager

cc:

TCEQ, Air Permit Division Attn: Ms. Cheryl Cavone 12100 Park 35 Circle Austin, TX 78753	**CERTIFIED MAIL NO. 7012 1640 0002 2889 7621**
Air Section Manager TCEQ, Region 12 5425 Polk Avenue, Suite H Houston, TX 77023-1486	**CERTIFIED MAIL NO. 7012 1640 0002 2889 7645**
Arturo Blanco City of Houston Bureau Chief of Air Quality Control Health and Human Services 7411 Park Place Blvd, Room 108 Houston, Texas 77087-4441	**CERTIFIED MAIL NO. 7012 1640 0002 2885 2545**
Bob Allen Harris County Environmental Public Health Division 101 South Richey Street, Suite G Pasadena, Texas 77506-1023	**CERTIFIED MAIL NO. 7012 1640 0002 2885 2552**
US Environmental Protection Agency Air Permit Division 1445 Ross Avenue Dallas, TX 75202-2733	**CERTIFIED MAIL NO. 7012 1640 0002 2885 2569**

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name: TPC Group, LLC	
Site or Facility Name: Houston Plant	
TCEQ Account Number (if applicable): HG0562P	Permit Number: 46307
Regulated Entity Number (RN): RN100219526	Customer Number (CN): CN603624289

All applicants must **complete all applicable** portions of this form. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days after the end of the designated comment period**. For more information regarding public notice, refer to the instructions in the public notice package.

Alternative Language Checklist

I have contacted the appropriate school district.	☐ Yes ☒ No*
School District:	Phone Number:
Person Contacted:	Date:
Is a bilingual education program (BEP) required by the Texas Education Code in the district?	☒ Yes ☐ No

If answer is "NO," skip to first question in verification box on next page.
(Note: A BEP is different from "English as a Second Language" (ESL) program; and Elementary/Middle schools that only offer ESL will not trigger notice in an alternative language.)

Notice in an alternative language is required if a BEP **is required** in the District, and **one** of the following conditions is met:

1. students in the elementary or middle school nearest the facility are enrolled in a program at that school;	☒ Yes ☐ No
2. students from the elementary or middle school nearest the facility attend a BEP at another location; or	☐ Yes ☐ No
3. the school district that otherwise would be required to provide a BEP has been granted an exception from the requirements to provide the program, as provided for in 19 Texas Administrative Code 89.1207(a).	☐ Yes ☐ No

If the answer is "NO" to **1, 2, and 3 above**, then alternative language notice **is not required**.

The name of the elementary school nearest to the proposed or existing facility is:

Park Place Elementary School

The name of the middle school nearest to the proposed or existing facility is:

Stevenson Middle School

The following language(s) is/are utilized in the bilingual program:

Spanish		

If notice in an alternative language is required, then applicants must publish alternative language notice(s) and post alternative language sign(s), as outlined in the *Instructions for Public Notice* and certify compliance with those requirements on this form.

*School district (Houston ISD) contacted previously and BEP is required. District was not contacted again for this notice.

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name: TPC Group, LLC	
Site or Facility Name: Houston Plant	
TCEQ Account Number (if applicable): HG0562P	Permit Number: 46307
Regulated Entity Number (RN): RN100219526	Customer Number (CN): CN603624289
For more information regarding public notice, refer to the instructions in the public notice package.	

Alternative Language Verification

1. A BEP is required by the Texas Education Code in the area addressed by this permit application and is subject to alternative language public notice requirements. **If "NO," skip 2 through 6 and complete signature, title, date, and name of applicant.**	☒ Yes ☐ No
2. The applicant has conducted a diligent search for a newspaper or publication of general circulation in both the municipality and county in which the facility is located (or proposed to be located).	☒ Yes ☐ No
3. A newspaper or publication **could not be found** in any of the alternative language(s) in which notice is required.	☐ Yes ☒ No
4. The publishers of the **newspaper listed below refused to publish the notice** as requested, **and** another newspaper or publication in the same language and of general circulation **could not be found** in the municipality or county in which the facility is located (or proposed to be located).	☐ Yes ☐ No ☒ N/A
Newspaper:	Language:
5. Proof of publication of the newspaper **alternative language** notice(s) and the requested affidavits have been sent to the TCEQ.	☒ Yes ☐ No
6. Alternative language signs were posted as required by the TCEQ.	☒Yes ☐ No

This form must be signed and dated by a designated representative acting on behalf of the applicant <u>after the end</u> of the designated comment period. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days <u>after the end</u> of the designated comment period.** The TCEQ will not accept this form if submitted prior to that date.

Verified by *(signature)*: Carolyn C. Bogany	
Applicant: TPC Group, LLC	
Title: Environmental Manager - HNO & BNO	Date: 5/8/13

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name: TPC Group, LLC	
Site or Facility Name: Houston Plant	
TCEQ Account Number (if applicable): HG0562P	Permit Number: 46307
Regulated Entity Number (RN): RN100219526	Customer Number (CN): CN603624289
For more information regarding public notice, refer to the instructions in the public notice package.	
New Source Review Permit Notice Verification (Complete this section, if applicable)	
Proof of publication of the newspaper notices and the requested affidavits have been furnished in accordance with the regulations and instructions of the TCEQ.	☒ Yes ☐ No
Notice of Receipt of Application and Intent to Obtain Permit (1st Notice):	
Required signs (for 1st notice) were posted in accordance with the regulations and instructions of the TCEQ.	☒ Yes ☐ No
A copy of the administratively complete air quality application, and any revisions, were available for review and copying at the public place indicated below throughout the duration of the public comment period.	☒ Yes ☐ No
The public place indicated below provides public access to the internet (for PSD, nonattainment, or FCAA 112(g) Permit).	☐ Yes ☐ No ☒ N/A
Notice of Application and Preliminary Decision (2nd Notice, if applicable):	
A copy of the complete air quality application (including any subsequent revisions to the application), executive director's preliminary decision (which includes the draft permit), the preliminary determination summary and air quality analysis (if applicable), are available for review and copying at the public place indicated below from the first day after newspaper publication, and will remain available until either: (1) the TCEQ acts on the application; or (2) the application is referred to the State Office of Administrative Hearings (SOAH) for hearing	☒ Yes ☐ No
Name of Public Place: Park Place Regional Library	
Address of Public Place: 8145 Park Place Boulevard	
City: Houston / State: TX	ZIP Code: 77017
This form must be signed and dated by a designated representative acting on behalf of the applicant <u>after the end</u> of the designated comment period. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days <u>after the end</u> of the designated comment period.** The TCEQ will not accept this form if submitted prior to that date.	
Verified by *(signature)*: Carolyn C. Bogany	
Applicant: TPC Group, LLC	
Title: Environmental Manager - HNO & BNO	Date: 5/8/13

Texas Commission on Environmental Quality
Public Notice Verification Form
Air Permit

Applicant Name:		
Site or Facility Name:		
TCEQ Account Number (if applicable):	Permit Number:	
Regulated Entity Number (RN):	Customer Number (CN):	
For more information regarding public notice, refer to the instructions in the public notice package.		
Federal Operating Permit (Title V) Notice Verification (Complete this section, if applicable)		
I verify that the required signs were posted in accordance with the regulations and instructions of the TCEQ.	☐ Yes ☐ No	
I verify that proof of publication of the newspaper notices and the requested affidavits have been furnished in accordance with the regulations and instruction of the TCEQ.	☐ Yes ☐ No	
I verify that a copy of the complete air quality application (including any subsequent revisions to the application) and draft permit were available for review and copying at the public place indicated below throughout the duration of the public comment period.	☐ Yes ☐ No	
Name of Public Place:		
Address of Public Place:		
City:	State:	ZIP Code:
This form must be signed and dated by a designated representative acting on behalf of the applicant <u>after the end</u> of the designated comment period. Send this completed form to the TCEQ to the attention of the Office of the Chief Clerk **within 10 business days <u>after the end</u> of the designated comment period.** The TCEQ will not accept this form if submitted prior to that date.		
Verified by *(signature)*:		
Applicant:		
Title:	Date:	

Print Form

7/31/2013

AIR, PESTICIDES, AND TOXICS
6TH FLOOR RECORDS CENTER
INFILING / NEW FILE FORM

New File ☐ OR Infiling ☒

Choose from the file types below:

AIR FACILITY:

(☐) AR - Acid Rain
(☐) CB - Confidential Business
(☐) CO - Compliance
(☐) EN - **Enforcement
(☐) GE - General
(☒) PE - Permit
(☐) RA - Regulatory Applicability
(☐) Other _____

TSCA:

(☐) AH - Asbestos Hazard Emergency Response Act
(☐) AS or AW - Asbestos or Asbestos Worker Protection
(☐) CB - Confidential
(☐) FI - Site Specific
(☐) FO - Non Site Specific
(☐) IM - **Section 5 & 8
(☐) LB - **Lead
(☐) PC - **PCB

** Extension of file type (if needed): (☐) ES - Enforcement Sensitive
(☐) DO - Docket Number

EPCRA / SARA (☐) ***FIFRA*** (☐)

EPA Registry I.D.

Current FRS Number: 110000461134
(Found in EnviroFacts)

Facility Name & Physical Address: TPC Group LLC
8600 Park Place Blvd.
Houston, TX. 77017 2513

Remarks:

Requestor's Name & Phone Number:

Les Koval X6733

Program Management Files:

A current listing of these file types and their numeric codes are located in a blue binder on the top shelf of the "APT" file cabinet in the 9th Floor Records Center.

AIRS - Aerometric Information Retrieval System
ATO - Air Toxics
EMR - Emergency Response
ENF - Enforcement -
ENF 5-5-1 requires Month and Fiscal Year accompany file code.
ENF 5-6-5 requires Fiscal Year accompany file code.
EXR - External Relations
GEO - Geographical Summary Data
GRA - Grants Administration
The majority of this section requires the Fiscal Year accompany file code.
Project Officer Grants require the Grant number and Fiscal Year accompany file code.
LAB - Laboratory Support
LBP - Lead Based Paint
LBP 12-3 requires the facility name in which document refers to be either highlighted or circled on the top page.
LEL - Legal and Legislative
MON – Monitoring NES - National Emission Standards
NSP - New Source Performance
NSR - New Source Review
OPP - Operating Permits Program
PEA - Permits Administration Program
PES - Pesticides
PLA - Planning
PUA - Public Affairs
RAD - Radiation
RCR - Resource Conservation and Recovery Act - Regulatory Development
RDE - Research and Development
REG - Registration
SIP - State Implementation Plan
SUP - Superfund
TITL - Title III
TSC - Toxic Substance Control
TSC 1-1-4 requires the facility name in which document refers to be either highlighted or circled on the top page.
TSU - Technical Support
VRP - Voluntary Reduction Program

Bryan W. Shaw, Ph.D., *Chairman*
Carlos Rubinstein, *Commissioner*
Toby Baker, *Commissioner*
Zak Covar, *Executive Director*

EPA

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

February 27, 2013

MR CHARLES KIRK JOHNSON
PLANT MANAGER
TPC GROUP LLC
8600 PARK PLACE BLVD
HOUSTON TX 77017-2513

RECEIVED
13 MAR -5 AM 11:56
AIR PERMITS SECTION
GPD-R

Re: Permit Amendment Application
Permit Number: 46307
Houston Plant
Houston, Harris County
Regulated Entity Number: RN100219526
Customer Reference Number: CN603624289

Dear Mr. Johnson:

The executive director has completed the technical review of your application and has prepared a preliminary decision and draft permit.

You are now required to publish notice of your proposed activity. To help you meet the regulatory requirements associated with this notice, we have included the following items:

- Notices for Newspaper Publication (Examples A and B)
- Public Notice Checklist
- Instructions for Public Notice
- Affidavit of Publication for Air Permitting (Form TCEQ-20533) and Alternative Language Affidavit of Publication for Air Permitting (Form TCEQ-20534)
- Web link to download Public Notice Verification Form (refer to Public Notice Instructions)
- Notification List
- Draft Permit

Please note that it is **very important** that you follow **all** directions in the enclosed instructions. If you do not, you may be required to republish the notice. A common mistake is the unauthorized changing of notice wording or font. If you have any questions, please contact us before you proceed with publication.

A "Public Notice Checklist" is enclosed which notes the time limitations for each step of the public notice process. **The processing of your application may be delayed if these time limitations are not met (i.e.; submitting proof of publication of the notice within 10 business days after publication, affidavits of publication within 30 calendar days after the date of publication, and public notice verification form within**

Re: Permit Number: 46307

10 business days after the end of the designated comment period). This checklist should be used as a tool in conjunction with the enclosed, detailed instructions.

If you do not comply with **all** requirements described in the instructions, further processing of your application may be suspended or the agency may take other actions.

If you have any questions regarding publication requirements, please contact the Office of the Chief Clerk at (512) 239-3300. If you have any other questions, please contact Ms. Cheryl Covone at (512) 239-1248.

Sincerely,

Bridget C. Bohac

Bridget C. Bohac
Chief Clerk
Office of the Chief Clerk
Texas Commission on Environmental Quality

BB/cc

Enclosures

cc: Bureau Chief Pollution Control & Prevention, Environmental Health Division, Houston Department of Health and Human Services, Houston
Director, Harris County, Pollution Control Services, Pasadena
Air Section Manager, Region 12 - Houston
Air Permits Section Chief, New Source Review, Section (6PD-R), U.S. Environmental Protection Agency, Region 6, Dallas

Project Number: 174136

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

EXAMPLE A

NOTICE OF APPLICATION AND PRELIMINARY DECISION FOR AN AIR QUALITY PERMIT

PERMIT NUMBER: 46307

APPLICATION AND PRELIMINARY DECISION. TPC Group LLC, 8600 Park Place Blvd, Houston, Texas 77017-2513, has applied to the Texas Commission on Environmental Quality (TCEQ) for an amendment to Air Quality Permit Number 46307, which would authorize modification to a Houston Plant located at 8600 Park Place Blvd, Houston, Harris County, Texas 77017. This application was submitted to the TCEQ on February 1, 2012. The existing facilities will emit the following air contaminants: particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less, carbon monoxide, sulfur dioxide, nitrogen oxides, ammonia, organic compounds, and hazardous air pollutants including but not limited to 1,3-butadiene.

The executive director has completed the technical review of the application and prepared a draft permit which, if approved, would establish the conditions under which the facility must operate. The executive director has made a preliminary decision to issue the permit because it meets all rules and regulations. The permit application, executive director's preliminary decision, and draft permit will be available for viewing and copying at the TCEQ central office, the TCEQ Houston regional office, and at the Park Place Regional Library, 8145 Park Place Boulevard, Houston, Harris County, Texas beginning the first day of publication of this notice. The facility's compliance file, if any exists, is available for public review at the TCEQ Houston Regional Office, 5425 Polk St Ste H, Houston, Texas.

PUBLIC COMMENT/PUBLIC MEETING. You may submit public comments or request a public meeting about this application. The purpose of a public meeting is to provide the opportunity to submit comment or to ask questions about the application. The TCEQ will hold a public meeting if the executive director determines that there is a significant degree of public interest in the application or if requested by a local legislator. A public meeting is not a contested case hearing. **You may submit additional written public comments within 30 days of the date of newspaper publication of this notice in the manner set forth in the AGENCY CONTACTS AND INFORMATION paragraph below.**

RESPONSE TO COMMENTS AND EXECUTIVE DIRECTOR ACTION. After the deadline for public comments, the executive director will consider the comments and prepare a response to all relevant and material or significant public comments. Because no timely hearing requests have been received, after preparing the response to comments, the executive director may then issue final approval of the application. **The response to comments, along with the executive director's decision on the application will be mailed to everyone who submitted public comments or is on a mailing list for this application, and will be posted electronically to the Commissioners' Integrated Database (CID).**

INFORMATION AVAILABLE ONLINE. When they become available, the executive director's response to comments and the final decision on this application will be accessible through the Commission's Web site at www.tceq.texas.gov/goto/cid. Once you have access to the CID using the above link, enter the permit number

for this application which is provided at the top of this notice. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For exact location, refer to application.
http://www.tceq.texas.gov/assets/public/hb610/index.html?lat=29.696666&lng=-95.255&zoom=13&type=r.

MAILING LIST. You may ask to be placed on a mailing list to obtain additional information on this application by sending a request to the Office of the Chief Clerk at the address below.

AGENCY CONTACTS AND INFORMATION. Public comments and requests must be submitted either electronically at www.tceq.texas.gov/about/comments.html, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. If you communicate with the TCEQ electronically, please be aware that your email address, like your physical mailing address, will become part of the agency's public record. For more information about this permit application or the permitting process, please call the Public Education Program toll free at 1-800-687-4040. Si desea información en Español, puede llamar al 1-800-687-4040.

Further information may also be obtained from TPC Group LLC at the address stated above or by calling Ms. Geri Shoop, Staff Environmental Engineer at (713) 475-7422.

Notice Issuance Date: February 27, 2013

Example B

Publication Elsewhere in the Newspaper:

TO ALL INTERESTED PERSONS AND PARTIES:

TPC Group LLC, has applied to the Texas Commission on Environmental Quality (TCEQ) for an amendment to Air Quality Permit Number 46307, which would authorize modification to a Houston Plant located at 8600 Park Place Blvd, Houston, Harris County, Texas 77017. Additional information concerning this application is contained in the public notice section of this newspaper.

3" minimum

Minimum 2 column widths or 4 inches

Public Notice Checklist
Notice of Application and Preliminary Decision for an Air Quality Permit
(2nd Notice)

The following tasks must be completed for public notice. If publication in an alternative language is required, please complete the tasks for both the English and alternative language publications. Detailed instructions are included in the "Instructions for Public Notice" section of this package.

Within 33 calendar days after date of this letter
Publish *Notice of Application and Preliminary Decision for an Air Quality Permit* in the same newspaper(s) in which you published *Notice of Receipt of Intent to Obtain Permit* for this application. - Example A must be published in "public notice" section of newspaper. Review for accuracy prior to publishing. - Example B (if applicable) must be published in prominent location (other than "public notice") in same issue of newspaper Provide copy of the complete application (including any subsequent revisions) and the executive director's preliminary decision (including the draft permit) at a public place for review and copying. Keep them there for duration of the designated comment period.
First day of newspaper publication
Review published newspaper notice for accuracy. If errors, contact Air Permits Division. Ensure copy of the complete application (including any subsequent revisions) and the executive director's preliminary decision (including the draft permit) are at the public place. It is recommended that the signs from the first notice be in place and be legible and visible until 30 days after publication of the *Notice of Application and Preliminary Decision* (either English or alternative language notice, whichever is later).
Within 10 business days after date of publication
Mail original proof of publication showing publication date and newspaper name to: Texas Commission on Environmental Quality Office of the Chief Clerk, MC-105 Attn: Notice Team P.O. Box 13087 Austin, Texas 78711-3087 Mail photocopies of newspaper clippings showing publication date and newspaper name to persons listed on *Notification List.*
Within 30 calendar days after date of publication
Mail original affidavit of publication for air permitting and alternative language affidavit of publication for air permitting (if applicable) to: Texas Commission on Environmental Quality Office of the Chief Clerk, MC-105 Attn: Notice Team P.O. Box 13087 Austin, Texas 78711-3087 Mail photocopies of affidavits to persons listed on *Notification List.*
Within 10 business days after end of the designated comment period
Mail Public Notice Verification Form to: Texas Commission on Environmental Quality Office of the Chief Clerk, MC-105 Attn: Notice Team P.O. Box 13087 Austin, Texas 78711-3087 Mail photocopies of Public Notice Verification Form to persons listed on *Notification List.*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Instructions for Public Notice
For New Source Review Air Permit

Notice of Application and Preliminary Decision

We have completed the technical review of your application and issued a preliminary decision. You must comply with the following instructions:

Review Notice

Included in the notice is all of the information which the commission believes is necessary to effectuate compliance with applicable public notice requirements. Please read it carefully and notify the Texas Commission on Environmental Quality (TCEQ) immediately if it contains any errors or omissions. You are responsible for ensuring the accuracy of all information published. You may not change the text of the notice without prior approval from the TCEQ.

Newspaper Notice

- You must publish the enclosed *Notice of Application and Preliminary Decision for an Air Quality Permit* within **33 calendar days** after the date this information was mailed to you (see date of letter).

- You must publish the enclosed *Notice of Application and Preliminary Decision for an Air Quality Permit* at your expense, in the same newspaper(s) in which you published the *Notice of Receipt and Intent to Obtain Permit* for this application. The newspaper must be a newspaper that is of general circulation in the municipality where the facility is or will be located. If the facility is not located within a municipality, the newspaper must be of general circulation in the municipality nearest the location.

- You must publish this notice in one issue of any applicable newspaper.

- You will find two example notices enclosed in this package. *Example A* must be published in the "public notice" section of the newspaper. The phrase "Example A" is not required to be published. *Example B* must be published in the **same issue** of the newspaper as *Example A*; however, it must be published in a prominent location (other than the public notice section). *Example B* refers the public to the "public notice" section of the newspaper where *Example A* provides more information regarding the permit application.

- *Example B* must be a total of at least **6 column inches (standard advertising units)** with a height of at least **3 inches** and a horizontal dimension of **2 column widths.** If the newspaper chosen does not use standard advertising units for measurement, the notice must be at least **12 square inches** with the shortest side of at least **3 inches**.

- The bold text of the enclosed notice **must** be printed in the newspaper in a font style or size that distinguishes it from the rest of the notice (i.e., **bold**, *italics*). **Failure to do so may require re-notice.**

Alternative Language Notice

In certain circumstances, applicants for air permits must complete notice in alternative languages.

- Public notice rules require the applicant to determine whether a bilingual program is required at either the elementary or middle school nearest to the facility or proposed facility location. Bilingual education programs are determined on a district-wide basis. When students who are required to attend either school are eligible to be enrolled in a bilingual education program, some alternative language notice is required (newspaper notice).

- Since the school district, and not the schools, must provide the bilingual education program, these programs do not have to be located at the elementary or middle school nearest to the facility or proposed facility to trigger the alternative language notice requirement. If there are students who would normally attend the nearest schools eligible to be taught in a bilingual education program at a different location, alternative language notice is required.

- If triggered, publications of alternative language notices must be made in a newspaper or publication printed primarily in each language taught in the bilingual education program. The same newspaper(s) used for *Notice of Receipt and Intent to Obtain Permit* must be used for publication of the *Notice of Application and Preliminary Decision for an Air Quality Permit*. This notice is required if such a newspaper or publication exists in the municipality or the county where the facility is or will be located.

- The applicant must demonstrate a good faith effort to identify a newspaper or publication in the required language. If a newspaper or publication of general circulation published at least once a month in such language cannot be found, publishing in that language is not required, but signs must remain posted in the same location(s) utilized during the *Notice of Receipt of Intent to Obtain Permit (1st public notice)*.

- Publication in an alternative language section or insertion within an English language newspaper does not satisfy these requirements.

- The applicant has the burden to demonstrate compliance with these requirements. You must fill out the ***Public Notice Verification Form (Form TCEQ-20244)*** indicating your compliance with the requirements regarding publication in an alternative language. **This form is available at www.tceq.texas.gov/permitting/air/nav/air_publicnotice.html.**

- It is suggested the applicant work with the local school district to do the following:

  (a) determine if a bilingual program is required in the district;
  (b) determine which language is required by the bilingual program;
  (c) locate the nearest elementary and middle schools; and
  (d) determine if any students attending either school are entitled to be enrolled in a bilingual educational program.

- **If you determine that you must meet the alternative language notice requirements, you are responsible for ensuring that the publication in the alternative language is complete and accurate in that language.** Since the most common bilingual programs are in Spanish, the TCEQ has provided example Spanish notice templates for your use. All italic notes should be replaced with the corresponding Spanish translations for the specific application and published in the alternative language publication. Electronic versions of the Spanish templates are available through the Air Permits Division Web site at www.tceq.texas.gov/goto/air/publicnotice.

- If you are required to publish notice in a language other than Spanish, you must translate the entire public notice at your own expense.

Public Comment Period

- The public comment period will last at least **30 calendar days after publication of the last notice.**

- The comment period will be longer if the last day of the public comment period ends on a weekend or a holiday. In this case, the comment period will end on the next business day.

- The comment period for the permit may lengthen depending on whether a public meeting is held. If a public meeting is held, the comment period will be extended to the later of either the date of the public meeting or the end of the second notice period.

Proof of Publication

- Check each publication to ensure that the articles were accurately published. If a notice was not published correctly you may be required to republish.

- For each newspaper in which you published, you must submit proof of publication that shows the notice, the date of publication, and the name of the newspaper to the Office of the Chief Clerk within **10 business days** after the date of publication. Acceptable proofs of publication are 1) copies of the published notice or 2) the original newspaper clippings of the published notice. If you choose to submit copies of the published notice to the Office of the Chief Clerk, copies must be on standard-size 8½" x 11" paper and must show the actual size of the published notice (do not reduce the image when making copies). Published notices longer than 11" must be copied onto multiple 8½" x 11" pages. Please note, submitting a copy of your published notice could result in faster processing of your application. It is recommended that you maintain original newspaper clippings or tear sheets of the notice for your records.

- You must submit an **original affidavit of publication for air permitting and alternate language affidavit of publication for air permitting (if applicable)**

to the Office of the Chief Clerk within **30 calendar days** after the date of publication. **You must use the enclosed affidavit forms.** The affidavits must clearly identify the applicant's name and permit number. You are encouraged to submit the affidavit with the proof of publication described above.

- You must submit the ***Public Notice Verification Form (Form TCEQ-20244)*** to the Office of the Chief Clerk within **10 business days** of the end of this public comment period. You must use this form to certify that you have met bilingual notice requirements. **This form is available at www.tceq.texas.gov/permitting/air/nav/air_publicnotice.html.**

- The **original affidavits of publication, *Public Notice Verification Form,* and acceptable proof of publication of the published notices** must be mailed to:

Texas Commission on Environmental Quality
Office of the Chief Clerk, MC-105
Attn: Notice Team
P.O. Box 13087
Austin, Texas 78711-3087

- Please ensure that the affidavit(s) you send to the Chief Clerk is/are originals and that all blanks on the affidavit are filled in correctly. Photocopies of affidavits will not be accepted.

- Photocopies of newspaper clippings, affidavits, and verifications must also be sent to those listed on the enclosed *Notification List* within the deadlines specified above.

Failure to Publish and Submit Proof of Publication

You must meet all publication requirements. **If you fail to publish the notice or submit proof of publication *on time,*** the TCEQ may suspend further processing on your application or take other actions.

Sign Posting

It is recommended that the signs that were put in place prior to publication of the first notice remain in place and be legible and visible until 30 days after publication of the *Notice of Application and Preliminary Decision* (either English or alternative language notice, whichever is later).

Application in a Public Place

- You must provide a copy of the complete application (including any subsequent revisions) and the executive director's preliminary decision (including the draft permit), at a public place for review and copying by the public. This place must be in the county in which the facility is located or proposed to be located.

- A public place is one that is publicly owned or operated (ex: libraries, county courthouses, or city halls.)

- This copy must be accessible to the public for review and copying. The copy must be available beginning on the first day of newspaper publication and remain in place until

the commission has taken action on the application or the commission refers issues to the State Office of Administrative Hearings.

- If the application is submitted to the TCEQ with information marked as "CONFIDENTIAL," you are required to indicate which specific portions of the application are not being made available to the public. These portions of the application must be accompanied with the following statement: "Any request for portions of this application that are marked as confidential must be submitted in writing, pursuant to the Public Information Act, to the Texas Commission on Environmental Quality, Public Information Coordinator, MC-197, P.O. Box 13087, Austin, Texas 78711-3087."

- You must submit verification of file availability using the ***Public Notice Verification Form (Form TCEQ-20244)*** within **10 business days** after end of the publications' designated comment period. Do not submit the form verifying that the application was in a public place until after the comment period is complete. If a public meeting is held or second notice is required causing the public comment period to be extended, at a later date you will be required to verify that the application was in a public place during the entire public comment period. **This form is available at www.tceq.texas.gov/permitting/air/nav/air_publicnotice.html.**

General Information

When contacting the Commission regarding this application, please refer to the permit number at the top of the *Notice of Application and Preliminary Decision.*

If you have questions or need assistance regarding publication requirements, please contact the Office of the Chief Clerk at (512) 239-3300 or the project reviewer listed in the cover letter.

TCEQ-Office of the Chief Clerk
MC-105 Attn: Notice Team
P.O. Box 13087
Austin, Texas 78711-3087

Applicant Name: TPC Group LLC

Permit No.: 46307

AFFIDAVIT OF PUBLICATION FOR AIR PERMITTING

STATE OF TEXAS §

COUNTY OF _____ §

Before me, the undersigned authority, on this day personally appeared

_____, who being by me duly sworn,
(name of person representing newspaper)

deposes and says that (s)he is the _____
(title of person representing newspaper)

of the _____; that said newspaper is generally circulated
(name of newspaper)

in _____, Texas;
*(the **municipality or nearest municipality** (not county) to the location of the facility or the proposed facility)*

that the enclosed notice was published in said newspaper on the following date(s):

_____

_____
(newspaper representative's signature)

Subscribed and sworn to before me this the _____ day of _____, 20_____,

to certify which witness my hand and seal of office.

_____
Notary Public in and for the State of Texas

(Seal)

_____
Print or Type Name of Notary Public

_____
My Commission Expires

TCEQ-Office of the Chief Clerk
MC-105 Attn: Notice Team
P.O. Box 13087
Austin, Texas 78711-3087

Applicant Name: TPC Group LLC

Permit No.: 46307

ALTERNATIVE LANGUAGE AFFIDAVIT OF PUBLICATION FOR AIR PERMITTING

STATE OF TEXAS §

COUNTY OF _____ §

Before me, the undersigned authority, on this day personally appeared

_____, who being by me duly sworn, deposes
(name of person representing newspaper)

and says that (s)he is the _____ of the
(title of person representing newspaper)

_____ that said newspaper or publication is generally circulated
(name of newspaper)

in _____, Texas;
*(the **municipality or the same county** as the location of the facility or the proposed facility)*

that the enclosed notice was published in said newspaper or publication on the following date(s):

_____.

_____
(newspaper or publication representative's signature)

Subscribed and sworn to before me this the ___ day of _____, 20_____,

to certify which witness my hand and seal of office.

_____
Notary Public in and for the State of Texas

(Seal)

_____
Print or Type Name of Notary Public

_____
My Commission Expires

Notification List

It is the responsibility of the applicant to furnish the following offices with copies of the notices published, the *Affidavit of Publication for Air Permitting, the Alternative Language Affidavit of Publication for Air Permitting (if applicable)*, and a completed copy of the *Public Notice Verification Form (Form TCEQ-20244)*. Acceptable proof of publication and originals of any affidavits and Form TCEQ-20244 should be sent to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. **Copies** should be sent to the following:

U.S. Environmental Protection Agency
Region 6
Attn: Air Permits Section (6PD-R)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Texas Commission on Environmental Quality
Houston Regional Office
5425 Polk St Ste H
Houston, Texas 77023-1452

Texas Commission on Environmental Quality
Office of Air
Air Permits Division, MC-163
Ms. Cheryl Covone
P.O. Box 13087
Austin, Texas 78711-3087

Bureau Chief Pollution Control & Prevention
Environmental Health Division
Houston Department of Health and Human Services
7411 Park Place Blvd
Houston, Texas 77087-4441

Director
Harris County
Pollution Control Services
101 S Richey St Ste H
Pasadena, Texas 77506-

SPECIAL CONDITIONS

Permit Number 46307

Emission Limitations

1. This permit authorizes emissions only from those points listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," and the facilities covered by this permit are authorized to emit subject to the emission rate limits on that table and other operating requirements specified in the special conditions.

Federal Applicability

2. These facilities shall comply with all applicable requirements of the U.S. Environmental Protection Agency (EPA) regulations on Standards of Performance for New Stationary Sources (NSPS) promulgated in Title 40 Code of Federal Regulations (40 CFR) Part 60 for: **(06/11)**

   A. Subpart A – General Provisions;

   B. Subpart Kb – Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984; and

   C. Subpart VV – Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry. **(07/11)**

   D. Subpart VVa – Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction or Modification Commenced After November 7, 2006. **(07/11)**

3. These facilities shall comply with all applicable requirements of EPA regulations on National Emission Standards for Hazardous Air Pollutants 40 CFR Part 61, Subparts FF and A promulgated for Benzene Waste Operations. **(DATE)**

4. These facilities shall comply with all applicable requirements of EPA regulations on National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP) in 40 CFR Part 63, promulgated for: **(DATE)**

   A. Subpart A – General Provisions;

   B. Subpart F - Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry;

DRAFT

C. Subpart G – Organic Hazardous Air Pollutants From Synthetic Organic Chemical Manufacturing Industry Process Vents, Storage Vessels, Transfer Operations, and Wastewater;

D. Subpart H – Organic Hazardous Air Pollutants for Equipment Leaks;

E. Subpart FFFF - Miscellaneous Organic Chemical Manufacturing;

F. Subpart ZZZZ - Stationary Reciprocating Internal Combustion Engines; and

Operational Limitations

5. Non-fugitive emissions from relief valves, safety valves, or rupture discs of gases containing VOC at a concentration of greater than 1 percent are not authorized by this permit unless authorized on the MAERT. Any releases directly to atmosphere from relief valves, safety valves, or rupture discs of gases containing VOC at a concentration greater than 1 weight percent are not consistent with good practice for minimizing emissions. **(07/11)**

6. Safety relief valves that discharge to the atmosphere only as a result of fire or failure of utilities are exempt from quarterly monitoring per 30 TAC Chapter 115 and 40 CFR Part 60 Subpart VV, provided that each valve is equipped with a rupture disc upstream. A pressure gauge shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity, but no later than the next process shutdown. **(07/11)**

7. Total production throughput of polyisobutylene (PIB) shall be limited to the production rates provided in Confidential Section 5.0 of the January 2007 permit amendment application submitted under then-applicable Permit Number 19806. Annual throughput records shall be maintained at the plant site. (07/11) Upon request by the TCEQ Executive Director, the holder of this permit shall perform stack sampling and other testing as required to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere. **(07/11)**

Emission Standards and Fuel Specifications

8. Fuel for the Diesel Water Blaster Engine (EPN 31G-2350) is limited to commercially available ultra low sulfur diesel fuel purchased after June 1, 2006. **(12/08)**

9. Particulate matter (PM) vent emissions from any spent catalyst transfer operations shall be controlled using filter systems and will not exceed 0.01 grain per dscf of air.

10. All PM filter systems must effectively capture emissions from associated equipment and prevent particulate emissions from escaping. The PM filter system shall be maintained free of holes, cracks, and other conditions that would reduce the collection efficiency of the emission capture system.

DRAFT

Storage of Volatile Organic Compounds (VOC)

11. The service of Tanks T-103, T-114, and T-115 shall be limited to MTBE/ETBE. Storage of other chemicals is prohibited unless prior approval for such storage is obtained from the Executive Director of the TCEQ. The tanks shall be limited to the specified annual MTBE/ETBE throughput, on a rolling 12-month basis. Records shall be kept of the rolling 12-month MTBE/ETBE throughput for Tanks T-103, T-114, and T-115. These records shall be made available upon request to the TCEQ and to local governmental air pollution control agencies. **(DATE)**

Storage Tank 103:	7,300,320 barrels per year
Storage Tank 114:	3,099,600 barrels per year
Storage Tank 115:	3,099,600 barrels per year

12. Storage tanks are subject to the following requirements. The control requirements specified in Paragraphs A – D of this condition shall not apply (1) where the VOC has an aggregate partial pressure of less than 0.50 psia at the maximum feed temperature or 95°F, whichever is greater, or (2) to storage tanks smaller than 25,000 gallons.

A. An internal floating deck or "roof" or equivalent control shall be installed in all tanks. The floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the internal floating roof: (1) a liquid-mounted seal, (2) two continuous seals mounted one above the other, or (3) a mechanical shoe seal.

B. An open-top tank containing a floating roof (external floating roof tank) which uses double seal or secondary seal technology shall be an approved control alternative to an internal floating roof tank provided the primary seal consists of either a mechanical shoe seal or a liquid-mounted seal and the secondary seal is rim-mounted. A weathershield is not approvable as a secondary seal unless specifically reviewed and determined to be vapor-tight.

C. For any tank equipped with a floating roof, the permit holder shall perform the visual inspections and seal gap measurements as specified in 40 CFR § 60.113b Testing and Procedures (as amended at 54 FR 32973, Aug. 11, 1989) to verify fitting and seal integrity. Records shall be maintained of the dates seals were inspected and seal gap measurements made, results of inspections and measurements made (including raw data), and actions taken to correct any deficiencies noted.

D. The floating roof design shall incorporate sufficient flotation to conform to the requirements of API Code 650 dated November 1, 1998, except that an internal floating cover need not be designed to meet rainfall support requirements and the materials of construction may be steel or other materials.

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E. Uninsulated tank exterior surfaces exposed to the sun shall be white or aluminum. Storage tanks must be equipped with permanent submerged fill pipes.

F. The permit holder shall maintain an emissions record which includes calculated emissions of VOC from all storage tanks during the previous calendar month and the past consecutive 12-month period. The record shall include tank identification number, control method used, tank capacity in gallons, name of the material stored, VOC molecular weight, VOC monthly average temperature in degrees Fahrenheit, VOC vapor pressure at the monthly average material temperature in psia, VOC throughput for the previous month and year-to-date. Records of VOC monthly average temperature are not required to be kept for unheated tanks which receive liquids that are at or below ambient temperatures. Emissions for tanks shall be calculated using: the TCEQ publication titled "Technical Guidance Package for Chemical Sources – Storage Tanks." (07/11)

13. For any tank associated with this permit that is equipped with a floating roof, the holder of this permit shall (1) conduct annual visual inspections to verify the integrity of the external floating roof seals; (2) conduct annual visual inspections to verify the integrity of the visible portion of the internal floating roof seal or seals; (3) maintain records which describe inspections dates, seal integrity, and corrective actions taken; and (4) make necessary repairs as soon as practicable, if corrective action is necessary.

The floating roof design shall incorporate sufficient flotation to conform to the requirements of API Code 650, Appendix C, or an equivalent degree of flotation, except that an internal floating cover need not be designed to meet rainfall support requirements. **(07/11)**

Product Loading

14. The total hourly loading transfer rate of PIB at all loading stations shall not exceed 430,839 gallons per hour. **(DATE)**

15. The permit holder shall maintain and update monthly emissions record which includes calculated emissions of VOC from all loading operations over the previous rolling 12-month period. The record shall include the loading spot, control method used, quantity loaded in gallons, name of the liquid loaded, vapor molecular weight, liquid temperature in degrees Fahrenheit, liquid vapor pressure at the liquid temperature in psia, liquid throughput for the previous month and rolling 12 months to date. Records of VOC temperature are not required to be kept for liquids loaded from unheated tanks which receive liquids that are at or below ambient temperatures. Emissions shall be calculated using the TCEQ publication titled "Technical Guidance Package for Chemical Sources - Loading Operations." **(07/11)**

16. All product loading lines and connectors shall be visually inspected for any defects prior to hookup. Product loading lines and connectors that are visibly damaged shall be

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removed from service operations shall cease immediately upon detection of any liquid leaking from the lines or connections. **(07/11)**

17. Any liquid spill that occurs during loading/unloading activities shall be reported pursuant to 30 TAC §§ 101.201 or 101.211 and shall be cleaned up immediately to minimize air emissions.

18. "Dry break" loading equipment will be used during loading and unloading of butadiene from railcars. **(11/07)**

19. All loading of PIB is subject to the following requirements. **(DATE)**

    A. All loading shall be controlled by the plant vapor recovery system.

    B. All tank trucks shall pass vapor-tight testing every 12 months using the methods described in 40 CFR Part 60, Subpart XX.

20. Emergency and upset emissions from the PIB Production Unit that contain non-neutralized boron trifluoride-alcohol complex shall be routed to a caustic scrubber and then a flare. Emergency and/or upset emissions from the PIB Production Unit are not authorized as a function of this permit and are subject to 30 TAC § 101.201. **(07/11)**

21. Atmospheric unloading of methanol/ethanol into Tank T-71 or Tank T-72 and atmospheric loading/unloading of methyl-tert-butyl ether (MTBE)/ethyl tert-butyl-ether (ETBE) to or from Tank T-103. Emissions from the unloading operations shall be included in the emission rates for Tank T-71 (Emission Point No. [EPN] T-71), Tank T-72 (EPN T-72), and Tank T-103 (EPN T-I03). **(07/11)**

Cooling Tower Requirements

22. A. The highly reactive VOC (HRVOC) associated with cooling tower water shall be monitored and tested as specified by 30 TAC § 115.764 (effective November 13, 2003) and 30 TAC § 115.766 (effective January 17, 2003). The total strippable VOC associated with cooling tower water shall be monitored by methods at least as stringent as monthly testing using the method represented in the TCEQ Sampling Procedures Manual, Appendix P. Continuous monitoring of total strippable VOCs according to the methods specified in § 115.766, if performed, shall also satisfy the monitoring requirements of this permit. Records shall be kept in compliance with 30 TAC § 115.767 effective November 13, 2003. The results of the monitoring and maintenance efforts shall be recorded, and such records shall be maintained for a period of five years. The records shall be made available to the TCEQ Executive Director upon request. **(DATE)**

    B. The VOC associated with cooling tower water shall be monitored weekly with an air stripping system meeting the requirements of the TCEQ Sampling Procedures

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Manual, Appendix P (dated January 2003 or a later edition) or an approved equivalent sampling method.

C. The cooling towers to be monitored include CT-3, CT-7, CT-10, CT-11, and CT-14.

D. The appropriate equipment shall be maintained so as to minimize fugitive VOC emissions from the cooling towers. Upon a reading of VOC concentration greater than 0.08 ppmw in the cooling tower heater exchange system, the permit holder shall identify the source of VOC and repair the equipment at the earliest opportunity but no later than the next scheduled shutdown of the process unit in which the leak occurs.

E. Emissions from the cooling tower are not authorized if the VOC concentration of the water returning to the cooling tower exceeds 0.8 ppmw. The VOC concentrations above 0.8 ppmw are not subject to extensions for delay of repair under this permit condition. The results of the monitoring and maintenance efforts shall be recorded.

Flare Requirements

23. The Plant Flare (Emission Point No. [EPN] EP-5) shall be designed and operated in accordance with the following requirements: **(07/10)**

A. The combined natural gas and waste stream to the flare shall meet the 40 CFR § 60.18 specifications of minimum heating value and maximum tip velocity under normal, upset, and maintenance flow conditions. Flare testing per 40 CFR § 60.18(f) may be requested by the TCEQ Regional Office or any local air program with jurisdiction, in addition to New Source Performance Standard (NSPS) or federal requirements, to demonstrate compliance with this condition. Testing to confirm the heating value (Btu/scf) may be requested by the TCEQ Regional Office or any local air program with jurisdiction to demonstrate compliance with this condition.

B. The flare(s) shall be operated with a pilot flame present at all times and have a constant pilot flame or an automatic reignition system. The pilot flame shall be monitored by a thermocouple or an infrared monitor. If the pilot flame is extinguished, proper 30 TAC Chapter 101 procedures shall be followed for this incident.

C. The flare shall be operated with no visible emissions except periods not to exceed a total of five minutes during any two consecutive hours. This shall be ensured by the use of steam assist to the flare (for steam-assisted flares).

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D. The flare shall comply with the Vent Gas Control provisions for HRVOCs found in 30 TAC Chapter 115, Subchapter H, effective December 23, 2004.

24. The Plant Flare (EPN EP-5) HRVOC emissions shall be monitored and recorded by a continuous online analyzer at least 95 percent of the time when the flare is operated as required in 30 TAC § 115.725(d)(3) to insure the maximum allowable emission rates table HRVOC's annual CAP is not exceeded. Compliance with the HRVOC CAP is based on a rolling 12-month period. During periods of monitor downtimes the requirements of 30 TAC § 115.725(d)(4) will be followed to determine compliance with the HRVOC annual CAP. The permit holder shall comply with all requirements of 30 TAC § 115.725(d). **(DATE)**

25. The following requirements apply to the capture system for the flare. **(DATE)**

A. The permit holder shall comply with the following:

(1) Conduct a once a month visual, audible, and/or olfactory inspection of the capture system to verify there are no leaking components in the capture system; or

(2) Once a year, verify the capture system is leak-free by inspecting in accordance with 40 CFR Part 60, Appendix A, Test Method 21. Leaks shall be indicated by an instrument reading greater than or equal to 500 ppmv above background.

B. The control device shall not have a bypass.

C. Records of the inspections required shall be maintained and if the results of any of the above inspections are not satisfactory, the permit holder shall promptly take necessary corrective action.

<u>Piping, Valves, Connectors, Pumps, and Compressors In VOC Service - 28VHP</u>

26. Except as may be provided for in the special conditions of this permit, the following requirements apply to the above-referenced equipment:

A. These conditions shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure of less than 0.044 psia at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list to be made available upon request.

B. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable ANSI, API, ASME, or equivalent codes.

C. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical.

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D. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Non-accessible valves, as defined by 30 TAC Chapter 115, shall be identified in a list to be made available upon request.

E. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. No later than the next scheduled quarterly monitoring after initial installation or replacement, all new or reworked connections shall be gas-tested or hydraulically-tested at no less than normal operating pressure and adjustments made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve. Except during sampling, the second valve shall be closed.

F. Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown.

An approved gas analyzer shall conform to requirements listed in 40 CFR § 60.485(a)-(b).

Replaced components shall be re-monitored within 15 days of being placed back into VOC service.

G. Except as may be provided for in the special conditions of this permit, all pump and compressor seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.

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H. Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump and compressor seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. (See exceptions in Special Condition No. 28) **(11/09)**

I. Every reasonable effort shall be made to repair a leaking component, as specified in this paragraph, within 15 days after the leak is found. If the repair of a component would require a unit shutdown, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging. At the discretion of the TCEQ Executive Director or designated representative, early unit shutdown or other appropriate action may be required based on the number and severity of tagged leaks awaiting shutdown.

J. The results of the required fugitive instrument monitoring and maintenance program shall be made available to the TCEQ Executive Director or designated representative and representatives of local air programs with jurisdiction upon request. Records shall indicate appropriate dates, test methods, instrument readings, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of physical inspections are not required unless a leak is detected.

K. Alternative monitoring frequency schedules of 30 TAC §§ 115.352 through 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F through G of this condition.

L. Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable NSPS, or an applicable National Emission Standard for Hazardous Air Pollutants and does not constitute approval of alternative standards for these regulations.

27. Polyisobutylene (PIB-1 and PIB-2) Unit Piping, Valves, Connectors, Pumps, Agitators, and Compressors – 28VHP. **(07/07)**

Except as may be provided for in the special conditions of this permit, the following requirements apply to the above-referenced equipment.

A. These conditions shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure of less than 0.044 pound per square inch, absolute (psia) at 68EF or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon

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request. The exempted components may be identified by one or more of the following methods:

(1) piping and instrumentation diagram (PID); or

(2) a written or electronic database.

B. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable ANSI, API, ASME, or equivalent codes.

C. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

D. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by 30 TAC Chapter 115, shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in Subparagraph A above. If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe-to-monitor times. A difficult-to-monitor component for which quarterly monitoring is specified may instead be monitored annually.

E. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve to seal the line so that no leakage occurs. Except during sampling, both valves shall be closed. If the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 24 hours. If the repair or replacement is not completed within 24 hours, the line or valve must have a cap, blind flange, plug, or second valve installed.

F. Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device

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are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown. A check of the reading of the pressure-sensing device to verify disc integrity shall be performed weekly and recorded in the unit log. The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR Part 60, Appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs are being monitored, the response factor shall be calculated for the average composition of the process fluid. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured. Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.

G. Except as may be provided for in the special conditions of this permit, all pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.

H. Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (*e.g.*, dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (*e.g.*, dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days. Records of the first attempt to repair shall be maintained. (See exemption in Special Condition No. 28.) **(11/09)**

I. Every reasonable effort shall be made to repair a leaking component, as specified in this paragraph, within 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled

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shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC § 115.782(c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC § 115.782(c)(1)(B)(i)(I), the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

J. Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. Records of physical inspections shall be noted in the operator's log or equivalent.

K. Alternative monitoring frequency schedules of 30 TAC Sections 115.352 – 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F through G of this condition.

L. Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable NSPS, or an applicable NESHAPS and does not constitute approval of alternative standards for these regulations. **(07/11)**

28. The leak definition level for identifying leaking or damaged valves, connectors, pumps, compressors, and agitator seals found to be emitting VOCs in Special Condition Nos.26H and 27H shall be 250 ppmv instead of the applicable 500 ppmv, 2,000 ppmv, or 10,000 ppmv. **(11/09)**

Quarterly Connector Monitoring (28CNTQ)

29. In addition to the weekly physical inspection required by Item E of Special Condition No. 26, all accessible connectors in gas\vapor and light liquid service shall be monitored quarterly with an approved gas analyzer in accordance with Items F thru J of Special Condition No. 26. (28CNTQ) **(04/11)**

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30. The permit holder shall implement the requirements of Special Condition No. 28 by no later than June 30, 2011. **(04/11)**

Aqueous Ammonia Handling (NH3)

31. Aqueous ammonia storage tanks shall be located within a physical barrier to traffic. Tank containment shall be employed with a minimum of 110 percent of tank volume. Vapors resulting from the filling operations of the aqueous ammonia storage tank(s) shall be collected and vapor returned back to the transport vessel. **(07/11)**

32. The relief valve system shall be designed and operated to ensure that there are no working loss emissions to the atmosphere resulting from filling operations, and that there are no breathing losses during normal non-filling (standing) operations. The fill level of the aqueous ammonia storage tank shall not exceed a level that is in line with good engineering practices, and shall include a high level alarm and a high-high level alarm. In addition, sealless pumps shall be used in all piping handling aqueous ammonia. **(07/11)**

33. Audio, visual and olfactory (AVO) checks for ammonia leaks shall be made once per day within the operating area. **(06/11)**

    A. No later than one hour following detection of a leak, plant personnel shall take the following actions:

        (1) Locate and isolate the leak; and

        (2) Use a leak collection or containment system to control the leak until repair or replacement can be made.

    B. A component in no instance may be allowed to have a leak for more than 15 calendar days after the leak is found. **(07/11)**

Recordkeeping

34. Records required by Special Condition Nos. 12, 15, 22, 23, 24, 26, and 27 shall be kept on-site and made available upon request to the Executive Director of the Texas Commission on Environmental Quality, to his representative, and to air quality agencies with jurisdiction over this site. **(07/11)**

35. The following information shall be maintained by the holder of this permit in a form suitable for inspection for a period of five years after collection and shall be made immediately available upon request to representatives of the TCEQ, EPA, or any local air pollution control program having jurisdiction: **(DATE)**

    A. Annual throughput records in accordance with Special Condition No. 7. **(06/11)**

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B. Records demonstrating compliance with AVO checks and maintenance as required by Special Condition No. 33.

Project Increase

36. The permit holder shall install a continuous flow monitor and calorimeter, on or before January 31, 2014 to monitor the flow and composition of the PIB WW Stripper overhead stream. Readings shall be taken at least once every 15 minutes and the average hourly values of the flow and composition shall be recorded each hour. Each month the permit holder shall calculate the 12 month rolling average emission rate and demonstrate that the annual emissions routed to the flare from the PIB WW Stripper overhead stream do not exceed 68.33 tpy. **(DATE)**

A. The flow monitor shall be calibrated on an annual basis and shall be accurate to within ± 5 percent.

B. The calorimeter shall be calibrated, installed, operated, and maintained, in accordance with manufacturer recommendations.

C. The flow monitor and calorimeter shall operate as required by this section at least 95 percent of the time when the PIB WW Stripper is operational, averaged over a rolling 12-month period.

Permit by Rule Sources (PBR)

37. The following sources are authorized under PBR by Title 30 Texas Administrative Code Chapter 106. This list is not intended to be all inclusive and may be altered without modifications to this permit. **(DATE)**

Authorization	Date	Source or Activity
Standard Exemption 8	1980	Cooling Tower (CT-17)
Standard Exemption 8	1980	Cooling Tower (CT-18)

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES
Permit Number 46307

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities, sources, and related activities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
EP-5	Plant Flare (6)	VOC	194.35	75.27
		NO_x	30.61	11.52
		SO_2	0.01	0.01
		CO	151.91	58.90
		BD	-----	4.42
		HRVOC	-----	15.00
		PM	0.71	3.10
		CO	7.82	34.27
12DG-15	Boilerhouse Emergency Generator	VOC	0.12	0.05
		NO_x	12.87	5.47
		SO_2	0.85	0.36
		PM	0.91	0.39
		PM_{10}	0.91	0.39
		$PM_{2.5}$	0.91	0.39
		CO	2.77	1.18
		HAP	0.01	0.01
3DG-14	OXO Emergency Generator	VOC	0.04	0.02
		NO_x	4.62	1.96
		SO_2	0.31	0.13

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Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
		PM	0.33	0.14
		PM_{10}	0.33	0.14
		$PM_{2.5}$	0.33	0.14
		CO	1.00	0.42
		HAP	0.01	0.01
31G-2350	Diesel Water Blaster Engine	VOC	0.75	0.78
		NO_x	3.04	3.16
		SO_2	0.01	0.01
		PM	0.33	0.14
		PM_{10}	0.33	0.14
		$PM_{2.5}$	0.33	0.14
		CO	1.72	1.79
		HAP	0.01	0.01
13G-2629	No. 10 Firewater Pump Engine	VOC	0.15	0.01
		NO_x	4.22	0.11
		SO_2	0.12	0.01
		PM_{10}	0.07	0.01
		$PM_{2.5}$	0.07	0.01
		CO	0.41	0.01
		HAP	0.01	0.01
20DG-16	Dock Emergency Generator	VOC	0.10	0.01
		NO_x	1.24	0.03
		SO_2	0.08	0.01
		PM_{10}	0.09	0.01
		$PM_{2.5}$	0.09	0.01
		CO	0.27	0.01
		HAP	0.01	0.01
21G-2216	Diesel Fire Pump Engine	VOC	0.40	0.01

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Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
		NO_x	6.10	0.16
		SO_2	0.60	0.02
		PM_{10}	0.24	0.01
		$PM_{2.5}$	0.24	0.01
		CO	0.50	0.01
		HAP	0.01	0.01
19G-3789	Diesel Driven Fire Water Engine	VOC	0.08	0.01
		NO_x	2.46	0.06
		SO_2	0.02	0.01
		PM_{10}	0.10	0.01
		$PM_{2.5}$	0.10	0.01
		CO	0.63	0.02
		HAP	0.01	0.01
N14-C475	Cummins Diesel Air Compressor	VOC	1.17	0.03
		NO_x	14.73	0.38
		SO_2	0.97	0.03
		PM_{10}	1.05	0.03
		$PM_{2.5}$	1.05	0.03
		CO	3.17	0.08
		Total HAPs	0.01	0.01
F-CT-10	Cooling Tower CT-10 (5)	PM_{10}	0.45	1.97
		$PM_{2.5}$	0.45	1.97
		VOC	0.14	0.63
F-CT-11	Cooling Tower CT-11 (5)	PM_{10}	0.12	0.53
		$PM_{2.5}$	0.12	0.53
		VOC	0.04	0.16
F-CT-14	Cooling Tower CT-14 (5)	PM_{10}	1.22	5.34
		$PM_{2.5}$	1.22	5.34

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Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
		VOC	0.39	1.69
F-CT-3	Cooling Tower CT-3 (5)	PM_{10}	0.59	2.59
		$PM_{2.5}$	0.01	0.01
		VOC	2.28	9.99
F-CT-7	Cooling Tower CT-7 (5)	PM_{10}	0.08	0.34
		$PM_{2.5}$	0.01	0.01
		VOC	0.60	2.63
CAT-TFR	Catalyst Transfer Hopper	PM	0.01	0.01
CAT-BH	Catalyst Baghouse	PM	0.01	0.01
F-TTR	Truck Rack Loading Facility	VOC	6.47	0.26
E-PIBTT	PIB-1 Product Loading B Tank Trucks	VOC	(9)	(9)
E-PIBTC	PIB-1 Product Loading B Rail Cars	VOC	(9)	(9)
E-PIB2RC1	PIB-2 Product Loading Rail Cars - Station 1	VOC	(9)	(9)
E-PIB2RC2	PIB-2 Product Loading Rail Cars - Station 2	VOC	(9)	(9)
E-PIB2TT1	PIB-2 Product Loading Tank Truck - Station 1	VOC	(9)	(9)
E-PIB2TT2	PIB-2 Product Loading Tank Truck - Station 2	VOC	(9)	(9)
LOAD-GRP	Loading Emissions Cap	VOC	2.56	1.18
F-PIBPROC	PIB-1 Process Fugitives (10)	VOC	0.13	0.57
F-PIBSTOR	PIB-1 Tank Farm Fugitives (10)	VOC	0.10	0.45
F-PIB2PROC	PIB-2 Process Fugitives (10)	VOC	0.15	0.66

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Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
F-PIB2STOR	PIB-2 Tank Farm Fugitives (10)	VOC	0.31	1.35
T-P1WW1	PIB-1 Wastewater Tank 1	VOC	0.01	0.01
		NH3	0.01	0.01
T-P1WW2	PIB-1 Wastewater Tank 2	VOC	0.01	0.01
		NH3	0.01	0.01
T-P2WW1	PIB-2 Wastewater Tank 1	VOC	0.01	0.01
		NH3	0.01	0.01
T-31	Tank 31	VOC	4.24	0.65
T-32	No. 32 Tank	VOC	0.08	0.33
T-33	No. 33 Tank	VOC	0.58	0.01
T-34	No. 34 Tank	VOC	0.52	0.32
T-36	DIB Storage Tank 36	VOC	0.64	0.17
T-37	DIB Storage Tank 37	VOC	0.64	0.17
T-69-1	No. 69-1 Tank	VOC	0.29	0.01
T-71	Methanol/Ethanol Tank	VOC	0.46	0.74
T-72	Methanol/Ethanol Tank	VOC	0.45	0.71
T-73	MTBE/ETBE Storage Tank 73	VOC	8.79	1.42
T-74	MTBE/ETBE Storage Tank 74	VOC	8.79	1.42
T-77	Tank	VOC	8.02	0.26
T-78	Tank	VOC	8.02	0.26
T-79	Tank	VOC	2.09	0.20
T-80	MeOH/EtOH Storage Tank 80	VOC	1.70	1.98
T-81	No. 81 Tank	VOC	0.58	1.46

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Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
T-82	No. 82 Tank	VOC	1.13	4.77
T-83	No. 83 Tank	VOC	1.13	0.04
T-84	No. 84 Tank	VOC	0.29	0.61
T-85	No. 85 Tank	VOC	0.29	0.01
T-86	No. 86 Tank	VOC	0.58	0.47
T-103	MTBE/ETBE Tank	VOC	0.42	1.28
T-111	Tank	VOC	1.01	0.01
T-112	Tank	VOC	1.01	0.01
T-114	MTBE/ETBE Tank	VOC	0.61	1.12
T-115	MTBE/ETBE Tank	VOC	0.61	1.12
T-117	PIB-1 Process Tank 117	VOC	0.62	(8)
T-118	PIB-1 Process Tank 118	VOC	0.62	(8)
T-119	PIB-1 Process Tank 119	VOC	0.62	(8)
T-204	PIB-2 Process Tank 1	VOC	0.68	(8)
T-205	PIB-2 Process Tank 2	VOC	0.68	(8)
T-206	PIB-2 Process Tank 3	VOC	0.68	(8)
TNK-GRP	Tank Emissions Cap	VOC	--	1.97
T-Diesel2	Tank	VOC	0.31	0.01
T-155	TEA Storage Tank	VOC	0.01	0.01
1F-511	Tank	VOC	1.33	0.01
Gas-2	Tank	VOC	56.77	0.78
T01	Diesel Tank	VOC	0.03	0.01
2F26	Furfural Sump Tank	VOC	0.01	0.01
4F14	Furfural Sump Tank	VOC	0.01	0.01

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Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
5F3	Furfural Sump Tank	VOC	0.01	0.01
1A	Isomerization Unit - Fugitives (5)	VOC	1.85	8.09
		1,3-Butadiene	0.04	0.17
		Other HAPs	0.01	0.05
1B	Hydrogenation Unit - Fugitives (5)	VOC	0.02	0.10
1C	Dimethyl Formamide Unit - Fugitives (5)	VOC	4.54	19.88
		1,3-Butadiene	1.16	5.09
		Other HAPs	0.48	2.08
1D	Diiso Unit - Fugitives (5)	VOC	1.67	7.33
		1,3-Butadiene	0.23	1.00
		Other HAPs	0.26	1.16
2A	Fugitive Area No. 2 (5)	VOC	1.59	6.95
		1,3-Butadiene	0.17	0.75
		Other HAPs	0.23	1.00
2B	Fugitive Area No. 2B (5)	VOC	1.31	5.73
		1,3-Butadiene	0.25	1.07
FUG-2C	Tank Car Loading Fugitives (5)	VOC	0.45	1.98
		1,3-Butadiene	0.09	0.38
		Other HAPs	0.06	0.26
FUG-2D	Truck Rack Loading Fugitives	VOC	0.16	0.69

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Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
	(5)	1,3-Butadiene	0.03	0.13
		Other HAPs	0.02	0.09
FUG-3	Fugitive Area No. 3 (5)	VOC	2.44	10.70
		1,3-Butadiene	0.54	2.38
		Other HAPs	0.09	0.41
FUG-4	Fugitive Area No. 4 (5)	VOC	2.76	12.10
		1,3-Butadiene	0.58	2.54
		Other HAPs	0.23	1.01
FUG-5	Fugitive Area No. 5 (5)	VOC	0.03	0.15
		Other Haps	0.03	0.15
F-10A	Oil Separation	VOC	0.17	0.76
DEGREAS 1	Cold Solvent Degreaser	VOC	3.34	0.07
DEGREAS 2	Cold Solvent Degreaser	VOC	3.34	0.07
NEW-LAB	New R&D and QC Lab	VOC	0.27	0.45
		NO_x	1.35	2.55
		CO	2.65	5.05
		PM_{10}	0.01	0.01
		$PM_{2.5}$	0.01	0.01
		1,3-butadiene	0.04	0.02
		butenes	0.26	0.02

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.

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(2) Specific point source name. For fugitive sources, use area name or fugitive source name.

(3) VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1
NO_x - total oxides of nitrogen
SO_2 - sulfur dioxide
CO - carbon dioxide
BD - 1,3-butadiene
HRVOC - BD, butenes, ethylene, and propylene
PM - total particulate matter, suspended in the atmosphere, including PM_{10} and $PM_{2.5}$, as represented
PM_{10} - total particulate matter equal to or less than 10 microns in diameter, including $PM_{2.5}$, as represented

(4) Compliance with annual emission limits (tons per year) is based on a 12-month rolling period.

(5) Emission rate is an estimate and is enforceable through compliance with the applicable special condition(s) and permit application representations.

(6) Annual emissions of BD and total HRVOCs are limited as indicated. The allowable emission rate listed for HRVOCs from this EPN are included in the total VOC emission rate. The HRVOC CAP of 15 tons per year includes the BD emission rate.

(7) The annual emissions of BD from all the cooling towers are limited as indicated. The VOC emission rate of each cooling tower includes BD. While short-term BD emission rates are not established, the hourly VOC emission rate of each cooling tower establishes a maximum BD short-term rate.

(8) The total annual emission rates for PIB process and storage tanks are limited to the annual cap indicated under EPN TNK-GRP.

(9) The total PIB product loading emission rates are limited to the hourly and annual caps indicated under EPN LOADGRP which may be loaded through either tank trucks or tank cars or both.

(10) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate. Emission rate is an estimate and is enforceable through compliance with the applicable special condition(s) and permit application representations.

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Date

440950

Print Form

T/34
V4

AIR, PESTICIDES, AND TOXICS
6TH FLOOR RECORDS CENTER
INFILING / NEW FILE FORM

New File ☐ OR Infiling ☒

Choose from the file types below:

AIR FACILITY:

(☐) AR - Acid Rain
(☐) CB - Confidential Business
(☐) CO - Compliance
(☐) EN - **Enforcement
(☐) GE - General
(☒) PE - Permit
(☐) RA - Regulatory Applicability
(☐) Other _____

TSCA:

(☐) AH - Asbestos Hazard Emergency Response Act
(☐) AS or AW - Asbestos or Asbestos Worker Protection
(☐) CB - Confidential
(☐) FI - Site Specific
(☐) FO - Non Site Specific
(☐) IM - **Section 5 & 8
(☐) LB - **Lead
(☐) PC - **PCB

** Extension of file type (if needed): (☐) ES - Enforcement Sensitive
(☐) DO - Docket Number

EPCRA / SARA (☐) ***FIFRA*** (☐)

EPA Registry I.D.

Current FRS Number: (Found in EnviroFacts) 110000461134

Facility Name & Physical Address: TPC Group LLC
8600 Park Place Blvd,
Houston, TX, 77017 2513

Remarks:

Requestor's Name & Phone Number: Les Koval X6733

Program Management Files:

A current listing of these file types and their numeric codes are located in a blue binder on the top shelf of the "APT" file cabinet in the 9th Floor Records Center.

AIRS - Aerometric Information Retrieval System
ATO - Air Toxics
EMR - Emergency Response
ENF - Enforcement -
ENF 5-5-1 requires Month and Fiscal Year accompany file code.
ENF 5-6-5 requires Fiscal Year accompany file code.
EXR - External Relations
GEO - Geographical Summary Data
GRA - Grants Administration
The majority of this section requires the Fiscal Year accompany file code.
Project Officer Grants require the Grant number and Fiscal Year accompany file code.
LAB - Laboratory Support
LBP - Lead Based Paint
LBP 12-3 requires the facility name in which document refers to be either highlighted or circled on the top page.
LEL - Legal and Legislative
MON – Monitoring NES - National Emission Standards
NSP - New Source Performance
NSR - New Source Review
OPP - Operating Permits Program
PEA - Permits Administration Program
PES - Pesticides
PLA - Planning
PUA - Public Affairs
RAD - Radiation
RCR - Resource Conservation and Recovery Act - Regulatory Development
RDE - Research and Development
REG - Registration
SIP - State Implementation Plan
SUP - Superfund
TITL - Title III
TSC - Toxic Substance Control
TSC 1-1-4 requires the facility name in which document refers to be either highlighted or circled on the top page.
TSU - Technical Support
VRP - Voluntary Reduction Program

EPA

Bryan W. Shaw, Ph.D., *Chairman*
Carlos Rubinstein, *Commissioner*
Toby Baker, *Commissioner*
Zak Covar, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 25, 2012

MR CHARLES KIRK JOHNSON
PLANT MANAGER
TPC GROUP LLC
8600 PARK PLACE BLVD
HOUSTON TX 77017-2513

RECEIVED
12 NOV -7 PM 4:43
AIR PERMITS SECTION
6PD-R

Re: Permit Amendment Application
Permit Number: 98149
Chemical Manufacturing Facility
Houston, Harris County
Regulated Entity Number: RN100219526
Customer Reference Number: CN603624289

Dear Mr. Johnson:

The executive director has completed the technical review of your application and has prepared a preliminary decision and draft permit.

You are now required to publish notice of your proposed activity. To help you meet the regulatory requirements associated with this notice, we have included the following items:

- Notices for Newspaper Publication (Examples A and B)
- Public Notice Checklist
- Instructions for Public Notice
- Affidavit of Publication for Air Permitting (Form TCEQ-20533) and Alternative Language Affidavit of Publication for Air Permitting (Form TCEQ-20534)
- Web link to download Public Notice Verification Form (refer to Public Notice Instructions)
- Notification List
- Draft Permit

Please note that it is **very important** that you follow **all** directions in the enclosed instructions. If you do not, you may be required to republish the notice. A common mistake is the unauthorized changing of notice wording or font. If you have any questions, please contact us before you proceed with publication.

A "Public Notice Checklist" is enclosed which notes the time limitations for each step of the public notice process. **The processing of your application may be delayed if these time limitations are not met (i.e.; submitting newspaper clippings within 10 business days after publication, affidavits of publication within 30 calendar days after the date of publication, and public notice verification form within 10 business days**

Re: Permit Number: 98149

after the end of the designated comment period). This checklist should be used as a tool in conjunction with the enclosed, detailed instructions.

If you do not comply with **all** requirements described in the instructions, further processing of your application may be suspended or the agency may take other actions.

If you have any questions regarding publication requirements, please contact the Office of the Chief Clerk at (512) 239-3300. If you have any other questions, please contact Ms. Cheryl Covone at (512) 239-1248.

Sincerely,

Bridget C. Bohac

Bridget C. Bohac
Chief Clerk
Office of the Chief Clerk
Texas Commission on Environmental Quality

BB/cc

Enclosures

cc: Bureau Chief Pollution Control & Prevention, Environmental Health Division, Houston Department of Health and Human Services, Houston
Director, Harris County, Pollution Control Services, Pasadena
Air Section Manager, Region 12 - Houston
Air Permits Section Chief, New Source Review, Section (6PD-R), U.S. Environmental Protection Agency, Region 6, Dallas

Project Number: 171658

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

EXAMPLE A

NOTICE OF APPLICATION AND PRELIMINARY DECISION FOR AN AIR QUALITY PERMIT

PERMIT NUMBER: 98149

APPLICATION AND PRELIMINARY DECISION. TPC Group LLC, 8600 Park Place Blvd, Houston, Texas 77017-2513, has applied to the Texas Commission on Environmental Quality (TCEQ) for an amendment to Air Quality Permit Number 98149, which would authorize modification to a Chemical Manufacturing Facility located at 8600 Park Place Blvd, Houston, Harris County, Texas 77017. This application was submitted to the TCEQ on November 9, 2011. The proposed facility will emit the following contaminants: organic compounds, particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less, nitrogen oxides, carbon monoxide, and sulfur dioxide.

The executive director has completed the technical review of the application and prepared a draft permit which, if approved, would establish the conditions under which the facility must operate. The executive director has made a preliminary decision to issue the permit because it meets all rules and regulations. The permit application, executive director's preliminary decision, and draft permit will be available for viewing and copying at the TCEQ central office, the TCEQ Houston regional office, and at the Park Place Regional Library, 8145 Park Place Boulevard, Houston, Harris County, Texas, beginning the first day of publication of this notice. The facility's compliance file, if any exists, is available for public review at the TCEQ Houston Regional Office, 5425 Polk St Ste H, Houston, Texas.

PUBLIC COMMENT/PUBLIC MEETING. You may submit public comments or request a public meeting about this application. The purpose of a public meeting is to provide the opportunity to submit comment or to ask questions about the application. The TCEQ will hold a public meeting if the executive director determines that there is a significant degree of public interest in the application or if requested by a local legislator. A public meeting is not a contested case hearing. **You may submit additional written public comments within 30 days of the date of newspaper publication of this notice in the manner set forth in the AGENCY CONTACTS AND INFORMATION paragraph below.**

RESPONSE TO COMMENTS AND EXECUTIVE DIRECTOR ACTION. After the deadline for public comments, the executive director will consider the comments and prepare a response to all relevant and material or significant public comments. Because no timely hearing requests have been received, after preparing the response to comments, the executive director may then issue final approval of the application. **The response to comments, along with the executive director's decision on the application will be mailed to everyone who submitted public comments or is on a mailing list for this application, and will be posted electronically to the Commissioners' Integrated Database (CID).**

INFORMATION AVAILABLE ONLINE. When they become available, the executive director's response to comments and the final decision on this application will be accessible through the Commission's Web site at www.tceq.texas.gov/goto/cid. Once you have access to the CID using the above link, enter the permit number for this application which is provided at the top of this notice. This link to an electronic map of the site or

facility's general location is provided as a public courtesy and not part of the application or notice. For exact location, refer to application.
http://www.tceq.texas.gov/assets/public/hb610/index.html?lat=29.699166&lng=-95.253888&zoom=13&type=r

MAILING LIST. You may ask to be placed on a mailing list to obtain additional information on this application by sending a request to the Office of the Chief Clerk at the address below.

AGENCY CONTACTS AND INFORMATION. Public comments and requests must be submitted either electronically at www.tceq.texas.gov/about/comments.html, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. If you communicate with the TCEQ electronically, please be aware that your email address, like your physical mailing address, will become part of the agency's public record. For more information about this permit application or the permitting process, please call the Public Education Program toll free at 1-800-687-4040. Si desea información en Español, puede llamar al 1-800-687-4040.

Further information may also be obtained from Tpc Group Llc at the address stated above or by calling Ms. Geri Shoop, Staff Environmental Engineer at (713) 475-7422.

Notice Issuance Date: October 9, 2012

Example B

Publication Elsewhere in the Newspaper:

TO ALL INTERESTED PERSONS AND PARTIES:

TPC Group LLC, has applied to the Texas Commission on Environmental Quality (TCEQ) for an amendment to Air Quality Permit Number 98149, which would authorize modification to a Chemical Manufacturing Facility located at 8600 Park Place Blvd, Houston, Harris County, Texas 77017. Additional information concerning this application is contained in the public notice section of this newspaper.

3" minimum

Minimum 2 column widths or 4 inches

Public Notice Checklist
Notice of Application and Preliminary Decision for an Air Quality Permit
(2nd Notice)

The following tasks must be completed for public notice. If publication in an alternative language is required, please complete the tasks for both the English and alternative language publications. Detailed instructions are included in the "Instructions for Public Notice" section of this package.

Within 33 calendar days after date of this letter
Publish *Notice of Application and Preliminary Decision for an Air Quality Permit* in the same newspaper(s) in which you published *Notice of Receipt of Intent to Obtain Permit* for this application. - Example A must be published in "public notice" section of newspaper. Review for accuracy prior to publishing. - Example B (if applicable) must be published in prominent location (other than "public notice") in same issue of newspaper Provide copy of the complete application (including any subsequent revisions) and the executive director's preliminary decision (including the draft permit) at a public place for review and copying. Keep them there for duration of the designated comment period.
First day of newspaper publication
Review published newspaper notice for accuracy. If errors, contact Air Permits Division. Ensure copy of the complete application (including any subsequent revisions) and the executive director's preliminary decision (including the draft permit) are at the public place. It is recommended that the signs from the first notice be in place and be legible and visible until 30 days after publication of the *Notice of Application and Preliminary Decision* (either English or alternative language notice, whichever is later).
Within 10 business days after date of publication
Mail original newspaper clippings showing publication date and newspaper name to: Texas Commission on Environmental Quality Office of the Chief Clerk, MC-105 Attn: Notice Team P.O. Box 13087 Austin, Texas 78711-3087 Mail photocopies of newspaper clippings showing publication date and newspaper name to persons listed on *Notification List.*
Within 30 calendar days after date of publication
Mail original affidavit of publication for air permitting and alternative language affidavit of publication for air permitting (if applicable) to: Texas Commission on Environmental Quality Office of the Chief Clerk, MC-105 Attn: Notice Team P.O. Box 13087 Austin, Texas 78711-3087 Mail photocopies of affidavits to persons listed on *Notification List.*
Within 10 business days after end of the designated comment period
Mail Public Notice Verification Form to: Texas Commission on Environmental Quality Office of the Chief Clerk, MC-105 Attn: Notice Team P.O. Box 13087 Austin, Texas 78711-3087 Mail photocopies of Public Notice Verification Form to persons listed on *Notification List.*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Instructions for Public Notice
For New Source Review Air Permit

Notice of Application and Preliminary Decision

We have completed the technical review of your application and issued a preliminary decision. You must comply with the following instructions:

Review Notice

Included in the notice is all of the information which the commission believes is necessary to effectuate compliance with applicable public notice requirements. Please read it carefully and notify the Texas Commission on Environmental Quality (TCEQ) immediately if it contains any errors or omissions. You are responsible for ensuring the accuracy of all information published. You may not change the text of the notice without prior approval from the TCEQ.

Newspaper Notice

- You must publish the enclosed *Notice of Application and Preliminary Decision for an Air Quality Permit* within **33 calendar days** after the date this information was mailed to you (see date of letter).

- You must publish the enclosed *Notice of Application and Preliminary Decision for an Air Quality Permit* at your expense, in the same newspaper(s) in which you published the *Notice of Receipt and Intent to Obtain Permit* for this application. The newspaper must be a newspaper that is of general circulation in the municipality where the facility is or will be located. If the facility is not located within a municipality, the newspaper must be of general circulation in the municipality nearest the location.

- You must publish this notice in one issue of any applicable newspaper.

- You will find two example notices enclosed in this package. *Example A* must be published in the "public notice" section of the newspaper. The phrase "Example A" is not required to be published. *Example B* must be published in the **same issue** of the newspaper as *Example A*; however, it must be published in a prominent location (other than the public notice section). *Example B* refers the public to the "public notice" section of the newspaper where *Example A* provides more information regarding the permit application.

- *Example B* must be a total of at least **6 column inches (standard advertising units)** with a height of at least **3 inches** and a horizontal dimension of **2 column widths.** If the newspaper chosen does not use standard advertising units for measurement, the notice must be at least **12 square inches** with the shortest side of at least **3 inches**.

- The bold text of the enclosed notice **must** be printed in the newspaper in a font style or size that distinguishes it from the rest of the notice (i.e., **bold**, *italics*). **Failure to do so may require re-notice.**

Alternative Language Notice

In certain circumstances, applicants for air permits must complete notice in alternative languages.

- Public notice rules require the applicant to determine whether a bilingual program is required at either the elementary or middle school nearest to the facility or proposed facility location. Bilingual education programs are determined on a district-wide basis. When students who are required to attend either school are eligible to be enrolled in a bilingual education program, some alternative language notice is required (newspaper notice).

- Since the school district, and not the schools, must provide the bilingual education program, these programs do not have to be located at the elementary or middle school nearest to the facility or proposed facility to trigger the alternative language notice requirement. If there are students who would normally attend the nearest schools eligible to be taught in a bilingual education program at a different location, alternative language notice is required.

- If triggered, publications of alternative language notices must be made in a newspaper or publication printed primarily in each language taught in the bilingual education program. The same newspaper(s) used for *Notice of Receipt and Intent to Obtain Permit* must be used for publication of the *Notice of Application and Preliminary Decision for an Air Quality Permit*. This notice is required if such a newspaper or publication exists in the municipality or the county where the facility is or will be located.

- The applicant must demonstrate a good faith effort to identify a newspaper or publication in the required language. If a newspaper or publication of general circulation published at least once a month in such language cannot be found, publishing in that language is not required, but signs must remain posted in the same location(s) utilized during the *Notice of Receipt of Intent to Obtain Permit (1st public notice)*.

- Publication in an alternative language section or insertion within an English language newspaper does not satisfy these requirements.

- The applicant has the burden to demonstrate compliance with these requirements. You must fill out the ***Public Notice Verification Form (Form TCEQ-20244)*** indicating your compliance with the requirements regarding publication in an alternative language. **This form is available at www.tceq.texas.gov/permitting/air/nav/air_publicnotice.html.**

- It is suggested the applicant work with the local school district to do the following:

  (a) determine if a bilingual program is required in the district;
  (b) determine which language is required by the bilingual program;
  (c) locate the nearest elementary and middle schools; and
  (d) determine if any students attending either school are entitled to be enrolled in a bilingual educational program.

- **If you determine that you must meet the alternative language notice requirements, you are responsible for ensuring that the publication in the alternative language is complete and accurate in that language.** Since the most common bilingual programs are in Spanish, the TCEQ has provided example Spanish notice templates for your use. All italic notes should be replaced with the corresponding Spanish translations for the specific application and published in the alternative language publication. Electronic versions of the Spanish templates are available through the Air Permits Division Web site at www.tceq.texas.gov/goto/air/publicnotice.

- If you are required to publish notice in a language other than Spanish, you must translate the entire public notice at your own expense.

Public Comment Period

- The public comment period will last at least **30 calendar days after publication of the last notice**.

- The comment period will be longer if the last day of the public comment period ends on a weekend or a holiday. In this case, the comment period will end on the next business day.

- The comment period for the permit may lengthen depending on whether a public meeting is held. If a public meeting is held, the comment period will be extended to the later of either the date of the public meeting or the end of the second notice period.

Proof of Publication

- Check each publication to ensure that the articles were accurately published. If a notice was not published correctly you may be required to republish.

- For each newspaper in which you published, you must submit **original newspaper clippings or tear sheets** of each published notice which shows the complete notice that was published, the date of publication, and the name of the newspaper to the TCEQ Office of the Chief Clerk within **10 business days** after the date of publication.

- You must submit an **original affidavit of publication for air permitting and alternate language affidavit of publication for air permitting (if applicable)** to the Office of the Chief Clerk within **30 calendar days** after the date of publication. **You must use the enclosed affidavit forms.** The affidavits must clearly identify the applicant's name and permit number. You are encouraged to submit the affidavit with the original newspaper clippings described above.

- You must submit the ***Public Notice Verification Form (Form TCEQ-20244)*** to the Office of the Chief Clerk within **10 business days** of the end of this public

comment period. You must use this form to certify that you have met bilingual notice requirements. **This form is available at www.tceq.texas.gov/permitting/air/nav/air_publicnotice.html.**

- The **original affidavits of publication, *Public Notice Verification Form*, and original newspaper clippings of the published notices** must be mailed to:

Texas Commission on Environmental Quality
Office of the Chief Clerk, MC-105
Attn: Notice Team
P.O. Box 13087
Austin, Texas 78711-3087

- Please ensure that the affidavit and newspaper clippings you send to the Chief Clerk are originals and that all blanks on the affidavit are filled in correctly. Photocopies of newspaper clippings and affidavits will not be accepted.

- Photocopies of newspaper clippings, affidavits, and verifications must also be sent to those listed on the enclosed *Notification List* within the deadlines specified above.

Failure to Publish and Submit Proof of Publication

You must meet all publication requirements. **If you fail to publish the notice or submit proof of publication *on time*,** the TCEQ may suspend further processing on your application or take other actions.

Sign Posting

It is recommended that the signs that were put in place prior to publication of the first notice remain in place and be legible and visible until 30 days after publication of the *Notice of Application and Preliminary Decision* (either English or alternative language notice, whichever is later).

Application in a Public Place

- You must provide a copy of the complete application (including any subsequent revisions) and the executive director's preliminary decision (including the draft permit), at a public place for review and copying by the public. This place must be in the county in which the facility is located or proposed to be located.

- A public place is one that is publicly owned or operated (ex: libraries, county courthouses, or city halls.)

- This copy must be accessible to the public for review and copying. The copy must be available beginning on the first day of newspaper publication and remain in place until the commission has taken action on the application or the commission refers issues to the State Office of Administrative Hearings.

- If the application is submitted to the TCEQ with information marked as "CONFIDENTIAL," you are required to indicate which specific portions of the application are not being made available to the public. These portions of the application must be accompanied with the following statement: "Any request for portions of this application that are marked as confidential must be submitted in

writing, pursuant to the Public Information Act, to the Texas Commission on Environmental Quality, Public Information Coordinator, MC-197, P.O. Box 13087, Austin, Texas 78711-3087."

- You must submit verification of file availability using the ***Public Notice Verification Form (Form TCEQ-20244)*** within **10 business days** after end of the publications' designated comment period. Do not submit the form verifying that the application was in a public place until after the comment period is complete. If a public meeting is held or second notice is required causing the public comment period to be extended, at a later date you will be required to verify that the application was in a public place during the entire public comment period. **This form is available at www.tceq.texas.gov/permitting/air/nav/air_publicnotice.html.**

General Information

When contacting the Commission regarding this application, please refer to the permit number at the top of the *Notice of Application and Preliminary Decision*.

If you have questions or need assistance regarding publication requirements, please contact the Office of the Chief Clerk at (512) 239-3300 or the project reviewer listed in the cover letter.

TCEQ-Office of the Chief Clerk
MC-105 Attn: Notice Team
P.O. Box 13087
Austin, Texas 78711-3087

Applicant Name: TPC Group LLC

Permit No.: 98149

AFFIDAVIT OF PUBLICATION FOR AIR PERMITTING

STATE OF TEXAS §

COUNTY OF _____ §

Before me, the undersigned authority, on this day personally appeared

_____, who being by me duly sworn,
(name of newspaper representative)

deposes and says that (s)he is the _____
(title of newspaper representative)

of the _____; that said newspaper is generally circulated
(name of newspaper)

in _____, Texas;
(in the municipality or nearest municipality to the location of the facility or the proposed facility)

that the attached notice was published in said newspaper on the following date(s):

_____

_____
(newspaper representative's signature)

Subscribed and sworn to before me this the _____ day of _____, 20_____,

to certify which witness my hand and seal of office.

_____
Notary Public in and for the State of Texas

(Seal)

_____
Print or Type Name of Notary Public

_____
My Commission Expires

TCEQ-Office of the Chief Clerk
MC-105 Attn: Notice Team
P.O. Box 13087
Austin, Texas 78711-3087

Applicant Name: TPC Group LLC

Permit No.: 98149

ALTERNATIVE LANGUAGE AFFIDAVIT OF PUBLICATION FOR AIR PERMITTING

STATE OF TEXAS §

COUNTY OF _____ §

Before me, the undersigned authority, on this day personally appeared

_____, who being by me duly sworn, deposes
(name of newspaper or publication representative)

and says that (s)he is the _____ of the
(title of newspaper or publication representative)

_____ that said newspaper or publication is generally circulated
(name of newspaper or publication)

in _____, Texas;
(in the municipality or the same county as the location of the facility or the proposed facility)

that the attached notice was published in said newspaper or publication on the following date(s):

_____.

_____
(newspaper or publication representative's signature)

Subscribed and sworn to before me this the ___ day of _____, 20_____,

to certify which witness my hand and seal of office.

_____
Notary Public in and for the State of Texas

(Seal)

_____
Print or Type Name of Notary Public

_____
My Commission Expires

Notification List

It is the responsibility of the applicant to furnish the following offices with copies of the notices published, the *Affidavit of Publication for Air Permitting, the Alternative Language Affidavit of Publication for Air Permitting (if applicable)*, and a completed copy of the *Public Notice Verification Form (Form TCEQ-20244)*. Originals should be sent to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. **Copies** should be sent to the following:

U.S. Environmental Protection Agency
Region 6
Attn: Air Permits Section (6PD-R)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Texas Commission on Environmental Quality
Houston Regional Office
5425 Polk St Ste H
Houston, Texas 77023-1452

Texas Commission on Environmental Quality
Office of Air
Air Permits Division, MC-163
Ms. Cheryl Covone
P.O. Box 13087
Austin, Texas 78711-3087

Bureau Chief Pollution Control & Prevention
Environmental Health Division
Houston Department of Health and Human Services
7411 Park Place Blvd
Houston, Texas 77087-4441

Director
Harris County
Pollution Control Services
101 S Richey St Ste H
Pasadena, Texas 77506-

SPECIAL CONDITIONS

Permit Number 98149

Emission Limitations

1. This permit authorizes emissions only from those points listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," and the facilities covered by this permit are authorized to emit subject to the emission rate limits on that table and other operating requirements specified in the special conditions.

Planned Maintenance, Start-Up, and Shutdown (MSS)

2. Planned startup and shutdown emissions due to the activities identified in Special Condition 3 are authorized from facilities and emission points identified in Attachment D in other construction permits at the site provided the facility and emissions are compliant with the respective MAERT and special conditions.

3. This permit authorizes the emissions from the facilities identified in Attachment D for the planned maintenance, startup, and shutdown (MSS) activities summarized in the MSS Activity Summary (Attachment C) attached to this permit.

   Attachment A identifies the inherently low emitting MSS activities that may be performed at the plant. Emissions from activities identified in Attachment A shall be considered to be equal to the potential to emit represented in the permit application. The estimated emissions from the activities listed in Attachment A must be revalidated annually. This revalidation shall consist of the estimated emissions for each type of activity and the basis for that emission estimate.

   Routine maintenance activities, as identified in Attachment B may be tracked through the work orders or equivalent. Emissions from activities identified in Attachment B shall be calculated using the number of work orders or equivalent that month and the emissions associated with that activity identified in the permit application.

   The performance of each planned MSS activity not identified in Attachments A or B and the emissions associated with it shall be recorded and include at least the following information:

   A. the process unit at which emissions from the MSS activity occurred, including the emission point number and common name of the process unit;

   B. the type of planned MSS activity and the reason for the planned activity;

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C. the common name and the facility identification number, if applicable, of the facilities at which the MSS activity and emissions occurred;

D. the date and time of the MSS activity and its duration;

E. the estimated quantity of each air contaminant, or mixture of air contaminants, emitted with the data and methods used to determine it. The estimated quantity of each air contaminant shall be converted to an hourly emission rate. The emissions shall be estimated using the methods identified in the permit application, consistent with good engineering practice.

All MSS emissions shall be summed monthly and the rolling 12-month emissions shall be updated on a monthly basis.

4. Process units and facilities, with the exception of those identified in Special Conditions 7, 8, and 10, and Attachment A shall be depressurized, emptied, degassed, and placed in service in accordance with the following requirements. (DATE)

A. The process equipment shall be depressurized to a control device or a controlled recovery system prior to venting to atmosphere, degassing, or draining liquid. Equipment that only contains material that is liquid with VOC partial pressure less than 0.50 psi at the normal process temperature and 95°F may be opened to atmosphere and drained in accordance with paragraph C of this special condition. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded.

B. If mixed phase materials must be removed from process equipment, the cleared material shall be routed to a knockout drum or equivalent to allow for managed initial phase separation. If the VOC partial pressure is greater than 0.50 psi at either the normal process temperature or 95°F, any vents in the system must be routed to a control device or a controlled recovery system. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded. Control must remain in place until degassing has been completed or the system is no longer vented to atmosphere.

C. All liquids from process equipment or storage vessels must be removed to the maximum extent practical prior to opening equipment to commence degassing and/or maintenance. Liquids must be drained into a closed vessel or closed liquid recovery system unless prevented by the physical configuration of the equipment. If it is necessary to drain liquid into an open

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pan or sump, the liquid must be covered or transferred to a covered vessel within one hour of being drained. This paragraph does not apply to wash water containing no more than 1000 ppmw TOC as determined by EPA Test Methods 5310B or 5310D.

D. If the VOC partial pressure is greater than 0.50 psi at the normal process temperature or 95°F, facilities shall be degassed using good engineering practice to ensure air contaminants are removed from the system through the control device or controlled recovery system to the extent allowed by process equipment or storage vessel design. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded. The facilities to be degassed shall not be vented directly to atmosphere, except as necessary to establish isolation of the work area or to monitor VOC concentration following controlled depressurization. The venting shall be minimized to the maximum extent practicable and actions taken recorded. The control device utilized shall be recorded with the estimated emissions from uncontrolled degassing calculated using the methods that were used to determine allowable emissions for the permit application.

(1) The locations and/or identifiers where the purge gas or steam enters the process equipment or storage vessel and the exit points for the exhaust gases shall be recorded (process flow diagrams [PFDs] or piping and instrumentation diagrams [P&IDs] may be used to demonstrate compliance with the requirement). If the process equipment is purged with a gas, two system volumes of purge gas must have passed through the control device or controlled recovery system before the vent stream may be sampled to verify acceptable VOC concentration prior to uncontrolled venting. The VOC sampling and analysis shall be performed using an instrument meeting the requirements of Special Condition 43. The sampling point shall be upstream of the inlet to the control device or controlled recovery system. The sample ports and the collection system must be designed and operated such that there is no air leakage into the sample probe or the collection system downstream of the process equipment or vessel being purged. Except as noted in (3) below, the facilities shall be degassed to a control device or controlled recovery system until the VOC concentration is less than 2,500 ppmv. Documented site procedures used to de-inventory equipment to a control device for safety purposes (i.e., hot work or vessel entry procedures) that achieve at least the same level of purging may be used in lieu of the above.

(2) Pressurized spheres in 1,3 butadiene service shall be degassed to control to a concentration of 2000 ppmv.

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(3) Before maintenance is performed on heat exchangers the vapor space shall be degassed to a concentration of 500 ppmv.

(4) Towers shall be degassed to control to a concentration of 250 ppmv.

a. Towers in MTBE or ETBE service shall not be opened to the atmosphere during the landing, cleaning or refilling of any tank in MTBE or ETBE service.

b. Only one tower in dimethylformamide (DMF) service may be opened at a time.

c. Only one tower in lean oil service may be opened at a time.

(5) Bullet tanks shall be degassed to a concentration of 10,000 ppmv.

(6) All vessels containing furfural shall be rinsed with two vessel volumes of water before being opened to the atmosphere.

5. Air contaminant concentration shall be measured using an instrument/detector meeting one set of requirements specified below.

A. VOC concentration shall be measured using an instrument meeting all the requirements specified in EPA Method 21 (40 CFR 60, Appendix A) with the following exceptions:

(1) The instrument shall be calibrated within 24 hours of use with a calibration gas such that the response factor (RF) of the VOC (or mixture of VOCs) to be monitored shall be less than 2.0. The calibration gas and the gas to be measured, and its approximate (RF) shall be recorded. If the RF of the VOC (or mixture of VOCs) to be monitored is greater than 2.0, the VOC concentration shall be determined as follows:

VOC Concentration = Concentration as read from the instrument*RF

In no case should a calibration gas be used such that the RF of the VOC (or mixture of VOCs) to be monitored is greater than 5.0.

(2) Sampling shall be performed as directed by this permit in lieu of section 8.3 of Method 21. During sampling, data recording shall not begin until after two times the instrument response time. The date and time shall be recorded, and VOC concentration shall be monitored

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for at least 5 minutes, recording VOC concentration each minute. The highest measured VOC concentration shall be recorded and shall not exceed the specified VOC concentration limit prior to uncontrolled venting.

B. Colorimetric gas detector tubes may be used to determine air contaminant concentrations if they are used in accordance with the following requirements.

(1) The air contaminant concentration measured as defined in (3) is less than 80 percent of the range of the tube and is at least 20 percent of the maximum range of the tube.

(2) The tube is used in accordance with the manufacturer's guidelines.

(3) At least 2 samples taken at least 5 minutes apart must satisfy the following prior to uncontrolled venting:

measured contaminant concentration (ppmv) < release concentration.

Where the release concentration is:

10,000*mole fraction of the total air contaminants present that can be detected by the tube.

The mole fraction may be estimated based on process knowledge. The release concentration and basis for its determination shall be recorded.

Records shall be maintained of the tube type, range, measured concentrations, and time the samples were taken.

6. This condition applies only to piping and components subject to leak detection and repair monitoring requirements identified in other NSR permits. Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period:

A. a cap, blind flange, plug, or second valve must be installed on the line or valve; or

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B. the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once by the end of the 72 hours period following the creation of the open ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 250 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

7. This permit authorizes emissions from EPNs Plant-MSS-1 and Plant-MSS-5, for the storage tanks identified in the attached facility list during planned floating roof landings. Tank roofs may only be landed for changes of tank service or tank inspection/maintenance as identified in the permit application. Emissions from change of service tank landings, for which the tank is not cleaned and degassed, shall not exceed 10 tons of VOC in any rolling 12 month period. Tank roof landings include all operations when the tank floating roof is on its supporting legs. These emissions are subject to the maximum allowable emission rates indicated on the MAERT. The following requirements apply to tank roof landings.

A. The tank liquid level shall be continuously lowered after the tank floating roof initially lands on its supporting legs until the tank has been drained to the maximum extent practicable without entering the tank. Liquid level may be maintained steady for a period of up to two hours if necessary to allow for valve lineups and pump changes necessary to drain the tank. This requirement does not apply where the vapor under a floating roof is routed to control or a controlled recovery system during this process.

B. If the VOC partial pressure of the liquid previously stored in the tank is greater than 0.50 psi at 95°F, tank refilling or degassing of the vapor space under the landed floating roof must begin within 24 hours after the tank has been drained unless the vapor under the floating roof is routed to control or a controlled recovery system during this period. The tank shall not be opened except as necessary to set up for degassing and cleaning. Controlled degassing of the vapor space under landed roofs shall be completed as follows:

(1) Any gas or vapor removed from the vapor space under the floating roof must be routed to a control device or a controlled recovery system and controlled degassing must be maintained until the completion of the tank cleaning, which includes completely filling the vapor space under the floating roof with water and/or microbial agents and the routing of all the displaced emissions to control. The locations and identifiers of vents other than permanent roof fittings and seals, control device or

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controlled recovery system, and controlled exhaust stream shall be recorded. There shall be no other gas/vapor flow out of the vapor space under the floating roof when degassing to the control device or controlled recovery system.

(2) The vapor space under the floating roof shall be vented using good engineering practice to ensure air contaminants are flushed out of the tank through the control device or controlled recovery system to the extent allowed by the storage tank design.

(3) A volume of purge gas equivalent to twice the volume of the vapor space under the floating roof must have passed through the control device or into a controlled recovery system, before the vent stream may be sampled to verify acceptable VOC concentration. The measurement of purge gas volume shall not include any make-up air introduced into the control device or recovery system. The VOC sampling and analysis shall be performed as specified in Special Condition 5.

(4) The sampling point shall be upstream of the inlet to the control device or controlled recovery system. The sample ports and the collection system must be designed and operated such that there is no air leakage into the sample probe or the collection system downstream of the process equipment or vessel being purged.

(5) Degassing must be performed every 24 hours unless there is no standing liquid in the tank or the VOC partial pressure of the remaining liquid in the tank is less than 0.15 psia.

C. Unless air circulation in the tank vapor space is minimized as follows, the tank shall not be opened or ventilated without control until one of the criteria in part D of this condition is satisfied.

(1) One manway may be opened to allow access to the tank to remove or de-volatilize the remaining liquid. Other manways or access points may be opened as necessary to remove or de-volatilize the remaining liquid. Wind barriers shall be installed at all open manways and access points to minimize air flow through the tank.

(2) Access points shall be closed when not in use

D. The tank may be opened without restriction and ventilated without control, after all standing liquid has been removed from the tank or the liquid remaining in the tank has a VOC partial pressure less than 0.02 psia. These

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criteria shall be demonstrated in any one of the following ways.

(1) Low VOC partial pressure liquid that is soluble with the liquid previously stored may be added to the tank to lower the VOC partial pressure of the liquid mixture remaining in the tank to less than 0.02 psia. This liquid shall be added during tank degassing if practicable. The estimated volume of liquid remaining in the drained tank and the volume and type of liquid added shall be recorded. The liquid VOC partial pressure may be estimated based on this information and engineering calculations.

(2) If water or a microbial agent is added or sprayed into the tank to remove standing VOC, one of the following must be demonstrated:

a. Take a representative sample of the liquid remaining in the tank and verify no visible sheen using the static sheen test from 40 CFR 435 Subpart A Appendix 1.

b. Take a representative sample of the liquid remaining in the tank and verify hexane soluble VOC concentration is less than 1000 ppmw using EPA method 1664 (may also use 8260B or 5030 with 8015 from SW-846).

c. Stop ventilation and close the tank for at least 24 hours. When the tank manway is opened after this period, verify VOC concentration is less than 1000 ppmv through the procedure in Special Condition 5.

(3) No standing liquid verified through visual inspection.

Once the VOC partial pressure is verified to be less than 0.02 psia additional water flushes may be performed without requiring re-verification.

The permit holder shall maintain records to document the method used to release the tank.

E. Tanks shall be refilled as rapidly as practicable until the roof is off its legs with the following exceptions:

(1) Only one tank containing the same material may be landed, cleaned, or filled at any time. The fill rate for the domed external floating roof tanks shall not exceed 500 bbl/hr, and the fill rate for the internal floating roof tanks containing MTBE or ETBE shall not exceed 500 bbl/hr. All other internal floating roof tanks shall have a fill rate not to

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exceed 1200 bbl/hr.

(2) The vapor space below the tank roof is directed to a control device when the tank is refilled until the roof is floating on the liquid. The control device used and the method and locations used to connect the control device shall be recorded. All vents from the tank being filled must exit through the control device.

F. All floating roof tanks shall be controlled during landing, cleaning and refilling.

G. The occurrence of each roof landing and the associated emissions shall be recorded and the rolling 12-month tank roof landing emissions shall be updated on a monthly basis. These records shall include at least the following information:

(1) the identification of the tank and emission point number, and any control devices or recovery systems used to reduce emissions;

(2) the reason for the tank roof landing;

(3) for the purpose of estimating emissions, the date, time, and other information specified for each of the following events:

a. the roof was initially landed,
b. all liquid was pumped from the tank to the extent practical,
c. start and completion of controlled degassing, and total volumetric flow,
d. all standing liquid was removed from the tank or any transfers of low VOC partial pressure liquid to or from the tank including volumes and vapor pressures to reduce tank liquid VOC partial pressure to <0.02 psi,
e. if there is liquid in the tank, VOC partial pressure of liquid, start and completion of uncontrolled degassing, and total volumetric flow,
f. refilling commenced, liquid filling the tank, and the volume necessary to float the roof; and
g. tank roof off supporting legs, floating on liquid;

(4) the estimated quantity of each air contaminant, or mixture of air contaminants, emitted between events c and g with the data and methods used to determine it. The emissions associated with roof landing activities shall be calculated using the methods described in Section 7.1.3.2 of AP-42 "Compilation of Air Pollution Emission

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Factors, Chapter 7 - Storage of Organic Liquids" dated November 2006 and the permit application.

8. Controlled fixed roof storage tanks indentified in Attachment D are subject to the requirements of Special Condition 7.C. and 7.D. If the ventilation of the vapor space is controlled, the emission control system shall meet the requirements of Special Condition 7.B.(1) through 7.B.(5). Records shall be maintained per Special Condition 7.F.(3)c through 7.F.(3)e, and 7.F.(4). Controlled fixed roof tanks shall be degassed to a concentration of 2500 ppmv before opening. **(DATE)**

9. The following requirements apply to vacuum and air mover truck operations to support planned MSS at this site: **(DATE)**

   A. Prior to initial use, identify any liquid in the truck. Record the liquid level and document the VOC partial pressure. After each liquid transfer, identify the liquid, the volume transferred, and its VOC partial pressure.

   B. If vacuum pumps or blowers are operated when liquid is in or being transferred to the truck, the following requirements apply:

      (1) If the VOC partial pressure of the liquid in or being transferred to the truck is greater than 0.5 psia at 95°F, the vacuum/blower exhaust shall be routed to a control device or a controlled recovery system achieving at least 90% control.

      (2) Equip fill line intake with a "duckbill" or equivalent attachment if the hose end cannot be submerged in the liquid being collected.

      (3) A daily record containing the information identified below is required for each vacuum truck in operation at the site each day.

         a. For each liquid transfer made with the vacuum operating, record the duration of any periods when air may have been entrained with the liquid transfer. The reason for operating in this manner and whether a "duckbill" or equivalent was used shall be recorded. Short, incidental periods, such as those necessary to walk from the truck to the fill line intake, do not need to be documented.

         b. If the vacuum truck exhaust is controlled with a control device other than an engine or oxidizer, VOC exhaust concentration upon commencing each transfer, at the end of each transfer, and at least every hour during each transfer shall be recorded, measured using an instrument meeting the requirements of

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Special Condition 5.A or B.

C. Record the volume in the vacuum truck at the end of the day, or the volume unloaded, as applicable.

D. The permit holder shall determine the vacuum truck emissions each month using the daily vacuum truck records and the calculation methods utilized in the permit application. If records of the volume of liquid transferred for each pick-up are not maintained, the emissions shall be determined using the physical properties of the liquid vacuumed with the greatest potential emissions. Rolling 12 month vacuum truck emissions shall also be determined on a monthly basis.

E. If the VOC partial pressure of all the liquids vacuumed into the truck is less than 0.10 psi, this shall be recorded when the truck is unloaded or leaves the plant site and the emissions may be estimated as the maximum potential to emit for a truck in that service as documented in the permit application. The recordkeeping requirements in Special Condition A through D of this condition do not apply.

10. The following requirements apply to frac, or temporary, tanks and vessels used in support of MSS activities. **(DATE)**

A. These containers shall be routed to a control device achieving at least 90% control.

B. The exterior surfaces of these tanks/vessels that are exposed to the sun shall be white or aluminum effective May 1, 2013. This requirement does not apply to tanks/vessels that only vent to atmosphere when being filled, sampled, gauged, or when removing material.

C. These tanks/vessels must be covered and equipped with fill pipes that discharge within 6 inches of the tank/vessel bottom. Poly tanks less that are less than or equal to 4000 gallons are exempt from this requirement.

D. These requirements do not apply to vessels storing less than 450 gallons of liquid that are closed such that the vessel does not vent to atmosphere except when filling, sampling, gauging, or when removing material.

E. The permit holder shall maintain an emissions record which includes calculated emissions of VOC from all frac tanks during the previous calendar month and the past consecutive 12 month period. This record must be updated by the last day of the month following. The record shall include tank

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identification number, dates put into and removed from service, control method used, tank capacity and volume of liquid stored in gallons, name of the material stored, VOC molecular weight, and VOC partial pressure at the estimated monthly average material temperature in psia. Filling emissions for tanks shall be calculated using the TCEQ publication titled "Technical Guidance Package for Chemical Sources - Loading Operations" and standing emissions determined using: the TCEQ publication titled "Technical Guidance Package for Chemical Sources - Storage Tanks."

F. If the tank/vessel is used to store liquid with VOC partial pressure less than 0.10 psi at 95°F, records may be limited to the days the tank is in service and the liquid stored. Emissions may be estimated based upon the potential to emit as identified in the permit application.

G. Liquid shall be stored in these containers for a period of no more than 90 days.

11. Additional occurrences of MSS activities authorized by this permit (see Attachment C) may be authorized under permit by rule only if conducted in compliance with this permit's procedures, emission controls, monitoring, and recordkeeping requirements applicable to the activity.

12. Control devices required by this permit for emissions from planned MSS activities are limited to those types identified in this condition. Control devices shall be operated with no visible emissions except periods not to exceed a total of five minutes during any two consecutive hours. Each device used must meet all the requirements identified for that type of control device.

A. Carbon Adsorption System (CAS).

(1) The CAS shall consist of 2 carbon canisters in series with adequate carbon supply for the emission control operation.

(2) The CAS shall be sampled downstream of the first can and the concentration recorded at least once every hour of CAS run time to determine breakthrough of the VOC. The sampling frequency may be extended using either of the following methods:

a. It may be extended to up to 30 percent of the minimum potential saturation time for a new can of carbon. The permit holder shall maintain records including the calculations performed to determine the minimum saturation time.

b. The carbon sampling frequency may be extended to longer

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periods based on previous experience with carbon control of a MSS waste gas stream. The past experience must be with the same VOC, type of facility, and MSS activity. The basis for the sampling frequency shall be recorded. If the VOC concentration on the initial sample downstream of the first carbon canister following a new polishing canister being put in place is greater than 100 ppmv above background, it shall be assumed that breakthrough occurred while that canister functioned as the final polishing canister and a permit deviation shall be recorded.

(3) The method of VOC sampling and analysis shall be by detector meeting the requirements of Special Condition 5.A or B.

(4) Breakthrough is defined as the highest measured VOC concentration at or exceeding 100 ppmv above background. When the condition of breakthrough of VOC from the initial saturation canister occurs, the waste gas flow shall be switched to the second canister and a fresh canister shall be placed as the new final polishing canister within four hours. Sufficient new activated carbon canisters shall be maintained at the site to replace spent carbon canisters such that replacements can be done in the above specified time frame.

(5) Records of CAS monitoring shall include the following:

a. Sample time and date.
b. Monitoring results (ppmv).
c. Canister replacement log.

(6) Single canister systems are allowed if the time the carbon canister is in service is limited to no more than 30 percent of the minimum potential saturation time. The permit holder shall maintain records for these systems, including the calculations performed to determine the saturation time. The time limit on carbon canister service shall be recorded and the expiration date attached to the carbon can.

B. Thermal Oxidizer. **(DATE)**

(1) The thermal oxidizer firebox exit temperature shall be maintained at not less than 1400°F and waste gas flows shall be limited to assure at least a 0.5 second residence time in the fire box while waste gas is being fed into the oxidizer. The thermal oxidizer shall achieve a minimum of 99% control of VOCs.

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(2) The thermal oxidizer exhaust temperature shall be continuously monitored and recorded when waste gas is directed to the oxidizer. The temperature measurements shall be made at intervals of six minutes or less and recorded at that frequency.

The temperature measurement device shall be installed, calibrated, and maintained according to accepted practice and the manufacturer's specifications. The device shall have an accuracy of the greater of ±0.75 percent of the temperature being measured expressed in degrees Celsius or ±2.5°C.

(3) As an alternative to complying with the minimum temperature in Special Condition 12.B.(1), the permit holder may establish a minimum operating temperature during testing demonstrating that 99% control is achieved. The stack test must have been performed within the past 12 month. Stack VOC concentrations and flow rates shall be determined using the appropriate EPA reference method. A copy of the test report shall be maintained with the thermal oxidizer and a summary of the testing results shall be included with the emissions calculations

13. A maximum of two temporary combustion control device may be operated at the same time. The temporary combustion devices shall operate no more than 1440 hrs/yr. **(DATE)**

14. If spray guns are used to apply paint, they shall be airless, high volume low pressure (HVLP), or have the same or higher transfer efficiency as airless or HVLP spray guns. **(DATE)**

15. In addition to the painting materials represented in the permit application submitted on August 15, 2011 other painting materials/air contaminants that meet all of the following sub-conditions are allowed, the qualifier that the emission limits in the attached MAERT must not be exceeded has been added to the first paragraph. **(DATE)**

A. The new materials shall serve the same basic function, and the emissions shall be from the same location as the emissions from the current materials.

B. All the ingredients of the new material are known; i.e., the weight percentages of the ingredients add to 100 percent or more.

C. Any air contaminant ingredient in the new material is exempt from Special Condition Nos. 15D and 15E if:

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(1) it is emitted at a rate and has a short-term effects screening level (ESL) and an annual ESL as stated in the following table; or

Emission Rate (lbs/hr)	Short-term ESL (µg/m³)	Annual ESL (µg/m³)
≤ 0.04	≥ 2 and < 500	≥ 0.2 and < 50
≤ 0.10	≥ 500 and < 3,500	≥ 50 and < 350
≤ 0.40	≥ 3,500	≥ 350

(2) it has a true vapor pressure at 68°F of less than 0.01 mm Hg, and it is not sprayed.

D. For all other new or increase in existing air contaminants, the following procedure shall be completed to determine if the short-term impacts are acceptable.

(1) Determine the emission rate of each air contaminant ingredient including emissions of the same air contaminant (if an existing air contaminant) from the currently authorized materials that may be emitted at the same time from each emission point.

(2) Multiply the emission rate of the air contaminant by the unit impact multiplier for each emission point from the following table to determine the off-property impact Ground Level Concentration (GLC) for each emission point.

Emission Point Number	Unit Impacts (µg/m³ per lb/hr)
Plant-MSS-15	204.83
Plant-MSS-16	424.87

DRAFT

(3) Sum the impacts from each emission point/emission point group to determine a total short-term off-property impact (Total GLC_{MAX}) for the new or existing air contaminant.

(4) Compare the total off-property impact to the short-term ESL for the air contaminant as shown below to determine if it less than or equal to the ESL.

$$\text{Total } GLC_{MAX} \leq ESL_{SHORT}$$

Where:

Total GLC_{MAX} = the sum of the short-term GLCs from each emission point.

ESL_{SHORT} = the short-term ESL of the new or existing air contaminant from the most current ESL list published by the TCEQ or as specifically derived by TCEQ Toxicology Division. The ESL shall be obtained in writing prior to the use of the new or increased air contaminant.

E. For all other new or increases in existing air contaminants, the following procedure shall be completed to determine if the annual impacts are acceptable.

(1) Multiply the total off-property impact (Total GLC_{MAX}) determined in Special Condition No. 15D(4) by 0.08 to determine an annual off-property impact (Annual GLC_{MAX}) for the new or existing air contaminant.

(2) Compare the annual off-property impact to the annual ESL for the air contaminant as shown below to determine if it less than or equal to the ESL.

$$\text{Annual } GLC_{MAX} \leq ESL_{ANNUAL}$$

Where:

ESL_{ANNUAL} = the annual ESL of the new or existing air contaminant from the most current ESL list published by the TCEQ or as specifically derived by TCEQ Toxicology Division.

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F. The short-term or annual emission rates from new or existing air contaminants shall not cause any increases in the short-term or annual emission rates as listed on the maximum allowable emission rates table (MAERT).

16. No visible emissions shall leave the property due to painting. **(DATE)**

Date: Date

DRAFT

Permit 98149
Attachment A
Inherently Low Emitting Activities

Activity	Emissions				
	VOC	NOx	CO	PM	H_2S/SO_2
Instrumentation/analyzer maintenance	x				
Meter proving	x				
Filter changes	x				
Sampling	x				
Draining Low Vapor Pressure Materials	x				

DRAFT

Date: DATE

Permit 98149
Attachment B
Routine Maintenance Activities

Piping and fugitive component maintenance (after clearing to 10,000 ppmv)

Draining wash water from tanks and towers

Catalyst changes (after clearing to 2000 ppmv for vessels in 1,3-butadiene service and 10,000ppmv for all other vessels)

Pump maintenance (after clearing to 500 ppmv)

Compressor maintenance (after clearing to 10,000 ppmv)

Roll-off box filling

DRAFT

Date: DATE

Permit 98149
Attachment C
Mss Activity Summary

Facilities	Description	Emissions Activity	EPN
external domed floating roof tanks	tank landings, cleaning, refilling	vent to temporary control device	PLANT-MSS- 11
external domed floating roof tanks	tank landings, cleaning, refilling	un-captured emissions vent to atmosphere	PLANT-MSS-1
frac tanks	temporary support of MSS activities	vent to temporary control	PLANT-MSS-3
heat exchangers	opening for maintenance	vent to atmosphere provided vapor pressure is less than 0.5 psia or the VOC concentration has been controlled to 500 ppmv	PLANT-MSS-4
internal floating roof tanks	tank landings, cleaning, refilling	vent to temporary control device	PLANT-MSS- 11
internal floating roof tanks	tank landings, cleaning, refilling	uncaptured emissions vent to atmosphere	PLANT-MSS-5
spheres	opening for maintenance	vent to atmosphere after purging to 2500 ppmv or 2000 ppmv for spheres in 1,3, butadiene service	PLANT-MSS-6
towers	opening for maintenance	vent to atmosphere after purging to 250 ppmv	PLANT-MSS-7
vacuum trucks	removal of material from tanks and vessels	vent to control device	PLANT-MSS-8
Attachment B Activities			PLANT-MSS-9
Attachment A Activities			PLANT-MSS-10
temporary control device	thermal oxidizer	controlled emissions released to atmosphere	PLANT-MSS-11
bullet tanks	opening for maintenance	vent to control device	PLANT-MSS-12
poly tanks	temporary support of MSS activities	vent to control device	PLANT-MSS-13
controlled fixed roof tanks	opening for maintenance	opening to atmosphere	PLANT-MSS-14
painting	painting	emissions to atmosphere	PLANT-MSS-15, PLANT-MSS-16, PLANT-MSS-17

Dated: DATE

DRAFT

Permit 98149
Attachment D
Facility List

This permit authorizes emissions from the following temporary facilities used to support planned MSS activities at permanent site facilities: frac tanks, containers, vacuum trucks, portable control devices identified in Special Condition 51, and controlled recovery systems. Emissions from temporary facilities are authorized provided the temporary facility (a) does not remain on the plant site for more than 12 consecutive months, (b) is used solely to support planned MSS activities at the permanent site facilities listed in this Attachment, and (c) does not operate as a replacement for an existing authorized facility.

This permit authorizes MSS emissions from the permanent site facilities identified below. The headings for each group of facilities (Process Units, Tanks, etc) are used in the MSS Activity Summary to identify all facilities in the respective group.

TANKS

Description	FIN	Permit
Floating Roof Tank	T-31	46307
Floating Roof Tank	T-32	46307
Floating Roof Tank	T-36	46307
Floating Roof Tank	T-37	46307
Floating Roof Tank	T-71	46307
Floating Roof Tank	T-73	46307
Floating Roof Tank	T-74	46307
Floating Roof Tank	T-77	46307
Floating Roof Tank	T-78	46307
Floating Roof Tank	T-79	46307
Floating Roof Tank	T-80	46307
Floating Roof Tank	T-84	46307
Floating Roof Tank	T-87	22052
Floating Roof Tank (EFR)	T-103	46307
Floating Roof Tank (EFR)	T-114	46307
Floating Roof Tank (EFR)	T-115	46307
Controlled Fixed Roof Tank	18F-2664	46307
Controlled Fixed Roof Tank	18F-2665	46307
Controlled Fixed Roof Tank	18F-2667	46307
Controlled Fixed Roof Tank	18F-2668	46307
Controlled Fixed Roof Tank	18F-2669	46307
Controlled Fixed Roof Tank	18F-2670	46307
Controlled Fixed Roof Tank	18F-2671	46307
Controlled Fixed Roof Tank	18F-2672	46307

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Equipment/Vessels/Piping

Description	Permit
Butadiene Unit	46307
MTBE/ETBE Unit	46307
Butene-1 Purification	46307
Diisobutylene Unit	46307
Isobutylene Unit	46307
High Purity Isobutylene Unit	46307
Polyisobutylene Unit #1	46307
Polyisobutylene Unit #2	46307
Dehydro 2 Unit	19806
Marine Loading Facility	22052

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Date: Date

Emission Sources - Maximum Allowable Emission Rates

Permit Number 98149

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities, sources, and related activities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

Air Contaminants Data

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
Plant-MSS-1	External Floating Roof Tanks MSS Emissions	VOC	45.02	3.45
Plant-MSS-3	Frac Tanks - MSS Emissions	VOC	34.34	1.70
Plant-MSS-4	Heat Exchangers - MSS Emissions	VOC	1.46	0.02
Plant-MSS-5	Internal Floating Roof Tanks - MSS Emissions	VOC	519.20	2.12
Plant-MSS-6	Spheres - MSS Emissions	VOC	74.98	0.39
Plant-MSS-7	Towers - MSS Emissions	VOC	31.41	0.07
Plant-MSS-8	Vacuum Trucks - MSS Emissions	VOC	14.90	1.24
Plant-MSS-9	Attachment B MSS Activities	VOC	16.41	0.10
		PM	11.44	0.14
		PM_{10}	5.41	0.07
		$PM_{2.5}$	0.82	0.01
Plant-MSS-10	Attachment A MSS Activities	VOC	0.85	0.65
Plant-MSS-11	Temporary Control Device - MSS Emissions	NOx	3.28	2.13
		CO	6.43	4.50
		SO_2	0.08	0.03
		VOC	3.30	0.17
		PM	0.26	0.18

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Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
		PM_{10}	0.26	0.18
		$PM_{2.5}$	0.26	0.18
Plant-MSS -12	Bullets	VOC	23.33	0.03
Plant-MSS -13	Poly Tank - MSS Emissions	VOC	6.17	0.03
Plant-MSS -14	Controlled Fixed Roof Tank - MSS Emissions	VOC	6.37	0.01
Plant-MSS -15	Plantwide Surface Coating	VOC	73.02	-
		Acetone	0.52	-
		PM	2.23	-
		PM_{10}	0.20	-
		$PM_{2.5}$	0.20	-
Plant-MSS -16	EFR Tank Surface Coating	VOC	36.51	-
		Acetone	0.26	-
		PM	1.12	-
		PM_{10}	0.10	-
		$PM_{2.5}$	0.10	-
Plant-MSS -17	Plantwide and EFR Surface Coating	VOC	-	6.28
		Acetone	-	0.10
		PM	-	0.07
		PM_{10}	-	0.01
		$PM_{2.5}$	-	0.01
Plant-MSS	Plantwide Short-term Emission Rate Allowables for	1,3 butadiene	91.12	-
		butene	16.75	-

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Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
	Individual Chemicals	diisobutylene	41.92	-
		dimethyl formamide	6.79	-
		ethyl tert-butyl ether	67.63	-
		ethanol	19.44	-
		furfural	3.67	-
		isobutane	50.57	-
		isobutylene	78.34	-
		lean oil	61.60	-
		methanol	31.09	-
		methyl tert-butyl ether	95.77	-
		pentane	0.66	-
		polyisobutylene	2.86	-
		Quench oil	5.65	-
		Triethanolamine (TEA)	0.45	-
		Vinyl Acetylene	0.53	-
		Acetone	0.52	-
		Aqueous Ammonia	0.30	-

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.
(2) Specific point source name. For fugitive sources, use area name or fugitive source name.
(3) Exempt Solvent - Those carbon compounds or mixtures of carbon compounds used as solvents which have been excluded from the definition of volatile organic compound.

VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1
HRVOC - highly reactive volatile organic compounds as defined in 30 TAC § 115.10
NO_x - total oxides of nitrogen
SO_2 - sulfur dioxide
PM - total particulate matter, suspended in the atmosphere, including PM_{10} and $PM_{2.5}$, as represented

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Emission Sources - Maximum Allowable Emission Rates

PM_{10} - total particulate matter equal to or less than 10 microns in diameter, including $PM_{2.5}$, as represented
$PM_{2.5}$ - particulate matter equal to or less than 2.5 microns in diameter
CO - carbon monoxide

(4) Compliance with annual emission limits (tons per year) is based on a 12 month rolling period.

Date: _____

DRAFT

TPC Group
Houston Operations

TEL 713.477.9211
FAX 713.475.6008

8600 Park Place Boulevard, Houston, Texas 77017
www.tpcgrp.com

July 23, 2012

CERTIFIED MAIL NO.:
7007 0710 0002 0682 5492
RETURN RECEIPT REQUESTED

Air Permit Initial Review Team (APIRT)
Texas Commission on Environmental Quality (TCEQ)
Mail Code 161, P.O. Box 13087
Austin, Texas 78711-3087

RECEIVED
12 JUL 25 PM 6:01
AIR PERMITS SECTION
GPD-R

Subject: Permit Amendment Application, Permit No. 19806
TPC Group, LLC
Houston, Harris County, Texas
Customer Reference Number: CN603624289
Regulated Entity Number: RN100219526

To Whom It May Concern:

This New Source Review (NSR) permit application is being submitted by TPC Group, LLC (TPC) for their Houston Plant, located in Harris County, Texas. This plant currently has units that produce various light olefin products including butadiene, butenes, and isobutylenes, as well as MTBE. TPC is submitting the attached NSR permit amendment application in accordance with 30 Texas Administrative Code (TAC), Chapter 116 to incorporate changes identified since the NSR permit was issued in June 2011.

A copy of the permit amendment application fee check of $900.00 is included in this submittal. The actual registration fee check is being sent to the TCEQ under a separate cover to the TCEQ Revenue Section concurrently with this permit application.

TPC would like to thank you in advance for your review and approval of this permit amendment application. If you have any questions, please do not hesitate to contact me at (713) 475-7422 or Geri.Shoop@TPCGRP.com.

Sincerely,

Geri Ann Shoop

Geri Shoop
Corporate Env Project Manager for Strategic Projects

Attachments:

Permit Amendment Application, Permit No. 19806

cc:

TCEQ, Region 12 5425 Polk Avenue, Suite H Houston, TX 77023-1486	CERTIFIED MAIL NO. 7007 0710 0002 0682 5508
City of Houston Bureau Chief of Air Quality Control Health and Human Services 7411 Park Place Blvd, Room 108 Houston, Texas 77087-4441	CERTIFIED MAIL NO. 7007 0710 0002 0682 5515
Harris County Environmental Public Health Division 101 South Richey Street, Suite G Pasadena, Texas 77506-1023	CERTIFIED MAIL NO. 7007 0710 0002 0682 5522
Environmental Protection Agency Air Permit Division 1445 Ross Avenue Dallas, TX 75202-2733	CERTIFIED MAIL NO. 7007 0710 0002 0682 5539

RECEIVED

New Source Review Permit Amendment Application

Permit Number: 19806

TPC Group

TPC Group, LLC
Houston Plant
8600 Park Place Blvd.
Houston, Texas 77017

CN: 603624289
RN: 100219526

TITAN Engineering, Inc.
A Division of Apex Companies, LLC

July 2012

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Appendix B - Emission Calculations
Appendix C - Netting Tables

1. INTRODUCTION

The TPC Group, LLC's (TPC) Houston Plant (TPC or Plant) is located in Houston, Harris County, Texas at 8600 Park Place Blvd. TPC is applying to the Texas Commission on Environmental Quality (TCEQ) to amend New Source Review (NSR) Permit 19806 to incorporate changes that have been identified since the permit authorization was obtained.

1.1 Application Content

This air permit application has been prepared based upon information provided by TPC Group, LLC and TCEQ guidance. The remainder of this document is structured as follows:

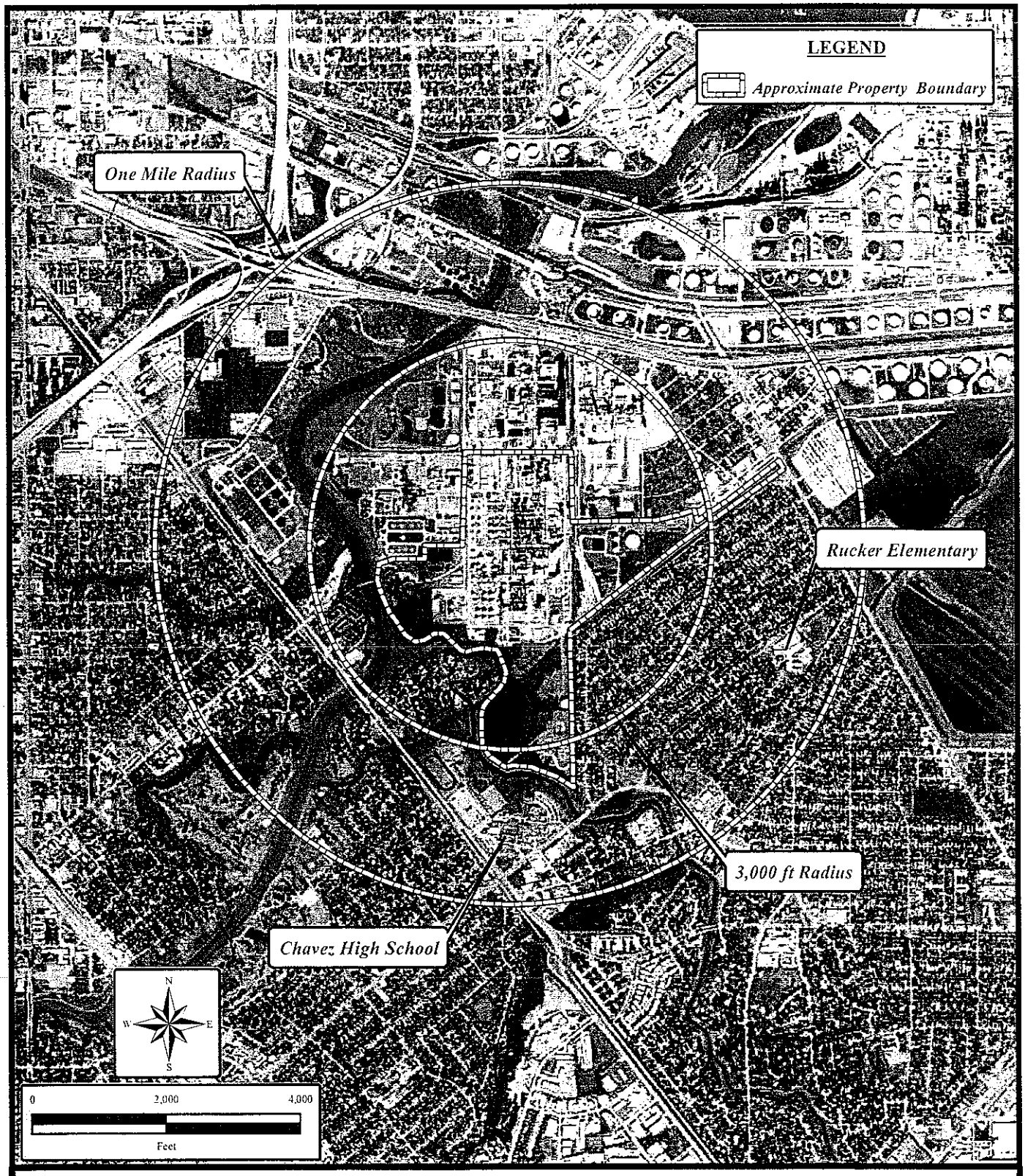
- Section 2 presents a project description;
- Section 3 presents a discussion of the Unit air emissions and Best Available Control Technology (B) review;
- Section 4 identifies the state and federal regulations that apply to the Unit for Permit Amendment and Renewal requirements demonstration; and
- Section 5 presents a list of references used in the preparation of this air permit application document.

This document also contains the following appendices:

- Appendix A contains the applicable TCEQ permit application forms;
- Appendix B contains the calculations required for this permit application; and
- Appendix C contains TPC's netting tables.

1.2 Permit Fee

For the permit amendment to NSR 19806, TPC is submitting a fee of $900.00 as calculated in TCEQ's Table 30. The Table 30 form is presented in Appendix A of this permit application.



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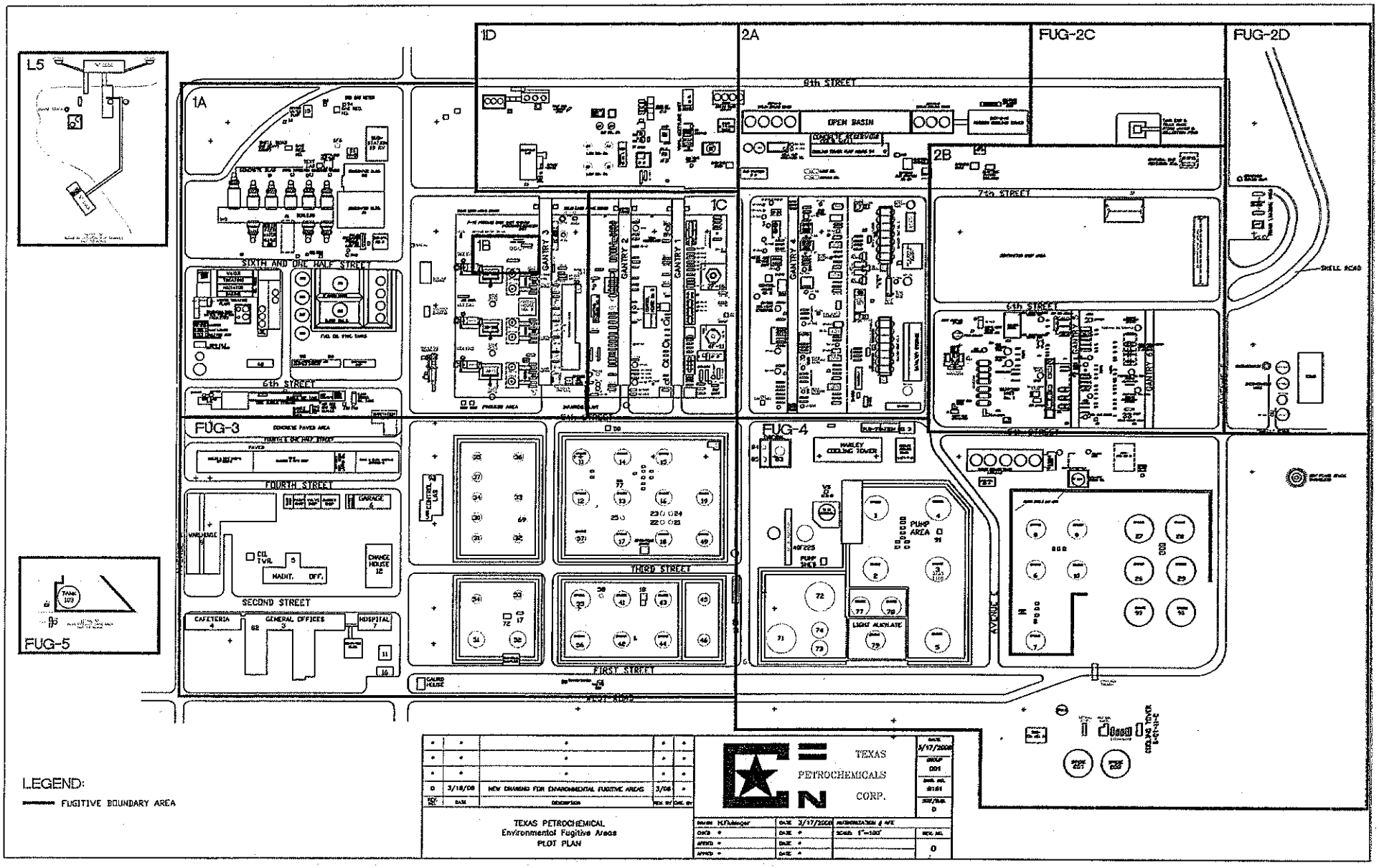
A Division of Apex Companies, LLC

TPC Group

FIGURE 1-1 AREA MAP

TPC Group LLC
8600 Park Place Blvd
Houston, Texas 77017
July 2012

from USGS Quadrangles Pasadena & Park Place, Texas
Ground Condition Depicted October 2007
Digital Data Courtesy of ESRI Online Datasets



L5
1A
1B
1C
1D
2A
2B
FUG-2C
FUG-2D
FUG-3
FUG-4
FUG-5
8th STREET
7th STREET
6th STREET
SIXTH AND ONE HALF STREET
FOURTH STREET
SECOND STREET
THIRD STREET
FIRST STREET
OPEN BASIN
GANTRY 1
GANTRY 2
GANTRY 3
GANTRY 4
GANTRY 5
GANTRY 6
HARLEY COOLING TOWER
PUMP AREA
LIGHT AUGMATE
CAFETERIA
GENERAL OFFICES
HOSPITAL
CHANGE HOUSE
GARAGE
WAREHOUSE
MAINT. OFF.
SHELL ROAD
AVENUE E
LEGEND:
FUGITIVE BOUNDARY AREA
TEXAS PETROCHEMICALS CORP.
NEW DRAWING FOR ENVIRONMENTAL FUGITIVE AREAS
3/18/08
TEXAS PETROCHEMICAL
Environmental Fugitive Areas
PLOT PLAN
3/17/2008
001
0

2. PROJECT DESCRIPTION

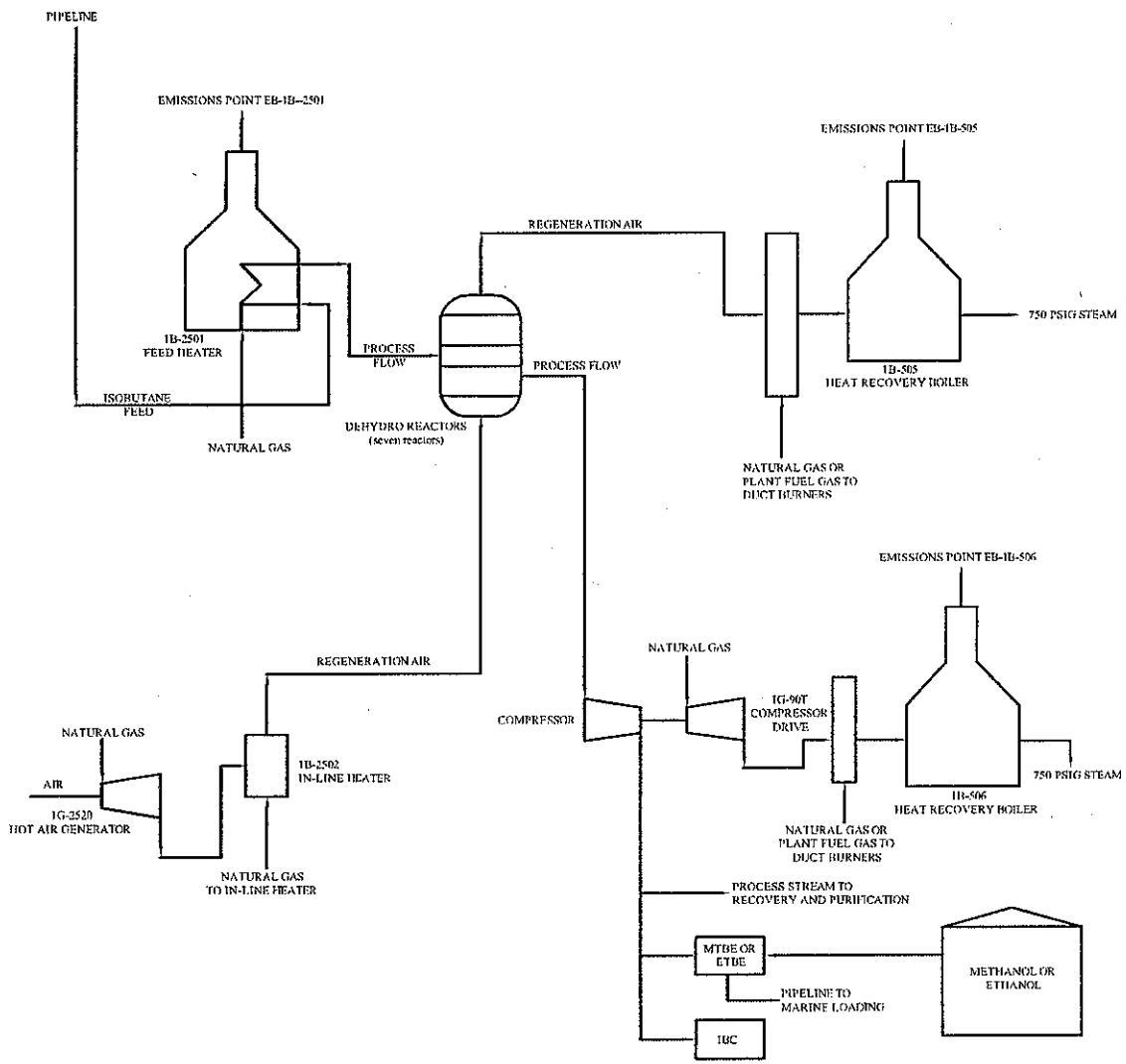
The TPC Group, LLC's (TPC) Houston Plant (TPC or Plant) is located in Houston, Harris County, Texas at 8600 Park Place Blvd. The Plant consists of several units and manufactures light olefin products including butadiene, butenes, and isobutylene, as well as methyl tert-butyl ether (MTBE). TPC is applying to the Texas Commission on Environmental Quality (TCEQ) to amend New Source Review (NSR) Permit 19806 which authorizes the commercial production of isobutylene in the Dehydro 2 manufacturing unit (DH2). This amendment application is to authorize changes that have been identified since the permit authorization was obtained.

Since NSR 19806's authorization was obtained, TPC has identified the following changes to the DH2 manufacturing unit:

- Quench Oil Tank 6F-1778 is being replaced with tank 1F-924;
- The fired source capacity for all fired sources is being increased;
- The sulfur emissions calculations basis been modified;
- Turbine 1G-2502T is being replaced with 1G-901T;
- Cooling Tower (CT-7) is being added as an affected source for the project, however it is not being physically modified;
- The 1B-505 stack is being relocated 35 feet due south of its current position; and
- A new diesel emergency generator (PHEGEN) is being added.

In addition, TPC is incorporating surface coating Maintenance, Startup and Shutdown (MSS) emissions as they pertain to the DH2 unit into this authorization.

A detailed process description has not been included with this application since no direct changes are being made to the process. However, a process flow diagram for the DH2 unit is located in Figure 2-1.



DEHYDRO UNIT 2

TITAN Engineering, Inc.
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A Division of Apex Companies, LLC

FIGURE 2-1
HNO-SUBGROUP 11
DEHYDRO UNIT 2 EMISSION POINTS PROCESS DIAGRAM

TPC Group

TPC Group LLC
Houston, Texas

DESIGNED BY:	DETAILED BY:	CHECKED BY:
TEI	LLA	HN
FILE NAME: T:\TPC Group\19806 Phoenix Mod\Figures\CAD		
DATE: 07/2012	PROJECT NO.: 84800323-20	PLOT SCALE: N.T.S.
DRAWING NO.: TEI-0000	REVISION: 0	FIGURE: 2-1

3. AIR EMISSIONS CALCULATIONS AND BACT

This section describes the air emissions associated with this permit amendment application. The detailed calculations, calculation methodologies, and equipment tables are presented in Appendix B.

This Section also presents proposed Best Available Control Technologies (BACT) for controlling air emissions from the equipment within the unit.

3.1 Air Emissions Calculations

The emissions presented in this application use the same methodology that was used in the October 2010 application submittal for NSR 19806. However, the basis for the sulfur emissions has been modified and are presented in Appendix B, Emissions Calculations. A summary of the air emissions are presented in Table 1(a) located in Appendix A. An additional emissions summary, Table B-1 and detailed calculations are presented in Appendix B.

3.2 Best Available Control Technology (BACT)

The Texas Clean Air Act (TCAA) and 30 TAC 116.111(a)(2)(C) require facilities to utilize Best Available Control Technology (BACT), with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facilities.

TPC previously submitted a BACT analysis for the DH2 emission sources as a part of the October 2010 application for NSR 19806. A new storage tank (1F-924), new diesel emergency (PHEGEN) engine, and a new cooling tower (CT-7) are the only equipment additions represented in this submittal.

Thus, TPC is only addressing the applicable BACT guidelines associated with those pieces of equipment.

<u>BACT for Storage Tanks</u>

The new storage tank, 1F-924, will meet BACT for fixed roof tanks. TCEQ has previously established that utilizing submerged fill loading, and storing materials with a vapor pressure less than 0.5 pounds per square inch absolute (psia) are considered BACT for these sources.

<u>BACT for Cooling Towers</u>

The new cooling tower, CT-7, will meet BACT in the same manner as Cooling Tower 3, CT-3, which was part of the original permit application submitted in 2010, by installing high efficiency drift eliminators to minimize particulate emissions. In addition, VOC emissions will be monitored and any leaks identified will be repaired as soon as possible.

BACT FOR EMERGENCY GENERATOR

The diesel emergency generator (PHE-GEN), will not be operated more than 52 hours per year. BACT requirements do not apply to this source since it is only used in emergency situations.

4. FEDERAL APPLICABILITY REVIEW

The New Source Review (NNSR) regulations require an evaluation of the major source thresholds for projects considered to be a "major modification" as defined in 30 TAC 116.12(18). The DH2 project which was approved in June 2011, was deemed a major project and required contemporaneous netting for NO_X, VOC, CO, SO_2, PM, PM_{10} and $PM_{2.5}$. The contemporaneous period for the project was established as June 2006 through June 2011.

The emission increases and decreases from this amendment application are part of the DH2 project. Thus, these emissions were applied to the DH2 project emissions and evaluated over the same contemporaneous period, June 2006 through June 2011. The emissions increases over the contemporaneous period are below the significance thresholds for all of the applicable pollutants. In addition, the contemporaneous increase in emissions of NO_X and VOC are below the NNSR significance levels. The Netting tables are presented in Appendix C.

Since the SO_2 emissions from the project did not exceed the 40 tpy PSD threshold, they were only evaluated as a project increase. Thus, the SO2 emissions are not presented in Appendix C – Netting Tables.

Based on the contemporaneous net increases; the DH2 project will not be subject to either the NNSR or Prevention of Signification Deterioration (PSR) regulations.

5. REGULARTORY APPLICABILITY

The following sections demonstrate that the Unit, as represented in this permit application, will meet 30 TAC §116.111 for the permit amendment. Furthermore, the following sections also demonstrate that theUnit will be operated in accordance with the intent of the Texas Clean Air Act, including protection of the health and physical property of the people.

5.1 30 TAC 101 - General Air Quality Rules (effective 10/27/11)

The Unit will be operated in accordance with the General Rules relating to circumvention, nuisance, traffic hazard, notification requirements for major upset, notification requirements for maintenance, sampling, sampling ports, emissions inventory requirements, sampling procedures and terminology, compliance with Environmental Protection Agency Standards, the National Primary and Secondary Ambient Air Quality Standards (NAAQS), inspection fees, emissions fees, and all other applicable General Rules.

5.2 30 TAC 111 - Control of Air Pollution from Visible Emissions and Particulate Matter (effective 2/16/12)

The potential applicability of this chapter to the Unit is explained in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§111.111-113	Visible Emissions	Yes	The Unit will not exceed 30% opacity for any six-minute period from any building, enclosed facility, or other structure.
§§111.121-129	Solid Waste Incineration	No	The Unit will not conduct solid waste incineration activities under this application.
§§111.131-139	Abrasive Blasting of Water Storage Tanks Performed by Portable Operations	No	Abrasive blasting of water storage tanks will not be conducted as part of this permit application.
§§111.141-149	Materials Handling, Construction, Roads, Streets, Alleys and Parking Lots	Yes	The Unit is located in Harris County, which is within the geographic area of applicability.

Section Number	Reference	Applicability	Compliance Explanation
§111.151	Allowable Emission Limits on Nonagricultural Processes	Yes	The Unit's particulate emissions associated with this application will be less than the allowable emission limits specified in §111.151.
§111.153	Emission Limits for Steam Generators	No	A steam generator, as defined in this section, is not part of this application.
§§111.171-175	Emission Limits on Agricultural Processes	No	The Unit will not conduct agricultural processes as part of this application.
§§111.181-183	Exemptions for Portable or Transient Operations	No	The Unit is not a portable or transient operation.
§§111.201-221	Outdoor Burning	Yes	Any outdoor burning that may be conducted at the Unit will be done in accordance with these requirements.

5.3 30 TAC 112 - Control of Air Pollution from Sulfur Compounds (effective 7/16/97)

30 TAC 112 governs various sulfur compound emissions including sulfur dioxide, hydrogen sulfide, sulfuric acid, and total reduced sulfur compounds. The potential applicability of this chapter to sources in this application is explained in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§112.3-4	SO_2 Net Ground Level Concentrations	Yes	SO_2 emissions are expected from the activities described in this permit.
§§112.5-7	Allowable SO_2 Emission Rates	No	There are no sulfuric acid or sulfur recovery plants in this permit application.
§112.8	Allowable SO_2 Emission Rates	No	There are no solid fossil fuel-fired steam generators in this permit application.

Section Number	Reference	Applicability	Compliance Explanation
§112.9	Allowable SO_2 Emission Rates	No	There will be no liquid fuel-fired steam generators, furnaces, or heaters in this permit application.
§112.14	Allowable SO_2 Emission Rates	No	The Unit will not include any nonferrous smelters.
§§112.15-18	Temporary Fuel Shortage Plan	No	The Unit does not anticipate a shortage of low sulfur fuel.
§§112.19-21	Area Control Plan	No	The Unit does not anticipate needing relief from the requirements of §112.3.
§§112.31-34	Allowable Emissions of H_2S	No	The Unit in this application does not anticipate producing H_2S emissions.
§§112.41-47	Allowable Emissions of H_2SO_4	No	The Unit is not anticipated to emit H_2SO_4.
§§112.51-59	Emission Limits for Total Reduced Sulfur Compounds	No	The Unit will not include a Kraft Pulp Mill.

5.4 30 TAC 113 - Hazardous Air Pollutant (HAP) Standards (effective 5/14/09)

30 TAC 113 addresses the control of air pollution from HAPs and other designated facilities, defined within this chapter to be certain air emissions from municipal solid waste landfills (MSWLFs), medical waste incinerators, and certain other processes/emissions regulated under 40 CFR Parts 61 and 63. The Unit will not include a MSWLF or medical waste incinerator, nor is the Unit anticipated to produce radon. Consequently, Subchapters B and D are not applicable.

30 TAC 113 Subchapter C implements 40 CFR Part 63 by regulating HAP emissions released from source categories listed in this rule. The Unit will comply with all applicable requirements of this rule.

5.5 30 TAC 114 - Control of Air Pollution from Motor Vehicles (effective 12/13/10)

The Unit production operations will not include a motor vehicle fleet. Any on-site company vehicles will be used for maintenance only. Therefore, this chapter does not apply.

5.6 30 TAC 115 - Control of Air Pollution from Volatile Organic Compounds (VOC) (effective 12/29/11)

30 TAC Chapter 115 regulates VOC emissions according to source type and Unit location (county). The Unit is located in Harris County, which is included in the "Houston/Galveston Nonattainment Area" under this rule. Therefore, the potential applicability of the 30 TAC 115 sections is addressed in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§115.112-119	Storage of VOC	Yes	The Unit does have VOC storage vessels associated with this application and will comply with this rule.
§§115.120-129	Vent Gas Control	Yes	The Unit does have vents covered by this rule associated with this application and will comply with this rule.
§§115.131-139	Water Separation	No	The Unit will not have any volatile organic compound water separators as part of this application.
§§115.140-149	Industrial Wastewater	No	The Unit will not handle industrial wastewater as defined in this section as part of this application.
§§115.152-159	Municipal Solid Waste Landfills	No	The Unit does not have a Municipal Solid Waste Landfill as part of this application.
§§115.160-169	Batch Processes	No	The Unit is not considered to be a Batch Process as part of this application.
§§115.211-259	VOC Transfer Operations	No	The Unit may conduct transfer operations as defined in this section as part of this application.
§§115.311-359	Petroleum Refining, Natural Gas Processing, and Petrochemical Processes	Yes	The Unit may conduct any of the referenced processes as part of this application and will comply with this rule.
§§115.412-419	Degreasing Processes	No	No degreasing process operations as defined in this section will be conducted as part of this application.

Section Number	Reference	Applicability	Compliance Explanation
§§115.420-429	Surface Coating Processes	Yes	The Unit will conduct surface coating process operations as defined in this section as part of this application.
§§115.430-449	Printing Processes	No	Facilities in this application will not conduct printing operations as defined in these sections as part of this application.
§§115.510-559	Miscellaneous Industrial Sources	No	Facilities in this application will not conduct any of the miscellaneous industrial activities defined in this section as part of this application.
§§115.600-619	Consumer-Related Sources and Products	No	Facilities in this application will not produce consumer products as part of this application.
§§115.720-729	HRVOC - Vent Gas Control	Yes	This rule applies to facilities or activities covered in this application.
§§115.760-769	HRVOC – Cooling Tower Heat Exchange Systems	Yes	This rule applies to facilities or activities covered in this application.
§§115.780-789	HRVOC – Fugitive Emissions	Yes	This rule applies to facilities or activities covered in this application.
§§115.901-916	Alternates Means of Control	No	Facilities in this application are not requesting alternate means of control.
§§115.920-923	Early Reductions	No	Facilities in this application are not requesting early reductions.
§§115.930-940	Compliance and Control Plan Requirements	No	No facilities in this application are affected by this section of 30 TAC 115.
§§115.950	Emissions Trading	No	No facilities in this application are affected by this section of 30 TAC 115.

5.7 30 TAC 117 - Control of Air Pollution from Nitrogen Compounds (effective 4/19/12)

30 TAC 117 governs NO_X emissions from the following types of facilities: Major Sources in an applicable ozone nonattainment area, acid manufacturers, and gas-fired combustion unit manufacturers, distributors, retailers, and installers. 30 TAC 117 also governs NO_X emissions from Minor Sources located in the Houston/Galveston ozone nonattainment area and sources located in specified counties in Central and East Texas. The Unit will be located in Houston, Harris County, which is part of the Houston/Galveston ozone nonattainment area. Therefore, the potential applicability of 30 TAC 117 sections is addressed in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§117.100-156	Combustion Control Beaumont–Port Arthur	No	The Unit will not be within the geographic area of applicability.
§§117.200-256	Combustion Control Dallas-Fort Worth	No	The Unit will not be within the geographic area of applicability.
§§117.300-356	Combustion Control Houston-Galveston-Brazoria	Yes	The Unit will comply with this rule.
§§117.400-456	Combustion Control Dallas/Fort Worth 8-HR	No	The Unit will not be within the geographic area of applicability.
§§117.1000-1056	Combustion Control at Major Utility Electric Generation Sources Beaumont-Port Arthur	No	The Unit will not be within the geographic area of applicability and is not an electrical generation source.
§§117.1100-1156	Combustion Control at Major Utility Electric Generation Sources Dallas-Fort Worth	No	The Unit will not be within the geographic area of applicability and is not an electrical generation source.

Section Number	Reference	Applicability	Compliance Explanation
§§117.1200-1256	Combustion Control at Major Utility Electric Generation Sources Houston-Galveston-Brazoria	No	The Unit will be within the geographic area of applicability, but is not owned or operated by an electric cooperative, municipality, river authority, public utility, or a Public Utility Commission of Texas regulated utility. Additionally, the Unit is not an electrical generation source.
§§117.1300-1356	Combustion Control at Major Utility Electric Generation Sources Dallas-Fort Worth 8-HR	No	The Unit will not be within the geographic area of applicability and is not an electrical generation source.
§§117.2000-2145	Combustion Control at Minor Sources	No	The Unit is a major source, and not a minor source. Therefore, this section of 30 TAC 117 does not apply.
§§117.3000-3345	Multi-Region Combustion Control	No	The Unit will be located in Harris County which is part of the Houston/Galveston area which is not within the geographic area of applicability.
§§117.4000-4210	Acid Manufacturing	No	The Unit is not an acid manufacturer. Therefore, this section of 30 TAC 117 does not apply.
§§117.8000-8140	General Monitoring and Testing Requirements	Yes	The Unit will perform monitoring and testing as defined in these sections as a part of this application and will comply with these rules.
§§117.9000-9810	Compliance Schedule and Compliance Flexibility	Yes	The Unit will perform monitoring and testing as defined in these sections as a part of this application and will comply with these rules.

5.8 30 TAC 118 - Control of Air Pollution Episodes (effective 5/14/04)

The Unit will operate in compliance with the TCEQ General Rules and the Air Pollution Episodic Requirements of 30 TAC 118.

5.9 30 TAC 122 - Federal Operating Permits (effective 03/04/10), Acid Rain, CAIR

30 TAC 122 addresses the Texas implementation of the federal operating permits program promulgated under Title V of the Clean Air Act. Based on its potential to emit, as reflected by this application, the Unit will be classified as a Major Source. Consequently, the Unit will submit a revision notification application, if required, for a Title V operating permit in accordance with this rule.

5.10 Measurement of Significant Air Contaminants - §116.111(a)(2)(B)

5.11 At the request of the Executive Director of the TCEQ, TPC will provide provisions for the measurement of significant emissions.

5.12 Best Available Control Technology (BACT) - §116.111(a)(2)(C)

Refer to Section 3.0 for a BACT analysis.

5.13 New Source Performance Standards - §116.111(a)(2)(D)

Emission sources in the DH2 Unit will comply with any applicable 40 CFR 60 Subparts.

5.14 National Emission Standards for Hazardous Air Pollutants (NESHAP) - §116.111(a)(2)(E)

Emission sources in the DH2 Unit will comply with any applicable 40 CFR 61 Subparts.

5.15 Maximum Achievable Control Technology (MACT) - §116.111 (a)(2)(F)

Emission sources in the DH2 Unit will comply with any applicable 40 CFR 63 Subparts.

5.16 Nonattainment Permitting Requirements - §116.111(a)(2)(H)

Nonattainment Permitting Requirements are not applicable. See Section 4 Federal Applicability Review for additional information.

5.17 Prevention of Significant Deterioration (PSD) Permitting Requirements - §116.111(a)(2)(I)

PSD Permitting Requirements are not applicable. See Section 4 Federal Applicability Review for additional information.

5.18 Hazardous Air Pollutant Major Source - §116.111(a)(2)(K)

The Unit is a major source of HAP; however, this regulation does not apply to this permit application because the application does not include the construction or reconstruction of a major new source of Hazardous Air Pollutants as defined in the Federal Clean Air Act (FCAA) §112(b).

5.19 Mass Cap and Trade Allowances - §116.111(a)(2)(L)

The Unit is located in Harris County which is in the Houston/Galveston area and is a Major Source of NO_X. Therefore, the Unit is subject to Chapter 101, Subchapter H, Division 3 relating to the Mass Emissions Cap and Trade Program and will comply with this rule.

6. REFERENCES

The following references have been used in the preparation of this air permit application document.

- State of Texas. Texas Administrative Code. Title 30, Chapter 101. *General Air Quality Rules.* April 19, 2012.
- State of Texas. Texas Administrative Code. Title 30, Chapter 111. *Control of Air Pollution from Visible Emissions and Particulate Matter.* February 16, 2012.
- State of Texas. Texas Administrative Code. Title 30, Chapter 112. *Control of Air Pollution from Sulfur Compounds.* July 16, 1997.
- State of Texas. Texas Administrative Code. Title 30, Chapter 113. *Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants.* May 14, 2009.
- State of Texas. Texas Administrative Code. Title 30, Chapter 114. *Control of Air Pollution from Motor Vehicles.* July 5, 2012.
- State of Texas. Texas Administrative Code. Title 30, Chapter 115. *Control of Air Pollution from Volatile Organic Compounds (VOCs).* December 29, 2011.
- State of Texas. Texas Administrative Code. Title 30, Chapter 116. *Control of Air Pollution by Permits for New Construction or Modification.* March 1, 2012.
- State of Texas. Texas Administrative Code. Title 30, Chapter 117. *Control of Air Pollution from Nitrogen Compounds.* April 19, 2012.
- United States. Code of Federal Regulations. Title 40, Part 60. *New Source Performance Standards.* July 2012.
- United States. Code of Federal Regulations. Title 40, Part 61. *National Emission Standards for Hazardous Air Pollutants.* July 2012.
- United States. Code of Federal Regulations. Title 40, Part 63. *National Emission Standards for Hazardous Air Pollutants for Source Categories.* July 2012.

APPENDIX A

TCEQ FORMS AND TABLES

TCEQ Forms and Tables **Page**

PI-1 – General Application for Air Permits A-1
Table 30 Permit Application Fee A-10
Copy of Permit Fee Check A-11
Table 7(a) – Fixed Roof Storage Tank Summary A-12
Table 1(a) – Emission Point Summary A-14

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

Important Note: The agency **requires** that a Core Data Form be submitted on all incoming applications unless a Regulated Entity and Customer Reference Number have been issued *and* no core data information has changed. For more information regarding the Core Data Form, call (512) 239-5175 or go to www.tceq.texas.gov/permitting/central_registry/guidance.html.

I. Applicant Information		
A. Company or Other Legal Name: TPC Group LLC.		
Texas Secretary of State Charter/Registration Number (*if applicable*):		
B. Company Official Contact Name: Charles Kirk Johnson		
Title: Plant Manager		
Mailing Address: 8600 Park Place Blvd.		
City: Houston	State: Texas	ZIP Code: 77017
Telephone No.: (713) 740-4230	Fax No.: (713) 475-6008	E-mail Address: kirk.johnson@tpcgrp.com
C. Technical Contact Name: Geri Shoop		
Title: Corporate Environmental Project Manager for Strategic Projects		
Company Name: TPC Group LLC.		
Mailing Address: 8600 Park Place Blvd.		
City: Houston	State: Texas	ZIP Code: 77017
Telephone No.: (713) 475-7422	Fax No.: (713) 475-6008	E-mail Address: Geri.Shoop@tpcgrp.com
D. Site Name: Houston Plant		
E. Area Name/Type of Facility: Houston Plant		☒ Permanent ☐ Portable
F. Principal Company Product or Business: 1,3 Butadiene, MTBE, Isobutylene, and other C4 Products		
Principal Standard Industrial Classification Code (SIC): 2869		
Principal North American Industry Classification System (NAICS): 325100		
G. Projected Start of Construction Date: N/A		
Projected Start of Operation Date: N/A		
H. Facility and Site Location Information (If no street address, provide clear driving directions to the site in writing.):		
Street Address: 8600 Park Place Blvd.		
City/Town: Houston	County: Harris	ZIP Code: 77017
Latitude (nearest second): 29.699166	Longitude (nearest second): - 95.253888	

Texas Commission on Environmental Quality
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I. Applicant Information (continued)	
I. Account Identification Number (leave blank if new site or facility): HG-0562-P	
J. Core Data Form.	
Is the Core Data Form (Form 10400) attached? If *No*, provide customer reference number and regulated entity number (complete K and L).	☐ YES ☒ NO
K. Customer Reference Number (CN): 603624289	
L. Regulated Entity Number (RN): 100219526	
II. General Information	
A. Is confidential information submitted with this application? If *Yes*, mark each **confidential** page **confidential** in large red letters at the bottom of each page.	☐ YES ☒ NO
B. Is this application in response to an investigation or enforcement action? If *Yes*, attach a copy of any correspondence from the agency.	☐ YES ☒ NO
C. Number of New Jobs: 0	
D. Provide the name of the State Senator and State Representative and district numbers for this facility site:	
Senator: Mario Gallegos	District No.: 6
Representative: Carol Alvarado	District No.: 145
III. Type of Permit Action Requested	
A. Mark the appropriate box indicating what type of action is requested.	
Initial ☐ Amendment ☒ Revision (30 TAC 116.116(e)) ☐ Change of Location ☐ Relocation ☐	
B. Permit Number (if existing): 19806	
C. Permit Type: Mark the appropriate box indicating what type of permit is requested. *(check all that apply, skip for change of location)*	
Construction ☐ Flexible ☐ Multiple Plant ☐ Nonattainment ☐ Prevention of Significant Deterioration ☐	
Hazardous Air Pollutant Major Source ☐ Plant-Wide Applicability Limit ☐	
Other: Amendment to existing NSR 19806	
D. Is a permit renewal application being submitted in conjunction with this amendment in accordance with 30 TAC 116.315(c).	☐ YES ☒ NO

III. Type of Permit Action Requested (continued)			
E. Is this application for a change of location of previously permitted facilities? If Yes, complete III.E.1 - III.E.4.			☐ YES ☒ NO
1. Current Location of Facility (If no street address, provide clear driving directions to the site in writing.):			
Street Address:			
City:	County:	ZIP Code:	
2. Proposed Location of Facility (If no street address, provide clear driving directions to the site in writing.):			
Street Address:			
City:	County:	ZIP Code:	
3. Will the proposed facility, site, and plot plan meet all current technical requirements of the permit special conditions? If *No*, attach detailed information.			☐ YES ☐ NO
4. Is the site where the facility is moving considered a major source of criteria pollutants or HAPs?			☐ YES ☐ NO
F. Consolidation into this Permit: List any standard permits, exemptions or permits by rule to be consolidated into this permit including those for planned maintenance, startup, and shutdown.			
List: N/A			
G. Are you permitting planned maintenance, startup, and shutdown emissions? If *Yes*, attach information on any changes to emissions under this application as specified in VII and VIII.			☒ YES ☐ NO
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability)			
Is this facility located at a site required to obtain a federal operating permit? If *Yes*, list all associated permit number(s), attach pages as needed).			☒ YES ☐ NO ☐ To be determined
Associated Permit No (s.): O-1598			
1. Identify the requirements of 30 TAC Chapter 122 that will be triggered if this application is approved.			
FOP Significant Revision ☐ FOP Minor ☐ Application for an FOP Revision ☐ To Be Determined ☐			
Operational Flexibility/Off-Permit Notification ☐ Streamlined Revision for GOP ☐ None ☒			

III. Type of Permit Action Requested (continued)	
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability) *(continued)*	
2. Identify the type(s) of FOP(s) issued and/or FOP application(s) submitted/pending for the site. (check all that apply)	
GOP Issued ☐	GOP application/revision application submitted or under APD review ☐
SOP Issued ☐	SOP application/revision application submitted or under APD review ☒
IV. Public Notice Applicability	
A. Is this a new permit application or a change of location application?	☐ YES ☒ NO
B. Is this application for a concrete batch plant? If Yes, complete V.C.1 – V.C.2.	☐ YES ☒ NO
C. Is this an application for a major modification of a PSD, nonattainment, FCAA 112(g) permit, or exceedance of a PAL permit?	☐ YES ☒ NO
D. Is this application for a PSD or major modification of a PSD located within 100 kilometers or less of an affected state or Class I Area?	☐ YES ☒ NO
If *Yes*, list the affected state(s) and/or Class I Area(s).	
E. Is this a state permit amendment application? If Yes, complete IV.E.1. – IV.E.3.	
1. Is there any change in character of emissions in this application?	a
2. Is there a new air contaminant in this application?	☐ YES ☒ NO
3. Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetables fibers (agricultural facilities)?	☐ YES ☒ NO
F. List the total annual emission increases associated with the application (*list* **all** *that apply and attach additional sheets as needed*):	
Volatile Organic Compounds (VOC): 8.89	
Sulfur Dioxide (SO_2): 0.00	
Carbon Monoxide (CO): 0.00	
Nitrogen Oxides (NO_x): 15.08	
Particulate Matter (PM): 9.99	
PM $_{10}$ microns or less (PM_{10}): 9.73	
PM $_{2.5}$ microns or less ($PM_{2.5}$): 9.51	
Lead (Pb): 0.00	
Hazardous Air Pollutants (HAPs):	
Other speciated air contaminants **not** listed above: NH_3 38.36	

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V. Public Notice Information (complete if applicable)		
A. Public Notice Contact Name: Geri Shoop		
Title: Corporate Environmental Manager for Strategic Projects		
Mailing Address: 8600 Park Place Blvd.		
City: Houston	State: Texas	ZIP Code: 77017
Telephone No.: (713) 475-7422		
B. Name of the Public Place: Park Place Regional Library		
Physical Address (No P.O. Boxes): 8145 Park Place Blvd.		
City: Houston	County: Harris	ZIP Code: 77017
The public place has granted authorization to place the application for public viewing and copying.		☒ YES ☐ NO
The public place has internet access available for the public.		☒ YES ☐ NO
C. Concrete Batch Plants, PSD, and Nonattainment Permits		
1. County Judge Information (For Concrete Batch Plants and PSD and/or Nonattainment Permits) for this facility site.		
The Honorable:		
Mailing Address:		
City:	State:	ZIP Code:
2. Is the facility located in a municipality or an extraterritorial jurisdiction of a municipality? *(For Concrete Batch Plants)*		☐ YES ☐ NO
Presiding Officers Name(s):		
Title:		
Mailing Address:		
City:	State:	ZIP Code:
3. Provide the name, mailing address of the chief executive of the city for the location where the facility is or will be located.		
Chief Executive:		
Mailing Address:		
City:	State:	ZIP Code:

V. Public Notice Information (complete if applicable) (continued)		
3. Provide the name, mailing address of the Indian Governing Body for the location where the facility is or will be located. *(continued)*		
Name of the Indian Governing Body:		
Title:		
Mailing Address:		
City:	State:	ZIP Code:
D. Bilingual Notice		
Is a bilingual program **required** by the Texas Education Code in the School District?		☒ YES ☐ NO
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?		☒ YES ☐ NO
If *Yes*, list which languages are required by the bilingual program? Spanish		

VI. Small Business Classification (Required)	
A. Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?	☐ YES ☒ NO
B. Is the site a major stationary source for federal air quality permitting?	☒ YES ☐ NO
C. Are the site emissions of any regulated air pollutant greater than or equal to 50 tpy?	☒ YES ☐ NO
D. Are the site emissions of all regulated air pollutants combined less than 75 tpy?	☒ YES ☐ NO

VII. Technical Information
A. The following information must be submitted with your Form PI-1 (this is just a checklist to make sure you have included everything)
1. Current Area Map ☒
2. Plot Plan ☒
3. Existing Authorizations ☒
4. Process Flow Diagram ☒
5. Process Description ☒ This was submitted previously. A project description is included.
6. Maximum Emissions Data and Calculations ☒
7. Air Permit Application Tables ☒
a. Table 1(a) (Form 10153) entitled, Emission Point Summary ☒
b. Table 2 (Form 10155) entitled, Material Balance ☒ This was submitted previously and doesn't apply to changes.
c. Other equipment, process or control device tables ☒

VII. Technical Information				
B. Are any schools located within 3,000 feet of this facility?				☒ YES ☐ NO
C. Maximum Operating Schedule:				
Hours: 24	Day(s): 7	Week(s): 52	Year(s):	
Seasonal Operation? If Yes, please describe in the space provide below.				☐ YES ☒ NO
D. Have the planned MSS emissions been previously submitted as part of an emissions inventory?				☐ YES ☒ NO
Provide a list of each planned MSS facility or related activity and indicate which years the MSS activities have been included in the emissions inventories. Attach pages as needed.				
E. Does this application involve any air contaminants for which a *disaster review* is required?				☐ YES ☒ NO
F. Does this application include a pollutant of concern on the *Air Pollutant Watch List (APWL)*?				☐ YES ☒ NO
VIII. State Regulatory Requirements **Applicants must demonstrate compliance with all applicable state regulations to obtain a permit or amendment.** *The application must contain detailed attachments addressing applicability or non applicability; identify state regulations; show how requirements are met; and include compliance demonstrations.*				
A. Will the emissions from the proposed facility protect public health and welfare, and comply with all rules and regulations of the TCEQ?				☒ YES ☐ NO
B. Will emissions of significant air contaminants from the facility be measured?				☒ YES ☐ NO
C. Is the Best Available Control Technology (BACT) demonstration attached?				☒ YES ☐ NO
D. Will the proposed facilities achieve the performance represented in the permit application as demonstrated through recordkeeping, monitoring, stack testing, or other applicable methods?				☒ YES ☐ NO
IX. Federal Regulatory Requirements **Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment** *The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.*				
A. Does Title 40 Code of Federal Regulations Part 60, (40 CFR Part 60) New Source Performance Standard (NSPS) apply to a facility in this application?				☒ YES ☐ NO
B. Does 40 CFR Part 61, National Emissions Standard for Hazardous Air Pollutants (NESHAP) apply to a facility in this application?				☒ YES ☐ NO
C. Does 40 CFR Part 63, Maximum Achievable Control Technology (MACT) standard apply to a facility in this application?				☒ YES ☐ NO

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

IX. Federal Regulatory Requirements **Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment** ***The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.***	
D. Do nonattainment permitting requirements apply to this application?	☐ YES ☒ NO
E. Do prevention of significant deterioration permitting requirements apply to this application?	☐ YES ☒ NO
F. Do Hazardous Air Pollutant Major Source [FCAA 112(g)] requirements apply to this application?	☒ YES ☐ NO
G. Is a Plant-wide Applicability Limit permit being requested?	☐ YES ☒ NO
X. Professional Engineer (P.E.) Seal	
Is the estimated capital cost of the project greater than $2 million dollars?	☐ YES ☒ NO
If *Yes*, submit the application under the seal of a Texas licensed P.E.	
XI. Permit Fee Information	
Check, Money Order, Transaction Number ,ePay Voucher Number: 75407	Fee Amount: $ 900.00
Company name on check: TPC Group LLC.	Paid online?: ☐ YES ☒ NO
Is a copy of the check or money order attached to the original submittal of this application?	☒ YES ☐ NO ☐ N/A
Is a Table 30 (Form 10196) entitled, Estimated Capital Cost and Fee Verification, attached?	☒ YES ☐ NO ☐ N/A

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

XII. Delinquent Fees and Penalties
This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: www.tceq.texas.gov/agency/delin/index.html.
XIII. Signature
The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations of the Texas Commission on Environmental Quality or any local governmental ordinance or resolution enacted pursuant to the TCAA I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.
Name: Charles Kirk Johnson
Signature: CK Johnson *Original Signature Required*
Date: 7/23/12

Texas Commission on Environmental Quality
Table 30
Estimated Capital Cost and Fee Verification

Include estimated cost of the equipment and services that would normally be capitalized according to standard and generally accepted corporate financing and accounting procedures. Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality, Air Permits Division Web site at www.tceq.state.tx.us/nav/permits/air_permits.html.

I. DIRECT COSTS [30 TAC § 116.141(c)(1)]	Estimated Capital Cost
A. A process and control equipment not previously owned by the applicant and not currently authorized under this chapter	$
B. Auxiliary equipment, including exhaust hoods, ducting, fans, pumps, piping, conveyors, stacks, storage tanks, waste disposal facilities, and air pollution control equipment specifically needed to meet permit and regulation requirements	$
C. Freight charges	$
D. Site preparation, including demolition, construction of fences, outdoor lighting, road and parking areas	$
E. Installation, including foundations, erection of supporting structures, enclosures or weather protection, insulation and painting, utilities and connections, process integration, and process control equipment	$
F. Auxiliary buildings, including materials storage, employee facilities, and changes to existing structures	$
G. Ambient air monitoring network	$
II. INDIRECT COSTS [30 TAC § 116.141(c)(2)]	**Estimated Capital Cost**
A. Final engineering design and supervision, and administrative overhead	$
B. Construction expense, including construction liaison, securing local building permits, insurance, temporary construction facilities, and construction clean-up	$
C. Contractor's fee and overhead	$
TOTAL ESTIMATED CAPITAL COST	$ 0

I certify that the total estimated capital cost of the project as defined in 30 TAC § 116.141 is equal to or less than the above figure. I further state that I have read and understand Texas Water Code § 7.179, which defines CRIMINAL OFFENSES for certain violations, including intentionally or knowingly making, or causing to be made, false material statements or representations.

Company Name: TPC Group L.L.C.

Company Representative Name (please print): Charles Kirk Johnson Title: Plant Manager

Company Representative Signature: CK Johnson

Estimated Capital Cost		Permit Application Fee	PSD/Nonattainment Application Fee
Less than	$300,000	$900 (minimum fee)	$3,000 (minimum fee)
$300,000 to	$25,000,000	0.30% of capital cost	
$300,000 to	$7,500,000		1.0% of capital cost
Greater than	$25,000,000	$75,000 (maximum fee)	
Greater than	$7,500,000		$75,000 (maximum fee)

PERMIT APPLICATION FEE (from table above) = $ 900 Date: 7/23/12

TCEQ-10196 (Revised 05/07) Table 30
This form is for use by facilities subject to Air New Source Review permit requirements and may be revised. (APDG 5846 v1)

Check Date: 13-JUL-2012 No. 75407

Vendor No.: 911 Vendor Name: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INVOICE NO.	INVOICE DATE	DESCRIPTION	DISCOUNT AMOUNT	NET AMOUNT
PERMIT NSR 19806	03-JUL-2012		0.00	900.00
			0.00	900.00

PLEASE DETACH AND RETAIN THIS STATEMENT AS YOUR RECORD OF PAYMENT. *Thank You*

WARNING - THIS CHECK IS PROTECTED BY SPECIAL SECURITY GUARD PROGRAM™ FEATURES

TPC Group

5151 San Felipe, Suite 800
Houston, Texas 77056
(713) 627-7474

Bank of America
Chicago, Illinois 60603

70-2328 / 719 IL

DATE	CHECK NO.	AMOUNT
13-Jul-2012	75407	$900.00

PAY Nine Hundred Dollars And Zero Cents*****

VOID AFTER 90 DAYS

TO THE ORDER OF
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. Box 13088
Austin, Tx 78711-3088

HEAT SENSITIVE RUB AREA TO VERIFY

Robert R Whitlow Jr.

AUTHORIZED SIGNATURE(S)

THIS CHECK CONTAINS MULTIPLE SECURITY FEATURES - SEE BACK FOR DETAILS

⑈075407⑈ ⑆071923284⑆ 5590095252⑈

TABLE 7(a)
VERTICAL FIXED ROOF STORAGE TANK SUMMARY

I. ***Tank Identification*** *(Use a separate form for each tank).*

1. Applicant's Name: TPC Group LLC
2. Location (*indicate on plot plan and provide coordinates*):_
3. Tank No. T-1F-924 4. Emission Point No. T-1F-924
5. FIN T-1F-924 CIN N/A
6. Status: New tank [X] Altered tank [ ] Relocation [ ] Change of Service [ ]
   Previous permit or exemption number(s)

II. ***Tank Physical Characteristics***

1. Dimensions
   a. Shell Height : 24 ft.
   b. Diameter: 30.5 ft.
   c. Maximum Liquid Height : 22 ft.
   d. Nominal Capacity or Working Volume: 145,056 gallons.
   e. Turnovers per year: 1.08
   f. Net Throughput : 156,000 gallons/year.
   g. Maximum Filling Rate: 2,100 gallons/hour.
2. Paint Characteristics
   a. Shell Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe _____)
   b. Shell Condition : Good [X] Poor [ ]
   c. Roof Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe _____)
   d. Roof Condition : Good [X] Poor [ ]
3. Roof Characteristics
   a. Roof Type: Dome [X] Cone [ ]
   b. Roof Height: 1.25 ft. (*not including shell height)*
   c. Radius (*Dome Roof Only*): _____ ft.
   d. Slope (*Cone Roof Only*): _____ ft/ft.

4. Breather Vent Settings				SPECIFY "Atmosphere" or Discharging to: (name of abatement device)
Valve Type	Number	Pressure Setting (psig)	Vacuum Setting (psig)	
Combination Vent Valve		0.03 (Default)	-0.03 (Default)	
Pressure Vent Valve				
Vacuum Vent Valve				
Open Vent Valve				

Table 7(a) VERTICAL FIXED ROOF TANK SUMMARY
Page 2
Permit No. 19806 Tank No. T-6F1778

III. ***Liquid Properties of Stored Material***

1. Chemical Category: Organic Liquids [X]Petroleum Distillates [ ] Crude Oils [ ]
2. Single or Multi-Component Liquid

   Single [X] *Complete Section III.3*
   Multiple [ ] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: Quench Oil
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: 70 °F.
   d. True Vapor Pressure at Average Liquid Surface Temperature: 0.04 psia.
   e. Liquid Molecular Weight: 188
4. Multiple Component Information
   a. Mixture Name: _____
   b. Average Liquid Surface Temperature: _____ °F.
   c. Minimum Liquid Surface Temperature: ____ °F.
   d. Maximum Liquid Surface Temperature: ____ °F.
   e. True Vapor Pressure at Average Liquid Surface Temperature: ____ psia.
   f. True Vapor Pressure at Minimum Liquid Surface Temperature: _____ psia.
   g. True Vapor Pressure at Maximum Liquid Surface Temperature: _____ psia.
   h. Liquid Molecular Weight: _____
   i. Vapor Molecular Weight: _____

j. Chemical Components Information

Chemical Name	CAS Number	Percent of Total Liquid Weight (typical)	Percent of Total Vapor Weight (typical)	Molecular Weight

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number	19806	RN Number	RN100219526	Date	7/23/2012
Company Name	TPC Group LLC				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS											
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate a		4. UTM Coordinates of Emission Point			5. Building Height (ft)	6. Height Above Ground (ft)	Source						
											7. Stack Exit Data			8. Fugitives			
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Temperature (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees b (C)	
Proposed Operations																	
EH-HB-505 Routine Emissions	HB-505	Dehydro #2 Heat Recovery Boiler	Nitrogen Oxide (NOx)	8.52	32.17	15	281832	3287347.01		65	10	72.7	455				
	HB-2502	Dehydro #2 Air Heater	Carbon Monoxide (CO)	4.37	16.65												
	HG-2520	Dehydro #2 Regen Gas Generator	Volatile Organic Compounds (VOCs)	3.48	11.20												
			Particulate Matter (PM/PM10/PM2.5)	5.52	20.10												
			Ammonia (NH_3)	15.16	57.72												
			Sulfur Dioxide (SO_2)	20.07	25.63												
EH-HB-505MSS Startup Emissions (Short Term)	HB-505	Dehydro #2 Heat Recovery Boiler	Nitrogen Oxide (NOx)	5.95	0.89	15	281832	3287347.01		65	10	64.35	350				
	HB-2502	Dehydro #2 Air Heate	Carbon Monoxide (CO)	36.14	5.42												
	HG-2520	Dehydro #2 Regen Gas Generator	Volatile Organic Compounds (VOCs)	0.64	0.10												
			Particulate Matter (PM/PM10/PM2.5)	0.89	0.13												
			Sulfur Dioxide (SO_2)	0.07	0.01												
EH-HB-506 Routine Emissions	HB-506	Dehydro #2 Heat Recovery Boiler	Nitrogen Oxide (NOx)	6.61	25.14	15	281859	3287216		60	9	81.09	385				
	HG-2502T	Dehydro #2 Turbine	Carbon Monoxide (CO)	5.84	22.20												
			Volatile Organic Compounds (VOCs)	1.77	6.76												
			Particulate Matter (PM/PM10/PM2.5)	3.29	12.53												
			Ammonia (NH_3)	20.25	76.96												
			Sulfur Dioxide (SO_2)	8.68	11.97												
EH-HB-506MSS Startup Emissions (Short Term)	HB-506	Dehydro #2 Heat Recovery Boiler	Nitrogen Oxide (NOx)	66.13	9.92	15	281859	3287216		60	9	81.09	385				
	HG-901T	Dehydro #2 Turbine	Carbon Monoxide (CO)	53.10	7.97												
			Volatile Organic Compounds (VOCs)	1.77	0.27												
			Particulate Matter (PM/PM10/PM2.5)	3.29	0.49												
			Sulfur Dioxide (SO_2)	8.68	0.41												
EH-HB-2501	EH-HB-2501	Dehydro #2 Unit Feed Heater	Nitrogen Oxide (NOx)	4.53	17.24	15	281853	3287165		113.6	5.4	25.1	720				
			Carbon Monoxide (CO)	0.87	3.33												
			Volatile Organic Compounds (VOCs)	0.49	1.86												
			Particulate Matter (PM/PM10/PM2.5)	0.67	2.57												
			Sulfur Dioxide (SO_2)	0.05	0.20												
PHB-GEN	PHB-GEN	Diesel Emergency Generator	Nitrogen Oxide (NOx)	0.88	0.02	15	281922	3287357									
			Carbon Monoxide (CO)	1.10	0.03												
			Volatile Organic Compounds (VOCs)	0.88	0.02												
			Particulate Matter (PM/PM10/PM2.5)	0.07	< 0.01												
			Sulfur Dioxide (SO_2)	4.43	0.12												

CT-7	CT-7	Cooling Tower #7	Volatile Organic Compounds (VOCs)	0.60	2.63	15	281789.21	3287372.91								
			Particulate Matter (PM)	0.11	0.46											
			Particulate Matter (PM_{10})	0.08	0.34											
			Particulate Matter ($PM_{2.5}$)	< 0.01	< 0.01											
T-HF-924	T-HF-924	Dehydro #2 Unit Tank HF-924	Volatile Organic Compounds (VOCs)	0.96	0.04	15	281761	3287239		24	0.003	0.003	Amb.	Pseudo Point Parameter		
PHX-PNT	PHX-PNT	Dehydro #2 Surface Coating	Volatile Organic Compounds (VOCs)	73.02	1.95	15	281870.34	3287384.9								
			Particulate Matter (PM)	2.23	0.02											
			Particulate Matter (PM_{10})	0.20	< 0.01											

APPENDIX B

EMISSION CALCULATIONS

Emission Calculations **Page**

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1B-505 NORMAL OPERATION EMISSIONS

PROPOSED EMISSIONS

Emission Point Number (EPN)	Description	Carbon Monoxide (CO)		Nitrogen Oxides (NO_X)		Particulate Matter (PM)		Particulate Matter (PM_{10})		Particulate Matter ($PM_{2.5}$)		Sulfur Dioxide (SO_2)		Volatile Organic Compounds (VOC)		Ammonia (NH_3)	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EB-1B-505	Dehydro #2 Heat Recovery Boiler Stack Normal Operations	4.37	16.65	8.52	32.17	5.52	20.10	5.52	20.10	5.52	20.10	20.07	25.63	3.48	11.20	15.16	57.72
EB-1B-505-MSS	Dehydro #2 Heat Recovery Boiler Stack MSS Operations	36.14	5.42	5.95	0.89	0.89	0.13	0.89	0.13	0.89	0.13	0.07	0.01	0.64	0.10	--	--
EB-1B-506	Dehydro #2 Heat Recovery Boiler Stack Normal Operations	5.84	22.20	6.61	25.14	3.29	12.53	3.29	12.53	3.29	12.53	8.68	11.97	1.77	6.76	20.25	76.96
EB-1B-506-MSS	Dehydro #2 Heat Recovery Boiler Stack MSS Operations	53.10	7.97	66.13	9.92	3.29	0.49	3.29	0.49	3.29	0.49	8.68	0.41	1.77	0.27	--	--
EB-1B-2501	Dehydro #2 Unit Feed Heater Stack	0.87	3.33	4.53	17.24	0.67	2.57	0.67	2.57	0.67	2.57	0.05	0.20	0.49	1.86	--	--
PHE-GEN	Diesel Emergency Generator	1.10	0.03	0.88	0.02	0.07	< 0.01	0.07	< 0.01	0.07	< 0.01	4.43	0.12	0.88	0.02	--	--
CT-7	CT-7 Cooling Tower	--	--	--	--	0.11	0.46	0.08	0.34	< 0.01	< 0.01	--	--	0.60	2.63	--	--
T-1F-924	Dehydro #2 Unit Tank 1F-924	--	--	--	--	--	--	--	--	--	--	--	--	0.96	0.04	--	--
PHX-PNT	Dehydro 2 Surface Coating	--	--	--	--	2.23	0.02	0.20	< 0.01	--	--	--	--	73.02	1.95	--	--
	Totals	***101.43***	***55.59***	***92.62***	***85.39***	***16.05***	***36.32***	***14.00***	***36.18***	***13.72***	***35.83***	***41.99***	***38.34***	***83.62***	***24.84***	***35.41***	***134.69***

AUTHORIZED EMISSIONS

Emission Point Number (EPN)	Description	Carbon Monoxide (CO)		Nitrogen Oxides (NO_X)		Particulate Matter (PM)		Particulate Matter (PM_{10})		Particulate Matter ($PM_{2.5}$)		Sulfur Dioxide (SO_2)		Volatile Organic Compounds (VOC)		Ammonia (NH_3)	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EB-1B-505	Dehydro #2 Heat Recovery Boiler Stack Normal Operations	2.59	14.82	7.23	32.22	3.37	14.76	3.37	14.76	3.37	14.76	29.33	38.60	2.01	8.81	8.99	39.37
EB-1B-505-MSS	Dehydro #2 Heat Recovery Boiler Stack MSS Operations	25.86	--	4.25	--	0.63	--	0.63	--	0.63	--	29.11	--	0.46	--	--	--
EB-1B-506	Dehydro #2 Heat Recovery Boiler Stack Normal Operations	33.74	193.30	4.66	26.70	2.15	9.44	2.15	9.44	2.15	9.44	0.18	0.79	1.16	5.07	13.00	56.96
EB-1B-506-MSS	Dehydro #2 Heat Recovery Boiler Stack MSS Operations	337.35	--	46.60	--	2.15	--	2.15	--	2.15	--	0.18	--	1.16	--	--	--
EB-1B-2501	Dehydro #2 Unit Feed Heater Stack	2.77	12.12	2.60	11.39	0.48	2.12	0.48	2.12	0.43	2.12	0.04	0.17	0.35	1.54	--	--
PHE-GEN	Diesel Emergency Generator	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CT-7	CT-7 Cooling Tower	--	--	--	--	0.039	< 0.01	0.029	0.128	< 0.01	< 0.01	--	--	0.113	0.493	--	--
T-6F-1778	Dehydro #2 Unit Tank 6F-1778	--	--	--	--	--	--	--	--	--	--	--	--	0.38	0.03	--	--
PHX-PNT	Dehydro 2 Surface Coating	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
	Totals	***402.31***	***220.24***	***65.34***	***70.31***	***8.82***	***26.32***	***8.81***	***26.45***	***8.78***	***26.32***	***58.84***	***39.56***	***5.63***	***15.94***	***21.99***	***96.33***

PROJECT EMISSIONS INCREASE

Emission Point Number (EPN)	Description	Carbon Monoxide (CO)		Nitrogen Oxides (NO_X)		Particulate Matter (PM)		Particulate Matter (PM_{10})		Particulate Matter ($PM_{2.5}$)		Sulfur Dioxide (SO_2)		Volatile Organic Compounds (VOC)		Ammonia (NH_3)	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EB-1B-505	Dehydro #2 Heat Recovery Boiler Stack Normal Operations	1.78	1.83	1.29	< 0.01	2.15	5.34	2.15	5.34	2.15	5.34	-9.26	-12.97	1.47	2.39	6.17	18.35
EB-1B-505-MSS	Dehydro #2 Heat Recovery Boiler Stack MSS Operations	10.28	5.42	1.70	0.89	0.26	0.13	0.26	0.13	0.26	0.13	-29.04	0.01	0.18	0.10	--	--
EB-1B-506	Dehydro #2 Heat Recovery Boiler Stack Normal Operations	-27.90	-171.10	1.95	-1.56	1.14	3.09	1.14	3.09	1.14	3.09	8.50	11.18	0.61	1.69	7.25	20.00
EB-1B-506-MSS	Dehydro #2 Heat Recovery Boiler Stack MSS Operations	-284.25	7.97	19.53	9.92	1.14	0.49	1.14	0.49	1.14	0.49	8.50	0.41	0.61	0.27	--	--
EB-1B-2501	Dehydro #2 Unit Feed Heater Stack	-1.90	-8.79	1.93	5.85	0.19	0.45	0.19	0.45	0.19	0.45	0.01	0.03	0.14	0.32	--	--
PHEGEN	Diesel Emergency Generator	1.10	0.03	0.88	0.02	0.07	< 0.01	0.07	< 0.01	0.07	< 0.01	4.43	0.12	0.88	0.02	--	--
CT-7	CT-7 Cooling Tower	--	--	--	--	0.07	0.46	0.05	0.21	< 0.01	< 0.01	--	--	0.49	2.14	--	--
T-1F-924	Dehydro #2 Unit Tank 1F-924	--	--	--	--	--	--	--	--	--	--	--	--	0.58	0.01	--	--
PHX-PNT	Dehydro 2 Surface Coating	--	--	--	--	2.23	0.02	0.20	< 0.01	--	--	--	--	73.02	1.95	--	--
	Totals	**-300.88**	**-164.65**	**27.28**	**15.08**	**7.23**	**9.99**	**5.19**	**9.73**	**4.94**	**9.51**	**-16.85**	**-1.22**	**77.98**	**8.89**	**13.42**	**38.36**

1B-505 NORMAL OPERATION EMISSIONS

OFF GAS IS FIRED IN DEHYDRO 2
576 Btu/scf Blended Off Gas

EPN	FIN	Description	Average Firing Rate (MMBtu/hr)	Maximum Firing Rate (MMBtu/hr)	Fuel Gas / Natural Gas (Btu/lb)	(Btu/scf)	Fuel Flowrate (lb/hr)	Average (mmscf/hr)	Maximum (mmscf/hr)		Pollutant	Emission Factor	Potential to Emit (PTE) Unit	Hourly (lb/hr)	Annual (T/yr)
1B-505	1B-505	Dehydro 2 Heat Recovery Boiler	168.8	203	21582.00	576.60	9405.99	0.29	0.35	(Notes 3 & 4)	CO		See following CO calculation		
										(Note 11)	NO_X	0.050	lb/MMBtu	10.1500	36.9672
										(Note 11)	PM	7.6	lb/MMscf	2.6757	9.7451
										(Note 2)	avg SO_2	299.00	ppm S		15.8884
										(Note 2)	max SO_2	1019.00	ppm S	12.4015	
										(Note 11)	VOC	5.5	lb/MMscf	1.9364	7.0524
1B-505	1F-501 THROUGH 1F-507	DH2 Reactors Coke	7.63	7.63	22,180		343.89			(Notes 3 & 4)	CO		See following CO calculation		
											NO_X	0.14	lb/MMscf	1.0679	4.6772
										(Note 2)	avg SO_2	299.00	ppm S		0.3642
										(Note 2)	max SO_2	1019.00	ppm S	0.2880	
		Natural Gas				1,020.0		0.007	0.007		PM	7.6	lb/MMscf	0.0568	0.2489
										(Note 6)	SO_2	0.6	lb/MMscf	0.0045	0.0197
											VOC	5.5	lb/MMscf	0.0411	0.1801
1B-505	1B-2502	Dehydro 2 Air Heater	95	119	21,582	577	5513.85	0.16	0.21	(Notes 3 & 4)	CO		See following CO calculation		
										(Note 12)	NO_X	0.050	lb/MMBtu	5.9500	20.8050
										(Note 12)	PM	7.6	lb/MMscf	1.5685	5.4845
										(Note 2)	avg SO_2	299.00	ppm S		8.9419
										(Note 2)	max SO_2	1019.00	ppm S	7.2698	
										(Note 12)	VOC	5.5	lb/MMscf	1.1351	3.9690
1B-505	1G-2520T	Dehydro 2 Regen Gas Generator Turbine	160	184.0	22,180	1,020	8295.76	0.16	0.18	(Notes 3 & 4)	CO		See following CO calculation		
										(Note 13)	NO_X	0.370	lb/MMBtu	68.0800	259.2960
										(Note 6 & 8)	PM	6.73	lb/MMscf	1.2140	4.6239
										(Note 6)	SO_2	0.60	lb/MMscf	0.1082	0.4122
		(Note 9)								(Note 6)	VOC	0.002	lb/MMBtu	0.3680	0.0000

Uncontrolled Emissions from 1B-505	lb/hr	tons/yr
CO	43.71	166.48
NO_X	85.25	321.75
PM	5.52	20.10
SO_2	20.07	25.63
VOC	3.48	11.20
NH_3	15.16	57.72

Controlled Emissions from 1B-505	lb/hr	tons/yr
CO	4.37	16.65
NO_X	8.52	32.17
PM	5.52	20.10
SO_2	20.07	25.63
VOC	3.48	11.20
NH_3	15.16	57.72

1B-505 NORMAL OPERATION EMISSIONS

Notes:

1) Flow does not include dilution air for NH3 vaporizer.
2) SO_2 lb/hr is from the Maximum Sulfur Balance (160 ppm Sulfur in Feed) and tpy is from the Average Sulfur Balance (47 ppm Sulfur in Feed).
3) CO in fuel and inlet "air" stream is consumed in combustion. No net CO production assumed.
4) CO based on proposed 50 ppmvd uncontrolled emission and 90% reduction across CO Oxidizing bed.
5) Design Fired Rates include nominal 10% margin above typical firing rates.
6) 1G-2520 VOC, PM and SO2 emission factors are from AP-42 Tale 3.1-2a.
7) Conversions: 1 year = 8760 hrs; 1 ton = 2000 lbs
8) AP-42 emission factor = 0.0066 lb PM/mmBtu/hr X 1020 Btu/scf = 6.73 lb PM/mmscf
9) Firing rate per TPC operating data.
10) A control efficiency of 90% is used for CO and NO_X.
11) 1B-505 NO_X, PM, and VOC emission factors are from AP-42 Table 1.4-1 and 2, dated July 1998.
12) 1B-2502 NO_X, PM, $S0_2$ and VOC emission factors are from AP-42 Table 1.4-1 and 2, dated July 1998.
13) NO_X emission factor for the turbine is vendor provided.

INFORMATION FOR EMISSIONS CALCULATIONS

Inlet to Regen Tx	coke		658.0	lb/hr			
Natural Gas into 1G-2520 (Note 5)		7213.706	8,295.8	lb/hr			
Air into 1G-2520	wet basis		747,700.0	lb/hr		189,993.06	scfm
Water Vapor in Air to 1G-2520	water vapor		10,620.0	lb/hr		3,723.52	scfm
Air into 1G-2520	Dry Basis					186,269.53	scfm
Gas flow to stack (Note 1)	wet basis	34,577.8	39,764.5	lb mol/hr	218,416.72	251,179.23	scfm

Carbon Monoxide Emission Rate (CO)

	Emission Point Number (EPN)	Wet Exhaust Flow scfm	Moisture Content at Stack Exit	Dry Exhaust Flow dscfm	Dry Oxygen Content at Stack Exit	CO ppmvd @ 15% Oxygen	CO Hourly (lb/hr)	CO Annual (T/yr)	Control Efficiency %	CO Hourly (lb/hr)	CO Annual (T/yr)
Max	1B-505	251,179.23	12.7	219,279.47	14.34	50	43.71		90%	4.37	
Average		218,416.72	12.7	190,677.80	14.34	50		166.48	90%		16.648

Ammonia Emission Rate (NH_3)

	Emission Point Number (EPN)	Wet Exhaust Flow scfm	Moisture Content at Stack Exit	Dry Exhaust Flow dscfm	Dry Oxygen Content at Stack Exit	NH_3 ppmvd @ 3% Oxygen	NH_3 Hourly (lb/hr)	NH_3 Annual (T/yr)
Max	1B-505	251,179.23	12.7	219,279.47	14.34	10	15.16	
Average		218,416.72	12.7	190,677.80	14.34	10		57.72

1B-505 START-UP EMISSIONS

OFF GAS IS FIRED IN DEHYDRO 2
576 Btu/scf Blended Off Gas

EPN	FIN	Description	Firing Rate (MMBtu/hr)	Fuel Gas / Natural Gas (Btu/lb)	Fuel Gas / Natural Gas (Btu/scf)	Fuel Flowrate (lb/hr)	Fuel Flowrate (mmscf/hr)		Pollutant	Emission Factor	Unit	Potential to Emit (PTE) Hourly (lb/hr)	Potential to Emit (PTE) Annual (T/yr)
1B-505	1B-505	Dehydro 2 Heat Recovery Boiler	0.00 (Note 5)	21582.00	576.60	0.00	0.00	(Notes 3 & 4)	CO		See following CO calculation		
								(Note 11)	NO_X	0.050	lb/MMBtu	0.0000	0.0000
								(Note 11)	PM	7.6	lb/MMscf	0.0000	0.0000
									SO_2		lb/hr	0.0000	0.0000
								(Note 11)	VOC	5.5	lb/MMscf	0.0000	0.0000
1B-505	1B-2502	Dehydro 2 Air Heater	119.000	22,180	1,020	5365.19	0.12	(Notes 3 & 4)	CO		See following CO calculation		
								(Note 12)	NO_X	0.050	lb/MMBtu	5.9500	0.8925
								(Note 12)	PM	7.6	lb/MMscf	0.8867	0.1330
								(Note 12)	SO_2	0.60	lb/MMscf	0.0700	0.0105
								(Note 12)	VOC	5.5	lb/MMscf	0.6417	0.0963
1B-505	1G-2520	Dehydro 2 Regen Gas Generator Turbine	0.000 (Note 5)	22,180	1,020	0.00	0.00	(Notes 3 & 4)	CO		See following CO calculation		
								(Note 10)	NO_X	0.370	lb/MMBtu	0.0000	0.0000
								(Note 6 & 8)	PM	6.73	lb/MMscf	0.0000	0.0000
								(Note 6)	SO_2	0.60	lb/MMscf	0.0000	0.0000
								(Note 6)	VOC	0.002	lb/MMBtu	0.0000	0.0000

1) Flow does not include dilution air for NH3 vaporizer.
2) SO_2 lb/hr is from the Maximum Sulfur Balance (160 ppm Sulfur in Feed) and tpy is from the Average Sulfur Balance (47 ppm Sulfur in Feed).
3) CO in fuel and inlet "air" stream is consumed in combustion. No net CO production assumed.
4) CO based on proposed 50 ppmvd uncontrolled emission and 0% reduction across CO Oxidizing bed.
5) Normal firing rates are used for start up calcs. No credit is taken for CO ox bend and SCR.
6) 1G-2520 VOC, PM and SO2 emission factors are from AP-42 Tale 3.1-2a.
7) Startup, Shutdown, and maintenance allowance = 300 hr, year.
8) AP-42 emission factor = 0.0066 lb PM/mmBtu/hr X 1020 Btu/scf = 6.73 lb PM/mmscf
9) Assume regen air flow from 1G-2520 is 40% of normal air flow
10) NO_X emission factor for the turbine is vendor provided.
11) 1B-505 NO_X, PM, and VOC emission factors are from AP-42 Table 1.4-1 and 2, dated July 1998.
12) 1B-2502 NO_X, PM, SO_2 and VOC emission factors are from AP-42 Table 1.4-1 and 2, dated July 1998.

Uncontrolled Emissions from 1B-505 Start-up	lb/hr	tons/yr
CO	36.14	5.42
NO_X	5.95	0.89
PM	0.89	0.13
SO_2	0.07	0.01
VOC	0.64	0.10

INFORMATION FOR EMISSIONS CALCULATIONS

Inlet to Regen Tx	coke	0.0	lb/hr		
Natural Gas into 1G-2520 (Note 5)		-	lb/hr		
Air into 1G-2520	wet basis	344,092.4	lb/hr	189,993.06	scfm
Water Vapor in Air to 1G-2520	water vapor	10,620.0	lb/hr	3,723.52	scfm
Air into 1G-2520	Dry Basis			186,269.53	scfm
Gas flow to stack (Note 1)	wet basis	32,874.4	lb mol/hr	207,656.88	scfm

Carbon Monoxide Emission Rate (CO)

Emission Point Number (EPN)	Wet Exhaust Flow scfm	Moisture Content at Stack Exit	Dry Exhaust Flow dscfm	Dry Oxygen Content at Stack Exit	CO ppmvd @ 15% Oxygen	CO Hourly (lb/hr)	CO Annual (T/yr)
1B-505	207,656.88	12.7	181,284.46	14.34	50	36.14	5.42

1B-506 NORMAL OPERATION EMISSIONS

OFF GAS IS FIRED IN DEHYDRO 2
576 Btu/scf Blended Off Gas

EPN	FIN	Description	Average Firing Rate (MMBtu/hr)	Maximum Firing Rate (MMBtu/hr)	Fuel Gas / Natural Gas (Btu/lb)	(Btu/scf)	Fuel Flowrate (lb/hr)	Average (mmscf/hr)	Maximum (mmscf/hr)		Pollutant	Emission Factor	Unit	Potential to Emit (PTE) Hourly (lb/hr)	Annual (T/yr)
1B-506	1B-506	Dehydro 2 Unit Heat Recover Boiler Stack	122	140.00	21582.00	576.60	6486.89	0.21	0.24	(Notes 3 & 4)	CO		See following CO calculation		
										(Note 10)	NO_X	0.050	lb/MMBtu	7.0000	26.7180
										(Note 10)	PM	7.6	lb/MMscf	1.8453	7.0432
										(Note 2)	avg SO_2	299.00	ppm S		11.4833
										(Note 2)	max SO_2	1019.00	ppm S	8.5527	
										(Note 10)	VOC	5.5	lb/MMscf	1.3354	5.0971
1B-506	IG-901T	Dehydro 2 Turbine	190	219.00	22180.00	1020.00	9873.76	0.19	0.21	(Notes 3 & 4)	CO		See following CO calculation		
										(Note 11)	NO_X	0.270	lb/MMBtu	59.1300	224.6940
										(Note 6 & 8)	PM	6.73	lb/MMscf	1.4450	5.4909
										(Note 6)	SO_2	0.60	lb/MMscf	0.1288	0.4895
										(Note 6)	VOC	0.002	lb/MMBtu	0.4380	1.6644

Notes:

1) Flow does not include dilution air for NH3 vaporizer
2) SO_2 lb/hr is from the Maximum Sulfur Balance (160 ppm Sulfur in Feed) and tpy is from the Average Sulfur Balance (47 ppm Sulfur in Feed)
3) CO in fuel and inlet "air" stream is consumed in combustion. No net CO production assumed.
4) CO based on proposed 50 ppmvd uncontrolled emission and 90% reduction across CO Oxidizing bed

5) Design Fired Rates include nominal 10% margin above typical firing rates.
6) IG-901T VOC, PM and SO2 emission factors are from AP-42 Table 3.1-2a.
7) Conversions: 1 year = 8760 hrs; 1 ton = 2000 lbs
8) AP-42 emission factor = 0.0066 lb PM/mmBtu/hr X 1020 Btu/scf = 6.73 lb PM/mmscf
9) A control efficiency of 90% is used for CO and NO
10) 1B-506 NO_X, PM, and VOC emission factors are from AP-42 Table 1.4-1 and 2, dated July 1998
11) NO_X emission factor for the turbine is vendor provided.

Uncontrolled Emissions from 1B-506		
	lb/hr	tons/yr
CO	58.41	221.97
NO_X	66.13	251.41
PM	3.29	12.53
SO_2	8.68	11.97
VOC	1.77	6.76
NH_3	20.25	76.96

Controlled Emissions from 1B-505			
		lb/hr	tons/yr
(Note 9)	CO	5.84	22.20
(Note 9)	NO_X	6.61	25.14
	PM	3.29	12.53
	SO_2	8.68	11.97
	VOC	1.77	6.76
	NH_3	20.25	76.96

INFORMATION FOR EMISSIONS CALCULATIONS

Natural Gas to IG-901T		8566.276	9,873.8	lb/hr			
Air to IG-901T	wet		692,981.0	lb/hr		151,875.00	scfm
Water Vapor in Air to IG-901T	water vapor		0.0	lb/hr			scfm
	dry air			lb/hr		151,875.00	scfm
Gas flow to stack	wet basis	35,001.2	40,343.4	lb mol/hr	221,090.66	254,836.08	scfm

Carbon Monoxide Emission Rate (CO)

	Emission Point Number (EPN)	Wet Exhaust Flow scfm	Moisture Content at Stack Exit	Dry Exhaust Flow dscfm	Dry Oxygen Content at Stack Exit	CO ppmvd @ 15% Oxygen	CO Hourly (lb/hr)	CO Annual (T/yr)	Control Efficiency %	CO Hourly (lb/hr)	CO Annual (T/yr)
Max	1B-506	254,836.08	9.2	231,391.16	15.72	50	58.41		90%	5.84	
Average		221,090.66	9.2	200,750.32	15.72	50		221.97	90%		22.20

Ammonia Emission Rate (NH_3)

	Emission Point Number (EPN)	Wet Exhaust Flow scfm	Moisture Content at Stack Exit	Dry Exhaust Flow dcfm	Dry Oxygen Content at Stack Exit	NH_3 ppmvd @ 3% Oxygen	NH_3 Hourly (lb/hr)	NH_3 Annual (T/yr)
Max	1B-506	254,836.08	9.2	231,391.16	15.72	10	20.25	
Average		221,090.66	9.2	200,750.32	15.72	10		76.96

1B-506 START-UP EMISSIONS

OFF GAS IS FIRED IN DEHYDRO 2
576 Btu/scf Blended Off Gas

EPN	FIN	Description	Firing Rate (MMBtu/hr)	Fuel Gas / Natural (Btu/lb)	Fuel Flowrate (Btu/scf)	(lb/hr)	mmscf/hr)		Pollutant	Emission Factor	Unit	Potential to Emit (PTE) Hourly (lb/hr)	Annual (T/yr)
1B-506	1B-506	Dehydro 2 Unit Heat Recover Boiler Stack	140.00	21582.00	576.60	6486.89	0.24	(Notes 3 & 4)	CO		See following CO calculation		
								(Note 10)	NO_X	0.050	lb/MMBtu	7.0000	1.0500
								(Note 10)	PM	7.6	lb/MMscf	1.8453	0.2768
									avg SO_2	299.00	ppm S		0.3933
									max SO_2	1019.00	ppm S	8.5527	
								(Note 10)	VOC	5.5	lb/MMscf	1.3354	0.2003
1B-506	1G-901T	Dehydro 2 Turbine	219.00	22180.00	1020.00	9873.76	0.21	(Notes 3 & 4)	CO		See following CO calculation		
								(Note 9)	NO_X	0.270	lb/MMBtu	59.1300	8.8695
								(Notes 6 & 8)	PM	6.73	lb/MMscf	1.4450	0.2167
								(Note 6)	SO_2	0.60	lb/MMscf	0.1288	0.0193
								(Note 6)	VOC	0.002	lb/MMBtu	0.4380	0.0657

1) Flow does not include dilution air for NH3 vaporizer.
2) SO_2 lb/hr is from the Maximum Sulfur Balance (160 ppm Sulfur in Feed) and tpy is from the Average Sulfur Balance (47 ppm Sulfur in Feed).
3) CO in fuel and inlet "air" stream is consumed in combustion. No net CO production assumed.
4) CO based on proposed 50 ppmvd uncontrolled emission and 0% reduction across CO Oxidizing bed.
5) Normal firing rates are used for start up calcs. No credit is taken for CO ox bend and SCR.
6) 1G-901T VOC, PM and SO2 emission factors are from AP-42 Tale 3.1-2a.
7) Startup, Shutdown, and maintenance allowance = 300 hr, year.
8) AP-42 emission factor = 0.0066 lb PM/mmBtu/hr X 1020 Btu/scf = 6.73 lb PM/mmscf
9) NO_X emission factor for the turbine is vendor provided.
10) 1B-506 NO_X, PM, and VOC emission factors are from AP-42 Table 1.4-1 and 2, dated July 1998.

Uncontrolled Emissions from 1B-506 Start-up		
	lb/hr	tons/yr
CO	53.10	7.97
NO_X	66.13	9.92
PM	3.29	0.49
SO_2	8.68	0.41
VOC	1.77	0.27

INFORMATION FOR EMISSIONS CALCULATIONS

Natural Gas to 1G-901T		9,873.8	lb/hr		
Air in 1G-901T	wet	692,981.0	lb/hr	151,875.00	scfm
Water Vapor in Air to 1G-901T	water vapor	0.0	lb/hr		scfm
	dry air		lb/hr	151,875.00	scfm
Gas flow to stack (Note 1)	wet basis	36,675.9	lb mol/hr	231,669.16	scfm

Carbon Monoxide Emission Rate (CO)

Emission Point Number (EPN)	Wet Exhaust Flow scfm	Moisture Content at Stack Exit	Dry Exhaust Flow dscfm	Oxygen Content at Stack Exit	CO ppmvd @ 15% Oxygen	CO Hourly (lb/hr)	CO Annual (T/yr)
1B-506	231,669.16	9.2	210,355.60	15.72	50	53.10	7.97

DEHYDRO 2 MAXIMUM SULFUR BALANCE (160 PPM SULFUR IN FEED)

CALCULATION BASIS:

1) The reactor catalyst retains 2% sulfur. Therefore the off gas contains 98% of the initial sulfur content.
2) The maximum concentration of sulfur in the feed is 160 ppmw.
3) The feed to the DH-2 unit is 90,000 lb/hr
4) The SO2 in the natural gas is based on AP-42, Table 1.4-1, dated July 1998.
5) Based on design conditions the absorber off gas volumetric flow rate is 672.1 mscfh and mass flow rate is 13, 849 lb/hr.
6) The high heating value of the off gas is 515 Btu/scf based on design criteria.
7) Fired sources 1B-2502, 1B-505 and 1B-506 receive off gas.

DH2 Feed Rate (lb/hr)	Maximum Conc Sulfur in Feed (ppmw)	Sulfur in Feed (lb/hr)	Sulfur in Off Gas (lb/hr) (1)	Off Gas Flow Rate (lb/hr)	Max Conc. Sulfur in Off Gas (ppmw)	Off Gas Flow Rate (mscfh)	Off Gas High Heat Value (Btu/scf)	Off Gas Heat of Combustion (mmBtu/hr)
90,000	160	14.40	14.11	13,849	1018.99	672.1	515	346.13

Natural Gas Make Up (Btu/hr)	Natural Gas High Heat Value (Btu/scf)	Natural Gas Make Up (Btu/hr)	Blended Off Gas Flow Rate (mscfh)	Blended Off Gas Heating Value (Btu/scf)	Sulfur in Natural Gas Makeup (lb/hr)	Total Sulfur in Blended Off Gas (lb/hr)
115.87	1020	113.60	785.70	588.01	0.034	14.146

Source	Maximum Firing Rates (mmBtu/hr)	Percent of Off Gas	Off Gas (mscfh)	Sulfur in Off Gas (lb S/hr)	SO2 in Off Gas (lb/hr)
1B-2502	119	25.76	202.38	3.6349	7.27
1B-505	203	43.94	345.23	6.2007	12.40
1B-506	140	30.30	238.09	4.2764	8.55
Total	462				

Example Calculations

1) Sulfur in Feed (lb/hr) = (DH2 Feed Rate - lb/hr)*(Maximum Conc Sulfur in Feed - ppmw)
(90,000)*(160)/(1000000)
14.4

2) Sulfur in Off Gas (lb/hr) = (Sulfur in Feed - lb/hr) * 98*
(14.40)*(.98)
14.11

3) Max Conc Sulfur in Off Gas = (ppmw) (Sulfur in Off Gas- lb/hr)/(Off Gas Flowrate - lb/hr)
(14.112)(1000000)/(13,849)
1018.99

4) Off Gas Heat of Combustion = (mmBtu/hr) (Off Gas High Heat Value - Btu/scf)*(Off Gas Flow Rate -mscfh)
(515)*(672.1)/1000
346.1315

5) Natural Gas Make Up = (Btu/hr) (Total Maximum Off Gas Firing Rate)-(Off Gas Heat of Combustion)
(462)-(346.13)
115.87

6) Natural Gas Make Up = (Btu/hr) (Natural Gas Make Up - Btu/hr)/(Natural Gas High Heat Value - Btu/scf)
(115.87)/(1020)*(1000000)/(1000)
113.60

7) Blended Off Gas Flowrate = (mmscfh) (Natural Gas Make Up - Btu/hr)+(Off Gas Flow Rate - Btu/hr)
(113.6)+(672.1)
785.7

8) Blended Off Gas Heating Value = (Btu/scf) (Maximum Firing Rate - mmBtu/hr)/(Blended Off Gas Flow Rate - mscf.hr)
(462)*(1000000)/(785.7)/(1000)
588.01

9) Sulfur in Natural Gas Makeup = (lb/hr) (Natural Gas Make Up - Btu/hr)*(SO_2 AP42 Factor - lb/mmscf)*(mw S)/(mw SO_2)
(113.6)*(0.6)/(1000)*(32)/(64)
0.034

10) Total Sulfur in Blended Off Gas = (lb/hr) (Sulfur in Natural Gas Makeup - lb/hr)+(Sulfur in Off Gas - lb/hr)
(0.034)+(14.11)
14.146

11) Percent of Off Gas Usage = (Source Maximum Firing Rate - mmBtu/hr)/(Total Maximum Firing Rate - mmBtu.hr)
(119)/(462)*100
25.76

12) Off Gas (mmscfh) = (Maximum Firing Rate - mmBtu/hr)/(Blended Off Gas Heating Value - Btu/scf)
(119)*(1000)/(588.01)
202.38

13) Sulfur in Off Gas (lb S/hr) = (Percent of Off Gas)*(Sulfur in Off Gas - lb/hr)
3.634736
3.6349

14) SO2 in Off Gas (lb/hr) (lb/hr) (Sulfur in Off Gas - lb S/hr)*(mw SO2)/(mw S)
(3.6349)*(64)/(32)
7.270

DEHYDRO 2 AVERAGE SULFUR BALANCE (47 PPM SULFUR IN FEED)

CALCULATION BASIS:

1) The reactor catalyst retains 2% sulfur. Therefore the off gas contains 98% of the initial sulfur content.
2) The average concentration of sulfur in the feed is 47 ppmw.
3) The feed to the DH-2 unit is 90,000 lb/hr
4) The SO2 in the natural gas is based on AP-42, Table 1.4-1, dated July 1998.
5) Based on design conditions the absorber off gas volumetric flow rate is 672.1 mscfh and mass flow rate is 13, 849 lb/hr.
6) The high heating value of the off gas is 515 Btu/scf based on design criteria.
7) Fired sources 1B-2502, 1B-505 and 1B-506 receive off gas.

DH2 Feed Rate (lb/hr)	Average Conc Sulfur in Feed (ppmw)	Sulfur in Feed (lb/hr)	Sulfur in Off Gas (lb/hr) (1)	Off Gas Flow Rate (lb/hr)	Max Conc. Sulfur in Off Gas (ppmw)	Off Gas Flow Rate (mscfh)	Off Gas High Heat Value (Btu/scf)	Off Gas Heat of Combustion (mmBtu/hr)
90,000	47	4.23	4.1454	13,849	299.33	672.1	515	346.13

Natural Gas Make Up (Btu/hr)	Natural Gas High Heat Value (Btu/scf)	Natural Gas Make Up (Btu/hr)	Blended Off Gas Flow Rate (mscfh)	Blended Off Gas Heating Value (Btu/scf)	Sulfur in Natural Gas Makeup (lb/hr)	Total Sulfur in Blended Off Gas (lb/hr)
39.67	1020	38.89	710.99	542.62	0.012	4.157

Source	Average Firing Rates (mmBtu/hr)	Percent of Off Gas	Off Gas (mscfh)	Sulfur in Off Gas (lb S/hr)	SO2 in Off Gas (lb/hr)
1B-2502	95	24.62	175.08	1.0208	2.04
1B-505	168.8	43.75	311.08	1.8137	3.63
1B-506	122	31.62	224.83	1.3109	2.62
Total	385.8				

1B-2501 NORMAL OPERATION EMISSIONS

EPN	FIN	Description	Average Firing Rate (MMBtu/hr)	Maximum Firing Rate (MMBtu/hr)	Fuel Gas / Natural Gas (Btu/lb)	(Btu/scf)	Fuel Flowrate (lb/hr)	Average (mmscf/hr)	Maximum (mmscf/hr)		Pollutant	Emission Factor	Unit	Potential to Emit (PTE) Hourly (lb/hr)	Annual (T/yr)
1B-2501	1B-2501	Dehydro 2 Feed Heater Stack	78.7	90.50	22180.00	1020.00	4080.25	0.08	0.09	(Note 2)	CO		See following CO calculation		
										(Note 3)	NO_X	0.050	lb/MMBtu	4.5250	17.2353
										(Note 4)	PM	7.6	lb/MMscf	0.6743	2.5684
										(Note 4)	SO_2	0.60	lb/MMscf	0.0532	0.2028
										(Note 4)	VOC	5.5	lb/MMscf	0.4880	1.8587

Notes:

1) Design Firing Rates are based on Permit Equipment data sheets, design maximums.
2) Permitted CO is 50 ppmvd at 15% O_2.
3) NO_X emission factor is from AP-42, Table 1.4-1, dated July 1998.
4) PM, SO_2, and VOC emission factors are from AP-42, Table 1.4-1, dated July 1998.
5) Conversions: 1 year = 8760 hrs; 1 ton = 2000 lbs

Uncontrolled Emissions from 1B-2501	lb/hr	tons/yr
CO	0.87	3.33
NO_X	4.53	17.24
PM	0.67	2.57
SO_2	0.05	0.20
VOC	0.49	1.86

INFORMATION FOR EMISSIONS CALCULATIONS

Natural Gas into 1B-2501 (Note 1)		3,548.2	4,080.3	lb/hr			
Air into 1B-2501	wet basis		60,514.0	lb/hr		14,279.00	scfm
Water Vapor in Air to 1B-2501	water vapor		752.0	lb/hr		263.66	scfm
	Dry Basis		59,762.0			14,015.34	scfm
Gas flow to stack (Note 1)		2002.719	2,303.0	lb mol/hr	12,650.5	14,547.28	scfm

Carbon Monoxide Emission Rate (CO)

	Emission Point Number (EPN)	Wet Exhaust Flow scfm	Moisture Content at Stack Exit	Dry Exhaust Flow dscfm	Oxygen Content at Stack Exit	CO ppmvd @ 15% Oxygen	CO Hourly (lb/hr)	CO Annual (T/yr)
Max	1B-2501	14,547.28	18.2	11,899.68	3.1	50	0.87	
Average		12,650.5	18.2	10,348.12	3.1	50		3.33

DIESEL EMERGENCY ENGINE (PHE-GEN) EMISSIONS

EPN	FIN	Description	Engine Ratings Type	Rated Horsepower (hp)	Fuel Consumption (Btu/hp-hr)	Fuel Usage Rate (lb/hr)	Annual Operating Hours (hr/yr)	Pollutant	Emission Factors	Units	Potential to Emit (PTE) Hourly [a] (lb/hr)	Annual [b] (T/yr)
PHE-GEN	PHE-GEN	Emergency Engine	Diesel	134	7,500	51.72	52	CO	3.73	g/hp-hr	1.10	0.029
								NO_X	2.98	g/hp-hr	0.88	0.023
								PM/PM_{10}	0.22	lb/MMBtu	0.07	0.002
								SO_2	15	ppm S	4.43	0.115
								VOC	2.98	g/hp-hr	0.88	0.023

Sample Calculations (NOx):

0.88 (hp) NOX = (134 hp) * (2.9828 g NOx/hp-hr) * (lb/454 g)

Notes:

Emission factors for NOx, CO, VOC, and PM are from NSPS IIII emission limitations specified in Table 1 of 40 CFR 89.112(a) for Tier 3 factors.
SO2 emissions are calculated assuming all fuel sulfur is oxidized to SO2.

COOLING TOWER (CT-7) EMISSIONS

Calculation Parameters

Future Actual Flow rate =	15000	GPM	
VOC Factor =	0.08	ppmw	Permit Limit
Total Liquid Drift (%) =	0.001		Current TCEQ BACT
TDS =	1,400		AP-42 Section 13.4
Density =	8.34	lb/gal	

Component	Concentration (ppmw)	Emissions	
		lb/hr	tpy
VOC	0.08	0.60	2.63

Component	Emissions	
	lb/hr	tpy
$PM_{2.5}$	0.0002	0.001
PM_{10}	0.08	0.34
PM	0.11	0.46

Example Calculations

VOC Emissions are calculated using the following formula:
Emissions (tpy) = flowrate (GPM)* VOC emission factor * conversion
VOC Emission = 15,000 GPM x 0.08 ppmw x 60 min/hr * 8760 hr/yr * ton/2000lb * 8.34/1000000 * = 9.99 tpy

PM Emissions are calculated using the following formula:
PM Emissions(tpy) = Flow rate * Liquid Drift (%) * TDS * Density
PM Emission =15,000 GPM x 0.002% x 1,400 x 8.34 lb/gal x 8760 x 60 / 2000 / 1000000 = 3.50 tpy

Notes:
1. These calculations assume all VOC's in the cooling water are released to atmosphere.
2. Calculations are based on 8760 hours per year runtime.
3. PM Calculations are based on Reisman Size Distribution technique.

COOLING TOWER (CT-7) PM EMISSIONS

Summary of Cooling Tower PM-10 Emissions
Reference: AP-42, Section 13.4, Wet Cooling Towers, 1/95.

Throughput (gal/min):	15,000
Annual Hours of Operation:	8,760
Hourly Operating Throughput (1000 gal./hr):	900
Annual Operating Throughput (1000 gal./yr):	7,884,000
Total Liquid Drift (%):	0.001
TDS (ppm):	1,400
Liquid Drift (gal/hr):	9.00
Liquid Drift (gal/yr):	78,840.00
Density (lb/gal):	8.34
Liquid Drift (lb/hr):	75.06
Liquid Drift (lb/yr):	657,525.60
Total PM Drift (lb/hr):	0.11
Total PM Drift (ton/yr):	0.46

Total PM Emissions		PM2.5 Reisman			PM10 Reisman		
lb/hr	ton/yr	mass %	lb/hr	ton/yr	mass %	lb/hr	ton/yr
0.11	0.46	0.22	0.0002	0.001	74.11	0.08	0.34

PM Distribution-1,400 TDS

EPRI Droplet Diameter (µm)	Droplet Volume (µm³)	Droplet Mass (µg)	Particle Mass (Solids) (µg)	Solid Particle Volume (µm3)	Solids Particle Diameter (µm)	EPRI % Mass Smaller
10	524	5.24E-04	7.33E-07	0.33	0.86	0.00
20	4,189	4.19E-03	5.86E-06	2.67	1.72	0.20
30	14,137	1.41E-02	1.98E-05	9.00	2.58	0.23
40	33,510	3.35E-02	4.69E-05	21.32	3.44	0.51
50	65,450	6.54E-02	9.16E-05	41.65	4.30	1.82
60	113,097	1.13E-01	1.58E-04	71.97	5.16	5.70
70	179,594	1.80E-01	2.51E-04	114.29	6.02	21.35
90	381,704	3.82E-01	5.34E-04	242.90	7.74	49.81
110	696,910	6.97E-01	9.76E-04	443.49	9.46	70.51
130	1,150,347	1.15E+00	1.61E-03	732.04	11.182	82.02
150	1,767,146	1.77E+00	2.47E-03	1,124.55	12.90	88.01
180	3,053,628	3.05E+00	4.28E-03	1,943.22	15.48	91.03
210	4,849,048	4.85E+00	6.79E-03	3,085.76	18.06	92.47
240	7,238,229	7.24E+00	1.01E-02	4,606.15	20.64	94.09
270	10,305,995	1.03E+01	1.44E-02	6,558.36	23.22	94.69
300	14,137,167	1.41E+01	1.98E-02	8,996.38	25.80	96.29
350	22,449,298	2.24E+01	3.14E-02	14,285.92	30.10	97.01
400	33,510,322	3.35E+01	4.69E-02	21,324.75	34.41	98.34
450	47,712,938	4.77E+01	6.68E-02	30,362.78	38.71	99.07
500	65,449,847	6.54E+01	9.16E-02	41,649.90	43.01	99.07
600	113,097,336	1.13E+02	1.58E-01	71,971.03	51.61	100.00

Abbreviation	Value	Unit
ρ_w	1.00E-06	µg/µm³
ρ_w	1.0	g/cm³
ρ_{TDS}	2.2	g/cm³
TDS	1400	ppmw TDS

Linear Interpolation			
	X1 =	1.72	Y1 = 0.20
Desired Diameter	X2 =	2.50	Y2 = 0.22
	X3 =	2.58	Y3 = 0.23

Linear Interpolation			
	X1 =	9.462	Y1 = 70.51
Desired Diameter	X2 =	10.00	Y2 = 74.11
	X3 =	11.18	Y3 = 82.02

COOLING TOWER (CT-7) ACTUAL EMISSIONS

Calculation Parameters

Future Actual Flow rate =	2812	GPM	
VOC Factor =	0.08	ppmw	Permit Limit
Total Liquid Drift (%) =	0.002		Process Knowledge
TDS =	1,400		AP-42 Section 13.4
Density =	8.34	lb/gal	

Component	Concentration (ppmw)	Emissions	
		lb/hr	tpy
VOC	0.08	0.11	0.49

Component	Emissions	
	lb/hr	tpy
$PM_{2.5}$	0.0001	0.0004
PM_{10}	0.03	0.13
PM	0.04	0.13

Example Calculations

VOC Emissions are calculated using the following formula:
Emissions (tpy) = flowrate (GPM)* VOC emission factor * conversion
VOC Emission = 2,812 GPM x 0.08 ppmw x 60 min/hr * 8760 hr/yr * ton/2000lb * 8.34/1000000 * = 9.99 tpy

PM Emissions are calculated using the following formula:
PM Emissions(tpy) = Flow rate * Liquid Drift (%) * TDS * Density
PM Emission =2,812 GPM x 0.002% x 1,400 x 8.34 lb/gal x 8760 x 60 / 2000 / 1000000 = 3.50 tpy

Notes:
1. These calculations assume all VOC's in the cooling water are released to atmosphere.
2. Calculations are based on 8760 hours per year runtime.
3. PM Calculations are based on Reisman Size Distribution technique.

COOLING TOWER (CT-7) ACTUAL PM EMISSIONS

Summary of Cooling Tower PM-10 Emissions
Reference: AP-42, Section 13.4, Wet Cooling Towers, 1/95.

Throughput (gal/min):	2,812
Annual Hours of Operation:	8,760
Hourly Operating Throughput (1000 gal./hr):	169
Annual Operating Throughput (1000 gal./yr):	1,477,987
Total Liquid Drift (%):	0.002
TDS (ppm):	1,400
Liquid Drift (gal/hr):	3.37
Liquid Drift (gal/yr):	29,559.74
Density (lb/gal):	8.34
Liquid Drift (lb/hr):	28.14
Liquid Drift (lb/yr):	246,528.26
Total PM Drift (lb/hr):	0.04
Total PM Drift (ton/yr):	0.17

Total PM Emissions		PM2.5 Reisman			PM10 Reisman		
lb/hr	ton/yr	mass %	lb/hr	ton/yr	mass %	lb/hr	ton/yr
0.04	0.17	0.22	0.0001	0.000	74.11	0.03	0.13

PM Distribution-1,400 TDS

EPRI Droplet Diameter (µm)	Droplet Volume (μm^3)	Droplet Mass (µg)	Particle Mass (Solids) (µg)	Solid Particle Volume (µm3)	Solids Particle Diameter (µm)	EPRI % Mass Smaller
10	524	5.24E-04	7.33E-07	0.33	0.86	0.00
20	4,189	4.19E-03	5.86E-06	2.67	1.72	0.20
30	14,137	1.41E-02	1.98E-05	9.00	2.58	0.23
40	33,510	3.35E-02	4.69E-05	21.32	3.44	0.51
50	65,450	6.54E-02	9.16E-05	41.65	4.30	1.82
60	113,097	1.13E-01	1.58E-04	71.97	5.16	5.70
70	179,594	1.80E-01	2.51E-04	114.29	6.02	21.35
90	381,704	3.82E-01	5.34E-04	242.90	7.74	49.81
110	696,910	6.97E-01	9.76E-04	443.49	9.46	70.51
130	1,150,347	1.15E+00	1.61E-03	732.04	11.182	82.02
150	1,767,146	1.77E+00	2.47E-03	1,124.55	12.90	88.01
180	3,053,628	3.05E+00	4.28E-03	1,943.22	15.48	91.03
210	4,849,048	4.85E+00	6.79E-03	3,085.76	18.06	92.47
240	7,238,229	7.24E+00	1.01E-02	4,606.15	20.64	94.09
270	10,305,995	1.03E+01	1.44E-02	6,558.36	23.22	94.69
300	14,137,167	1.41E+01	1.98E-02	8,996.38	25.80	96.29
350	22,449,298	2.24E+01	3.14E-02	14,285.92	30.10	97.01
400	33,510,322	3.35E+01	4.69E-02	21,324.75	34.41	98.34
450	47,712,938	4.77E+01	6.68E-02	30,362.78	38.71	99.07
500	65,449,847	6.54E+01	9.16E-02	41,649.90	43.01	99.07
600	113,097,336	1.13E+02	1.58E-01	71,971.03	51.61	100.00

Abbreviation	Value	Unit
ρ_w	1.00E-06	$\mu g/\mu m^3$
ρ_w	1.0	g/cm^3
ρ_{TDS}	2.2	g/cm^3
TDS	1400	ppmw TDS

Linear Interpolation			
	X1 =	1.72	Y1 = 0.20
Desired Diameter	X2 =	2.50	Y2 = 0.22
	X3 =	2.58	Y3 = 0.23

Linear Interpolation			
	X1 =	9.462	Y1 = 70.51
Desired Diameter	X2 =	10.00	Y2 = 74.11
	X3 =	11.18	Y3 = 82.02

SURFACE COATING (PHX-PNT) EMISSIONS

Basis:

TPC Group LLC will perform surface coating at the Houston Plant associated with the DH2 process/start up. This surface coating will be on immovable fixed structures and in a laydown yard. Annual emissions are based on the annual usage rate and average content of the coatings and thinners used at the site. Maximum hourly emissions are based on the maximum hourly usage rate and maximum content. Emission calculation formulas and emission factors are defined in TCEQ Technical Guidance Document for Surface Coating Operations dated April 2001. The emission factor for each compound is based on the compounds from coatings and thinners used at the site. The overspray factor is from TCEQ's Air Permit Technical Guidance for Coating Sources: Surface Coating Operations, Table 1, for airless spray guns painting flat surfaces. The PM factor is based on TCEQ guidance using the "RESCAR Study" for PM distribution using airless spray guns. The PM10 factor is also based on TCEQ guidance using the "RESCAR Study" for PM distribution using airless spray guns.

Data for Calculations:

Annual Coating Usage Rate =	1,050	gal/yr
Maximum Hourly Coating Usage Rate =	20	gal/hr
Annual Thinner Solvent Usage Rate =	171	gal/yr
Maximum Hourly Thinner Solvent Usage Rate =	6	gal/hr
Max. Coating Overspray =	30.0%	(airless spray gun)
RESCAR PM Factor=	1.44%	(for airless spray guns)
RESCAR PM_{10} Factor=	0.13%	(for airless spray guns)

Compound	Speciation	Maximum Content (lb/gal)	Average Content (lb/gal)	Maximum Emission Rates (lb/hr)	(tpy)
VOC (Coatings)		3.50	3.44	70.00	1.81
	1,2,4-Trimethylbenzene	0.60	0.44	11.96	0.23
	1,3,5-Trimethylbenzene	0.36	0.25	7.20	0.13
	1-Butanol	0.90	0.39	17.93	0.21
	1-Methoxy-2-Propanol Acetate	0.61	0.61	12.18	0.32
	2-Butoxyethanol	0.27	0.24	5.46	0.13
	Cyclohexanone	0.19	0.19	3.74	0.10
	Ethylbenzene	0.35	0.20	7.03	0.10
	Light Aromatic Hydrocarbons	0.45	0.28	8.97	0.15
	Medium Aromatic Hydrocarbons	0.24	0.24	4.87	0.13
	Methyl Ethyl Ketone	0.85	0.54	17.00	0.28
	Methyl Isobutyl Ketone	1.34	1.34	26.83	0.70
	Methyl n-Amyl Ketone	2.48	1.46	49.60	0.76
	Mineral Spirits	2.45	1.27	48.92	0.67
	Naphthalene	0.02	0.02	0.49	0.01
	n-Butyl Acetate	0.97	0.97	19.50	0.51
	Phenol	0.17	0.17	3.45	0.09
	Phenylmethanol	3.27	2.38	65.40	1.25
	Polycyclic Aromatic Compounds	0.11	0.11	2.18	0.06
	Xylene	1.96	1.22	39.27	0.64
VOC (Thinners)		8.04	6.90	3.02	0.15
	1-Methoxy-2-Propanol Acetate	8.04	5.04	3.02	0.11
	2-Butoxyethyl Acetate	0.07	0.07	0.02	0.00
	2-Propanol	0.67	0.67	0.25	0.01
	Ethylbenzene	0.63	0.44	0.24	0.01
	Light Aliphatic Hydrocarbon Solvent	1.66	1.66	0.62	0.04
	Methanol	0.27	0.27	0.10	0.01
	Methyl Isobutyl Ketone	3.32	2.50	1.24	0.05
	Methyl n-Amyl Ketone	1.67	1.67	0.63	0.04
	Toluene	2.20	1.63	0.82	0.03
	Xylene	3.66	2.52	1.37	0.05
VOC (Total)				73.02	1.95
Acetone (Exempt Solvents)		1.39	1.39	0.52	0.03
PM		25.77	9.64	2.23	0.02
	Quartz	7.81	2.47	0.67	0.01
	Refined Coal Tar Pitch	3.80	3.73	0.33	0.01
	Talc	3.45	1.55	0.30	0.00
	Titanium Dioxide	4.26	2.28	0.37	0.01
	Zinc	22.95	22.95	1.98	0.05
PM_{10}		25.77	9.64	0.20	0.00

Coatings

Hourly Potential to Emit VOC

VOC Emissions (lb/hr) = (Maximum Usage Rate, gal/hr) * (Max. VOC Content, lb/gal)

VOC Emissions (lb/hr) = (20 gal/hr) * (3.50 lb/gal)

Annual Potential to Emit VOC

VOC Emissions (T/yr) = (Annual Usage Rate, gal/yr) * (Avg. VOC Content, lb/gal) / (2,000 lb/T)

VOC Emissions (T/yr) = (3377 gal/yr) * (3.44 lb/gal) / (2,000 lb/T)

Thinners

Hourly Potential to Emit VOC

VOC Emissions (lb/hr) = (Maximum Paint Thinner Poured into Vat, gal) / (Evaporation Time, hrs.) * (Max. VOC Content, lb/gal) * (25%)

VOC Emissions (lb/hr) = (6 gal) / (4.0 hr) * (8.04 lb VOC / gal) *(0.25)

Annual Potential to Emit VOC

VOC Emissions (T/yr) = (Maximum Annual Usage Rate, gal/yr) * (Avg. VOC Content, lb/gal) / (2,000 lb/T) * (25%)

VOC Emissions (T/yr) = (552 gal/yr) * (6.90 lb VOC / gal) / (2,000 lb/T) * (0.25)

Particulate Matter

Hourly Potential to Emit PM

PM Emissions (lb/hr) = (Maximum Hourly Usage Rate, gal/hr) * (Max. Solids Content, lb/gal) * (Overspray, %) * (RESCAR Factor, %)

PM Emissions (lb/hr) = (20 gal/hr) * (25.77 lb/gal) * (30 %) * (1.44 %)

Annual Potential to Emit PM

PM Emissions (T/yr) = (Maximum Annual Usage Rate, gal/yr) * (Avg. Solids Content, lb/gal) * (Overspray, %) * (RESCAR Factor, %) / (2,000 lb/T)

PM Emissions (T/yr) = (3377 gal/yr) * (9.64 lb/gal) * (30%) * (1.44 %) / (2,000 lb/T)

TANK 1F-924 EMISSIONS

Tank No.	Material Stored	Molecular Wt.	True Vapor Pressure at Max Temp (95 F)	Tank Capacity	Max Fill Rate	Annual Throughput	Annual Throughput	Turnovers per Year	AP-42 (Eq. 1-23) Working Loss	TANKS 4.0 Working Loss	TANKS 4.0 Breathing Loss	Maximum Hourly Emissions	Annual Emissions
		(lb/lb-mol)	(psia)	(gal)	(gal/hr)	(gal/yr)	(bbl/yr)		(lb/yr)	(lb/yr)	(lb/yr)	(lb/hr)	(tpy)
1F-924	Quench Oil	188	0.1025	145,056	2,100	156,000	3,714	1.08	72	19.31	70.31	0.96	0.04

Example Calculations

Maximum Hourly Emissions

From AP-42 Section 7.1, Equation (1-23)

Given: $L_W = 0.0010 \times M_V \times P_{Vmax} \times Q_{max} \times K_N \times K_p$

where: L_W = working loss, lb/yr
M_V = vapor molecular weight, lb/lb-mole
P_{Vmax} = vapor pressure at maximum liquid surface temperature, psia
Q_{max} = maximum annual throughput (bbl/yr)
K_N = turnover factor (1.0 for short-term calculation)
K_p = working loss product factor

AP-42 Working Losses = 0.0010 x (188 lb/lb-mol) x (0.04 psia) x (3,714 bbl/yr) x 1.0 x 1.0 = 28 lb/yr

From TCEQ Technical Guidance Package for Chemical Sources - Storage Tanks; Equation V-1

Given: $L_{MAX} = L_W \times FR_M / (N \times T_{CG})$

where: L_{MAX} = maximum short-term emission rate, lb/hr
L_W = working loss calculated using AP-42, lb/yr
FR_M = maximum filling rate, gal/hr
N = number of turnovers, dimensionless
T_{CG} = tank capacity, gal

TCEQ Maximum Hourly Emissions = (28) x (2,100) / ((1.4) x (110,160)) = 0.38 lb/hr

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

Identification

User Identification:	1F-924
City:	Houston
State:	Texas
Company:	TPC Group LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	DH2 Quench Oil Tank

Tank Dimensions

Shell Height (ft):	24.00
Diameter (ft):	33.50
Liquid Height (ft) :	22.00
Avg. Liquid Height (ft):	20.00
Volume (gallons):	145,055.89
Turnovers:	1.08
Net Throughput(gal/yr):	156,000.00
Is Tank Heated (y/n):	N

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)	33.50

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

1F-924 - Vertical Fixed Roof Tank
Houston, Texas

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
Quench oil	All	59.81	64.30	75.32	67.93	0.0400	0.0400	0.0533	130.0000			188.00	Option 1: VP60 = .04 VP70 = .04

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

1F-924 - Vertical Fixed Roof Tank
Houston, Texas

Annual Emission Calcaulations

Standing Losses (lb):	70.3132
Vapor Space Volume (cu ft):	5,550.9459
Vapor Density (lb/cu ft):	0.0009
Vapor Space Expansion Factor:	0.0384
Vented Vapor Saturation Factor:	0.0868
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	5,550.9459
Tank Diameter (ft):	33.5000
Vapor Space Outage (ft):	6.2978
Tank Shell Height (ft):	24.0000
Average Liquid Height (ft):	20.0000
Roof Outage (ft):	2.2978
Roof Outage (Dome Roof)	
Roof Outage (ft):	2.2978
Dome Radius (ft):	33.5000
Shell Radius (ft):	16.7500
Vapor Density	
Vapor Density (lb/cu ft):	0.0009
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400
Daily Avg. Liquid Surface Temp. (deg. R):	529.4813
Daily Average Ambient Temp. (deg. F):	67.9125
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,405.5061
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0384
Daily Vapor Temperature Range (deg. R):	22.0322
Daily Vapor Pressure Range (psia):	0.0133
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0400
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0533
Daily Avg. Liquid Surface Temp. (deg R):	529.4813
Daily Min. Liquid Surface Temp. (deg R):	523.0732
Daily Max. Liquid Surface Temp. (deg R):	534.9893
Daily Ambient Temp. Range (deg. R):	21.3083
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.0868
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0400
Vapor Space Outage (ft):	6.2978

Working Losses (lb):	19.3143
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400
Annual Net Throughput (gal/yr.):	156,000.0000
Annual Turnovers:	1.0754
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	145,055.8015
Maximum Liquid Height (ft):	22.0000
Tank Diameter (ft):	33.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	89.6275

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

Emissions Report for: Annual

1F-924 - Vertical Fixed Roof Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Quench oil	19.31	70.31	89.63

APPENDIX C

NETTING TABLES

Netting	Page
CO Netting Table	C-1
NOX Netting Table	C-3
PM Netting Table	C-5
PM10 Netting Table	C-7
PM2.5 Netting Table	C-9
VOC Netting Table	C-11

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company:	TPC Group - DH2 Unit								
Permit Application Number:						Criteria Pollutant: CO			
Project Date	Facility at Which Emission Change Occurred		Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
	FIN	EPN							
October-06	Multiple	Multiple	PBR 80271	Polyblend Project		0.0028	-	-0.0028	-0.0028
October-06	AUXBOIL1	AUXBOIL1	46426	Construction of new boiler (Boiler # 10)[1]	-	-	200.4	200.4	---
November-06	AUXBOIL2	AUXBOIL2	46426	Construction of new boiler (Boiler #11)[1]	-	-	200.4	200.4	---
December-06	1B-505 1B-2520 1G-2520	EB-1B-505	19806	Dehydro 2 shutdown	2004-2005	15.01	-	-15.01	-15.01
December-06	1B-506 1G2502T	EB-1B-506	19806	Dehydro 2 shutdown	2004-2005	5.11	-	-5.11	-5.11
December-06	1B-2501	EB-1B-2501	19806	Dehydro 2 shutdown	2004-2005	0.02	-	-0.02	-0.02
December-06	BLR-8	EP-H8	19806	Shutdown of Boiler 8	2004-2005	6.82	-	-6.82	-6.82
December-06	BLR-1	EPH1	1341A	Shutdown of Boiler 1	2003-2004	43.67	-	-43.67	-43.67
December-06	Multiple	Multiple	PBR 80340	Polyblend Project	-	0.0028	-	-0.0028	-0.0028
September-07	EP-H21	EP-H21	46307	Shutdown Dehydro 1 Unit	2005-2006	0.03	-	-0.03	-0.03
September-07	1B-902 1B-905 1G-905 1G-906	EP-1B905	46307	Shutdown Dehydro 1 Unit	2005-2006	49.97	-	-49.97	-49.97
October-07	BLR-4	EP-H4	1341A	Shutdown Boiler#4	2005-2006	76.60	-	-76.6	-76.60

PROJECT CONTEMPORANEOUS CHANGES

Company:	TPC Group - DH2 Unit									
Permit Application Number:						Criteria Pollutant: CO				
	Project Date	Facility at Which Emission Change Occurred		Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
		FIN	EPN							
	December-08	31G-2350	31G-2350	46307	Replace Diesel Water Blast Engine 31G-2350	2006-2007	1.79	0.32	-1.47	-1.47
	August-10	Multiple	Multiple	106.122, 261, 262 and 472	New R&D and QC labs	-	-	5.05	5.05	5.05
	May-11	Multiple	Multiple	46307	Plant Wide Maintanance Startup and Shutdown	-	-	1.16	1.16	1.16
	June-11	1B-2501	EB-1B-2501	19806	Construct New DH2 Unit (Routine and Startup emissions)	-	-	7.97	7.97	7.97
	June-11	1B-505 1B-2520 1G-2520	EB-1B-505	19806	Construct New DH2 Unit (Routine and Startup emissions)	-	-	22.07	22.07	22.07
	June-11	PHE-GEN	PHE-GEN	19806	New Emergency Generator	-	-	0.03	0.03	0.03
	June-11	1B-506 1G901T	EB-1B-506	19806	Construct New DH2 Unit (Routine and Startup emissions)	-	-	30.16	30.16	30.16
Summary of Contemporaneous Changes					Five Year Period:	June-06	to	June-11	**TOTAL**	**-132.3**

Note

1. CO emissions increases for installation of Boilers 10 & 11 are not counted as creditable increases as that permit action triggered PSD.

TCEQ

FACILITY CONTEMPORANEOUS CHANGES

Company:	TPC Group - DH2 Unit								
Permit Application Number:					Criteria Pollutant: NO_X				
Project Date	Source at Which Emission Change Occurred		Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change (tons/year)	Creditable Increase or Decrease (tons/year)
	FIN	EPN							
October-06	AUXBOIL1	AUXBOIL1	46426	Construction of new boiler (Boiler # 10)	-	-	55.50	55.50	55.50
November-06	AUXBOIL2	AUXBOIL2	46426	Construction of new boiler (Boiler #11)	-	-	55.50	55.50	55.50
December-06	Multiple	Multiple	PBR 80340	Polyblend Project	-	-	0.001	0.001	0.001
Dec-2006	1B-505 1B-2520 1G-2520	EB-1B-505	19806	DH2 Shutdown	2004-2005	107.16	-	-107.16	-107.16
Dec-2006	1B-506 1G2502T	EB-1B-506	19806	DH2 Shutdown	2004-2005	58.07	-	-58.07	-58.07
Dec-2006	1B-2501	EB-1B-2501	19806	DH2 Shutdown	2004-2005	7.31	-	-7.31	-7.31
Dec-2006	BLR-8	EP-H8	19806	Shutdown of Boiler 8	2004-2005	173.28	-	-173.28	-173.28
Dec-2006	BLR-1	EP-H1	1341A	Shutdown of Boiler 1	2003-2004	136.16	-	-136.16	-136.16
January-07	31G-2350	31G-2350	46307	Amend VERP (46307) - Replace Diesel Water Blast Engine 31G-2350.	2005-2006	1.35	3.16	1.81	1.81

TCEQ

FACILITY CONTEMPORANEOUS CHANGES

Company:	TPC Group - DH2 Unit								
Permit Application Number:						Criteria Pollutant: NO_X			
Project Date	Source at Which Emission Change Occurred FIN	EPN	Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change (tons/year)	Creditable Increase or Decrease (tons/year)
September-07	EP-H21	EP-H21	46307	Shutdown Dehydro 1 unit	2005-2006	22.13	-	-22.13	-22.13
September-07	1B-902 1B-905 1G-905 1G-906	EP-1B905	46307	Shutdown Dehydro 1 unit	2005-2006	158.30	-	-158.30	-158.30
October-07	BLR-4	EP-H4	1341A	Shutdown Boiler #4	2005-2006	122.52	-	-122.52	-122.52
December-07	N/A	N/A	106.511	Installation of Cummins Diesel Air Compressor N14-C475 in the MTBE area	-	-	0.50	0.50	0.50
August-10	19G-3789 T01	19G-3789 T01	106.473 and 511	New Diesel engine 19G-3789 and the associated diesel tank	-	-	0.12	0.12	0.12
August-10	N/A	N/A	106.122, 261, 262 and 472	New R&D and QC labs	-	-	2.55	2.55	2.55
May-11	Multiple	Multiple	98149	Plant Wide Maintenance, startup and shutdown activities	-	-	0.59	0.59	0.59
June-11	1B-506 1G901T	EB-1B-506	19806	DH2 (Routine and Startup Emissions)	-	-	35.06	35.06	35.06
June-11	1B-2501	EB-1B-2501	19806	Construct new Dehydro 2 unit	-	-	17.24	17.24	17.24
June-11	PHE-GEN	PHE-GEN	19806	New Emergency Generator	-	-	0.02	0.02	0.02
June-11	1B-505 1B-2520 1G-2520	EB-1B-505	19806	DH2 (Routine and Startup Emissions)	-	-	33.07	33.07	33.07
Summary of Contemporaneous Changes				Five Year Period:	June-06	to	June-11	**Total**	**-583.0**

TCEQ - 10156 (Revised 10/08) Table 1F
These forms are for use by facilities subject to air quality permit requirements and may be revised periodically. (APDG 5913v1)

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company:	TPC Group - DH2 Unit								
Permit Application Number:						Criteria Pollutant: PM			
Project Date	Facility at Which Emission Change Occurred		Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
	FIN	EPN							
October-06	AUXBOIL1	AUXBOIL1	46426	Construction of new boiler (Boiler # 10)[1]	-	-	20.70	20.70	---
November-06	AUXBOIL2	AUXBOIL2	46426	Construction of new boiler (Boiler #11)[1]	-	-	20.70	20.70	---
December-06	1B-505 1B-2520 1G-2520	EB-1B-505	19806	Dehydro 2 shutdown	2004-2005	6.60	-	-6.60	-6.60
December-06	1B-506 1G2502T	EB-1B-506	19806	Dehydro 2 shutdown	2004-2005	3.14	-	-3.14	-3.14
December-06	1B-2501	EB-1B-2501	19806	Dehydro 2 shutdown	2004-2005	0.86	-	-0.86	-0.86
December-06	BLR-8	EP-H8	19806	Shutdown of Boiler 8	2004-2005	6.52	-	-6.52	-6.52
December-06	BLR-1	EPH1	1341A	Shutdown of Boiler 1	2003-2004	5.81	-	-5.81	-5.81
September-07	EP-H21	EP-H21	46307	Shutdown Dehydro 1 unit	2005-2006	4.12	-	-4.12	-4.12
September-07	1B-902 1B-905 1G-905 1G-906	EP-1B905	46307	Shutdown Dehydro 1 unit	2005-2006	8.13	-	-8.13	-8.13
October-07	BLR-4	EP-H4	1341A	Shutdown Boiler #4	2005-2006	4.59	-	-4.59	-4.59
December-08	31G-2350	31G-2350	46307	Replace Diesel Water Blast Engine 31G-2350	2006-2007	0.1	0.53	0.43	0.43
August-10	Multiple	Multiple	106.122, 261, 262 and 472	New R&D and QC labs	-	-	0.01	0.01	0.01
May-11	Multiple	Multiple	98149	Plant-wide Maintenance, startup and shutdown activities	-	-	0.05	0.05	0.05

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company:	TPC Group - DH2 Unit									
Permit Application Number:						Criteria Pollutant: PM				
Project Date		Facility at Which Emission Change Occurred		Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
		FIN	EPN							
	June-11	1B-2501	EB-1B-2501	19806	Construct new Dehydro 2 unit	-	-	2.57	2.57	2.57
	June-11	1B-505 1B-2520 1G-2520	EB-1B-505	19806	Construct new Dehydro 2 unit	-	-	20.24	20.24	20.24
	June-11	1B-506 1G901T	EB-1B-506	19806	Construct new Dehydro 2 unit	-	-	13.03	13.03	13.03
	June-11	CT-3	CT-3	46307	Increased Throughput due to Dehydro 2 Unit Restart	2009-2010	1.33	3.50	2.17	2.17
	June-11	CT-7	CT-7	46307	Increased Throughput due to Dehydro 2 Unit Restart	2009-2010	0.17	0.46	0.29	0.29
	June-11	PHE-GEN	PHE-GEN	19806	New Emergency Generator	-	-	0.01	0.01	0.01
	June-11	DH2CAT-MSS	DH2CAT-MSS	19806	Construct new Dehydro 2 unit	-	-	0.04	0.04	0.04
Summary of Contemporaneous Changes					Five Year Period:	June-06	to	June-11	**TOTAL**	**-0.9**

Note

1. PM emissions increases for installation of Boilers 10 & 11 are not counted as creditable increases as that permit action triggered PSD.

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company:	TPC Group - DH2 Unit								
Permit Application Number:					Criteria Pollutant: PM2.5				
Project Date	Facility at Which Emission Change Occurred		Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
	FIN	EPN							
October-06	AUXBOIL1	AUXBOIL1	46426	Construction of new Boiler (Boiler # 10)[1]	---	-	20.70	-	-
November-06	AUXBOIL2	AUXBOIL2	46426	Construction of new boiler (Boiler #11)[1]	---	-	20.70	-	-
December-06	1B-505 1B-2520 1G-2520	EB-1B-505	19806	Dehydro 2 shutdown	2004-2005	6.60	-	-6.60	-6.60
December-06	1B-506 1G2502T	EB-1B-506	19806	Dehydro 2 shutdown	2004-2005	3.14	-	-3.14	-3.14
December-06	1B-2501	EB-1B-2501	19806	Dehydro 2 shutdown	2004-2005	0.86	-	-0.86	-0.86
December-06	BLR-8	EP-H8	19806	Shutdown of Boiler 8	2003-2004	6.52	-	-6.52	-6.52
December-06	BLR-1	EPH1	1341A	Shutdown of Boiler 1	2005-2006	5.81	-	-5.81	-5.81
September-07	EP-H21	EP-H21	46307	Shutdown Dehydro 1 unit	2005-2006	4.12	-	-4.12	-4.12
September-07	1B-902 1B-905 1G-905 1G-906	EP-1B905	46307	Shutdown Dehydro 1 unit	2005-2006	8.13	-	-8.13	-8.13
October-07	BLR-4	EP-H4	1341A	Shutdown Boiler #4	2005-2006	4.59	-	-4.59	-4.59
December-08	31G-2350	31G-2350	46307	Replace Diesel Water Blast Engine 31G-2350	2006-2007	0.53	0.10	-0.43	-0.43
August-10	Multiple	Multiple	106.122, 261, 262 and 472	New R&D and QC labs	-	-	0.01	0.01	0.01

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company:	TPC Group - DH2 Unit									
Permit Application Number:						Criteria Pollutant: PM2.5				
Project Date	Facility at Which Emission Change Occurred		Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease	
	FIN	EPN								
May-11	Multiple	Multiple	46307	Plant-wide Maintenance, startup and shutdown activities	-	-	0.05	0.05	0.05	
June-11	1B-2501	EB-1B-2501	19806	Construct new Dehydro 2 unit	-	-	2.57	2.57	2.57	
June-11	1B-505 1B-2520 1G-2520	EB-1B-505	19806	Construct new Dehydro 2 unit	-	-	20.24	20.24	20.24	
June-11	1B-506 1G-901T	EB-1B-506	19806	Construct new Dehydro 2 unit	-	-	13.03	13.03	13.03	
June-11	CT-3	CT-3	46307	Increased Throughput due to Dehydro 2 Unit Restart	-	0.00	0.01	0.00	0.00	
June-11	CT-7	CT-7	46307	Increased Throughput due to Dehydro 2 Unit Restart	-	0.0004	0.01	0.01	0.01	
June-11	PHE-GEN	PHE-GEN	19806	New Emergency Generator	-	-	0.01	0.01	0.01	
June-11	DH2CAT-MSS	DH2CAT-MSS	19806	Construct new Dehydro 2 unit	-	-	0.04	0.04	0.04	
Summary of Contemporaneous Changes				Five Year Period:	June-06	to	June-11	**TOTAL**	**-4.2**	

Note

1. PM2.5 emissions increases for installation of Boilers 10 & 11 are not counted as creditable increases as that permit action triggered PSD.

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company: TPC Group - DH2 Unit

Permit Application Number:

Criteria Pollutant: PM10

Project Date	Facility at Which Emission Change Occurred		Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
	FIN	EPN							
October-06	AUXBOIL1	AUXBOIL1	46426	Construction of new Boiler (Boiler # 10)[1]	---	---	20.7	-	-
November-06	AUXBOIL2	AUXBOIL2	46426	Construction of new boiler (Boiler #11)[1]	---	---	20.7	-	-
December-06	1B-505 1B-2520 1G-2520	EB-1B-505	19806	Dehydro 2 shutdown	2004-2005	6.60	-	-6.60	-6.60
December-06	1B-506 1G2502T	EB-1B-506	19806	Dehydro 2 shutdown	2004-2005	3.14	-	-3.14	-3.14
December-06	1B-2501	EB-1B-2501	19806	Dehydro 2 shutdown	2004-2005	0.86	-	-0.86	-0.86
December-06	BLR-8	EP-H8	19806	Shutdown of Boiler 8	2004-2005	6.52	-	-6.52	-6.52
December-06	BLR-1	EPH1	1341A	Shutdown of Boiler 1	2003-2004	5.81	-	-5.81	-5.81
September-07	EP-H21	EP-H21	46307	Shutdown Dehydro 1 unit	2005-2006	4.12	-	-4.12	-4.12
September-07	1B-902 1B-905 1G-905 1G-906	EP-1B905	46307	Shutdown Dehydro 1 unit	2005-2006	8.13	-	-8.13	-8.13
October-07	BLR-4	EP-H4	1341A	Shutdown Boiler #4	2005-2006	4.59	-	-4.59	-4.59
December-08	31G-2350	31G-2350	46307	Replace Diesel Water Blast Engine 31G-2350	2006-2007	0.53	0.1	-0.43	-0.43
August-10	Multiple	Multiple	106.122, 261, 262 and 472	New R&D and QC labs	-	-	0.01	0.01	0.01
May-11	Multiple	Multiple	46307	Plant-wide Maintenance, startup and shutdown activities	-	-	0.05	0.05	0.05

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company: TPC Group - DH2 Unit

Permit Application Number:

Criteria Pollutant: PM10

Project Date	Facility at Which Emission Change Occurred		Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
	FIN	EPN							
June-11	1B-2501	EB-1B-2501	19806	Construct new Dehydro 2 unit	-	-	2.57	2.57	2.57
June-11	1B-505 1B-2520 1G-2520	EB-1B-505	19806	Construct new Dehydro 2 unit	-	-	20.24	20.24	20.24
June-11	1B-506 1G901T	EB-1B-506	19806	Construct new Dehydro 2 unit	-	-	13.03	13.03	13.03
June-11	CT-3	CT-3	46307	Increased Throughput due to Dehydro 2 Unit Restart	-	0.98	2.59	1.61	1.61
June-11	CT-7	CT-7	46307	Increased Throughput due to Dehydro 2 Unit Restart	-	0.13	0.34	0.21	0.21
June-11	PHE-GEN	PHE-GEN	19806	New Emergency Generator	-	-	0.01	0.01	0.01
June-11	DH2CAT-MSS	DH2CAT-MSS	19806	Construct new Dehydro 2 unit	-	-	0.04	0.04	0.04
Summary of Contemporaneous Changes				Five Year Period:	June-06	to	June-11	**TOTAL**	**-2.4**

Note

1. PM10 emissions increases for installation of Boilers 10 & 11 are not counted as creditable increases as that permit action triggered PSD.

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company: TPC Group - DH2 Unit

Permit Application Number:

Criteria Pollutant: VOC

Project Date	Facility at Which Emission Change Occurred FIN	EPN	Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
October-06	AUXBOIL1	AUXBOIL1	46426	Construction of new boiler (Boiler # 10)	-	-	15.00	15.00	15.00
November-06	AUXBOIL2	AUXBOIL2	46426	Construction of new boiler (Boiler #11)	-	0.00	15.00	15.00	15.00
Dec-2006	1B-505 1B-2520 1G-2520	EB-1B-505	19806	DH2 Shutdown	2004-2005	1.23	-	-1.23	-1.23
Dec-2006	1B-506 1G2502T	EB-1B-506	19806	DH2 Shutdown	2004-2005	0.69	-	-0.69	-0.69
Dec-2006	1B-2501	EB-1B-2501	19806	DH2 Shutdown	2004-2005	0.02	-	-0.02	-0.02
Dec-2006	BLR-8	EP-H8	19806	Shutdown of Boiler 8	2004-2005	0.44	-	-0.44	-0.44
Dec-2006	BLR-1	EP-H1	1341A	Shutdown of Boiler 1	2003-2004	0.34	-	-0.34	-0.34
January-07	Multiple	Multiple	PBR 80921	Generic fugitives	-	-	4.30	4.30	4.30
January-07	Multiple	Multiple	PBR 80916	Several fugitive PBRs combined	-	-	3.08	3.08	3.08
January-07	TK-71	TK-71	STD Ex. 86 (Reg. 28410) and 106.478	TK-71 change of service - Authorize storage of iso-octene in addition to Methanol	-	-	0.47	0.47	0.47
February-07	Multiple	Multiple	PBR 81669	Several fugitive PBRs combined	-	-	0.05	0.05	0.05
March-07	T-73, T-74	T-73, T-74	106.478	Tank 73 and 74 change of service	-	-	0.05	0.05	0.05
March-07	Multiple	Multiple	PBR 81662	Several fugitive PBRs combined	-	-	0.02	0.02	0.02
March-07	Multiple	Multiple	PBR 81648	Several fugitive PBRs combined	-	-	0.23	0.23	0.23
June-07	TK-33	TK-33	46307 and 106.478	TK-33 change of service - Authorize storage of Quench oil in addition to Furfural	-	-	0.001	0.001	0.001
July-07	Multiple	Multiple	PBR 82280	Several fugitive PBRs combined	-	-	0.03	0.03	0.03
August-07	Multiple	Multiple	19806	Amend Permit No. 19806 to construct the new PIB Unit 2.	2005-2006	5.84	10.40	4.56	4.56
September-07	EP-H21	EP-H21	46307	Shutdown Dehydro 1 unit	2005-2006	3.00	-	-3.00	-3.00
September-07	1B-902 1B-905 1G-905 1G-906	EP-1B905	46307	Shutdown Dehydro 1 unit	2005-2006	3.81	-	-3.81	-3.81
October-07	BLR-4	EP-H4	1341A	Shutdown Boiler #4	2005-2006	0.45	-	-0.45	-0.45
December-07	---	---	106.532, 106.261 and 106.262	Temporary Wastewater Frac Tanks	-	-	0.01	0.01	0.01
April-08	TK-35	TK-35	106.472	Authorize storage of Fuel oil "A" in Tank 35	-	-	0.82	0.82	0.82
October-08	LAB-1	LAB-1	106.122	Addendum to Laboratory Operations PBR.	2006-2007	0.20	0.21	0.01	0.01
November-08	TkK83	FUG	106.4 and 106.472	Use Frac Tank to store DMF wastewater from Tank 83	-	-	0.02	0.02	0.02
December-08	31G-2350	31G-2350	VERP - 46307	Amend VERP (46307) - Replace Diesel Water Blast Engine 31G-2350.	2006-2007	0.07	0.78	0.71	0.71
March-09	Multiple	Multiple	87907	Fugitives for projects conducted in calendar year 2008	-	-	0.49	0.49	0.49

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company: TPC Group - DH2 Unit

Permit Application Number:

Criteria Pollutant: VOC

Project Date	Facility at Which Emission Change Occurred FIN	Facility at Which Emission Change Occurred EPN	Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
8/25/2009	T-72, T-77, T-78	T-72, T-77, T-78	89962	TK-72, 77 and 78 throughput increases and change of service for tank 72 to MTBE.	2007-2008	2.81	3.58	0.77	0.77
9/1/2009	T-35	T-35		Utilizing Tank 35 to store a furfural and water mixture	-	-	0.02	0.02	0.02
10/1/2009		Many Tanks	106.4 and 106.472	Authorize 20 tanks in water, diesel, fuel oil, caustic, sulfuric acid, hydrochloric acid and polymer use.	2007-2008	-	0.30	0.30	0.30
March-10	Multiple	Multiple	106.261 and 106.262	Fugitives for projects conducted in calendar year 2009	-	-	1.04	1.04	1.04
June-10	T-84	T-84	30 TAC §106.472	Tank 84 Lean Oil Service	-	-	0.09	0.09	0.09
8/23/2010	19G-3789 T01	19G-3789 T01	106.473 and 511	New diesel engine 19G-3789 and the associated diesel tank	-	-	0.004	0.004	0.00
8/23/2010	Multiple	Multiple	106.472	Furfural sump tanks 2F-26, 4F-14 and 5F-3	-	-	0.001	0.001	0.00
8/23/2010	DEGREASER 1 & 2	DEGREASER 1 & 2	106.454	Two cold solvent degreasers	-	-	0.04	0.04	0.04
8/24/2010			106.122, 261, 262 and 472	New R&D and QC labs	-	-	0.45	0.45	0.45
March-10	Multiple	Multiple	106.261 and 106.262	Fugitives for projects conducted in calander year 2010	-	-	1.07	1.07	1.07
May-11	Multiple	Multiple	98149	MSS Permit	-	-	3.50	3.50	3.50
Jun-11	FUG-1A	1A	46307	LDAR Monitoring Program Update	2008-2009	11.83	8.09	-3.73	-3.73
Jun-11	FUG-1B	1B	46307	LDAR Monitoring Program Update	2008-2009	0.35	0.10	-0.24	-0.24
June-11	FUG-1C	1C	46307	LDAR Monitoring Program Update	2008-2009	44.48	19.88	-24.59	-24.59
June-11	FUG-1D	1D	46307	LDAR Monitoring Program Update	2008-2009	12.72	7.33	-5.40	-5.40

TCEQ

PROJECT CONTEMPORANEOUS CHANGES

Company:	TPC Group - DH2 Unit								
Permit Application Number:						Criteria Pollutant: VOC			
Project Date	Facility at Which Emission Change Occurred FIN	EPN	Permit No.	Project Name or Activity	Baseline Period	Baseline Emissions (tons/year)	Proposed Emissions (tons/year)	Net Change	Creditable Increase or Decrease
Jun-11	FUG-2A	2A	46307	LDAR Monitoring Program Update	2008-2009	22.35	6.95	-15.40	-15.40
Jun-11	FUG-2B	2B	46307	LDAR Monitoring Program Update	2008-2009	10.08	5.73	-4.34	-4.34
Jun-11	FUG-2C	FUG-2C	46307	LDAR Monitoring Program Update	2008-2009	6.06	1.98	-4.08	-4.08
Jun-11	FUG-2D	FUG-2D	46307	LDAR Monitoring Program Update	2008-2009	1.80	0.69	-1.11	-1.11
Jun-11	FUG-3	FUG-3	46307	LDAR Monitoring Program Update	2008-2009	27.05	10.70	-16.35	-16.35
Jun-11	FUG-4	FUG-4	46307	LDAR Monitoring Program Update	2008-2009	20.18	12.10	-8.09	-8.09
Jun-11	FUG-5	FUG-5	46307	LDAR Monitoring Program Update	2008-2009	0.45	0.15	-0.30	-0.30
Jun-11	L-5	L-5	46307	LDAR Monitoring Program Update	2008-2009	1.13	0.44	-0.69	-0.69
June-11	1B-2501	EB-1B-2501	19806	Construct new Dehydro 2 unit	-	-	1.86	1.86	1.54
June-11	1B-505 1B-2520 1G-2520	EB-1B-505	19806	Construct new Dehydro 2 unit	-	-	11.30	11.30	8.81
June-11	1B-506 1G-901T	EB-1B-506	19806	Construct new Dehydro 2 unit	-	-	7.03	7.03	7.03
June-11	PHE-GEN	PHE-GEN	19806	New Emergency Generator	-	-	0.02	0.02	0.02
June-11	F-20	F-20	19806	Quarterly Connector Monitoring for Dehydro 2 Fugitive Area	Based on Permit	18.29	2.29	-16.00	-16.00
June-11	T-31	T-31	46307	Construct new Dehydro 2 unit	2008-2009	0.33	0.63	0.30	0.30
June-11	T-1F-924	T-1F-924	19806	Construct new Dehydro 2 unit	-	-	0.04	0.04	0.04
June-11	CT-7	CT-7	46307	Construct new Dehydro 2 unit	2008-2009	0.49	2.63	2.14	2.14
June-11	T-74	T-74	46307	Construct new Dehydro 2 unit	2008-2009	1.28	1.42	0.13	0.13
June-11	T-36	T-36	46307	Construct new Dehydro 2 unit	2008-2009	1.16	0.17	-0.99	-0.99
June-11	T-37	T-37	46307	Construct new Dehydro 2 unit	2008-2009	1.02	0.17	-0.84	-0.84
June-11	T-87	T-87	22052	Construct new Dehydro 2 unit	2008-2009	0.10	0.60	0.51	0.51
Summary of Contemporaneous Changes				Five Year Period:	June-06	to	June-11	**Total**	**-39.47**

TCEQ - 10156 (Revised 10/08) Table 1F
These forms are for use by facilities subject to air quality permit requirements and may be revised periodically. (APDG 5913v1)

7/22/2012 - 9:27 AM

Print Form

134
V.3

AIR, PESTICIDES, AND TOXICS
6TH FLOOR RECORDS CENTER
INFILING / NEW FILE FORM

New File ☐ OR Infiling ☒

Choose from the file types below:

AIR FACILITY:

(☐) AR - Acid Rain
(☐) CB - Confidential Business
(☐) CO - Compliance
(☐) EN - **Enforcement
(☐) GE - General
(☒) PE - Permit
(☐) RA - Regulatory Applicability
(☐) Other _____

TSCA:

(☐) AH - Asbestos Hazard Emergency Response Act
(☐) AS or AW - Asbestos or Asbestos Worker Protection
(☐) CB - Confidential
(☐) FI - Site Specific
(☐) FO - Non Site Specific
(☐) IM - **Section 5 & 8
(☐) LB - **Lead
(☐) PC - **PCB

** Extension of file type (if needed): (☐) ES - Enforcement Sensitive
(☐) DO - Docket Number

EPCRA / SARA (☐) ***FIFRA*** (☐)

EPA Registry I.D.

Current FRS Number: 110000461134
(Found in EnviroFacts)

Facility Name & Physical Address: TPC Group LLC
8600 Park Place Blvd
Houston, TX, 77017 2513

Remarks:

Requestor's Name & Phone Number:

Les Koval X6733

TPC Group
Houston Operations

TEL 713.477.9211
FAX 713.475.6008

8600 Park Place Boulevard, Houston, Texas 77017
www.tpcgrp.com

January 30, 2012

CERTIFIED MAIL NO.:
7007 0710 0002 0682 5072
RETURN RECEIPT REQUESTED

Air Permit Initial Review Team (APIRT)
Texas Commission on Environmental Quality (TCEQ)
Mail Code 161, P.O. Box 13087
Austin, Texas 78711-3087

RECEIVED
12 FEB -2 AM 11:15
AIR PERMITS SECTION
GPD-R

Subject: New Source Review (NSR) Permit Application and
Permit Alteration Request for NSR Permit No. 46307
TPC Group LLC
Houston, Harris County, Texas
Customer Reference Number: CN603624289
Regulated Entity Number: RN100219526

To Whom It May Concern:

This New Source Review (NSR) permit application is being submitted by TPC Group LLC (TPC) for their Houston Plant located in Harris County, TX. This plant currently has units that produce various light olefin products including butadiene, butenes, and isobutlyenes, as well as MTBE. This application is being submitted to request a modification to NSR Permit No. 46307. As noted in the enclosed application, this request is being submitted to correct emissions limits for several sources, remove sources that have been permanently shutdown and incorporate sources currently covered by Permits by Rule (PBR).

A copy of the permit amendment application fee check of $900.00 for the amendment fee is included in this submittal. The actual registration fee check will be sent under a separate cover to the TCEQ Revenue Section.

TPC Group LLC would like to thank you in advance for your review and approval of this permit amendment. If you have any questions, please do not hesitate to contact me at (713) 475-7422 or Geri.Shoop@TPCGRP.com.

Sincerely,

Geri Ann Shoop

Geri Shoop
Staff Environmental Engineer

Attachments:

NSR 46307 Permit Application

cc:

TCEQ, Region 12 5425 Polk Avenue, Suite H Houston, TX 77023-1486	CERTIFIED MAIL NO. 7007 0710 0002 0682 5089
City of Houston Bureau Chief of Air Quality Control Health and Human Services 7411 Park Place Blvd, Room 108 Houston, Texas 77087-4441	CERTIFIED MAIL NO. 7007 0710 0002 0682 5096
Harris County Environmental Public Health Division 101 South Richey Street, Suite G Pasadena, Texas 77506-1023	CERTIFIED MAIL NO. 7007 0710 0002 0682 5102
Environmental Protection Agency Air Permit Division 1445 Ross Avenue Dallas, TX 75202-2733	CERTIFIED MAIL NO. 7007 0710 0002 0682 5119

PERMIT AMENDMENT APPLICATION
PERMIT NO. 46307

Prepared by:

TRINITY CONSULTANTS
1001 West Loop South
Suite 640
Houston, Texas 77027
(713) 552-1371

January 2012

Project No. 114402.0075

Trinity Consultants

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1. EXECUTIVE SUMMARY

TPC Group, LLC. (TPC) operates a chemical manufacturing facility in Houston, Harris County, Texas. TPC currently operates under Texas Commission on Environmental Quality (TCEQ) Central Registry Regulated Entity No. RN100219526, Central Registry Customer No. CN603624289, and Account Number HG-0562-P. The Polyisobutylene (PIB) production unit and several other sources at the facility are permitted under NSR Permit Number 46307.

With this submittal, TPC intends to consolidate permit by rule authorizations (PBR) and standard permits into Permit No. 46307. Also, TPC would like to update several representations in the current permit. The proposed modifications and the list of authorizations to be consolidated are discussed in more detail in Section 6.

All required supporting documentation for the permit amendment is provided in the attached application. TCEQ Form PI-1 is included in Section 2 of this application. An area map indicating the site location and a plot plan identifying the location of various sources throughout the site are included in Sections 3 and 4 of the application, respectively. A process description is provided in Section 5 of the application. A description of the proposed permit changes is provided in Section 6. Emission documentation showing the emission calculation procedures can be found in Section 7 of this application. BACT requirements are addressed in Section 8. Application fee requirements for the amendment application are addressed in Section 9. Compliance with general and administrative requirements is demonstrated in Section 10 of the application.

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

Important Note: The agency **requires** that a Core Data Form be submitted on all incoming applications unless a Regulated Entity and Customer Reference Number have been issued *and* no core data information has changed. For more information regarding the Core Data Form, call (512) 239-5175 or go to www.tceq.texas.gov/permitting/central_registry/guidance.html.

I. Applicant Information		
A. Company or Other Legal Name: **TPC Group, LLC**		
Texas Secretary of State Charter/Registration Number (*if applicable*):		
B. Company Official Contact Name: **Charles Kirk Johnson**		
Title: **Plant Manager**		
Mailing Address: **8600 Park Place Blvd.**		
City: **Houston**	State: **Texas**	ZIP Code: **77017**
Telephone No.: **713-740-4238**	Fax No.: **713-475-6008**	E-mail Address: **kirk.johnson@tpcgrp.com**
C. Technical Contact Name: **Ms. Geri Shoop**		
Title: **Staff Environmental Engineer**		
Company Name: **TPC Group, LLC**		
Mailing Address: **8600 Park Place Blvd.**		
City: **Houston**	State: **Texas**	ZIP Code: **77017**
Telephone No.: **713-475-7422**	Fax No.: **713-475-7463**	E-mail Address: **geri.shoop@tpcgrp.com**
D. Site Name: **Houston Facility**		
E. Area Name/Type of Facility: **Houston Facility**		☒ Permanent ☐ Portable
F. Principal Company Product or Business: **1,3 Butadiene, MTBE, Isobutylene, and other C4 products**		
Principal Standard Industrial Classification Code (SIC): **2869**		
Principal North American Industry Classification System (NAICS):		
G. Projected Start of Construction Date: **N/A**		
Projected Start of Operation Date: **N/A**		
H. Facility and Site Location Information (If no street address, provide clear driving directions to the site in writing.):		
Street Address: **8600 Park Place Blvd.**		
City/Town: **Houston**	County: **Harris**	ZIP Code: **77017**
Latitude (nearest second): **29°41'48"**	Longitude (nearest second): **95°15'18"**	

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

I.	**Applicant Information (continued)**	
I.	Account Identification Number (leave blank if new site or facility): **HG-0562-P**	
J.	Core Data Form.	
Is the Core Data Form (Form 10400) attached? If *No*, provide customer reference number and regulated entity number (complete K and L).		☐ YES ☒ NO
K.	Customer Reference Number (CN): **CN603624289**	
L.	Regulated Entity Number (RN): **RN100219526**	
II.	**General Information**	
A.	Is confidential information submitted with this application? If *Yes*, mark each **confidential** page **confidential** in large red letters at the bottom of each page.	☐ YES ☒ NO
B.	Is this application in response to an investigation or enforcement action? If *Yes*, attach a copy of any correspondence from the agency.	☐ YES ☒ NO
C.	Number of New Jobs: 0	
D.	Provide the name of the State Senator and State Representative and district numbers for this facility site:	
Senator: **Senator Mario Gallegos**		District No.: 6
Representative: **Representative Carol Alvarado**		District No.: 145
III.	**Type of Permit Action Requested**	
A.	Mark the appropriate box indicating what type of action is requested.	
Initial ☐ Amendment ☒ Revision (30 TAC 116.116(e)) ☐ Change of Location ☐ Relocation ☐		
B.	Permit Number (if existing): 46307	
C.	Permit Type: Mark the appropriate box indicating what type of permit is requested. *(check all that apply, skip for change of location)*	
Construction ☒ Flexible ☐ Multiple Plant ☐ Nonattainment ☐ Prevention of Significant Deterioration ☐		
Hazardous Air Pollutant Major Source ☐ Plant-Wide Applicability Limit ☐		
Other:_____		
D.	Is a permit renewal application being submitted in conjunction with this amendment in accordance with 30 TAC 116.315(c).	☐ YES ☒ NO

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

III. Type of Permit Action Requested (continued)			
E. Is this application for a change of location of previously permitted facilities? If Yes, complete III.E.1 - III.E.4.			☐ YES ☒ NO
1. Current Location of Facility (If no street address, provide clear driving directions to the site in writing.):			
Street Address:			
City:	County:	ZIP Code:	
2. Proposed Location of Facility (If no street address, provide clear driving directions to the site in writing.):			
Street Address:			
City:	County:	ZIP Code:	
3. Will the proposed facility, site, and plot plan meet all current technical requirements of the permit special conditions? If *No*, attach detailed information.			☐ YES ☐ NO
4. Is the site where the facility is moving considered a major source of criteria pollutants or HAPs?			☐ YES ☐ NO
F. Consolidation into this Permit: List any standard permits, exemptions or permits by rule to be consolidated into this permit including those for planned maintenance, startup, and shutdown.			
List: See Table 6-1 in the application.			
G. Are you permitting planned maintenance, startup, and shutdown emissions? If *Yes*, attach information on any changes to emissions under this application as specified in VII and VIII.			☐ YES ☒ NO
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability)			
Is this facility located at a site required to obtain a federal operating permit? If *Yes*, list all associated permit number(s), attach pages as needed).			☒ YES ☐ NO ☐ To be determined
Associated Permit No (s.): **O1598**			
1. Identify the requirements of 30 TAC Chapter 122 that will be triggered if this application is approved.			
FOP Significant Revision ☐ FOP Minor ☐ Application for an FOP Revision ☐ To Be Determined ☐			
Operational Flexibility/Off-Permit Notification ☐ Streamlined Revision for GOP ☐ None ☒			

III. Type of Permit Action Requested (continued)		
H.	Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability) *(continued)*	
2.	Identify the type(s) of FOP(s) issued and/or FOP application(s) submitted/pending for the site. (check all that apply)	
GOP Issued ☐	GOP application/revision application submitted or under APD review ☐	
SOP Issued ☒	SOP application/revision application submitted or under APD review ☐	
IV. Public Notice Applicability		
A.	Is this a new permit application or a change of location application?	☐ YES ☒ NO
B.	Is this application for a concrete batch plant? If Yes, complete V.C.1 – V.C.2.	☐ YES ☒ NO
C.	Is this an application for a major modification of a PSD, nonattainment, FCAA 112(g) permit, or exceedance of a PAL permit?	☐ YES ☒ NO
D.	Is this application for a PSD or major modification of a PSD located within 100 kilometers of an affected state?	☐ YES ☒ NO
If *Yes*, list the affected state(s).		
E.	Is this a state permit amendment application? If Yes, complete IV.E.1. – IV.E.3.	
1.	Is there any change in character of emissions in this application?	☒ YES ☐ NO
2.	Is there a new air contaminant in this application?	☐ YES ☒ NO
3.	Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetables fibers (agricultural facilities)?	☐ YES ☒ NO
F.	List the total annual emission increases associated with the application (*list* **all** *that apply and attach additional sheets as needed*):	
Volatile Organic Compounds (VOC): **2.99 tpy**		
Sulfur Dioxide (SO_2): **0.08 tpy**		
Carbon Monoxide (CO): **0.34 tpy**		
Nitrogen Oxides (NO_x): **3.29 tpy**		
Particulate Matter (PM): **67.79 tpy**		
PM $_{10}$ microns or less (PM_{10}): **67.79 tpy**		
PM $_{2.5}$ microns or less ($PM_{2.5}$): **67.79 tpy**		
Lead (Pb): **0 tpy**		
Hazardous Air Pollutants (HAPs): **19.75 tpy**		
Other speciated air contaminants **not** listed above: **NH3 – 0.02 tpy**		

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

V. Public Notice Information (complete if applicable)		
A. Public Notice Contact Name: **Ms. Geri Shoop**		
Title: **Staff Environmental Engineer**		
Mailing Address: **8600 Park Place Blvd.**		
City: **Houston**	State: **Texas**	ZIP Code: **77017**
B. Name of the Public Place: **Park Place Regional Library**		
Physical Address (No P.O. Boxes): **8145 Park Place Boulevard**		
City: **Houston**	County: **Harris**	ZIP Code: **77017**
The public place has granted authorization to place the application for public viewing and copying.		☒ YES ☐ NO
The public place has internet access available for the public.		☒ YES ☐ NO
C. Concrete Batch Plants, PSD, and Nonattainment Permits		
1. County Judge Information (For Concrete Batch Plants and PSD and/or Nonattainment Permits) for this facility site.		
The Honorable:		
Mailing Address:		
City:	State:	ZIP Code:
2. Is the facility located in a municipality or an extraterritorial jurisdiction of a municipality? *(For Concrete Batch Plants)*		☐ YES ☐ NO
Presiding Officers Name(s):		
Title:		
Mailing Address:		
City:	State:	ZIP Code:
3. Provide the name, mailing address of the chief executives of the city and county, Federal Land Manager, or Indian Governing Body for the location where the facility is or will be located.		
Chief Executive:		
Mailing Address:		
City:	State:	ZIP Code:
Name of the Federal Land Manager:		
Title:		
Mailing Address:		
City:	State:	ZIP Code:

V. Public Notice Information (complete if applicable) (continued)		
3. Provide the name, mailing address of the chief executives of the city and county, State, Federal Land Manager, or Indian Governing Body for the location where the facility is or will be located. *(continued)*		
Name of the Indian Governing Body:		
Title:		
Mailing Address:		
City:	State:	ZIP Code:
D. Bilingual Notice		
Is a bilingual program **required** by the Texas Education Code in the School District?		☒ YES ☐ NO
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?		☒ YES ☐ NO
If *Yes*, list which languages are required by the bilingual program? **Spanish**		
VI. Small Business Classification (Required)		
A. Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?		☐ YES ☒ NO
B. Is the site a major stationary source for federal air quality permitting?		☒ YES ☐ NO
C. Are the site emissions of any regulated air pollutant greater than or equal to 50 tpy?		☒ YES ☐ NO
D. Are the site emissions of all regulated air pollutants combined less than 75 tpy?		☒ YES ☐ NO
VII. Technical Information		
A. The following information must be submitted with your Form PI-1 (this is just a checklist to make sure you have included everything)		
1. Current Area Map ☒		
2. Plot Plan ☒		
3. Existing Authorizations ☒		
4. Process Flow Diagram ☐		
5. Process Description ☒		
6. Maximum Emissions Data and Calculations ☒		
7. Air Permit Application Tables ☒		
a. Table 1(a) (Form 10153) entitled, Emission Point Summary ☒		
b. Table 2 (Form 10155) entitled, Material Balance ☐		
c. Other equipment, process or control device tables ☒		

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

VII. Technical Information				
B.	Are any schools located within 3,000 feet of this facility?			☒ YES ☐ NO
C.	Maximum Operating Schedule:			
Hours: 24	Day(s): 7	Week(s): 52	Year(s):	
Seasonal Operation? If Yes, please describe in the space provide below.				☐ YES ☒ NO
D.	Have the planned MSS emissions been previously submitted as part of an emissions inventory?			☐ YES ☒ NO
Provide a list of each planned MSS facility or related activity and indicate which years the MSS activities have been included in the emissions inventories. Attach pages as needed.				
No new MSS emissions are included in this amendment. Facility MSS emissions are authorized via NSR 98149.				
E.	Does this application involve any air contaminants for which a *disaster review* is required?			☐ YES ☒ NO
F.	Does this application include a pollutant of concern on the *Air Pollutant Watch List (APWL)*?			☐ YES ☒ NO
VIII.	**State Regulatory Requirements** **Applicants must demonstrate compliance with all applicable state regulations to obtain a permit or amendment**. *The application must contain detailed attachments addressing applicability or non applicability; identify state regulations; show how requirements are met; and include compliance demonstrations.*			
A.	Will the emissions from the proposed facility protect public health and welfare, and comply with all rules and regulations of the TCEQ?			☒ YES ☐ NO
B.	Will emissions of significant air contaminants from the facility be measured?			☒ YES ☐ NO
C.	Is the Best Available Control Technology (BACT) demonstration attached?			☒ YES ☐ NO
D.	Will the proposed facilities achieve the performance represented in the permit application as demonstrated through recordkeeping, monitoring, stack testing, or other applicable methods?			☒ YES ☐ NO
IX.	**Federal Regulatory Requirements** **Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment** *The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.*			
A.	Does Title 40 Code of Federal Regulations Part 60, (40 CFR Part 60) New Source Performance Standard (NSPS) apply to a facility in this application?			☒ YES ☐ NO
B.	Does 40 CFR Part 61, National Emissions Standard for Hazardous Air Pollutants (NESHAP) apply to a facility in this application?			☒ YES ☐ NO
C.	Does 40 CFR Part 63, Maximum Achievable Control Technology (MACT) standard apply to a facility in this application?			☒ YES ☐ NO

IX. Federal Regulatory Requirements **Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment** ***The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.***	
D. Do nonattainment permitting requirements apply to this application?	☐ YES ☒ NO
E. Do prevention of significant deterioration permitting requirements apply to this application?	☐ YES ☒ NO
F. Do Hazardous Air Pollutant Major Source [FCAA 112(g)] requirements apply to this application?	☐ YES ☒ NO
G. Is a Plant-wide Applicability Limit permit being requested?	☐ YES ☒ NO
X. Professional Engineer (P.E.) Seal	
Is the estimated capital cost of the project greater than $2 million dollars?	☐ YES ☒ NO
If *Yes*, submit the application under the seal of a Texas licensed P.E.	
XI. Permit Fee Information	
Check, Money Order, Transaction Number ,ePay Voucher Number:	Fee Amount: **$900**
Company name on check:	Paid online?: ☐ YES ☒ NO
Is a copy of the check or money order attached to the original submittal of this application?	☒ YES ☐ NO ☐ N/A
Is a Table 30 (Form 10196) entitled, Estimated Capital Cost and Fee Verification, attached?	☒ YES ☐ NO ☐ N/A

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

XII. Delinquent Fees and Penalties

This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: www.tceq.texas.gov/agency/delin/index.html.

XIII. Signature

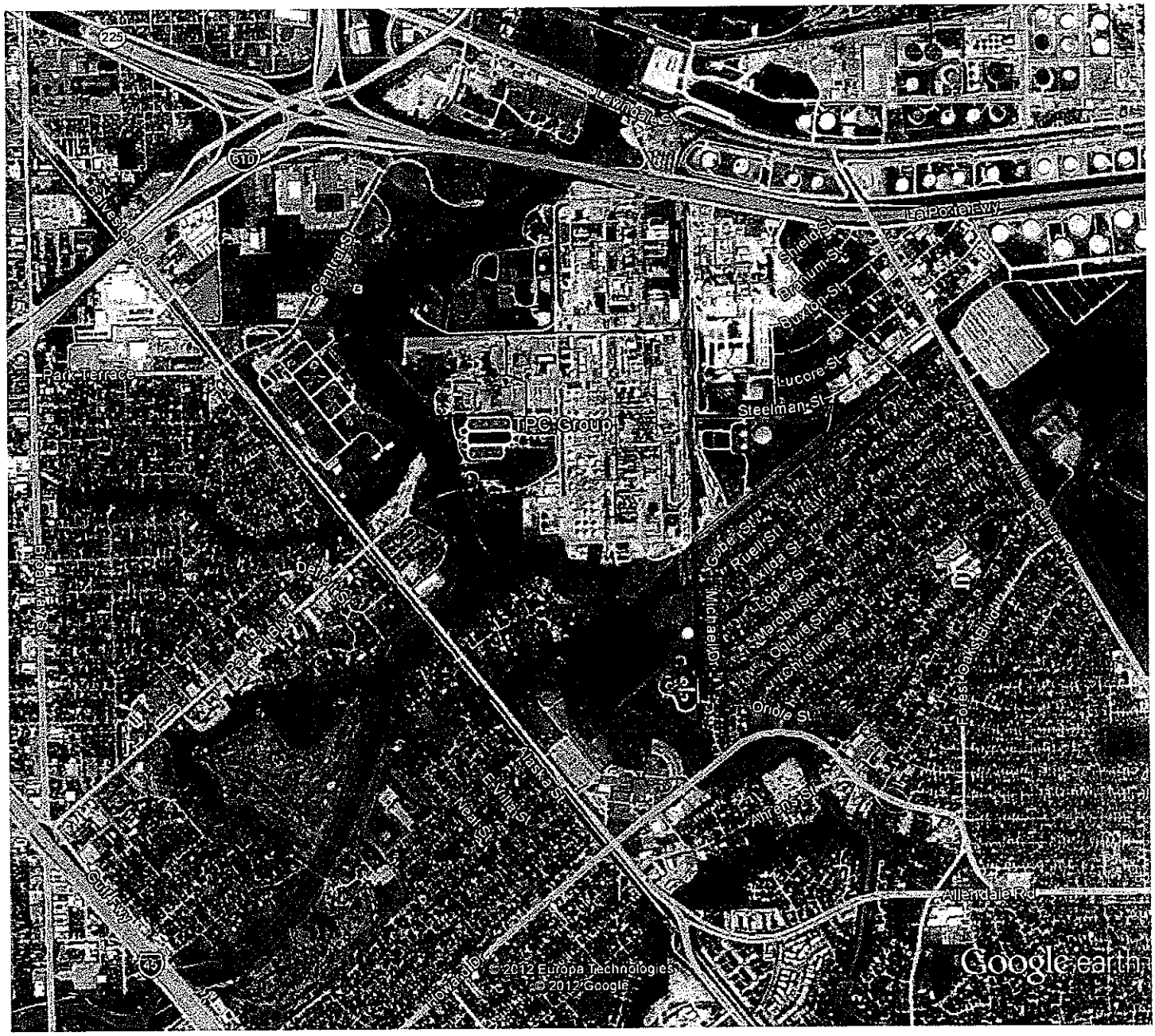
The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations of the Texas Commission on Environmental Quality or any local governmental ordinance or resolution enacted pursuant to the TCAA I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.

Name: Charles Kirk Johnson

Signature: CK Johnson

Original Signature Required

Date: 1/30/12



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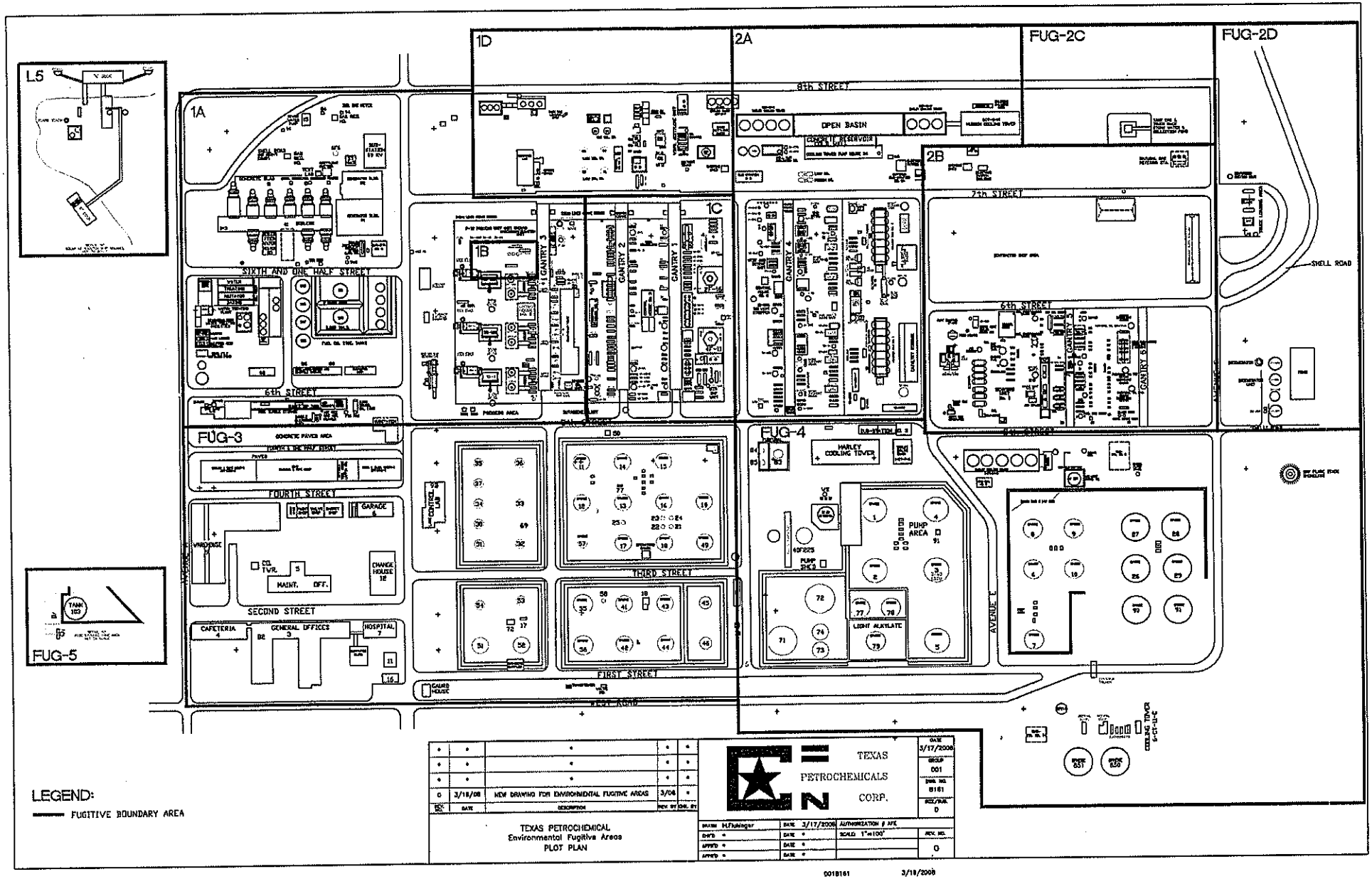

L5
1A
1B
1C
1D
2A
2B
FUG-2C
FUG-2D
FUG-3
FUG-4
FUG-5
8th STREET
7th STREET
6th STREET
SIXTH AND ONE HALF STREET
FOURTH STREET
SECOND STREET
THIRD STREET
FIRST STREET
WEST ROAD
AVENUE E
SHELL ROAD
OPEN BASIN
CONCRETE RESERVOIR
GANTRY 1
GANTRY 2
GANTRY 3
GANTRY 4
GANTRY 5
GANTRY 6
HARLEY COOLING TOWER
PUMP AREA
LIGHT ALKYLATE
PUMP SHED
CONTROL LAB
GARAGE
CHANGE HOUSE
CAFETERIA
GENERAL OFFICES
HOSPITAL
MAINT. OFF.
CO. TWR.
VAREHOUSE
TANK 103
COOLING TOWER
LEGEND:
FUGITIVE BOUNDARY AREA
0 3/18/08 NEW DRAWING FOR ENVIRONMENTAL FUGITIVE AREAS 3/08
TEXAS PETROCHEMICAL
Environmental Fugitive Areas
PLOT PLAN
TEXAS PETROCHEMICALS CORP.
DATE 3/17/2008
GROUP 001
DWG. NO. B161
SIZE/SUB. D
DRAWN H.Flukinger
DATE 3/17/2008
AUTHORIZATION # AFE
SCALE 1"=100'
REV. NO. 0
0018161 3/18/2008

5. PROCESS DESCRIPTION

TPC owns and operates a petrochemical production facility in Houston, Harris County, Texas. The plant currently manufactures various light olefin products including butadiene, butenes, isobutylenes, and methyl-tert-butyl ether (MTBE). The Houston Facility includes the Butadiene Unit, the Raffinate Unit, the MTBE Unit, the PIB units, and associated utility sources, e.g. boilers, cooling towers.

With this submittal, TPC intends to consolidate the PBR authorizations, Standard Exemptions, and Standard Permits, shown in Table 6-1 below, into the permit 46307 and subsequently void them. TPC would also like to authorize the modifications presented in Table 6-2, and add the new emission sources listed in Table 6-3.

List of Authorizations for Consolidation

TPC requests to consolidate authorizations shown in Table 6-1.

TABLE 6-1. LIST OF AUTHORIZATIONS FOR CONSOLIDATION

Standard Exemptions/ Registration No.	Description	Action Requested
50995	Standard Permit to install floating roofs in T-77, T-78, and T-79	Consolidate into permit 46307. Emission calculations are provided in Appendix A.
X-840	MeOH T/T Unloading	Consolidate into permit 46307. Action would not result in emission increase from any source.
X-16351	Hydrogenation Unit (Skid)	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 86	73 & 74 Tanks	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 82	Channel Gas Odorizing Station	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 76	Polygas Pilot Unit	Consolidate into permit 46307. Action would not result in emission increase from any source.
106	Debottleneck dimethylformamide (DMF)	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 118	Pipeline Transfer Pump, 19G-2215	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 83	90 & 91 Tanks	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 6	Diesel Driven Fire Water Pump (emergency)	Consolidate into permit 46307. Emission calculations are provided in Appendix A.

Standard Exemptions/ Registration No.	Description	Action Requested
106.511	Emergency generator 20DG-16	Consolidate into permit 46307. Emission calculations are provided in Appendix A.
106.511	Diesel firewater pump engine 13G-2629	Consolidate into permit 46307. Emission calculations are provided in Appendix A.
106.473 and 106.511	New diesel engine 19G-3789 and the associated diesel tank	Consolidate into permit 46307. Emission calculations are provided in Appendix A and supporting documents are provided in Appendix B.
106.511	Installation of Cummins Diesel Air Compressor N14-C475	Consolidate into permit 46307. Emission calculations are provided in Appendix A and supporting documents are provided in Appendix B.
93360	New R&D and QC labs	Consolidate into permit 46307. Supporting documents are provided in Appendix B.
106.122 and 106.372	New Lab Gas Generators	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 106	Lubrizol Pipeline	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 106	Lyondell Metering Station	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 86	New Gasoline Tank (EPN Gas-2)	Consolidate into permit 46307. Increase in throughput to the tank is being requested. Emission Summary is provided in Appendix A, and TANKS results are provided in Appendix B.
SE 106	Reactivation of 1D-506 & 507	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 106	DIB Modifications	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 106	Phillips Pipeline	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 106	Flare Knockout Drum	Consolidate into permit 46307. Action would not result in emission increase from any source.

Standard Exemptions/ Registration No.	Description	Action Requested
SE 106	Bliss (Skip)	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 106	BHY Unit	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 106	Tank Car Rack	Consolidate into permit 46307. Action would not result in emission increase from any source.
24187	Tanks 114 & 115	Consolidate into permit 46307. Correcting the tank type to domed external floating roof tanks. Emission Summary is provided in Appendix A, and TANKS results are provided in Appendix B.
28410	Tanks 71, 73, 74 & 80 change of service	Consolidate into permit 46307. Change of service requested for T-71. T-73 and T-74 no changes requested. New throughput is requested for T-80. Emission Summary is provided in Appendix A, and TANKS results are provided in Appendix B.
SE 106	MTBE Loading Pump, 21G-2290	Consolidate into permit 46307. Action would not result in emission increase from any source.
SE 106	VOC Steam Stripper	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.261	Change of Service Tanks 47 and 48	Consolidate into permit 46307. Action would not result in emission increase from any source.
40807	TPC Alkylate Process	Consolidate into permit 46307. Action would not result in emission increase from any source.
43252	BD Reconfiguration	Consolidate into permit 46307. Action would not result in emission increase from any source.
44686	Railcar Uploading Project	Consolidate into permit 46307. Action would not result in emission increase from any source.
44488	Install Flash Vessel 5D1	Consolidate into permit 46307. Action would not result in emission increase from any source.
44268	Insulated BD Loading Line	Consolidate into permit 46307. Action would not result in emission increase from any source.

Standard Exemptions/ Registration No.	Description	Action Requested
44927	Exxon BD Pipeline Pump	Consolidate into permit 46307. Action would not result in emission increase from any source.
46456	Change of Service Tank 72	Consolidate into permit 46307.
47147	Reactor Spike	Consolidate into permit 46307. Action would not result in emission increase from any source.
47393	Dow Butene-1 Pipeline Pump	Consolidate into permit 46307. Action would not result in emission increase from any source.
48550	DMA and Methanol Wash of Butadiene	Consolidate into permit 46307. Action would not result in emission increase from any sour
106.472	Tank 79 Change of Service	Consolidate into permit 46307. New throughput is requested for T-79. Emission Summary is provided in Appendix A, and TANKS results are provided in Appendix B.
77343	Pressure Transmitter on PIB A Reactor Inlet	Consolidate into permit 46307. Action would not result in emission increase from any source.
77344	Oligimers Loop Sampler	Consolidate into permit 46307. Action would not result in emission increase from any source.
77345	2005 Generic Fugitives	Consolidate into permit 46307. Action would not result in emission increase from any source.
77346	PIB Storage Tanks Sample Valve Replacement	Consolidate into permit 46307. Action would not result in emission increase from any source.
77347	6G-2064 Liquid Switch Sensor	Consolidate into permit 46307. Action would not result in emission increase from any source.
77348	54 Tank Positive Pressure Control	Consolidate into permit 46307. Action would not result in emission increase from any source.
78118	Installation of various fugitive components	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.472	Tank 85 change of service and increase annual throughput limit	Consolidate into permit 46307. Emission Summary is provided in Appendix A, and TANKS results are provided in Appendix B.
106.472	Tank 155 increase annual throughput limit	Consolidate into permit 46307. Emission Summary is provided in Appendix A, and TANKS results

Standard Exemptions/ Registration No.	Description	Action Requested
		are provided in Appendix B.
106.478	T-72, T-73, T-74, T-79 change of service	Consolidate into permit 46307. Emission Summary is provided in Appendix A, and TANKS results are provided in Appendix B.
79947	Several fugitive sources combined in one submittal	Consolidate into permit 46307. Action would not result in emission increase from any source.
79933	Several fugitive sources combined in one submittal	Consolidate into permit 46307. Action would not result in emission increase from any source.
80271	Ultra	Consolidate into permit 46307. Action would not result in emission increase from any source.
80340	Polyblend	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.263	Maintenance activity involving the conversion of railcar valves to the new DryLok coupling system.	Consolidate into permit 46307. Action would not result in emission increase from any source.
80921	2007 Generic Fugitive PBR	Consolidate into permit 46307. Action would not result in emission increase from any source.
80916	Several fugitive sources combined in one submittal	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.263	Valve replacement at the Railcars	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.478	T-71 change of service	Consolidate into permit 46307.
81669	Several fugitive sources combined in one submittal	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.478	Tank 73 and 74 change of service	Consolidate into permit 46307.
81662	Several fugitive sources combined in one submittal	Consolidate into permit 46307. Action would not result in emission increase from any source.
81648	Several fugitive sources combined in one submittal	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.263	Reboiler Maintenance	Consolidate into permit 46307. Action would not result in emission increase from any source.

Standard Exemptions/ Registration No.	Description	Action Requested
106.263	114 Tank Maintenance	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.478	Tank 33 Change of Service	Consolidate into permit 46307. Emission Summary is provided in Appendix A, and TANKS results are provided in Appendix B.
82280	Several fugitive sources combined in one submittal	Consolidate into permit 46307. Action would not result in emission increase from any source.
83905	Wastewater Surge Tanks	Consolidate into permit 46307. Requesting to change the EPNs from 18F-264, 18F-265, 18F-267, 18F-268, 18F-269, 18F-270, 18F-271, and 18F-272 to 18F-2664, 18F-2665, 18F-2667, 18F-2668, 18F-2669, 18F-2670, 18F-2671, and 18F-2672.
106.261	Isobutane spike pump project	Consolidate into permit 46307. Action would not result in emission increase from any source.
87907	Projects (Additions of Fugitive Component) Conducted in CY2008	Consolidate into permit 46307. Action would not result in emission increase from any source.
89962	T-72 change of service to MTBE; T-77 and 78 increase throughput	Consolidate into permit 46307. Change of service requested for T-72. New throughput is requested for T-77 and T-78. Emission Summary is provided in Appendix A, and TANKS results are provided in Appendix B.
106.476	Pressurizer Vessels	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.478	Correction to Emissions Estimate for Tank No. 71	Consolidate into permit 46307.
106.4 and 106.472	T-diesel Tank for Diesel Storage	Consolidate into permit 46307. New throughput is requested. Emission Summary is provided in Appendix A, and TANKS results are provided in Appendix B.
92143	South Absorber	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.4 and 106.472	Tank 99 Hydrochloric Acid Tank Replacement in Kind	Consolidate into permit 46307. Action would not result in emission increase from any source.

Standard Exemptions/ Registration No.	Description	Action Requested
92198	261-262 Annual Update	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.472	T-84 Lean Oil Service	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.263	Tank 73 Seal Replacement	Consolidate into permit 46307. Action would not result in emission increase from any source.
106.472	Furfural sump tanks 2F-26, 4F-14 and 5F-3	Consolidate into permit 46307. Supporting documents are provided in Appendix B.
95574	Annual Fugitives Update - 261 and 262	Consolidate into permit 46307. Action would not result in emission increase from any source.

Modifications to the existing EPNs

TPC proposes to modify the sources as shown in Table 6-2.

TABLE 6-2. PROPOSED MODIFICATIONS

EPN	Description	Proposed changes
EP-5	Plant Flare	Include the PIB WW Stripper Overhead stream as a vent to the flare
F-CT-3	Cooling Tower CT-3	Update the permit to reflect revised PM emissions from the source.
F-CT-7	Cooling Tower CT-7	Adding PM emissions to the source.
F-CT-10	Cooling Tower CT-10	Adding PM emissions to the source.
F-CT-11	Cooling Tower CT-11	Adding PM emissions to the source.
F-CT-14	Cooling Tower CT-14	Adding PM emissions to the source.
N/A	Combined Cooling	Requesting to remove cooling tower VOC emissions cap.
T-31	Tank 31	Requesting an increase in throughput from 35,412 bbl/yr to 70,080 bbl/yr; and change in service from lean oil to lean oil **and/or** fuel oil "B".
T-32	No. 32 Tank	Requesting to correct the capacity of the tank from 260 bbl to 2,600 bbl. Requesting to increase the throughput from 2,600 bbl to 36,400 bbl. Requesting change in service from Distillate Fuel No. 2 to Lean oil.
T-34	No. 34 Tank	Requesting to increase the throughput from 28,330 bbl to 70,080 bbl. Requesting change in service from Distillate Fuel No. 2 to Fuel oil "B".
T-80	MeOH/EtOH Storage Tank 80	Requesting an increase in throughput from 2,277,600 bbl/yr to 16,000,000 bbl/yr.
T-81	No. 81 Tank	Requesting to authorize the tank for 4500 bbl/hr continuous flow of furfural instead of 21,153 bbl of annual throughput.
T-82	No. 82 Tank	Requesting to authorize the tank for 3300 bbl/hr continuous flow of DMF instead of 10,576 bbl of annual throughput.
T-84	No. 84 Tank	Requesting to correct the tank type from VFRT to IFRT; Change in service from Distillate Fuel Oil 2 to Lean oil; Increase the throughput from 15,445 bbl/yr to 47,619 bbl/yr.

EPN	Description	Proposed changes
T-85	No. 85 Tank	Requesting a change in service from Distillate Fuel Oil 2 to AS110 (AOS); Increase the throughput from 1,088 bbl/yr to 22,050 bbl/yr.
T-86	No. 86 Tank	Requesting to authorize the tank for 1,600 bbl/hr continuous flow of furfural instead of 10,879 bbl of annual throughput.
T-103	MTBE/ETBE Tank	Requesting increase the throughput from 10,950 bbl/yr to 7,300,000 bbl/yr.
T-117	PIB-1 Process Tank	Requesting to update hourly emission rate.
T-118	PIB-1 Process Tank	Requesting to update hourly emission rate.
T-119	PIB-1 Process Tank	Requesting to update hourly emission rate.
T-IP-1	PIB-2 Process Tank 1	Requesting to update hourly emission rate and changing the EPN to T-204.
T-IP-2	PIB-2 Process Tank 2	Requesting to update hourly emission rate and changing the EPN to T-205.
T-IP-3	PIB-2 Process Tank 3	Requesting to update hourly emission rate and changing the EPN to T-206.
TNK-GRP	Tank Emissions Cap	Requesting to update annual emissions cap based on PIB 1 & 2 production.
E-PIBTT	PIB-1 Product Loading B Tank Trucks	Increase allowable throughput
E-PIB-TC	PIB-1 Product Loading B Rail Cars	Increase allowable throughput
E-PIB2RC1	PIB-2 Product Loading Rail Cars Station 1	Increase allowable throughput
E-PIB2RC2	PIB-2 Product Loading Rail Cars Station 2	Increase allowable throughput
E-PIB2TT1	PIB-2 Product Loading Tank Truck Station 1	Increase allowable throughput
E-PIB2TT2	PIB-2 Product Loading Tank Truck Station 2	Increase allowable throughput
LOAD-GRP	Loading Emissions Cap	Increase allowable throughput
T-P1WW1	PIB-1 Wastewater Tank 1	Updating the annual throughput and changing the EPN to T-120.
T-P1WW2	PIB-1 Wastewater Tank 2	Updating the annual throughput and changing the EPN to T-121.
T-P2WW1	PIB-2 Wastewater Tank 1	Updating the annual throughput, changing the EPN to 8F-3016, increasing the capacity.
T-6F-1778	Tank 6F-2778	Updating the description to Tank 6F-1778

Proposed New Sources:

TPC proposes to add new sources as shown in Table 6-3.

TABLE 6-3. PROPOSED NEW SOURCES

EPN	Description	Action Requested
F-CT-17	Cooling Tower CT-17	Existing emission unit, installed in 1980. Add to the permit.
F-CT-18	Cooling Tower CT-18	Existing emission unit, installed in 1980. Add to the permit.
T-111	ISO68	Adding a new tank.
T-112	ISO32	Adding a new tank.
1F-511	Fuel Oil Tank	Adding a new tank.

Sources to be deleted:

TPC would like to delete the sources listed in Table 6-3.

TABLE 6-4. SOURCES TO BE DELETED

EPN	Description	Proposed changes
EP-4	OXO Incinerator/Boiler	Unit has been shutdown. Needs to be removed from permit.
EP-H10	No. 1 Butylene Heater	Unit has been shutdown. Needs to be removed from permit.
EP-H11	No. 1 C.E. Steam Superheater	Unit has been shutdown. Needs to be removed from permit.
EP-H13	No. 2 OXO Butylene Heater	Unit has been shutdown. Needs to be removed from permit.
EP-H-14	NO. 2 C.E. Steam Stripper	Unit has been shutdown. Needs to be removed from permit.
20G-437	Dock Pump Engine 20G-437	The engine has been converted to electric. Remove from the permit.
F-CT-1	Cooling Tower CT-1	The unit has been demolished. Delete from permit.
CAT-TFR	Catalyst Transfer Hopper	Requesting to remove from permit.
CAT-BH	Catalyst Baghouse	Requesting to remove from permit.
T-PIB-1	PIB-2 Storage Tank 1	Requesting to delete from permit. Never constructed.
T-PIB-2	PIB-2 Storage Tank 2	Requesting to delete from permit. Never constructed.
T-PIB-3	PIB-2 Storage Tank 3	Requesting to delete from permit. Never constructed.

EPN	Description	Proposed changes
T-PIB-4	PIB-2 Storage Tank 4	Requesting to delete from permit. Never constructed.
T-PIB-5	PIB-2 Storage Tank 5	Requesting to delete from permit. Never constructed.
T-PIB-6	PIB-2 Storage Tank 6	Requesting to delete from permit. Never constructed.
T-P2WW2	PIB-2 Wastewater Tank 2	Requesting to delete from permit. Never constructed.
T-46	No. 46 Tank	Unit has been shutdown. Needs to be removed from permit.
T-83	No. 83 Tank	Unit has been shutdown. Needs to be removed from permit.

This section contains a detailed description of the calculation methodology used to determine the proposed emission rates for sources at TPC's Houston Facility. Detailed emission calculations are included Appendix A.

7.1 FLARES

NO_x and CO emissions from the flare are estimated by using the emissions factors for steam-assisted flare with a low Btu fuel stream. The emission factors are taken from *TCEQ's Technical Guidance for Flares and Vapor Oxidizers* (October 2000). The VOC destruction efficiency of the flare is 99% for C1-C3 compounds and 98% for C3+ compounds.

7.2 STORAGE TANKS

The emission rate for each tank is calculated using the U.S. Environmental Protection Agency's (EPA) TANKS program (Version 4.09d), AP-42 Section 7.1, *Organic Liquid Storage Tanks*, and TCEQ's *Air Permit Technical Guidance for Chemical Sources: Storage Tanks*. The emissions for the storage tanks are represented in the TANKS output reports which can be found in Appendix B.

7.3 FUGITIVE EMISSIONS

Fugitive emissions are calculated using the methodology described in the TCEQ document entitled *Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives, October 2000.* However, in this application, TPC is just calculating HAP emissions based on stream composition and already permitted potential to emit emissions in permit 46307. As such, there is no requested VOC increase for these sources in this application.

7.4 COOLING TOWERS

VOC, PM_{10}, and $PM_{2.5}$ emissions from cooling towers are calculated based on U.S. EPA AP-42 sections 5.1 and 13.4 respectively, and water circulation rate. However, the AP-42 PM_{10} factor based on 12,000 ppm total dissolved solids (TDS) is adjusted for TDS data of 1,400 ppm from TPC's cooling towers. Detailed calculations are provided in Appendix A.

7.5 ENGINES

NOx, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$, and HAP emissions from engines are calculated based on vendor's data, where provided, or U.S. EPA AP-42 section 3.3. Emissions are calculated based on a maximum operating time of 52 hr/year. Detailed calculations are provided in Appendix A.

7.6 LOADING EMISSIONS

VOC emissions from loading operations are calculated using methodology from AP-42, Section 5.2. A saturation factor of 0.6 for submerged filling with dedicated normal service is used. Loading operations are routed to the vapor recovery system for control. Detailed calculations are provided in Appendix A.

In accordance with 30 TAC 116, the emission sources in this permit amendment application will be operated with the best available control technology (BACT) for minimizing emissions to the atmosphere, with consideration given to technical practicability and economic reasonableness of reducing emissions from the site. The following discusses BACT for each emission source included in this permit amendment application.

8.1 FLARES

BACT for the flares consists of a continuously lit pilot flame (using natural gas) and steam assist to reduce smoke during operation. The flare is equipped with a reignition system that includes a flame detector and alarm system. The minimum heat input to the flare is maintained to at least 300 Btu/scf to meet the heating value requirements of 40 CFR 60.18. The exit velocity for the flare confirms to the guidelines in NSPS Subpart A (40 CFR 60.18). Therefore, BACT is met for the flare.

8.2 STORAGE TANKS

Shown below in Table 9-1 are the TCEQ's published BACT guidelines for storage tanks as listed in the *TCEQ Chemical Sources Current Best Available Control Technology (BACT) Requirements - Storage Tanks*, August 2011. Table 9-2 lists the tanks and describes how each tank meets the BACT requirements.

TABLE 8-1. TCEQ BACT GUIDELINES FOR STORAGE TANKS

Tank Type	Minimum Acceptable Control	Control Efficiency or Details
Tank capacity < 25 Mgal or Vp < 0.5 psia	Fixed roof with submerged fill. White or aluminum uninsulated exterior surfaces exposed to the sun.	
Tank capacity > 25 Mgal and Vp > 0.5 psia	Internal floating roof (IFR). White or aluminum uninsulated exterior surfaces exposed to the sun.	Alternative 1: Primary seal: mechanical or liquid mounted
	External floating roof (EFR). White or aluminum uninsulated exterior surfaces exposed to the sun. Slotted guide pole fittings must have gasketed cover, and at least 2 of the following - wiper, float, or sleeve.	Primary seal: mechanical or liquid mounted, and Secondary seal: rim mounted
	Vent to control	Appropriate control device efficiency

TABLE 8-2. LIST OF TANKS WITH BACT COMPLIANCE

EPN	Tank Type	Capacity (gal)	Vapor Pressure (psia)	BACT Compliance
GAS-2	HFRT	3,000	>0.5	White tank with submerged fill pipe.
1F-511	HFRT	6,600	<0.5	White tank with submerged fill pipe.
T-31	IFRT	105,000	>0.5	Primary seal is mechanical shoe and the secondary seal is shoe-mounted.
T-32	IFRT	109,200	>0.5	Primary seal is mechanical shoe and the secondary seal is rim-mounted.
T-33	VFRT	37,605	<0.5	White tank with submerged fill pipe.
T-34	VFRT	109,200	<0.5	White tank with submerged fill pipe.
T-77	IFRT	382,000	>0.5	Primary seal is Vapor-Mounted and the secondary seal is Rim-Mounted. No physical modification of this source as a result of this amendment. Current seal configuration is considered acceptable for BACT.
T-78	IFRT	382,000	>0.5	Primary seal is Vapor-Mounted and the secondary seal is Rim-Mounted. No physical modification of this source as a result of this amendment. Current seal configuration is considered acceptable for BACT.
T-79	IFRT	285,000	>0.5	Primary seal is Vapor-Mounted and the secondary seal is Rim-Mounted. No physical modification of this source as a result of this amendment. Current seal configuration is considered acceptable for BACT.
T-80	IFRT	336,000	>0.5	Primary seal is Mechanical Shoe and the secondary seal is Rim-Mounted.
T-81	VFRT	111,053	<0.5	White tank with submerged fill pipe.
T-82	VFRT	111,053	<0.5	White tank with submerged fill pipe.
T-84	IFRT	54,057	>0.5	Primary seal is Mechanical Shoe and the secondary seal is shoe-mounted.
T-85	VFRT	15,230	<0.5	White tank with submerged fill pipe.
T-86	VFRT	57,113	<0.5	White tank with submerged fill pipe.
T-103	DEFRT	11,256,000	>0.5	Primary seal is Mechanical Shoe and the secondary seal is Rim-Mounted.
T-111	HFRT	14,700	<0.5	White tank with submerged fill pipe.
T-112	HFRT	14,700	<0.5	White tank with submerged fill pipe.
T-114	DEFRT	1,587,600	>0.5	Primary seal is Vapor-Mounted and

EPN	Tank Type	Capacity (gal)	Vapor Pressure (psia)	BACT Compliance
				the secondary seal is Rim-Mounted. No physical modification of this source as a result of this amendment. Current seal configuration is considered acceptable for BACT.
T-115	DEFRT	1,587,600	>0.5	Primary seal is Vapor-Mounted and the secondary seal is Rim-Mounted. No physical modification of this source as a result of this amendment. Current seal configuration is considered acceptable for BACT.
T-117	VFRT	70,500	<0.5	Aluminum tank with submerged fill pipe.
T-118	VFRT	70,500	<0.5	Aluminum tank with submerged fill pipe.
T-119	VFRT	70,500	<0.5	Aluminum tank with submerged fill pipe.
T-155	VFRT	5,287	<0.5	White tank with submerged fill pipe.
T-Diesel	VFRT	564	<0.5	White tank with submerged fill pipe.
T-Diesel2	VFRT	4,998	<0.5	White tank with submerged fill pipe.
T-204 (T-IP-1)	VFRT	179,800	<0.5	Aluminum tank with submerged fill pipe.
T-205 (T-IP-2)	VFRT	179,800	<0.5	Aluminum tank with submerged fill pipe.
T-206 (T-IP-3)	VFRT	179,800	<0.5	Aluminum tank with submerged fill pipe.
T-P1WW1	VFRT	60,200	VOC partial pressure <0.5	White tank with submerged fill pipe.
T-P1WW2	VFRT	30,100	VOC partial pressure <0.5	White tank with submerged fill pipe.
T-P2WW1	VFRT	60,200	VOC partial pressure <0.5	White tank with submerged fill pipe.

8.3 ENGINES

All the engines included in this application (other than 31G-2350) are diesel fired and are for emergency purposes only with a maximum operating time of 52 hours per year. Engine 31G-2350 is not an emergency engine and is not limited in operating hours. As per the current BACT, liquid fired engines must use low emissions fuels only. TPC will comply with this requirement.

8.4 Cooling Towers

TPC is requesting to add PM emissions from cooling towers to the permit as they were not represented in the past since TCEQ did not previously require PM emissions from cooling towers to be quantified. These sources are not being modified, thus, BACT review is not triggered.

8.5 Loading Operations

TPC is requesting to increase the annual throughput for PIB loading operations. The vapor pressure of the compound is less than 0.5 psia and the mode of operation is submerged fill type and controlled. Therefore, BACT requirements are met.

The proposed project does not involve capital expenditure. Therefore, according to 30 TAC 116.141(e), a check in the amount of $900 made payable to the TCEQ, along with a copy of the form PI-1 is sent to the financial division in a separate package.

Check Date: 21-OCT-2011 No. **67744**

Vendor No.: 911 Vendor Name: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INVOICE NO.	INVOICE DATE	DESCRIPTION	DISCOUNT AMOUNT	NET AMOUNT
NSR PERMIT 46307 MODIFICATION APPLICATION 2011	10-OCT-2011		0.00	900.00
			0.00	900.00

PLEASE DETACH AND RETAIN THIS STATEMENT AS YOUR RECORD OF PAYMENT. *Thank You*

WARNING - THIS CHECK IS PROTECTED BY SPECIAL SECURITY GUARD PROGRAM™ FEATURES

TPC Group

5151 San Felipe, Suite 800
Houston, Texas 77056
(713) 627-7474

Bank of America
Chicago, Illinois 60603

70-2328 / 719 IL

DATE	CHECK NO.	AMOUNT
21-Oct-2011	67744	$900.00

PAY Nine Hundred Dollars And Zero Cents*****

VOID AFTER 90 DAYS

TO THE ORDER OF
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. Box 13089
HOUSTON-AIR EMISSION
Autin, TX 78711

Robert R Whitlow Jr.
AUTHORIZED SIGNATURE(S)

SECURE FEATURES INCLUDE INVISIBLE FIBERS • MICROPRINTING • VOID FEATURE PANTOGRAPH • ENDORSEMENT BACKER • BROWNSTAIN CHEMICAL REACTANT

⑈067744⑈ ⑆071923284⑆ 5590095252⑈

§116.111. General Application.

In order to be granted a permit, amendment, or special permit amendment, the application must include:

(1) a completed Form PI-1 General Application signed by an authorized representative of the applicant. All additional support information specified on the form must be provided before the application is complete;

A signed Form PI-1 is included in Section 2 of this report. Additional supporting information, as specified on the application form, is included in various other sections of this report.

(2) information which demonstrates that all of the following are met.
(2)(A) Protection of public health and welfare.
(2)(A)(i) The emissions from the proposed facility will comply with all rules and regulations of the commission and with the intent of the TCAA, including protection of the health and physical property of the people.

Operations at TPC's Houston Facility are consistent with the goal of protecting the public health, welfare, and physical property of the people. This is demonstrated by the facility's compliance with all applicable air quality rules in the Texas Administrative Code, as outlined below.

Chapter 101 - General Rules:

The TPC Houston Facility will be operated in accordance with the General Rules relating to circumvention, nuisance, traffic hazard, notification and recordkeeping requirements for major emission events and for startup/shutdown/maintenance, sampling/sampling port/sampling procedures, emissions inventory requirements, compliance with Environmental Protection Agency Standards, the National Primary and Secondary Air Quality Standards, inspection fees, emissions fees, and all other applicable General Rules.

Chapter 111 - Control of Air Pollution from Visible Emissions and Particulate Matter:

The facility will comply with the allowable visible emission requirements in 30 TAC §111.111 and the particulate matter (PM) emission rate specified in 30 TAC §111.151. In addition, TPC will comply with the outdoor burning restrictions in 30 TAC §111.201.

Chapter 112 – Control of Air Pollution from Sulfur Compounds:

The TPC Houston Facility will comply with all applicable requirements of Chapter 112.

Chapter 113 – Control of Air Pollution from Toxic Materials:

Chapter 113 regulates the emission of radionuclides (40 CFR 61, Subpart R), municipal solid waste landfills, hospital/medical/infectious waste incinerators, and hazardous air pollutants for source categories (40 CFR 63). There will be no emissions of radionuclides, the Facility is not a municipal solid waste landfill and does not have a hospital/medical/infectious waste incinerator. Therefore, these sections of the regulation do not apply. Emissions from hazardous air pollutants are regulated under the MACT program, addressed in the response to NESHAP for source categories, item (2)(F) below.

Chapter 114 – Control of Air Pollution from Motor Vehicles:

All motor vehicles owned or operated by TPC will comply with the applicable provisions of this regulation including maintenance and operation of air pollution control systems or devices, inspection requirements, equipment evaluation procedures for vehicle exhaust gas analyzers, and use of oxygenated fuels.

Chapter 115 – Control of Air Pollution from Volatile Organic Compounds (VOC):

The TPC Houston Facility is located in Harris County and is regulated by §115.112, §115.122, §115.132, §115.142, §115.212, §115.352, and §115.412 [storage, vents, water separators, wastewater, loading, fugitive components, and degreasers]. The sources regulated by Chapter 115 at the facility are currently in compliance with the standards, recordkeeping, and reporting requirements associated with these regulations.

Chapter 117 – Control of Air Pollution from Nitrogen Compounds:

The TPC Houston Facility is a major source of NOx and is subject to the requirements of Chapter 117. TPC is following the requirements of the Mass Emission Cap and Trade (MECT) program and is in compliance with the standards, recordkeeping, and reporting requirements associated with Chapter 117.

Chapter 118 – Control of Air Pollution Episodes:

The TPC Houston Facility will be operated in compliance with the rules relating to generalized and localized air pollution episodes.

Chapter 122 – Federal Operating Permits:

Title V Permit No. O-1598 is issued for the TPC Houston Facility. The unit will be operated in accordance with the requirements of that Title V permit.

(2)(A)(ii) For issuance of a permit for construction or modification of any facility within 3,000 feet of an elementary, junior high/middle, or senior high school, the commission shall consider any possible

adverse short-term or long-term side effects that an air contaminant or nuisance odor from the facility may have on the individuals attending the school(s).

There are schools located within 3,000 feet of the facility. TPC will perform a health effects review if requested by TCEQ.

(2)(B) Measurement of emissions. The proposed facility will have provisions for measuring the emission of significant air contaminants as determined by the executive director. This may include the installation of sampling ports on exhaust stacks and construction of sampling platforms in accordance with guidelines in the "Texas Natural Resource Conservation Commission (TNRCC) Sampling Procedures Manual."

Emissions from any source addressed in the application will be sampled upon request of the Executive Director of the TCEQ and sampling ports, etc. will be installed as needed.

(2)(C) Best available control technology (BACT). The proposed facility will utilize BACT, with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility.

BACT requirements are addressed in Section 8 of this application.

(2)(D) New Source Performance Standards (NSPS). The emissions from the proposed facility will meet the requirements of any applicable NSPS as listed under Title 40 Code of Federal Regulations (CFR) Part 60, promulgated by the EPA under FCAA, §111, as amended.

TPC will comply with all the applicable requirements of Federal New Source Performance Standards (NSPS) regulations of 40 CFR Part 60.

(2)(E) National Emission Standards for Hazardous Air Pollutants (NESHAP). The emissions from the proposed facility will meet the requirements of any applicable NESHAP, as listed under 40 CFR Part 61, promulgated by EPA under FCAA, §112, as amended.

The TPC Houston Facility is subject to 40 CFR Part 61, Subpart FF. The site has total annual benzene quantity from waste less than 1 megagram/yr and maintains all required records to document compliance.

(2)(F) NESHAP for source categories. The emissions from the proposed facility will meet the requirements of any applicable maximum achievable control technology standard as listed under 40 CFR Part 63, promulgated by the EPA under FCAA, §112 or as listed under Chapter 113, Subchapter C of this title (relating to National Emissions Standards for Hazardous Air Pollutants for Source Categories (FCAA §112, 40 CFR 63)).

The TPC Houston Facility is a major source of HAPs. Emission units at the site are subject to 40 CFR Part 63, Subparts F, G, H, Y, FFFF, ZZZZ and DDDDD. TPC will comply with all the applicable standards.

(2)(G) Performance demonstration. The proposed facility will achieve the performance specified in the permit application. The applicant may be required to submit additional engineering data after a permit has been issued in order to demonstrate further that the proposed facility will achieve the performance specified in the permit application. In addition, dispersion modeling, monitoring, or stack testing may be required.

The TPC Houston Facility will achieve the performance as represented in this permit application.

(2)(H) Nonattainment review. If the proposed facility is located in a nonattainment area, it shall comply with all applicable requirements in this chapter concerning nonattainment review.

The facility is located in a severe nonattainment area for ozone. Emissions of volatile organic compounds (VOC) and nitrogen oxides (NOx) are regulated as precursors to ozone formation. In a severe nonattainment area, a major stationary source is defined as having VOC or NOx emissions equal and greater than 25 tons per year. The site is currently a major stationary source for both NOx and VOC emissions. For major sources, a change of 5 tons per year or more of VOC pollutant will trigger netting for Nonattainment New Source Review (NNSR)

The proposed increase in VOC and NOx emissions associated with this project, without regard to decreases, is less than five ton per year. Therefore, emission increases of VOC and NOx do not need to be evaluated for Nonattainment New Source Review (NNSR).

(2)(I) Prevention of Significant Deterioration (PSD) review. If the proposed facility is located in an attainment area, it shall comply with all applicable requirements in this chapter concerning PSD review.

The facility is operating in an attainment area for SO_2, PM_{10}, CO, NO_2 and lead. The site is a major source of criteria pollutants. There are no increases in criteria pollutant emissions associated with a physical change or modification. Therefore, PSD review is not required for any criteria pollutants.

(2)(J) Air dispersion modeling. Computerized air dispersion modeling may be required by the executive director to determine air quality impacts from a proposed new facility or source modification.

Air dispersion modeling will be performed and provided if requested by TCEQ.

(2)(K) Hazardous air pollutants. Affected sources (as defined in §116.15(1) of this title (relating to Section 112(g) Definitions)) for hazardous air pollutants shall comply with all applicable requirements under Subchapter C of this chapter (relating to Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources (FCAA, §112(g), 40 CFR Part 63)).

The proposed project does not meet the definition of construction or reconstruction of a major source.

(2)(L) Mass cap and trade allowances: If subject to Chapter 101, Subchapter H, Division 3, of this title (relating to Mass Emissions Cap and Trade Program), the proposed facility, group of facilities, or account must obtain allowances to operate.

The TPC Houston Facility is a major source of NOx, and therefore will obtain allowances to operate, as required.

APPENDIX A

EMISSION CALCULATIONS

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date	1/31/2012	Permit No.:	46307	Regulated Entity No.:	RN100219526
Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		MTCE/yr (A)	TPY (B)
EP-5	EP-5	Plant Flare	VOC	194.35	75.27
			NOx	30.61	11.56
			SO2	0.01	0.01
			CO	151.91	58.90
			BD		4.42
			HRVOC		15.00
12DG-15	12DG-15	Boilerhouse Emergency Generator	VOC	0.12	0.05
			NOx	12.87	5.47
			SO2	0.85	0.36
			PM	0.91	0.39
			CO	2.77	1.18
			Total HAPs	0.01	<0.01
3DG-14	3DG-14	OXO Emergency Generator	VOC	0.04	0.02
			NOx	4.62	1.96
			SO2	0.31	0.13
			PM	0.33	0.14
			CO	1.00	0.42
			Total HAPs	<0.01	<0.01

EPN = Emission Point Number
FIN = Facility Identification Number

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date	1/31/2012	Permit No.:	46307	Regulated Entity No.:	RN100219526
Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

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AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		MTCE/yr (A)	TPY (B)
31G-2350	31G-2350	Diesel Water Blaster Engine	VOC	0.75	0.78
			NOx	3.04	3.16
			SO2	0.01	0.01
			PM	0.10	0.10
			CO	1.72	1.79
			Total HAPs	<0.01	0.03
13G-2629	13G-2629	No. 10 Firewater Pump Engine	VOC	0.15	0.01
			NOx	4.22	0.11
			SO2	0.12	0.01
			PM	0.07	0.01
			CO	0.41	0.01
			Total HAPs	<0.01	<0.01
20DG-16	20DG-16	Dock Emergency Generator	VOC	0.10	0.01
			NOx	1.24	0.03
			SO2	0.08	0.01
			PM10	0.09	0.01
			PM2.5	0.09	0.01
			CO	0.27	0.01
			Total HAPs	<0.01	<0.01

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date	1/31/2012	Permit No.:	46307	Regulated Entity No.:	RN100219526
Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		MTCE/yr (A)	TPY (B)
21G-2216	21G-2216	Diesel Fire Pump Engine	VOC	0.40	0.01
			NOx	6.10	0.16
			SO2	0.60	0.02
			PM	0.24	0.01
			CO	0.50	0.01
			Total HAPs	0.01	<0.01
F-CT-3	F-CT-3	Cooling Tower CT-3	PM10	0.59	2.59
			PM2.5	<0.01	<0.01
			VOC	2.28	9.99
F-CT-7	F-CT-7	Cooling Tower CT-7	PM10	1.11	4.86
			PM2.5	1.11	4.86
			VOC	10.00	2.76
F-CT-10	F-CT-10	Cooling Tower CT-10	PM10	0.45	1.97
			PM2.5	0.45	1.97
			VOC	10.00	1.47
F-CT-11	F-CT-11	Cooling Tower CT-11	PM10	0.12	0.53
			PM2.5	0.12	0.53
			VOC	10.00	0.55
F-CT-14	F-CT-14	Cooling Tower CT-14	PM10	1.22	5.34
			PM2.5	1.22	5.34

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

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Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		MTCE/yr (A)	TPY (B)
			VOC	23.50	10.30
F-CT-17	F-CT-17	Cooling Tower CT-17	PM10	6.78	29.70
			PM2.5	6.78	29.70
			VOC	2.14	9.38
F-CT-18	F-CT-18	Cooling Tower CT-18	PM10	5.19	22.73
			PM2.5	5.19	22.73
			VOC	1.64	7.17
1F-511	1F-511	Tank	VOC	1.33	<0.01
Gas-2	Gas-2	Tank	VOC	46.26	0.78
T-103	T-103 MTBE/ETBE	Tank	VOC	0.42	1.28
T-111	T-111	Tank	VOC	1.01	0.01
T-112	T-112	Tank	VOC	1.01	0.01
T-114	T-114 MTBE/ETBE	Tank	VOC	0.61	1.12
T-115	T-115 MTBE/ETBE	Tank	VOC	0.61	1.12
TNK-GRP	T-117/118/119/204/205/206	Tank	VOC		1.97
T-117	T-117	Tank	VOC	0.62	TNK-GRP
T-118	T-118	Tank	VOC	0.62	TNK-GRP
T-119	T-119	Tank	VOC	0.62	TNK-GRP
T-155	T-155	Tank	VOC	0.01	<0.01
T-204	T-204	Tank	VOC	0.68	TNK-GRP

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

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Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		MTCE/yr (A)	TPY (B)
T-205	T-205	Tank	VOC	0.68	TNK-GRP
T-206	T-206	Tank	VOC	0.68	TNK-GRP
T-31	T-31 Fuel Oil/Lean Oil	Tank	VOC	4.24	0.65
T-32	Tank 32	Tank	VOC	0.08	0.33
T-33	T-33	Tank	VOC	0.58	0.01
T-34	T-34	Tank	VOC	0.29	0.23
T-77	T-77IFR	Tank	VOC	4.91	0.26
T-78	T-78IFR	Tank	VOC	4.91	0.26
T-79	T-79	Tank	VOC	1.28	0.20
T-80	T-80 Methanol/Ethanol	Tank	VOC	1.70	1.98
T-81	T-81	Tank	VOC	0.58	1.46
T-82	T-82	Tank	VOC	1.13	4.77
T-84	T-84 (IFR)	Tank	VOC	0.29	0.61
T-85	T-85	Tank	VOC	0.29	<0.01
T-86	T-86	Tank	VOC	0.58	0.47
T-Diesel	T-Diesel	Tank	VOC	0.02	<0.01
T-Diesel2	T-Diesel2	Tank	VOC	0.20	<0.01
T-P1WW1	T-P1WW1	Tank	VOC	0.01	0.01
			NH3	<0.01	<0.01
T-P1WW2	T-P1WW2	Tank	VOC	0.01	0.01

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

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Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		MTCE/yr (A)	TPY (B)
			NH3	<0.01	<0.01
T-P2WW1	T-P2WW1	Tank	VOC	0.01	0.01
			NH3	<0.01	<0.01
LOAD-GRP	E-PIBTT, E-PIBTC, E-PIB2RC1, E-PIB2RC2, E-PIB2TT1, E-PIB2TT2	Loading Emissions Cap	VOC		
1A	FU-1A	Isomerization Unit - Fugitives	VOC	1.85	8.09
			1,3-Butadiene	0.04	0.17
			Other HAPs	0.01	0.05
1C	FU-1C	Dimethyl Formamide Unit - Fugitives	VOC	4.54	19.88
			1,3-Butadiene	1.16	5.09
			Other HAPs	0.48	2.08
1D	FU-1D	Diiso Unit - Fugitives (5)	VOC	1.67	7.33
			1,3-Butadiene	0.23	1.00
			Other HAPs	0.26	1.16
2A	FU-2A	Fugitive Area No. 2	VOC	1.59	6.95
			1,3-Butadiene	0.17	0.75
			Other HAPs	0.23	1.00
2B	FU-2B	Fugitive Area No. 2B	VOC	1.31	5.73
			1,3-Butadiene	0.25	1.07
FUG-2C	FU-2C	Tank Car Loading Fugitives	VOC	0.45	1.98

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AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		MTCE/yr (A)	TPY (B)
			1,3-Butadiene	0.09	0.38
			Other HAPs	0.06	0.26

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

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Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

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AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		MTCE/yr (A)	TPY (B)
FUG-2D	FU-2D	Truck Rack Loading Fugitives	VOC	0.16	0.69
			1,3-Butadiene	0.03	0.13
			Other HAPs	0.02	0.09
FUG-3	FU-3	Fugitive Area No. 3	VOC	2.44	10.70
			1,3-Butadiene	0.54	2.38
			Other HAPs	0.09	0.41
FUG-4	FU-4	Fugitive Area No. 4	VOC	2.76	12.10
			1,3-Butadiene	0.58	2.54
			Other HAPs	0.23	1.01
FUG-5	FU-5	Fugitive Area No. 5	VOC	0.03	0.15
			Other HAPs	0.03	0.15
DEGREASER1	DEGREASER1	Cold Solvent Degreaser	VOC	--	0.02
DEGREASER2	DEGREASER2	Cold Solvent Degreaser	VOC	--	0.02
19G-3789	19G-3789	Diesel driven Fire Water Engine	VOC	0.08	<0.01
			NOx	2.46	0.06
			SO2	0.02	0.01
			PM	0.10	0.01
			CO	0.63	0.02
			Total HAPs	0.01	<0.01
T01	T01	Diesel Tank	VOC		<0.01

EPN = Emission Point Number
FIN = Facility Identification Number

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date	1/31/2012	Permit No.:	46307	Regulated Entity No.:	RN100219526
Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		MTCE/yr (A)	TPY (B)
2F6	2F6	Furfural Sump Tank	VOC		<0.01
4F14	4F14	Furfural Sump Tank	VOC		<0.01
5F3	5F3	Furfural Sump Tank	VOC		<0.01
LABSUMP	LABSUMP	Lab Sump	VOC	0.04	0.01
N14-C475	N14-C475	Cummins Diesel Air Compressor N14-C475	VOC	1.17	0.03
			NOx	14.73	0.38
			SO2	0.97	0.03
			PM10	1.05	0.03
			PM2.5	1.05	0.03
			CO	3.17	0.08
			Total HAPs	0.01	<0.01

EPN = Emission Point Number
FIN = Facility Identification Number

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date	1/31/2012	Permit No.:	46307	Regulated Entity No.:	RN100219526
Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA			EMISSION POINT DISCHARGE PARAMETERS										
1. Emission Point			4. UTM Coordinates of Emission			5.	6. Height	7. Stack Exit Data			8. Fugitives		
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)	Building Height (Feet)	Above Ground (Feet)	(A) Diameter (Feet)	(B) Velocity (fps)	(C) Temperature (°F)	(A) Length (Ft)	(B) Width (Ft)	(C) Axis Degrees
EP-5	EP-5	Plant Flare	15										
12DG-15	12DG-15	Boilerhouse Emergency Generator	15										
3DG-14	3DG-14	OXO Emergency Generator	15										
31G-2350	31G-2350	Diesel Water Blaster Engine	15										
13G-2629	13G-2629	No. 10 Firewater Pump Engine	15										
20DG-16	20DG-16	Dock Emergency Generator	15										
21G-2216	21G-2216	Diesel Fire Pump Engine	15										
F-CT-3	F-CT-3	Cooling Tower CT-3	15										
F-CT-7	F-CT-7	Cooling Tower CT-7	15										
F-CT-10	F-CT-10	Cooling Tower CT-10	15										
F-CT-11	F-CT-11	Cooling Tower CT-11	15										
F-CT-14	F-CT-14	Cooling Tower CT-14	15										
F-CT-17	F-CT-17	Cooling Tower CT-17	15										
F-CT-18	F-CT-18	Cooling Tower CT-18	15										
1F-511	1F-511	Tank	15										
Gas-2	Gas-2	Tank	15										
T-103	T-103 (DEFR)	Tank	15										
T-114	T-114 MTBE	Tank	15										
T-115	T-115 MTBE	Tank	15										
T-117	T-117	Tank	15										
T-118	T-118	Tank	15										
T-119	T-119	Tank	15										
T-155	T-155	Tank	15										
T-204	T-204	Tank	15										
T-205	T-205	Tank	15										
T-206	T-206	Tank	15										
T-31	T-31 (Fuel Oil)	Tank	15										
T-32	Tank 32	Tank	15										
T-33	T-33	Tank	15										
T-34	T-34	Tank	15										

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date	1/31/2012	Permit No.:	46307	Regulated Entity No.:	RN100219526
Area Name:	TPC Group LLC			Customer Reference No.:	CN603624289

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA			EMISSION POINT DISCHARGE PARAMETERS										
1. Emission Point			4. UTM Coordinates of Emission			5.	6. Height	7. Stack Exit Data			8. Fugitives		
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)	Building Height (Feet)	Above Ground (Feet)	(A) Diameter (Feet)	(B) Velocity (fps)	(C) Temperature (°F)	(A) Length (Ft)	(B) Width (Ft)	(C) Axis Degrees
DEGREASER2	DEGREASER2	Cold Solvent Degreaser	15										
19G-3789	19G-3789	Diesel driven Fire Water Engine	15										
T01	T01	Diesel Tank	15										
2F6	2F6	Furfural Sump Tank	15										
4F14	4F14	Furfural Sump Tank	15										
5F3	5F3	Furfural Sump Tank	15										
LABSUMP	LABSUMP	Lab Sump	15										
N14-C475	N14-C475	Cummins Diesel Air Compressor N14-C475	15										

TPC Group LLC
Houston Plant
Emission Calculations

EPN	FIN	Description	Pollutant	Current MAERT Emissions		Project Emissions		Proposed PTE Emissions	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EP-5	EP-5	Plant Flare	VOC	194.00	74.58	0.35	0.69	194.35	75.27
			NO_x	29.29	11.52	1.32	0.04	30.61	11.56
			SO2	0.01	0.01			0.01	0.01
			CO	149.24	58.69	2.67	0.21	151.91	58.90
			BD		4.42				4.42
			HRVOC		15.00				15.00
12DG-15	12DG-15	Boilerhouse Emergency Generator	VOC	0.12	0.05			0.12	0.05
			NO_x	12.87	5.47			12.87	5.47
			SO2	0.85	0.36			0.85	0.36
			PM	0.91	0.39			0.91	0.39
			CO	2.77	1.18			2.77	1.18
			Total HAPs			0.01	0.00	0.01	0.00
3DG-14	3DG-14	OXO Emergency Generator	VOC	0.04	0.02			0.04	0.02
			NO_x	4.62	1.96			4.62	1.96
			SO2	0.31	0.13			0.31	0.13
			PM	0.33	0.14			0.33	0.14
			CO	1.00	0.42			1.00	0.42
			Total HAPs			0.00	0.00	0.00	0.00
31G-2350	31G-2350	Diesel Water Blaster Engine	VOC	0.75	0.78			0.75	0.78
			NO_x	3.04	3.16			3.04	3.16
			SO2	0.01	0.01			0.01	0.01
			PM	0.10	0.10			0.10	0.10
			CO	1.72	1.79			1.72	1.79
			Total HAPs			0.01	0.03	0.01	0.03
13G-2629	13G-2629	No. 10 Firewater Pump	VOC			0.15	0.01	0.15	0.01
			NOx			4.22	0.11	4.22	0.11
			SO_2			0.12	0.01	0.12	0.01
			PM			0.07	0.01	0.07	0.01
			CO			0.41	0.01	0.41	0.01
			Total HAPs			0.01	0.00	0.01	0.00
20DG-16	20DG-16	Dock Emergency Generator	VOC			0.10	0.01	0.10	0.01
			NOx			1.24	0.03	1.24	0.03
			SO_2			0.08	0.01	0.08	0.01
			PM10			0.09	0.01	0.09	0.01
			PM2.5			0.09	0.01	0.09	0.01
			CO			0.27	0.01	0.27	0.01
			Total HAPs			0.00	0.00	0.00	0.00
21G-2216	21G-2216	Diesel Fire Pump Engine	VOC			0.40	0.01	0.40	0.01
			NOx			6.10	0.16	6.10	0.16
			SO_2			0.60	0.02	0.60	0.02
			PM			0.24	0.01	0.24	0.01
			CO			0.50	0.01	0.50	0.01
			Total HAPs			0.01	0.00	0.01	0.00
F-CT-1	F-CT-1	Cooling Tower CT-1	VOC	50.40	22.08	-50.40	-22.08	0	0
F-CT-3	F-CT-3	Cooling Tower CT-3	PM10			0.59	2.59	0.59	2.59
			PM2.5			0.00	0.01	0.00	0.01
			VOC	24.40	10.67	2.28	9.99	2.28	9.99
F-CT-7	F-CT-7	Cooling Tower CT-7	PM10			1.11	4.86	1.11	4.86
			PM2.5			1.11	4.86	1.11	4.86
			VOC	10.00	2.76			10.00	2.76
F-CT-10	F-CT-10	Cooling Tower CT-10	PM10			0.45	1.97	0.45	1.97
			PM2.5			0.45	1.97	0.45	1.97
			VOC	10.00	1.47			10.00	1.47
F-CT-11	F-CT-11	Cooling Tower CT-11	PM10			0.12	0.53	0.12	0.53
			PM2.5			0.12	0.53	0.12	0.53
			VOC	10.00	0.55			10.00	0.55
F-CT-14	F-CT-14	Cooling Tower CT-14	PM10			1.22	5.34	1.22	5.34
			PM2.5			1.22	5.34	1.22	5.34
			VOC	23.50	10.30			23.50	10.30
F-CT-17	F-CT-17	Cooling Tower CT-17	PM10			6.78	29.70	6.78	29.70
			PM2.5			6.78	29.70	6.78	29.70
			VOC			2.14	9.38	2.14	9.38
F-CT-18	F-CT-18	Cooling Tower CT-18	PM10			5.19	22.73	5.19	22.73
			PM2.5			5.19	22.73	5.19	22.73
			VOC			1.64	7.17	1.64	7.17
1F-511	1F-511	Tank	Fuel Oil			1.33	0.01	1.33	0.01
Gas-2	Gas-2	Tank	Gasoline (RVP 13)			46.26	0.78	46.26	0.78

FUG-2C	FU-2C	Tank Car Loading Fugitives	VOC	0.45	1.98			**0.45**	**1.98**
			1,3-Butadiene			0.09	0.38	**0.09**	**0.38**
			Other HAPs			0.06	0.26	**0.06**	**0.26**
FUG-2D	FU-2D	Truck Rack Loading Fugitives	VOC	0.16	0.69			**0.16**	**0.69**
			1,3-Butadiene			0.03	0.13	**0.03**	**0.13**
			Other HAPs			0.02	0.09	**0.02**	**0.09**
FUG-3	FU-3	Fugitive Area No. 3	VOC	2.44	10.70			**2.44**	**10.70**
			1,3-Butadiene			0.54	2.38	**0.54**	**2.38**
			Other HAPs			0.09	0.41	**0.09**	**0.41**
FUG-4	FU-4	Fugitive Area No. 4	VOC	2.76	12.10			**2.76**	**12.10**
			1,3-Butadiene			0.58	2.54	**0.58**	**2.54**
			Other HAPs			0.23	1.01	**0.23**	**1.01**
FUG-5	FU-5	Fugitive Area No. 5	VOC	0.03	0.15			**0.03**	**0.15**
			Other HAPs			0.03	0.15	**0.03**	**0.15**
DEGREASER1	DEGREASER1	Cold Solvent Degreaser	VOC				0.02		**0.02**
DEGREASER2	DEGREASER2	Cold Solvent Degreaser	VOC				0.02		**0.02**
19G-3789	19G-3789	Diesel driven Fire Water Engine	VOC			0.08	0.00	**0.08**	**0.00**
			NOx			2.46	0.06	**2.46**	**0.06**
			SO2			0.02	0.01	**0.02**	**0.01**
			PM			0.10	0.01	**0.10**	**0.01**
			CO			0.63	0.02	**0.63**	**0.02**
			Total HAPs			0.01	0.00	**0.01**	**0.00**
T01	T01	Diesel Tank	VOC				0.00		**0.00**
2F6	2F6	Furfural Sump Tank	VOC				<0.01		**<0.01**
4F14	4F14	Furfural Sump Tank	VOC				<0.01		**<0.01**
5F3	5F3	Furfural Sump Tank	VOC				<0.01		**<0.01**
LABSUMP	LABSUMP	Lab Sump	VOC			0.04	0.01	**0.04**	**0.01**
N14-C475	N14-C475	Cummins Diesel Air Compressor N14-C475	VOC			1.17	0.03	**1.17**	**0.03**
			NO_x			14.73	0.38	**14.73**	**0.38**
			SO2			0.97	0.03	**0.97**	**0.03**
			PM10			1.05	0.03	**1.05**	**0.03**
			PM2.5			1.05	0.03	**1.05**	**0.03**
			CO			3.17	0.08	**3.17**	**0.08**
			Total HAPs			0.01	0.00	**0.01**	**0.00**

Storage Tank Emissions [1]

EPN	Product	Product Vapor Pressure	Product Vapor MW	Flow Rates	Working Losses	Standing Losses	Emissions	
		psia	lb/lb-mol	bbl/hr	lb/yr	lb/yr	lb/hr	tpy
1F-511	Fuel Oil	0.07	130.00	157.00	1.87	8.24	1.33	0.01
Gas-2	Gasoline (RVP 13)	10.45	62.00	71.43	369.68	1185.78	46.26	0.78
T-103 MTBE	Methyl-tert-butyl ether (MTBE)	4.85	88.15		320.10	2236.28	0.00	1.28
T-103 ETBE	ETBE	2.40	102.17		317.52	1157.04	0.00	0.74
T-114 MTBE	Methyl-tert-butyl ether (MTBE)	4.85	88.15		362.44	1869.00	0.00	1.12
T-114 ETBE	ETBE	2.40	102.17		359.52	967.01	0.00	0.66
T-115 MTBE	Methyl-tert-butyl ether (MTBE)	4.85	88.15		362.44	1869.00	0.00	1.12
T-115 ETBE	ETBE	2.40	102.17		359.52	967.01	0.00	0.66
T-117/118/119	Polyisobutylene	0.12	93.30		1477.54	0.00		0.74
T-117	Polyisobutylene	0.12	93.30	54.44			0.62	
T-118	Polyisobutylene	0.12	93.30	54.44			0.62	
T-119	Polyisobutylene	0.12	93.30	54.44			0.62	
T-155	Triethanolamine	0.0002	149.19		0.06	0.02	0.00	0.01
T-204/T205/T-206	Polyisobutylene	0.12	93.30		2455.25	0.00	0.00	1.23
T-204	Polyisobutylene	0.12	93.30	59.39			0.68	
T-205	Polyisobutylene	0.12	93.30	59.39			0.68	
T-206	Polyisobutylene	0.12	93.30	59.39			0.68	
T-31 (Fuel Oil)	Fuel Oil	0.06	130.00		27.22	30.66	0.00	0.03
T-31 Lean Oil	Lean oil	2.05	130.00		29.28	1264.78	0.00	0.65
T-33	Furfural	0.04	96.09		9.66	4.10	0.00	0.01
T-34	Fuel Oil	0.07	130.00		417.30	41.66	0.00	0.23
T-77IFR	Diisobutylene	0.87	112.20	50.00	87.76	436.93	4.91	0.26
T-78IFR	Diisobutylene	0.87	112.20	50.00	87.76	436.93	4.91	0.26
T-79	Diisobutylene	0.87	112.20	13.00	26.42	378.68	1.28	0.20
T-80	Methyl alcohol	2.41	32.04		3751.25	216.27	0.00	1.98
T-80 Ethanol	Ethyl alcohol	1.15	46.07		3739.94	140.46	0.00	1.94
T-81	Furfural	0.04	96.09		2871.18	46.74	0.00	1.46

TPC Group LLC
Houston Plant
Emission Calculations

EPN: EP-5

Description: Plant Flare

Parameters:

PIB Overhead Stream Composition

Compound	Flow	Heating Value
	lb/hr	Btu/lb
Methanol	[illegible]	[illegible]
Isobutane	[illegible]	[illegible]
Isobutene	[illegible]	[illegible]

Heat Input to Flare	0.14	MMBtu/hr
VOC Conrol Efficiency (C1-C3)	[illegible]	[1]
VOC Conrol Efficiency (C3+)	[illegible]	[1]
Annual Hours of Operation	[illegible]	hr/yr

Emission Factors:

Pollutant	Emission Factor	Units	Emission Factor Reference
NOx	0.0680	lb/MMBtu	[2]
CO	0.3465	lb/MMBtu	[2]

Total Emissions:

Pollutant	Maximum Hourly Emissions lb/hr	Annual Average Emissions ton/yr
NOx	0.01	0.04
CO	0.05	0.21
NM/NEVOC	0.16	0.69

[1] VOC destruction efficiencies are obtained from *Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers*, 10/2000 .
[2] Emission Factor used is for a steam assisted flare with low Btu stream provided in *Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, 10/2000* .

Sample Calculation:

CO Maximum Hourly Emissions

*CO (lb/hr) = CO emission factor (lb/MMBtu) * Heat Input Rate (MMBtu/hr)*

$$\frac{0.35\ \text{lb}}{\text{MMBtu}} \times \frac{0.14\ \text{MMBtu}}{\text{Hour}} = \frac{0.05\ \text{lb}}{\text{Hour}}$$

VOC Maximum Hourly Emissions

*VOC (lb/hr) = Stream flow rate (lb/hr) * (1-VOC control efficiency)*

$$\frac{15.47\ \text{lb}}{\text{hr}} \times (1\text{-}99\%\ \text{DRE}) + \frac{0.09\ \text{lb}+0.04\ \text{lb}}{\text{hr}} \times (1\text{-}98\%\ \text{DRE}) = \frac{0.16\ \text{lb}}{\text{Hour}}$$

CO Annual Average Emissions

*CO (tpy) = CO emission rate (lb/hr) * unit run time (hr/yr) * conversion factor lb to ton (1ton/2000lb)*

$$\frac{0.05\ \text{lb}}{\text{Hour}} \times \frac{8{,}760\ \text{hr}}{\text{Year}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} = \frac{0.21\ \text{ton}}{\text{Year}}$$

Color Code

Input data

Emission Calculations

Calculation Parameters

Flow rate =	[redacted]	GPM	
VOC Factor =	[redacted]	ppmw	Permit Limit
Total Liquid Drift (%) =	[redacted]		Based onProcess Knowledge
TDS =	[redacted]		AP-42 Section 13.4
Density =	[redacted]	lb/gal	

Component	Concentration (ppmw)	Emissions	
		lb/hr	tpy
VOC	0.08	2.28	9.99

PM-10 Emissions

Reference: AP-42, Section 13.4, Wet Cooling Towers, 1/95.

Throughput (gal/min):	[redacted]
Annual Hours of Operation:	[redacted]
Hourly Operating Throughput (1000 gal./hr):	3420
Annual Operating Throughput (1000 gal./yr):	29,959,200
Total Liquid Drift (%):	[redacted]
TDS (ppm):	[redacted]
Liquid Drift (gal/hr):	68.40
Liquid Drift (gal/yr):	599,184.00
Density (lb/gal):	8.34
Liquid Drift (lb/hr):	570.46
Liquid Drift (lb/yr):	4,997,194.56
Total PM Drift (lb/hr):	0.80
Total PM Drift (ton/yr):	3.50

Total PM Emissions		PM2.5 Reisman			PM10 Reisman		
lb/hr	ton/yr	mass %	lb/hr	ton/yr	mass %	lb/hr	ton/yr
0.80	3.50	0.22	0.002	0.008	74.11	0.59	2.59

TPC Group LLC
Houston Plant
Emission Calculations

EPN: F-CT-7

Parameters

Density of Water (32°F)	[redacted]	lb/gal
Hours of Operation	[redacted]	hr/yr
Circulation Rate	[redacted]	gpm
Total Dissolved Solids	[redacted]	ppm[1]

Emission Calculations

EPN	FIN	PM_{10} Emission Factor[2]	Adjusted PM_{10} Emission Factor[3]	PM_{10} Emissions		$PM_{2.5}$ Emissions[4]	
		(lb/Mgal)	(lb/Mgal)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
F-CT-7	CT-7	0.019	0.0022	1.11	4.86	1.11	4.86

[1] TDS concentration used is based on site monitoring data.
[2] Based on AP-42 Table 13.4-1, PARTICULATE EMISSIONS FACTORS FOR WET COOLING TOWERS, 1/95.
[3] Adjusted PM-10 factor developed by adjusting the AP-42 emission factor (based on 12,000 ppm TDS) based on surrogate TDS data for TPC's cooling towers (1,400 ppm).
[4] $PM_{2.5}$ is conservatively assumed to equal 100 % of PM_{10}.

Sample Calculation:

Adjusted PM-10 Emission Factor = 0.019 lb/Mgal* [1,400 ppm/12,000 ppm]

$$\text{PM Emission Factor (lb/Mgal)} = \frac{0.019\ \text{lb}}{\text{Mgal}} \cdot \frac{1400\ \text{ppm}}{12000\ \text{ppm}} = \frac{0.0022\ \text{lb}}{\text{Mgal}}$$

Hourly PM Emissions (lb/hr) = (Adj. Emission Factor lb/Mgal) * (1/1000 Mgal/gal) * (Circulation Rate [gpm]) * (60 min/hour)

$$\text{PM Emissions (lb/hr)} = \frac{0.0022\ \text{lb}}{\text{Mgal}} \cdot \frac{8379\ \text{gpm}}{} \cdot \frac{60\ \text{min}}{\text{hr}} \cdot \frac{}{1000} = \frac{1.11\ \text{lb}}{\text{hr}}$$

Annual PM Emissions (tpy) = (Hourly PM emissions [lb/hr])*(Hours of Operation [hr/yr])*(2000 lb/ton).

$$\text{PM Emissions (lb/hr)} = \frac{1.11\ \text{lb}}{\text{hr}} \cdot \frac{8760\ \text{hr}}{\text{yr}} \cdot \frac{\text{ton}}{2000\ \text{lb}} = \frac{4.86\ \text{ton}}{\text{yr}}$$

TPC Group LLC
Houston Plant
Emission Calculations

EPN: F-CT-10

Parameters

Density of Water (32°F)	[redacted]	lb/gal
Hours of Operation	[redacted]	hr/yr
Circulation Rate	[redacted]	gpm
Total Dissolved Solids	[redacted]	ppm[1]

Emission Calculations

EPN	FIN	PM_{10} Emission Factor[2]	Adjusted PM_{10} Emission Factor[3]	PM_{10} Emissions		$PM_{2.5}$ Emissions[4]	
		(lb/Mgal)	(lb/Mgal)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
F-CT-10	CT-10	0.019	0.0022	0.45	1.97	0.45	1.97

[1] TDS concentration used is based on site monitoring data.
[2] Based on AP-42 Table 13.4-1, PARTICULATE EMISSIONS FACTORS FOR WET COOLING TOWERS, 1/95.
[3] Adjusted PM-10 factor developed by adjusting the AP-42 emission factor (based on 12,000 ppm TDS) based on surrogate TDS data for TPC's cooling towers (1,400 ppm).
[4] $PM_{2.5}$ is conservatively assumed to equal 100 % of PM_{10}.

Sample Calculation:

Adjusted PM-10 Emission Factor = 0.019 lb/Mgal* [1,400 ppm/12,000 ppm]

$$\text{PM Emission Factor (lb/Mgal)} = \frac{0.019\ \text{lb}}{\text{Mgal}} \cdot \frac{1400\ \text{ppm}}{12000\ \text{ppm}} = \frac{0.0022\ \text{lb}}{\text{Mgal}}$$

Hourly PM Emissions (lb/hr) = (Adj. Emission Factor lb/Mgal) * (1/1000 Mgal/gal) * (Circulation Rate [gpm]) * (60 min/hour)

$$\text{PM Emissions (lb/hr)} = \frac{0.0022\ \text{lb}}{\text{Mgal}} \cdot \frac{3419\ \text{gpm}}{} \cdot \frac{60\ \text{min}}{\text{hr}} \cdot \frac{}{1000} = \frac{0.45\ \text{lb}}{\text{hr}}$$

Annual PM Emissions (tpy) = (Hourly PM emissions [lb/hr])*(Hours of Operation [hr/yr])*(2000 lb/ton).

$$\text{PM Emissions (lb/hr)} = \frac{0.45\ \text{lb}}{\text{hr}} \cdot \frac{8760\ \text{hr}}{\text{yr}} \cdot \frac{\text{ton}}{2000\ \text{lb}} = \frac{1.97\ \text{ton}}{\text{yr}}$$

TPC Group LLC
Houston Plant
Emission Calculations

EPN: F-CT-11

Parameters

Density of Water (32°F)	[redacted]	lb/gal
Hours of Operation	[redacted]	hr/yr
Circulation Rate	[redacted]	gpm
Total Dissolved Solids	[redacted]	ppm[1]

Emission Calculations

EPN	FIN	PM_{10} Emission Factor[2]	Adjusted PM_{10} Emission Factor[3]	PM_{10} Emissions		$PM_{2.5}$ Emissions[4]	
		(lb/Mgal)	(lb/Mgal)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
F-CT-11	CT-11	0.019	0.0022	0.12	0.53	0.12	0.53

[1] TDS concentration used is based on site monitoring data.
[2] Based on AP-42 Table 13.4-1, PARTICULATE EMISSIONS FACTORS FOR WET COOLING TOWERS, 1/95.
[3] Adjusted PM-10 factor developed by adjusting the AP-42 emission factor (based on 12,000 ppm TDS) based on surrogate TDS data for TPC's cooling towers (1,400 ppm).
[4] $PM_{2.5}$ is conservatively assumed to equal 100 % of PM_{10}.

Sample Calculation:

Adjusted PM-10 Emission Factor = 0.019 lb/Mgal* [1,400 ppm/12,000 ppm]

$$\text{PM Emission Factor (lb/Mgal)} = \frac{0.019\ \text{lb}}{\text{Mgal}} \cdot \frac{1400\ \text{ppm}}{12000\ \text{ppm}} = \frac{0.0022\ \text{lb}}{\text{Mgal}}$$

Hourly PM Emissions (lb/hr) = (Adj. Emission Factor lb/Mgal) * (1/1000 Mgal/gal) * (Circulation Rate [gpm]) * (60 min/hour)

$$\text{PM Emissions (lb/hr)} = \frac{0.0022\ \text{lb}}{\text{Mgal}} \cdot \frac{880\ \text{gpm}}{} \cdot \frac{60\ \text{min}}{\text{hr}} \cdot \frac{}{1000} = \frac{0.12\ \text{lb}}{\text{hr}}$$

Annual PM Emissions (tpy) = (Hourly PM emissions [lb/hr])*(Hours of Operation [hr/yr])*(2000 lb/ton).

$$\text{PM Emissions (lb/hr)} = \frac{0.12\ \text{lb}}{\text{hr}} \cdot \frac{8760\ \text{hr}}{\text{yr}} \cdot \frac{\text{ton}}{2000\ \text{lb}} = \frac{0.53\ \text{ton}}{\text{yr}}$$

TPC Group LLC
Houston Plant
Emission Calculations

EPN: F-CT-14

Parameters

Density of Water (32°F)	[redacted]	lb/gal
Hours of Operation	[redacted]	hr/yr
Circulation Rate	[redacted]	gpm
Total Dissolved Solids	[redacted]	ppm[1]

Emission Calculations

EPN	FIN	PM_{10} Emission Factor[2]	Adjusted PM_{10} Emission Factor[3]	PM_{10} Emissions		$PM_{2.5}$ Emissions[4]	
		(lb/Mgal)	(lb/Mgal)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
F-CT-14	CT-14	0.019	0.0022	1.22	5.34	1.22	5.34

[1] TDS concentration used is based on site monitoring data.
[2] Based on AP-42 Table 13.4-1, PARTICULATE EMISSIONS FACTORS FOR WET COOLING TOWERS, 1/95.
[3] Adjusted PM-10 factor developed by adjusting the AP-42 emission factor (based on 12,000 ppm TDS) based on surrogate TDS data for TPC's cooling towers (1,400 ppm).
[4] $PM_{2.5}$ is conservatively assumed to equal 100 % of PM_{10}.

Sample Calculation:

Adjusted PM-10 Emission Factor = 0.019 lb/Mgal* [1,400 ppm/12,000 ppm]

$$\text{PM Emission Factor (lb/Mgal)} = \frac{0.019\ \text{lb}}{\text{Mgal}} \cdot \frac{1400\ \text{ppm}}{12000\ \text{ppm}} = \frac{0.0022\ \text{lb}}{\text{Mgal}}$$

Hourly PM Emissions (lb/hr) = (Adj. Emission Factor lb/Mgal) * (1/1000 Mgal/gal) * (Circulation Rate [gpm]) * (60 min/hour)

$$\text{PM Emissions (lb/hr)} = \frac{0.0022\ \text{lb}}{\text{Mgal}} \cdot \frac{9188\ \text{gpm}}{} \cdot \frac{60\ \text{min}}{\text{hr}} \cdot \frac{}{1000} = \frac{1.22\ \text{lb}}{\text{hr}}$$

Annual PM Emissions (tpy) = (Hourly PM emissions [lb/hr])*(Hours of Operation [hr/yr])*(2000 lb/ton).

$$\text{PM Emissions (lb/hr)} = \frac{1.22\ \text{lb}}{\text{hr}} \cdot \frac{8760\ \text{hr}}{\text{yr}} \cdot \frac{\text{ton}}{2000\ \text{lb}} = \frac{5.34\ \text{ton}}{\text{yr}}$$

TPC Group LLC
Houston Plant
Emission Calculations

EPN: F-CT-17

Parameters

Density of Water (32°F)	[redacted]	lb/gal
Hours of Operation	[redacted]	hr/yr
Circulation Rate	[redacted]	gpm
Total Dissolved Solids	[redacted]	ppm [1]

Emission Calculations

EPN	FIN	VOC Emission Factor [2] (lb/MMgal)	PM_{10} Emission Factor [3] (lb/Mgal)	Adjusted PM_{10} Emission Factor [4] (lb/Mgal)	PM_{10} Emissions (lb/hr)	PM_{10} Emissions (tpy)	$PM_{2.5}$ Emissions [5] (lb/hr)	$PM_{2.5}$ Emissions [5] (tpy)	VOC Emissions (lb/hr)	VOC Emissions (tpy)
F-CT-17	CT-17	7.00E-01	0.019	0.0022	6.78	29.70	6.78	29.70	2.14	9.38

[1] TDS concentration used is based on site monitoring data.
[2] Based on AP-42 Table 5.1-2, FUGITIVE EMISSION FACTORS FOR PETROLEUM REFINERIES, 1/95.
[3] Based on AP-42 Table 13.4-1, PARTICULATE EMISSIONS FACTORS FOR WET COOLING TOWERS, 1/95.
[4] Adjusted PM-10 factor developed by adjusting the AP-42 emission factor (based on 12,000 ppm TDS) based on surrogate TDS data for TPC's cooling towers (1,400 ppm).
[5] $PM_{2.5}$ is conservatively assumed to equal 100 % of PM_{10}.

Sample Calculation:

Hourly VOC Emissions (lb/hr) = (Emission Factor lb/MMgal) * (1/10^6 MMgal/gal) * (Circulation Rate [gpm]) * (60 min/hour)

$$\text{VOC Emissions (lb/hr)} = \frac{0.700\ \text{lb}}{\text{MMgal}} \cdot \text{gpm} \cdot \frac{60\ \text{min}}{\text{hr}} \cdot \frac{1}{1000000} = \frac{2.142\ \text{lb}}{\text{hr}}$$

Adjusted PM-10 Emission Factor = 0.019 lb/Mgal* [1,400 ppm/12,000 ppm]

$$\text{PM Emission Factor (lb/Mgal)} = \frac{0.019\ \text{lb}}{\text{Mgal}} \cdot \frac{1400\ \text{ppm}}{12000\ \text{ppm}} = \frac{0.0022\ \text{lb}}{\text{Mgal}}$$

Hourly VOC Emissions (lb/hr) = (Adj. Emission Factor lb/Mgal) * (1/1000 Mgal/gal) * (Circulation Rate [gpm]) * (60 min/hour)

$$\text{PM Emissions (lb/hr)} = \frac{0.0022\ \text{lb}}{\text{Mgal}} \cdot 51000\ \text{gpm} \cdot \frac{60\ \text{min}}{\text{hr}} \cdot \frac{1}{1000} = \frac{6.78\ \text{lb}}{\text{hr}}$$

Annual PM Emissions (tpy) = (Hourly PM emissions [lb/hr])*(Hours of Operation [hr/yr])*(2000 lb/ton).

$$\text{PM Emissions (lb/hr)} = \frac{6.78\ \text{lb}}{\text{hr}} \cdot \frac{8760\ \text{hr}}{\text{yr}} \cdot \frac{\text{ton}}{2000\ \text{lb}} = \frac{29.7\ \text{ton}}{\text{yr}}$$

TPC Group LLC
Houston Plant
Emission Calculations

EPN: F-CT-17

Parameters

Density of Water (32°F)	[redacted]	lb/gal
Hours of Operation	[redacted]	hr/yr
Circulation Rate	[redacted]	gpm
Total Dissolved Solids	[redacted]	ppm [1]

Emission Calculations

EPN	FIN	VOC Emission Factor [2] (lb/MMgal)	PM_{10} Emission Factor [3] (lb/Mgal)	Adjusted PM_{10} Emission Factor [4] (lb/Mgal)	PM_{10} Emissions (lb/hr)	PM_{10} Emissions (tpy)	$PM_{2.5}$ Emissions [5] (lb/hr)	$PM_{2.5}$ Emissions [5] (tpy)	VOC Emissions (lb/hr)	VOC Emissions (tpy)
F-CT-18	CT-18	7.00E-01	0.019	0.0022	5.19	22.73	5.19	22.73	1.64	7.17

[1] TDS concentration used is based on site monitoring data.
[2] Based on AP-42 Table 5.1-2, FUGITIVE EMISSION FACTORS FOR PETROLEUM REFINERIES, 1/95.
[3] Based on AP-42 Table 13.4-1, PARTICULATE EMISSIONS FACTORS FOR WET COOLING TOWERS, 1/95.
[4] Adjusted PM-10 factor developed by adjusting the AP-42 emission factor (based on 12,000 ppm TDS) based on surrogate TDS data for TPC's cooling towers (1,400 ppm).
[5] $PM_{2.5}$ is conservatively assumed to equal 100 % of PM_{10}.

Sample Calculation:

Hourly VOC Emissions (lb/hr) = (Emission Factor lb/MMgal) * (1/10^6 MMgal/gal) * (Circulation Rate [gpm]) * (60 min/hour)

$$\text{VOC Emissions (lb/hr)} = \frac{0.700\ \text{lb}}{\text{MMgal}} \cdot \frac{\text{gpm}}{} \cdot \frac{60\ \text{min}}{\text{hr}} \cdot \frac{}{1000000} = \frac{1.638\ \text{lb}}{\text{hr}}$$

Adjusted PM-10 Emission Factor = 0.019 lb/Mgal* [1,400 ppm/12,000 ppm]

$$\text{PM Emission Factor (lb/Mgal)} = \frac{0.019\ \text{lb}}{\text{Mgal}} \cdot \frac{1400\ \text{ppm}}{12000\ \text{ppm}} = \frac{0.0022\ \text{lb}}{\text{Mgal}}$$

Hourly VOC Emissions (lb/hr) = (Adj. Emission Factor lb/Mgal) * (1/1000 Mgal/gal) * (Circulation Rate [gpm]) * (60 min/hour)

$$\text{PM Emissions (lb/hr)} = \frac{0.0022\ \text{lb}}{\text{Mgal}} \cdot \frac{39000\ \text{gpm}}{} \cdot \frac{60\ \text{min}}{\text{hr}} \cdot \frac{}{1000} = \frac{5.19\ \text{lb}}{\text{hr}}$$

Annual PM Emissions (tpy) = (Hourly PM emissions [lb/hr])*(Hours of Operation [hr/yr])*(2000 lb/ton).

$$\text{PM Emissions (lb/hr)} = \frac{5.19\ \text{lb}}{\text{hr}} \cdot \frac{8760\ \text{hr}}{\text{yr}} \cdot \frac{\text{ton}}{2000\ \text{lb}} = \frac{22.73\ \text{ton}}{\text{yr}}$$

TPC Group LLC
Houston Plant
Emission Calculations

EPN: 12DG-15

Description: Boilerhouse Emergency Generator

Parameters:

Engine Rating:	415	hp	[1]
Annual Hours of Operation:	52	hr/yr	
Brake-Specific Fuel Consumption (BSFC)	7,000	Btu/hp-hr	[2]

HAP Emissions

Pollutant	Emission Factor [3] (lb/MMBtu)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
Benzene	9.33E-04	2.71E-03	7.05E-05
Toluene	4.09E-04	1.19E-03	3.09E-05
Xylenes	2.85E-04	8.28E-04	2.15E-05
1,3 Butadiene	3.91E-05	1.14E-04	2.95E-06
Formaldehyde	1.18E-03	3.43E-03	8.91E-05
Acetaldehyde	7.67E-04	2.23E-03	5.79E-05
Acrolein	9.25E-05	2.69E-04	6.99E-06
Naphthalene	8.48E-05	2.46E-04	6.40E-06
	Total HAPs	**1.10E-02**	**2.86E-04**

[1] Based on 2010 EI calculations presented in "2010 Monthly Emissions Calc_final_06302011.xlsx".
[2] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, foot note "a", 10/96.
[3] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-2 - Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, 10/96.

Sample Calculation:

Benzene Maximum Hourly Emissions

$$\frac{7000\ \text{Btu}}{\text{hp-hr}} \times 415\ \text{hp} \times \frac{0.0009\ \text{lb}}{1000000\ \text{MMBtu}} = 0.0027\ \text{lb/hr}$$

Benzene Maximum Annual Emissions

$$\frac{0.0027\ \text{lb}}{\text{Hour}} \times \frac{52\ \text{hr}}{\text{Year}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} = 0.00\ \text{ton/yr}$$

Color Code

Input data

TPC Group LLC
Houston Plant
Emission Calculations

EPN: 19G-3789
Description: Diesel Driven Firewater Engine

Parameters:

Engine Rating:	422	hp	[1]
Annual Hours of Operation:	52	hr/yr	
Brake-Specific Fuel Consumption (BSFC)	7,000	Btu/hp-hr	[2]

Emission Factors:

Pollutant	Emission Factor [1]	Units	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
PM	0.107	g/hp-hr	0.10	0.01
SO_2	0.29	lb/MMBtu	0.02	0.01
NOx	2.64	g/hp-hr	2.46	0.06
CO	0.68	g/hp-hr	0.63	0.02
VOC	0.09	g/hp-hr	0.08	0.01

HAP Emissions

Pollutant	Emission Factor [3] (lb/MMBtu)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
Benzene	9.33E-04	2.76E-03	7.17E-05
Toluene	4.09E-04	1.21E-03	3.14E-05
Xylenes	2.85E-04	8.42E-04	2.19E-05
1,3 Butadiene	3.91E-05	1.16E-04	3.00E-06
Formaldehyde	1.18E-03	3.49E-03	9.06E-05
Acetaldehyde	7.67E-04	2.27E-03	5.89E-05
Acrolein	9.25E-05	2.73E-04	7.10E-06
Naphthalene	8.48E-05	2.50E-04	6.51E-06
	Total HAPs	**1.12E-02**	**2.91E-04**

[1] Based on 2010 EI calculations presented in "2010 Monthly Emissions Calc_final_06302011.xlsx".
[2] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, foot note "a", 10/96.
[3] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-2 - Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, 10/96.

Sample Calculation:

Benzene Maximum Hourly Emissions

$$\frac{7000\ \text{Btu}}{\text{hp-hr}} \times 422\ \text{hp} \times \frac{0.0009\ \text{lb}}{1000000\ \text{MMBtu}} = 0.0028\ \text{lb/hr}$$

Benzene Maximum Annual Emissions

$$\frac{0.0028\ \text{lb}}{\text{Hour}} \times \frac{52\ \text{hr}}{\text{Year}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} = 0.00\ \text{ton/yr}$$

Color Code
Input data

TPC Group LLC
Houston Plant
Emission Calculations

EPN: 3DG-14
Description: OXO Emergency Generator

Parameters:

Engine Rating:	149	hp	[1]
Annual Hours of Operation:	52	hr/yr	
Brake-Specific Fuel Consumption (BSFC)	7,000	Btu/hp-hr	[2]

HAP Emissions

Pollutant	Emission Factor [3] (lb/MMBtu)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
Benzene	9.33E-04	9.73E-04	2.53E-05
Toluene	4.09E-04	4.27E-04	1.11E-05
Xylenes	2.85E-04	2.97E-04	7.73E-06
1,3 Butadiene	3.91E-05	4.08E-05	1.06E-06
Formaldehyde	1.18E-03	1.23E-03	3.20E-05
Acetaldehyde	7.67E-04	8.00E-04	2.08E-05
Acrolein	9.25E-05	9.65E-05	2.51E-06
Naphthalene	8.48E-05	8.84E-05	2.30E-06
	Total HAPs	**3.95E-03**	**1.03E-04**

[1] Based on 2010 EI calculations presented in "2010 Monthly Emissions Calc_final_06302011.xlsx".
[2] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, foot note "a", 10/96.
[3] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-2 - Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, 10/96.

Sample Calculation:

Benzene Maximum Hourly Emissions

$$\frac{7000\ \text{Btu}}{\text{hp-hr}} \times 149\ \text{hp} \times \frac{0.0009\ \text{lb}}{1000000\ \text{MMBtu}} = 0.0010\ \text{lb/hr}$$

Benzene Maximum Annual Emissions

$$\frac{0.0010\ \text{lb}}{\text{Hour}} \times \frac{52\ \text{hr}}{\text{Year}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} = 0.00\ \text{ton/yr}$$

Color Code
Input data

EPN: 31G-2350

Description: Diesel Water Blaster Engine

Parameters:

Engine Rating:	300	hp	[1]
Annual Hours of Operation:	8,760	hr/yr	
Brake-Specific Fuel Consumption (BSFC)	7,000	Btu/hp-hr	[2]

HAP Emissions

Pollutant	Emission Factor [3] (lb/MMBtu)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
Benzene	9.33E-04	1.96E-03	8.58E-03
Toluene	4.09E-04	8.59E-04	3.76E-03
Xylenes	2.85E-04	5.99E-04	2.62E-03
1,3 Butadiene	3.91E-05	8.21E-05	3.60E-04
Formaldehyde	1.18E-03	2.48E-03	1.09E-02
Acetaldehyde	7.67E-04	1.61E-03	7.05E-03
Acrolein	9.25E-05	1.94E-04	8.51E-04
Naphthalene	8.48E-05	1.78E-04	7.80E-04
	Total HAPs	**7.96E-03**	**3.49E-02**

[1] Based on 2010 EI calculations presented in "2010 Monthly Emissions Calc_final_06302011.xlsx".
[2] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, foot note "a", 10/96.
[3] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-2 - Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, 10/96.

Sample Calculation:

Benzene Maximum Hourly Emissions

$$\frac{7000\ \text{Btu}}{\text{hp-hr}} \times 300\ \text{hp} \times \frac{0.0009\ \text{lb}}{1000000\ \text{MMBtu}} = 0.0020\ \text{lb/hr}$$

Benzene Maximum Annual Emissions

$$\frac{0.0020\ \text{lb}}{\text{Hour}} \times \frac{8760\ \text{hr}}{\text{Year}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} = 0.01\ \text{ton/yr}$$

Color Code

Input data

TPC Group LLC
Houston Plant
Emission Calculations

EPN: 13G-2629
Description: No. 10 Firewater Pump Engine

Parameters:

Engine Rating:	375	hp	[1]
Annual Hours of Operation:	52	hr/yr	
Brake-Specific Fuel Consumption (BSFC)	7,000	Btu/hp-hr	[2]

Emission Factors:

Pollutant	Emission Factor [1] (g/hp-hr)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
PM	0.09	0.07	0.01
SO_2	0.14	0.12	0.01
NOx	5.10	4.22	0.11
CO	0.49	0.41	0.01
VOC	0.18	0.15	0.01

HAP Emissions

Pollutant	Emission Factor [3] (lb/MMBtu)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
Benzene	9.33E-04	2.45E-03	6.37E-05
Toluene	4.09E-04	1.07E-03	2.79E-05
Xylenes	2.85E-04	7.48E-04	1.95E-05
1,3 Butadiene	3.91E-05	1.03E-04	2.67E-06
Formaldehyde	1.18E-03	3.10E-03	8.05E-05
Acetaldehyde	7.67E-04	2.01E-03	5.23E-05
Acrolein	9.25E-05	2.43E-04	6.31E-06
Naphthalene	8.48E-05	2.23E-04	5.79E-06
	Total HAPs	**9.95E-03**	**2.59E-04**

[1] Based on manufacturer's data, per 210 EI calculations presented in "2010 Monthly Emissions Calc_final_06302011.xlsx".
[2] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, foot note "a", 10/96.
[3] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-2 - Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, 10/96.

Sample Calculation:

PM_{10} Maximum Hourly Emissions

$$\frac{0.09\ g}{hp\text{-}hr} \times 375\ hp \times \frac{1\ lb}{453.59\ g} = 0.07\ lb/hr$$

PM_{10} Maximum Annual Emissions

$$\frac{0.07\ lb}{Hour} \times \frac{052\ hr}{Year} \times \frac{1\ ton}{2000\ lb} = 0.01\ ton/yr$$

Color Code
Input data

TPC Group LLC
Houston Plant
Emission Calculations

EPN: 20DG-16

Description: Dock Emergency Generator

Parameters:

Engine Rating:	40	hp	[1]
Annual Hours of Operation:	52	hr/yr	
Brake-Specific Fuel Consumption (BSFC)	7,000	Btu/hp-hr	[2]

Emission Factors:

Pollutant	Emission Factor [3] (lb/hp-hr)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
PM10 [4]	2.20E-03	0.09	0.01
PM2.5 [4]	2.20E-03	0.09	0.01
SO_2	2.05E-03	0.08	0.01
NOx	3.10E-02	1.24	0.03
CO	6.68E-03	0.27	0.01
VOC	2.47E-03	0.10	0.01

HAP Emissions

Pollutant	Emission Factor [5] (lb/MMBtu)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
Benzene	9.33E-04	2.61E-04	6.79E-06
Toluene	4.09E-04	1.15E-04	2.98E-06
Xylenes	2.85E-04	7.98E-05	2.07E-06
1,3 Butadiene	3.91E-05	1.09E-05	2.85E-07
Formaldehyde	1.18E-03	3.30E-04	8.59E-06
Acetaldehyde	7.67E-04	2.15E-04	5.58E-06
Acrolein	9.25E-05	2.59E-05	6.73E-07
Naphthalene	8.48E-05	2.37E-05	6.17E-07
	Total HAPs	**1.06E-03**	**2.76E-05**

[1] Based on 2010 EI calculations presented in "2010 Monthly Emissions Calc_final_06302011.xlsx".
[2] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, foot note "a", 10/96.
[3] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96.
[4] Per foot note "b" to AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines; 10/96, it is assumed that all the PM is less than 1μ in diameter. Hence, the factor is used for both PM10 and PM2.5 emissions.
[5] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-2 - Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, 10/96.

Sample Calculation:

PM_{10} Maximum Hourly Emissions

$$\frac{0.0022\ \text{lb}}{\text{hp-hr}} \cdot 40\ \text{hp} \cdot \frac{1\ \text{lb}}{453.59\ \text{g}} = 0.09\ \text{lb/hr}$$

PM_{10} Maximum Annual Emissions

$$\frac{0.09\ \text{lb}}{\text{Hour}} \cdot \frac{052\ \text{hr}}{\text{Year}} \cdot \frac{1\ \text{ton}}{2000\ \text{lb}} = 0.01\ \text{ton/yr}$$

Color Code

Input data

TPC Group LLC
Houston Plant
Emission Calculations

EPN: N14-C475

Description: Cummins Diesel Air Compressor

Parameters:

Engine Rating:	475	hp	[1]
Annual Hours of Operation:	52	hr/yr	
Brake-Specific Fuel Consumption (BSFC)	7,000	Btu/hp-hr	[1]

Emission Factors:

Pollutant	Emission Factor [2] (lb/hp-hr)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
PM10 [3]	2.20E-03	1.05	0.03
PM2.5 [3]	2.20E-03	1.05	0.03
SO_2	2.05E-03	0.97	0.03
NOx	3.10E-02	14.73	0.38
CO	6.68E-03	3.17	0.08
VOC	2.47E-03	1.17	0.03

HAP Emissions

Pollutant	Emission Factor [4] (lb/MMBtu)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
Benzene	9.33E-04	3.10E-03	8.07E-05
Toluene	4.09E-04	1.36E-03	3.54E-05
Xylenes	2.85E-04	9.48E-04	2.46E-05
1,3 Butadiene	3.91E-05	1.30E-04	3.38E-06
Formaldehyde	1.18E-03	3.92E-03	1.02E-04
Acetaldehyde	7.67E-04	2.55E-03	6.63E-05
Acrolein	9.25E-05	3.08E-04	8.00E-06
Naphthalene	8.48E-05	2.82E-04	7.33E-06
	Total HAPs	**1.25E-02**	**3.24E-04**

[1] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, foot note "a", 10/96.
[2] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96.
[3] Per foot note "b" to AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines; 10/96, it is assumed that all the PM is less than 1 μ in diameter. Hence, the factor is used for both PM10 and PM2.5 emissions.
[4] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-2 - Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, 10/96.

Sample Calculation:

PM_{10} Maximum Hourly Emissions

$$\frac{0.0022\text{lb}}{\text{hp-hr}} \times 475\text{ hp} \times \frac{1\text{ lb}}{453.59\text{ g}} = 1.05\text{ lb/hr}$$

PM_{10} Maximum Annual Emissions

$$\frac{1.05\text{ lb}}{\text{Hour}} \times 052\text{ hr} \times \frac{1\text{ ton}}{2000\text{ lb}} = 0.03\text{ ton/yr}$$

Color Code

Input data

TPC Group LLC
Houston Plant
Emission Calculations

EPN: 21G-2216
Description: Diesel Fire Pump Engine

Parameters:

Engine Rating:	430	hp	[1]
Annual Hours of Operation:	52	hr/yr	
Brake-Specific Fuel Consumption (BSFC)	7,000	Btu/hp-hr	[2]

Emission Factors:

Pollutant	Emission Factor [1] (lb/hr)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
PM	0.24	0.24	0.01
SO_2	0.60	0.60	0.02
NOx	6.10	6.10	0.16
CO	0.50	0.50	0.01
VOC	0.40	0.40	0.01

HAP Emissions

Pollutant	Emission Factor [3] (lb/MMBtu)	Max. Hourly Emissions lb/hr	Annual Emissions ton/yr
Benzene	9.33E-04	2.81E-03	7.30E-05
Toluene	4.09E-04	1.23E-03	3.20E-05
Xylenes	2.85E-04	8.58E-04	2.23E-05
1,3 Butadiene	3.91E-05	1.18E-04	3.06E-06
Formaldehyde	1.18E-03	3.55E-03	9.23E-05
Acetaldehyde	7.67E-04	2.31E-03	6.00E-05
Acrolein	9.25E-05	2.78E-04	7.24E-06
Naphthalene	8.48E-05	2.55E-04	6.64E-06
	Total HAPs	**1.14E-02**	**2.97E-04**

[1] Based on manufacturer's data, per 2010 EI calculations presented in "2010 Monthly Emissions Calc_final_06302011.xlsx".
[2] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-1 - Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, foot note "a", 10/96.
[3] Based on AP-42 Fifth Edition, Volume 1, Chapter 3 , Section 3.3 - Gasoline and Diesel Industrial Engines, Table 3.3-2 - Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, 10/96.

Sample Calculation:

PM_{10} Maximum Hourly Emissions

$$\frac{0.24\ g}{hp\text{-}hr} \times 430\ hp \times \frac{1\ lb}{453.59\ g} = 0.24\ lb/hr$$

PM_{10} Maximum Annual Emissions

$$\frac{0.24\ lb}{Hour} \times \frac{052\ hr}{Year} \times \frac{1\ ton}{2000\ lb} = 0.01\ ton/yr$$

Color Code
Input data

TPC Group LLC
Houston Plant
Emission Calculations

		FU Areas emissions composition, wt% - as used in previous EI reports											
					HAP			HAP			HAP	HAP	
	Propylene	Butane	Isobutane	Butene	Butadiene	Pentane	Furfural	DMF	Olef-U	DIB	Methanol	MTBE	Fuel Oil
FU-1A	1.76	11.5098	3.3193	53.7538	2.0535	0.0016	0.0000	0.0000	25.9144	0.0000	0.0000	0.5747	1.1099
FU-1B													
FU-1C	0.01	12.0426	4.0550	28.7872	25.6196	1.1449	14.6819	9.5086	1.3026	1.8722	0.0414	0.9286	0.0004
FU-1D	0.01	2.9543	27.4639	1.0170	13.6394	0.0045	28.4004	0.0045	0.9677	9.6729	5.7529	10.1067	0.0045
FU-2A	0.48	27.1517	15.4775	22.7543	10.7709	0.0004	0.0004	0.0004	9.0350	0.0004	8.4450	5.8860	0.0004
FU-2B	0.39	31.4080	23.3285	7.5573	18.7233	0.0000	0.0000	0.0000	18.5932	0.0000	0.0000	0.0000	0.0000
FU-2C/D	0.00	1.7497	21.5447	27.5720	19.1151	0.0000	0.0000	0.0000	0.0287	12.9961	0.0000	12.9961	3.9975
FU-3	0.00	13.0621	18.7050	19.6786	22.2139	7.0775	0.0055	1.8043	5.7162	3.5765	1.1425	0.8569	6.1610
FU-4	0.00	18.0703	5.1411	36.9581	21.0156	0.0000	0.0102	0.0197	7.0705	3.3919	6.0405	2.2821	0.0000
FU-5	0.00								0.0000			100.0000	0.0000

EPN	Currently Permitted VOC Emissions		HAP Emissions							
			Butadiene	DMF	Methanol	MTBE	Butadiene	DMF	Methanol	MTBE
	lb/hr	tpy	lb/hr	lb/hr	lb/hr	lb/hr	tpy	tpy	tpy	tpy
FU-1A	1.85	8.09	0.0380	0.0000	0.0000	0.0106	0.1661	0.0000	0.0000	0.0465
FU-1B	0.02	0.1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FU-1C	4.54	19.88	1.1631	0.4317	0.0019	0.0422	5.0932	1.8903	0.0082	0.1846
FU-1D	1.67	7.33	0.2278	0.0001	0.0961	0.1688	0.9998	0.0003	0.4217	0.7408
FU-2A	1.59	6.95	0.1713	0.0000	0.1343	0.0936	0.7486	0.0000	0.5869	0.4091
FU-2B	1.31	5.73	0.2453	0.0000	0.0000	0.0000	1.0728	0.0000	0.0000	0.0000
FU-2C	0.45	1.98	0.0860	0.0000	0.0000	0.0585	0.3785	0.0000	0.0000	0.2573
FU-2D	0.16	0.69	0.0306	0.0000	0.0000	0.0208	0.1319	0.0000	0.0000	0.0897
FU-3	2.44	10.7	0.5420	0.0440	0.0279	0.0209	2.3769	0.1931	0.1222	0.0917
FU-4	2.76	12.1	0.5800	0.0005	0.1667	0.0630	2.5429	0.0024	0.7309	0.2761
FU-5	0.03	0.15	0.0000	0.0000	0.0000	0.0300	0.0000	0.0000	0.0000	0.1500

Loading Emissions

Equation:

$$L_L = \frac{12.46 \times S \times M \times P \times (1\text{-}CE)}{T}$$

Variables:

L_L - Loading Loss (lbs/1000 gal loaded)
S - Saturation Factor (From Table 5.2-1 of AP-42, Section 5.2)
P - True Vapor Pressure of Loaded Liquid (psia)
M - Molecular Weight of Vapor (lb/lb mol)
T- Temperature of Bulk Liquid (°R = [°F + 460])

Hourly loading controlled to vapor system

	Material Loaded	Loading Method	S	P_{max}[a] (psia)	M (lb/lbmol)	T (F)	T (°R)	L_L (lbs/1000 gal)	Capture Efficiency[b] (%)	Maximum Filling Rate[c] (gal/hr)	Hourly Fugitive Emissions (lb/hr)	Hourly Emissions to Vapor Recovery System (lbs/hr)
E-PIBTT	Polyisobutylene	submerged	0.6	0.432	93.30	200	660.0	0.4570	95%	68,027	1.55	29.53
E-PIB-TC	Polyisobutylene	submerged	0.6	0.432	93.30	200	660.0	0.4570	95%	68,027	1.55	29.53
E-PIB2RC1	Polyisobutylene	submerged	0.6	0.432	93.30	200	660.0	0.4570	95%	73,696	1.68	32.00
E-PIB2RC2	Polyisobutylene	submerged	0.6	0.432	93.30	200	660.0	0.4570	95%	73,696	1.68	32.00
E-PIB2TT1	Polyisobutylene	submerged	0.6	0.432	93.30	200	660.0	0.4570	95%	73,696	1.68	32.00
E-PIB2TT2	Polyisobutylene	submerged	0.6	0.432	93.30	200	660.0	0.4570	95%	73,696	1.68	32.00

Annual loading controlled to vapor system

	Material Loaded	Loading Method	S	P_{avg}[d] (psia)	M (lb/lbmol)	T (F)	T (°R)	L_L (lbs/1000 gal)	Capture Efficiency[b] (%)	Annual Throughput (gal/yr)	Annual Fugitive Emissions (tpy)	Annual Emissions to Vapor Recovery System (tpy)
LOAD-GRP	Polyisobutylene	submerged	0.6	0.138	93.30	200	660.0	0.1460	95%	1,241,500,000	4.53	86.10

NOTES:

(a) Worst case maximum short-term loading loss factor and emissions based on loading of PIB Grade "HOF260" at 200 °F, with corresponding PIB vapor pressure of 0.432 psia and estimated PIB vapor space molecular weight of 93.3 lb/lb-mole.

(b) Controlled loading will be conducted into tank trucks and rail cars that have been DOT leak tested (95% capture) with captured emissions being routed to the plant vent recovery system.

(c) Maximum short-term controlled transfer to truck or railcar equals PIB-1 or PIB-2 production capacity.

(d) Annual loading loss factor and emissions based on annual average vapor pressure of 0.138 psia assuming 5% PIB Grade HOF260 (vp = 0.432 psia), 95% PIB Grade 575 (vp = 0.123 psia), and estimated PIB vapor space molecular weight of 93.3 lb/lb-mole.

APPENDIX B

SUPPORTING DOCUMENTS

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

Identification

User Identification:	1F-511
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):		20.00
Diameter (ft):		7.50
Volume (gallons):		6,609.13
Turnovers:		2.00
Net Throughput(gal/yr):		13,218.26
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

1F-511 - Horizontal Tank
Houston, Texas

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
Fuel Oil	Jan	61.33	56.49	66.17	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Feb	63.24	57.86	68.61	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Mar	66.49	61.09	71.90	67.93	0.0400	0.0400	0.0447	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Apr	70.21	64.66	75.75	67.93	0.0405	0.0400	0.0544	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	May	73.22	67.46	78.98	67.93	0.0480	0.0400	0.0624	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jun	75.96	70.18	81.75	67.93	0.0549	0.0404	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jul	76.90	71.00	82.80	67.93	0.0572	0.0425	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Aug	76.62	70.81	82.43	67.93	0.0566	0.0420	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Sep	74.50	68.97	80.03	67.93	0.0513	0.0400	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Oct	70.45	64.55	76.36	67.93	0.0411	0.0400	0.0559	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Nov	66.19	60.93	71.45	67.93	0.0400	0.0400	0.0436	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Dec	62.62	57.63	67.61	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04

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

1F-511 - Horizontal Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5320	0.5365	0.5945	0.6014	0.7676	0.8456	0.9235	0.8988	0.7581	0.6756	0.5585	0.5481
Vapor Space Volume (cu ft):	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853
Vapor Density (lb/cu ft):	0.0009	0.0009	0.0009	0.0009	0.0011	0.0012	0.0013	0.0013	0.0012	0.0009	0.0009	0.0009
Vapor Space Expansion Factor:	0.0330	0.0370	0.0373	0.0388	0.0407	0.0408	0.0414	0.0408	0.0390	0.0415	0.0362	0.0341
Vented Vapor Saturation Factor:	0.9921	0.9921	0.9921	0.9920	0.9905	0.9892	0.9888	0.9889	0.9899	0.9919	0.9921	0.9921
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853	562.7853
Tank Diameter (ft):	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000
Effective Diameter (ft):	13.8233	13.8233	13.8233	13.8233	13.8233	13.8233	13.8233	13.8233	13.8233	13.8233	13.8233	13.8233
Vapor Space Outage (ft):	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500
Tank Shell Length (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0009	0.0009	0.0009	0.0009	0.0011	0.0012	0.0013	0.0013	0.0012	0.0009	0.0009	0.0009
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0330	0.0370	0.0373	0.0388	0.0407	0.0408	0.0414	0.0408	0.0390	0.0415	0.0362	0.0341
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0000	0.0000	0.0047	0.0144	0.0224	0.0246	0.0225	0.0230	0.0250	0.0159	0.0036	0.0000
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0400	0.0400	0.0404	0.0425	0.0420	0.0400	0.0400	0.0400	0.0400
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0400	0.0400	0.0447	0.0544	0.0624	0.0650	0.0650	0.0650	0.0650	0.0559	0.0436	0.0400
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9921	0.9921	0.9921	0.9920	0.9905	0.9892	0.9888	0.9889	0.9899	0.9919	0.9921	0.9921
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Vapor Space Outage (ft):	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500	3.7500
Working Losses (lb):	0.1364	0.1364	0.1364	0.1382	0.1638	0.1872	0.1952	0.1928	0.1748	0.1402	0.1364	0.1364
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Net Throughput (gal/mo.):	1,101.5217	1,101.5217	1,101.5217	1,101.5217	1,101.5217	1,101.5217	1,101.5217	1,101.5217	1,101.5217	1,101.5217	1,101.5217	1,101.5217

Annual Turnovers:	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Diameter (ft):	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.6684	0.6729	0.7309	0.7396	0.9314	1.0328	1.1187	1.0916	0.9328	0.8158	0.6949	0.6845

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

1F-511 - Horizontal Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Fuel Oil	1.87	8.24	10.11

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

Identification

User Identification:	Gas-2
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):		18.00
Diameter (ft):		5.33
Volume (gallons):		3,000.00
Turnovers:		10.00
Net Throughput(gal/yr):		30,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

Gas-2 - Horizontal Tank
Houston, Texas

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
Gasoline (RVP 13)	Jan	61.33	56.49	66.17	67.93	7.1213	6.5036	7.7846	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Feb	63.24	57.86	68.61	67.93	7.3772	6.6739	8.1381	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Mar	66.49	61.09	71.90	67.93	7.8312	7.0900	8.6324	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Apr	70.21	64.66	75.75	67.93	8.3755	7.5732	9.2434	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	May	73.22	67.46	78.98	67.93	8.8381	7.9699	9.7792	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Jun	75.96	70.18	81.75	67.93	9.2772	8.3710	10.2589	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Jul	76.90	71.00	82.80	67.93	9.4309	8.4951	10.4460	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Aug	76.62	70.81	82.43	67.93	9.3851	8.4671	10.3798	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Sep	74.50	68.97	80.03	67.93	9.0418	8.1915	9.9601	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Oct	70.45	64.55	76.36	67.93	8.4123	7.5577	9.3416	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Nov	66.19	60.93	71.45	67.93	7.7879	7.0683	8.5642	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
Gasoline (RVP 13)	Dec	62.62	57.63	67.61	67.93	7.2941	6.6452	7.9922	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3

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

Gas-2 - Horizontal Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	61.8748	66.5621	83.1387	95.1422	115.4222	126.3366	139.0377	135.0475	113.1221	105.8521	77.4487	66.7977
Vapor Space Volume (cu ft):	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098
Vapor Density (lb/cu ft):	0.0790	0.0815	0.0860	0.0913	0.0958	0.1001	0.1015	0.1011	0.0978	0.0917	0.0856	0.0807
Vapor Space Expansion Factor:	0.1982	0.2328	0.2568	0.2963	0.3415	0.3801	0.4026	0.3917	0.3432	0.3186	0.2477	0.2119
Vented Vapor Saturation Factor:	0.4985	0.4897	0.4748	0.4581	0.4448	0.4328	0.4288	0.4300	0.4392	0.4570	0.4762	0.4925
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098	255.8098
Tank Diameter (ft):	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300
Effective Diameter (ft):	11.0552	11.0552	11.0552	11.0552	11.0552	11.0552	11.0552	11.0552	11.0552	11.0552	11.0552	11.0552
Vapor Space Outage (ft):	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650
Tank Shell Length (ft):	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0790	0.0815	0.0860	0.0913	0.0958	0.1001	0.1015	0.1011	0.0978	0.0917	0.0856	0.0807
Vapor Molecular Weight (lb/lb-mole):	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.1213	7.3772	7.8312	8.3755	8.8381	9.2772	9.4309	9.3851	9.0418	8.4123	7.7879	7.2941
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.1982	0.2328	0.2568	0.2963	0.3415	0.3801	0.4026	0.3917	0.3432	0.3186	0.2477	0.2119
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	1.2810	1.4642	1.5423	1.6702	1.8094	1.8879	1.9509	1.9127	1.7686	1.7839	1.4960	1.3471
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.1213	7.3772	7.8312	8.3755	8.8381	9.2772	9.4309	9.3851	9.0418	8.4123	7.7879	7.2941
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	6.5036	6.6739	7.0900	7.5732	7.9699	8.3710	8.4951	8.4671	8.1915	7.5577	7.0683	6.6452
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.7846	8.1381	8.6324	9.2434	9.7792	10.2589	10.4460	10.3798	9.9601	9.3416	8.5642	7.9922
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.4985	0.4897	0.4748	0.4581	0.4448	0.4328	0.4288	0.4300	0.4392	0.4570	0.4762	0.4925
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	7.1213	7.3772	7.8312	8.3755	8.8381	9.2772	9.4309	9.3851	9.0418	8.4123	7.7879	7.2941
Vapor Space Outage (ft):	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650	2.6650
Working Losses (lb):	26.2808	27.2255	28.9008	30.9095	32.6167	34.2372	34.8045	34.6355	33.3685	31.0455	28.7409	26.9186
Vapor Molecular Weight (lb/lb-mole):	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.1213	7.3772	7.8312	8.3755	8.8381	9.2772	9.4309	9.3851	9.0418	8.4123	7.7879	7.2941
Net Throughput (gal/mo.):	2,500.0000	2,500.0000	2,500.0000	2,500.0000	2,500.0000	2,500.0000	2,500.0000	2,500.0000	2,500.0000	2,500.0000	2,500.0000	2,500.0000

Annual Turnovers:	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Diameter (ft):	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300	5.3300
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	88.1556	93.7875	112.0395	126.0517	148.0390	160.5738	173.8422	169.6829	146.4905	136.8977	106.1896	93.7164

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

Gas-2 - Horizontal Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 13)	369.68	1,185.78	1,555.47

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

Identification

User Identification:	T-103 ETBE
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Domed External Floating Roof Tank
Description:	ETBE

Tank Dimensions

Diameter (ft):	200.00
Volume (gallons):	11,256,000.00
Turnovers:	27.24

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	30
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	80
Roof Drain (3-in. Diameter)/90% Closed	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

T-103 ETBE - Domed External Floating Roof Tank
Houston, Texas

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
ETBE	Jan	61.33	56.49	66.17	67.93	1.5971	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Feb	63.24	57.86	68.61	67.93	1.6810	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Mar	66.49	61.09	71.90	67.93	1.8329	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Apr	70.21	64.66	75.75	67.93	2.0197	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	May	73.22	67.46	78.98	67.93	2.1823	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Jun	75.96	70.18	81.75	67.93	2.3398	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Jul	76.90	71.00	82.80	67.93	2.3956	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Aug	76.62	70.81	82.43	67.93	2.3789	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Sep	74.50	68.97	80.03	67.93	2.2550	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Oct	70.45	64.55	76.36	67.93	2.0325	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Nov	66.19	60.93	71.45	67.93	1.8182	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Dec	62.62	57.63	67.61	67.93	1.6536	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438

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

T-103 ETBE - Domed External Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	29.3625	31.0029	33.9959	37.7252	41.0163	44.2438	45.3978	45.0527	42.5009	37.9834	33.7056	30.4663
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0287	0.0303	0.0333	0.0369	0.0401	0.0433	0.0444	0.0441	0.0416	0.0372	0.0330	0.0298
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.5971	1.6810	1.8329	2.0197	2.1823	2.3398	2.3956	2.3789	2.2550	2.0325	1.8182	1.6536
Tank Diameter (ft):	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000
Vapor Molecular Weight (lb/lb-mole):	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	26.4600	26.4600	26.4600	26.4600	26.4600	26.4600	26.4600	26.4600	26.4600	26.4600	26.4600	26.4600
Net Throughput (gal/mo.):	25,550,000.000025,550,000.000025,550,000.000025,550,000.000025,550,000.000025,550,000.000025,550,000.000025,550,000.000025,550,000.000025,550,000.000025,550,000.000025,550,000.0000											
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500
Tank Diameter (ft):	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000
Roof Fitting Losses (lb):	45.7247	48.2792	52.9401	58.7476	63.8726	68.8986	70.6957	70.1583	66.1845	59.1497	52.4880	47.4437
Value of Vapor Pressure Function:	0.0287	0.0303	0.0333	0.0369	0.0401	0.0433	0.0444	0.0441	0.0416	0.0372	0.0330	0.0298
Vapor Molecular Weight (lb/lb-mole):	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	101.5472	105.7421	113.3959	122.9329	131.3489	139.6024	142.5534	141.6709	135.1454	123.5931	112.6536	104.3700

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	6.0383
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	52.8351
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	46.7968
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	31.00	150.00	1.40	116.9920
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	1.7737
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	30	2.00	0.37	0.91	225.4361
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	80	0.82	0.53	0.14	247.5702
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	6.7931

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-103 ETBE - Domed External Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
ETBE	452.45	317.52	704.58	0.00	1,474.56

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

Identification

User Identification:	T-103 MTBE
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Domed External Floating Roof Tank
Description:	MTBE

Tank Dimensions

Diameter (ft):	200.00
Volume (gallons):	11,256,000.00
Turnovers:	27.24

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	30
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	80
Roof Drain (3-in. Diameter)/90% Closed	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

T-103 MTBE - Domed External Floating Roof Tank
Houston, Texas

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
Methyl-tert-butyl ether (MTBE)	Jan	61.33	56.49	66.17	67.93	3.3383	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Feb	63.24	57.86	68.61	67.93	3.5080	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Mar	66.49	61.09	71.90	67.93	3.7979	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Apr	70.21	64.66	75.75	67.93	4.1323	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	May	73.22	67.46	78.98	67.93	4.4543	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Jun	75.96	70.18	81.75	67.93	4.7479	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Jul	76.90	71.00	82.80	67.93	4.8482	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Aug	76.62	70.81	82.43	67.93	4.8184	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Sep	74.50	68.97	80.03	67.93	4.5919	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Oct	70.45	64.55	76.36	67.93	4.1585	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Nov	66.19	60.93	71.45	67.93	3.7709	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Dec	62.62	57.63	67.61	67.93	3.4534	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11

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

T-103 MTBE - Domed External Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	56.6762	59.9783	65.7314	72.5512	79.3192	85.6687	87.8765	87.2195	82.2731	73.0938	65.1877	58.9106
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0643	0.0680	0.0746	0.0823	0.0900	0.0972	0.0997	0.0989	0.0933	0.0829	0.0740	0.0668
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.3383	3.5080	3.7979	4.1323	4.4543	4.7479	4.8482	4.8184	4.5919	4.1585	3.7709	3.4534
Tank Diameter (ft):	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000
Vapor Molecular Weight (lb/lb-mole):	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	26.6751	26.6751	26.6751	26.6751	26.6751	26.6751	26.6751	26.6751	26.6751	26.6751	26.6751	26.6751
Net Throughput (gal/mo.):	25,550,000.000	25,550,000.000	25,550,000.000	25,550,000.000	25,550,000.000	25,550,000.000	25,550,000.000	25,550,000.000	25,550,000.000	25,550,000.000	25,550,000.000	25,550,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000
Tank Diameter (ft):	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000
Roof Fitting Losses (lb):	88.2590	93.4012	102.3603	112.9804	123.5198	133.4076	136.8457	135.8226	128.1197	113.8253	101.5136	91.7385
Value of Vapor Pressure Function:	0.0643	0.0680	0.0746	0.0823	0.0900	0.0972	0.0997	0.0989	0.0933	0.0829	0.0740	0.0668
Vapor Molecular Weight (lb/lb-mole):	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700	186.8700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	171.6103	180.0547	194.7669	212.2067	229.5142	245.7514	251.3973	249.7173	237.0679	213.5942	193.3764	177.3242

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	11.6706
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	102.1174
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	90.4468
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	31.00	150.00	1.40	226.1171
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	3.4282
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	30	2.00	0.37	0.91	437.6459
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	80	0.82	0.53	0.14	478.4929
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	13.1294

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-103 MTBE - Domed External Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Methyl-tert-butyl ether (MTBE)	874.49	320.10	1,361.79	0.00	2,556.38

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

Identification

User Identification:	T-111
City:	Houston
State:	Texas
Company:	Texas Petrochemicals Corp
Type of Tank:	Horizontal Tank
Description:	Horizontal fixed tank roof storing Lube Oil.

Tank Dimensions

Shell Length (ft):	24.75
Diameter (ft):	10.00
Volume (gallons):	14,700.00
Turnovers:	1.00
Net Throughput(gal/yr):	14,700.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.13
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-111 - Horizontal Tank
Houston, Texas

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
Fuel Oil	Jan	61.33	56.49	66.17	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Feb	63.24	57.86	68.61	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Mar	66.49	61.09	71.90	67.93	0.0400	0.0400	0.0447	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Apr	70.21	64.66	75.75	67.93	0.0405	0.0400	0.0544	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	May	73.22	67.46	78.98	67.93	0.0480	0.0400	0.0624	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jun	75.96	70.18	81.75	67.93	0.0549	0.0404	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jul	76.90	71.00	82.80	67.93	0.0572	0.0425	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Aug	76.62	70.81	82.43	67.93	0.0566	0.0420	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Sep	74.50	68.97	80.03	67.93	0.0513	0.0400	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Oct	70.45	64.55	76.36	67.93	0.0411	0.0400	0.0559	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Nov	66.19	60.93	71.45	67.93	0.0400	0.0400	0.0436	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Dec	62.62	57.63	67.61	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04

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

T-111 - Horizontal Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	1.0108	1.0363	1.1494	1.1687	1.4998	1.6519	1.8072	1.7556	1.4732	1.3240	1.0754	1.0466
Vapor Space Volume (cu ft):	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277
Vapor Density (lb/cu ft):	0.0009	0.0009	0.0009	0.0009	0.0011	0.0012	0.0013	0.0013	0.0012	0.0009	0.0009	0.0009
Vapor Space Expansion Factor:	0.0286	0.0326	0.0329	0.0343	0.0362	0.0363	0.0370	0.0363	0.0346	0.0371	0.0318	0.0297
Vented Vapor Saturation Factor:	0.9895	0.9895	0.9895	0.9894	0.9874	0.9857	0.9851	0.9852	0.9866	0.9892	0.9895	0.9895
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Effective Diameter (ft):	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563
Vapor Space Outage (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Tank Shell Length (ft):	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500
Vapor Density												
Vapor Density (lb/cu ft):	0.0009	0.0009	0.0009	0.0009	0.0011	0.0012	0.0013	0.0013	0.0012	0.0009	0.0009	0.0009
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0286	0.0326	0.0329	0.0343	0.0362	0.0363	0.0370	0.0363	0.0346	0.0371	0.0318	0.0297
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0000	0.0000	0.0047	0.0144	0.0224	0.0246	0.0225	0.0230	0.0250	0.0159	0.0036	0.0000
Breather Vent Press. Setting Range(psia):	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0400	0.0400	0.0404	0.0425	0.0420	0.0400	0.0400	0.0400	0.0400
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0400	0.0400	0.0447	0.0544	0.0624	0.0650	0.0650	0.0650	0.0650	0.0559	0.0436	0.0400
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9895	0.9895	0.9895	0.9894	0.9874	0.9857	0.9851	0.9852	0.9866	0.9892	0.9895	0.9895
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Vapor Space Outage (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Working Losses (lb):	0.1517	0.1517	0.1517	0.1536	0.1822	0.2082	0.2171	0.2144	0.1944	0.1560	0.1517	0.1517
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Net Throughput (gal/mo.):	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000

Annual Turnovers:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	1.1625	1.1880	1.3011	1.3223	1.6819	1.8600	2.0243	1.9701	1.6675	1.4800	1.2270	1.1982

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-111 - Horizontal Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Fuel Oil	2.08	16.00	18.08

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

Identification

User Identification:	T-112
City:	Houston
State:	Texas
Company:	Texas Petrochemicals Corp
Type of Tank:	Horizontal Tank
Description:	Horizontal fixed roof tank storing quench oil.

Tank Dimensions

Shell Length (ft):		24.75
Diameter (ft):		10.00
Volume (gallons):		14,700.00
Turnovers:		1.00
Net Throughput(gal/yr):		14,700.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.13
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-112 - Horizontal Tank
Houston, Texas

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
Fuel Oil	Jan	61.33	56.49	66.17	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Feb	63.24	57.86	68.61	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Mar	66.49	61.09	71.90	67.93	0.0400	0.0400	0.0447	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Apr	70.21	64.66	75.75	67.93	0.0405	0.0400	0.0544	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	May	73.22	67.46	78.98	67.93	0.0480	0.0400	0.0624	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jun	75.96	70.18	81.75	67.93	0.0549	0.0404	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jul	76.90	71.00	82.80	67.93	0.0572	0.0425	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Aug	76.62	70.81	82.43	67.93	0.0566	0.0420	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Sep	74.50	68.97	80.03	67.93	0.0513	0.0400	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Oct	70.45	64.55	76.36	67.93	0.0411	0.0400	0.0559	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Nov	66.19	60.93	71.45	67.93	0.0400	0.0400	0.0436	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Dec	62.62	57.63	67.61	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04

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

T-112 - Horizontal Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	1.0108	1.0363	1.1494	1.1687	1.4998	1.6519	1.8072	1.7556	1.4732	1.3240	1.0754	1.0466
Vapor Space Volume (cu ft):	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277
Vapor Density (lb/cu ft):	0.0009	0.0009	0.0009	0.0009	0.0011	0.0012	0.0013	0.0013	0.0012	0.0009	0.0009	0.0009
Vapor Space Expansion Factor:	0.0286	0.0326	0.0329	0.0343	0.0362	0.0363	0.0370	0.0363	0.0346	0.0371	0.0318	0.0297
Vented Vapor Saturation Factor:	0.9895	0.9895	0.9895	0.9894	0.9874	0.9857	0.9851	0.9852	0.9866	0.9892	0.9895	0.9895
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277	1,238.1277
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Effective Diameter (ft):	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563	17.7563
Vapor Space Outage (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Tank Shell Length (ft):	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500	24.7500
Vapor Density												
Vapor Density (lb/cu ft):	0.0009	0.0009	0.0009	0.0009	0.0011	0.0012	0.0013	0.0013	0.0012	0.0009	0.0009	0.0009
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0286	0.0326	0.0329	0.0343	0.0362	0.0363	0.0370	0.0363	0.0346	0.0371	0.0318	0.0297
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0000	0.0000	0.0047	0.0144	0.0224	0.0246	0.0225	0.0230	0.0250	0.0159	0.0036	0.0000
Breather Vent Press. Setting Range(psia):	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0400	0.0400	0.0404	0.0425	0.0420	0.0400	0.0400	0.0400	0.0400
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0400	0.0400	0.0447	0.0544	0.0624	0.0650	0.0650	0.0650	0.0650	0.0559	0.0436	0.0400
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9895	0.9895	0.9895	0.9894	0.9874	0.9857	0.9851	0.9852	0.9866	0.9892	0.9895	0.9895
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Vapor Space Outage (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Working Losses (lb):	0.1517	0.1517	0.1517	0.1536	0.1822	0.2082	0.2171	0.2144	0.1944	0.1560	0.1517	0.1517
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Net Throughput (gal/mo.):	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000	1,225.0000

Annual Turnovers:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	1.1625	1.1880	1.3011	1.3223	1.6819	1.8600	2.0243	1.9701	1.6675	1.4800	1.2270	1.1982

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-112 - Horizontal Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Fuel Oil	2.08	16.00	18.08

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

Identification

User Identification:	T-114 ETBE
City:	Houston
State:	Texas
Company:	Texas Petrochemicals Corp
Type of Tank:	Domed External Floating Roof Tank
Description:	T-114; ETBE DEFRT

Tank Dimensions

Diameter (ft):	75.00
Volume (gallons):	1,587,600.00
Turnovers:	82.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Typical

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Vapor-mounted
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	15
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	10

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

T-114 ETBE - Domed External Floating Roof Tank
Houston, Texas

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
ETBE	Jan	61.33	56.49	66.17	67.93	1.5971	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Feb	63.24	57.86	68.61	67.93	1.6810	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Mar	66.49	61.09	71.90	67.93	1.8329	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Apr	70.21	64.66	75.75	67.93	2.0197	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	May	73.22	67.46	78.98	67.93	2.1823	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Jun	75.96	70.18	81.75	67.93	2.3398	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Jul	76.90	71.00	82.80	67.93	2.3956	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Aug	76.62	70.81	82.43	67.93	2.3789	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Sep	74.50	68.97	80.03	67.93	2.2550	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Oct	70.45	64.55	76.36	67.93	2.0325	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Nov	66.19	60.93	71.45	67.93	1.8182	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Dec	62.62	57.63	67.61	67.93	1.6536	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438

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

T-114 ETBE - Domed External Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	40.3734	42.6290	46.7443	51.8722	56.3974	60.8352	62.4219	61.9474	58.4387	52.2272	46.3452	41.8912
Seal Factor A (lb-mole/ft-yr):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000
Value of Vapor Pressure Function:	0.0287	0.0303	0.0333	0.0369	0.0401	0.0433	0.0444	0.0441	0.0416	0.0372	0.0330	0.0298
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.5971	1.6810	1.8329	2.0197	2.1823	2.3398	2.3956	2.3789	2.2550	2.0325	1.8182	1.6536
Tank Diameter (ft):	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000
Vapor Molecular Weight (lb/lb-mole):	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600
Net Throughput (gal/mo.):	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500
Tank Diameter (ft):	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000
Roof Fitting Losses (lb):	22.3815	23.6320	25.9134	28.7561	31.2647	33.7248	34.6044	34.3414	32.3963	28.9529	25.6921	23.2230
Value of Vapor Pressure Function:	0.0287	0.0303	0.0333	0.0369	0.0401	0.0433	0.0444	0.0441	0.0416	0.0372	0.0330	0.0298
Vapor Molecular Weight (lb/lb-mole):	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	92.7149	96.2209	102.6176	110.5882	117.6220	124.5200	126.9863	126.2488	120.7950	111.1400	101.9973	95.0741

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	6.0383
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	52.8351
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	23.3984
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	31.00	150.00	1.40	116.9920
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	1.7737
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	15	2.00	0.37	0.91	113.2181
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	10	0.82	0.53	0.14	30.9463

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-114 ETBE - Domed External Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
ETBE	622.12	359.52	344.88	0.00	1,326.53

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

Identification

User Identification:	T-114 MTBE
City:	Houston
State:	Texas
Company:	Texas Petrochemicals Corp
Type of Tank:	Domed External Floating Roof Tank
Description:	T-114; MTBE DEFRT

Tank Dimensions

Diameter (ft):	75.00
Volume (gallons):	1,587,600.00
Turnovers:	82.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Typical

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Vapor-mounted
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	15
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	10

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

T-114 MTBE - Domed External Floating Roof Tank
Houston, Texas

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
Methyl-tert-butyl ether (MTBE)	Jan	61.33	56.49	66.17	67.93	3.3383	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Feb	63.24	57.86	68.61	67.93	3.5080	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Mar	66.49	61.09	71.90	67.93	3.7979	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Apr	70.21	64.66	75.75	67.93	4.1323	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	May	73.22	67.46	78.98	67.93	4.4543	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Jun	75.96	70.18	81.75	67.93	4.7479	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Jul	76.90	71.00	82.80	67.93	4.8482	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Aug	76.62	70.81	82.43	67.93	4.8184	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Sep	74.50	68.97	80.03	67.93	4.5919	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Oct	70.45	64.55	76.36	67.93	4.1585	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Nov	66.19	60.93	71.45	67.93	3.7709	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Dec	62.62	57.63	67.61	67.93	3.4534	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11

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

T-114 MTBE - Domed External Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	77.9298	82.4702	90.3807	99.7579	109.0639	117.7945	120.8302	119.9269	113.1255	100.5040	89.6331	81.0021
Seal Factor A (lb-mole/ft-yr):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000
Value of Vapor Pressure Function:	0.0643	0.0680	0.0746	0.0823	0.0900	0.0972	0.0997	0.0989	0.0933	0.0829	0.0740	0.0668
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.3383	3.5080	3.7979	4.1323	4.4543	4.7479	4.8482	4.8184	4.5919	4.1585	3.7709	3.4534
Tank Diameter (ft):	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000
Vapor Molecular Weight (lb/lb-mole):	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035
Net Throughput (gal/mo.):	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000
Tank Diameter (ft):	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000
Roof Fitting Losses (lb):	43.2014	45.7185	50.1038	55.3022	60.4611	65.3010	66.9839	66.4831	62.7126	55.7157	49.6893	44.9046
Value of Vapor Pressure Function:	0.0643	0.0680	0.0746	0.0823	0.0900	0.0972	0.0997	0.0989	0.0933	0.0829	0.0740	0.0668
Vapor Molecular Weight (lb/lb-mole):	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	151.3347	158.3922	170.6881	185.2636	199.7285	213.2990	218.0176	216.6135	206.0416	186.4232	169.5260	156.1102

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	11.6706
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	102.1174
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	45.2234
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	31.00	150.00	1.40	226.1171
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	3.4282
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	15	2.00	0.37	0.91	218.8230
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	10	0.82	0.53	0.14	59.8116

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-114 MTBE - Domed External Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Methyl-tert-butyl ether (MTBE)	1,202.42	362.44	666.58	0.00	2,231.44

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

Identification

User Identification:	T-115 ETBE
City:	Houston
State:	Texas
Company:	Texas Petrochemicals Corp
Type of Tank:	Domed External Floating Roof Tank
Description:	T-115; ETBE DEFRT

Tank Dimensions

Diameter (ft):	75.00
Volume (gallons):	1,587,600.00
Turnovers:	82.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Typical

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Vapor-mounted
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	15
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	10

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

T-115 ETBE - Domed External Floating Roof Tank
Houston, Texas

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
ETBE	Jan	61.33	56.49	66.17	67.93	1.5971	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Feb	63.24	57.86	68.61	67.93	1.6810	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Mar	66.49	61.09	71.90	67.93	1.8329	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Apr	70.21	64.66	75.75	67.93	2.0197	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	May	73.22	67.46	78.98	67.93	2.1823	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Jun	75.96	70.18	81.75	67.93	2.3398	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Jul	76.90	71.00	82.80	67.93	2.3956	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Aug	76.62	70.81	82.43	67.93	2.3789	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Sep	74.50	68.97	80.03	67.93	2.2550	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Oct	70.45	64.55	76.36	67.93	2.0325	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Nov	66.19	60.93	71.45	67.93	1.8182	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438
ETBE	Dec	62.62	57.63	67.61	67.93	1.6536	N/A	N/A	102.1700			102.17	Option 2: A=6.95301, B=1202.27, C=222.438

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

T-115 ETBE - Domed External Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	40.3734	42.6290	46.7443	51.8722	56.3974	60.8352	62.4219	61.9474	58.4387	52.2272	46.3452	41.8912
Seal Factor A (lb-mole/ft-yr):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000
Value of Vapor Pressure Function:	0.0287	0.0303	0.0333	0.0369	0.0401	0.0433	0.0444	0.0441	0.0416	0.0372	0.0330	0.0298
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.5971	1.6810	1.8329	2.0197	2.1823	2.3398	2.3956	2.3789	2.2550	2.0325	1.8182	1.6536
Tank Diameter (ft):	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000
Vapor Molecular Weight (lb/lb-mole):	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600	29.9600
Net Throughput (gal/mo.):	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500	6.1500
Tank Diameter (ft):	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000
Roof Fitting Losses (lb):	22.3815	23.6320	25.9134	28.7561	31.2647	33.7248	34.6044	34.3414	32.3963	28.9529	25.6921	23.2230
Value of Vapor Pressure Function:	0.0287	0.0303	0.0333	0.0369	0.0401	0.0433	0.0444	0.0441	0.0416	0.0372	0.0330	0.0298
Vapor Molecular Weight (lb/lb-mole):	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700	102.1700
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	92.7149	96.2209	102.6176	110.5882	117.6220	124.5200	126.9863	126.2488	120.7950	111.1400	101.9973	95.0741

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	6.0383
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	52.8351
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	23.3984
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	31.00	150.00	1.40	116.9920
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	1.7737
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	15	2.00	0.37	0.91	113.2181
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	10	0.82	0.53	0.14	30.9463

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-115 ETBE - Domed External Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
ETBE	622.12	359.52	344.88	0.00	1,326.53

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

Identification

User Identification:	T-115 MTBE
City:	Houston
State:	Texas
Company:	Texas Petrochemicals Corp
Type of Tank:	Domed External Floating Roof Tank
Description:	T-115; MTBE DEFRT

Tank Dimensions

Diameter (ft):	75.00
Volume (gallons):	1,587,600.00
Turnovers:	82.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Typical

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Vapor-mounted
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	15
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	10

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

T-115 MTBE - Domed External Floating Roof Tank
Houston, Texas

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
Methyl-tert-butyl ether (MTBE)	Jan	61.33	56.49	66.17	67.93	3.3383	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Feb	63.24	57.86	68.61	67.93	3.5080	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Mar	66.49	61.09	71.90	67.93	3.7979	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Apr	70.21	64.66	75.75	67.93	4.1323	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	May	73.22	67.46	78.98	67.93	4.4543	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Jun	75.96	70.18	81.75	67.93	4.7479	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Jul	76.90	71.00	82.80	67.93	4.8482	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Aug	76.62	70.81	82.43	67.93	4.8184	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Sep	74.50	68.97	80.03	67.93	4.5919	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Oct	70.45	64.55	76.36	67.93	4.1585	N/A	N/A	88.1500			88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Methyl-tert-butyl ether (MTBE)	Nov	66.19	60.93	71.45	67.93	3.7709	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Methyl-tert-butyl ether (MTBE)	Dec	62.62	57.63	67.61	67.93	3.4534	N/A	N/A	88.1500			88.15	Option 1: VP60 = 3.22 VP70 = 4.11

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

T-115 MTBE - Domed External Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	77.9298	82.4702	90.3807	99.7579	109.0639	117.7945	120.8302	119.9269	113.1255	100.5040	89.6331	81.0021
Seal Factor A (lb-mole/ft-yr):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000	4.3000
Value of Vapor Pressure Function:	0.0643	0.0680	0.0746	0.0823	0.0900	0.0972	0.0997	0.0989	0.0933	0.0829	0.0740	0.0668
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.3383	3.5080	3.7979	4.1323	4.4543	4.7479	4.8482	4.8184	4.5919	4.1585	3.7709	3.4534
Tank Diameter (ft):	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000
Vapor Molecular Weight (lb/lb-mole):	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035	30.2035
Net Throughput (gal/mo.):	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000	10,848,600.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000	6.2000
Tank Diameter (ft):	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000	75.0000
Roof Fitting Losses (lb):	43.2014	45.7185	50.1038	55.3022	60.4611	65.3010	66.9839	66.4831	62.7126	55.7157	49.6893	44.9046
Value of Vapor Pressure Function:	0.0643	0.0680	0.0746	0.0823	0.0900	0.0972	0.0997	0.0989	0.0933	0.0829	0.0740	0.0668
Vapor Molecular Weight (lb/lb-mole):	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500	88.1500
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700	91.4700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	151.3347	158.3922	170.6881	185.2636	199.7285	213.2990	218.0176	216.6135	206.0416	186.4232	169.5260	156.1102

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	11.6706
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	102.1174
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	45.2234
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	31.00	150.00	1.40	226.1171
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	3.4282
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	15	2.00	0.37	0.91	218.8230
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	10	0.82	0.53	0.14	59.8116

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-115 MTBE - Domed External Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Methyl-tert-butyl ether (MTBE)	1,202.42	362.44	666.58	0.00	2,231.44

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

Identification

User Identification:	T-117/118/119
City:	Houston
State:	Texas
Company:	Texas Petrochemicals LP
Type of Tank:	Vertical Fixed Roof Tank
Description:	Polyisobutylene

Tank Dimensions

Shell Height (ft):		32.00
Diameter (ft):		20.00
Liquid Height (ft) :		30.00
Avg. Liquid Height (ft):		16.00
Volume (gallons):		70,500.00
Turnovers:		280.21
Net Throughput(gal/yr):		19,755,102.00
Is Tank Heated (y/n):	Y	

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		1.67
Slope (ft/ft) (Cone Roof)		0.17

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-117/118/119 - Vertical Fixed Roof Tank
Houston, Texas

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
Polyisobutylene	Jan	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Feb	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Mar	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Apr	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	May	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Jun	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Jul	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Aug	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Sep	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Oct	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Nov	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Dec	200.00	200.00	200.00	200.00	0.1230	0.1230	0.1230	93.3000			350.00	

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

T-117/118/119 - Vertical Fixed Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Volume (cu ft):	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302
Vapor Density (lb/cu ft):	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Vapor Space Expansion Factor:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vented Vapor Saturation Factor:	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302	5,201.4302
Tank Diameter (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Vapor Space Outage (ft):	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567
Tank Shell Height (ft):	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000
Average Liquid Height (ft):	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000
Roof Outage (ft):	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567	0.5567
Roof Height (ft):	1.6700	1.6700	1.6700	1.6700	1.6700	1.6700	1.6700	1.6700	1.6700	1.6700	1.6700	1.6700
Roof Slope (ft/ft):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Shell Radius (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Vapor Molecular Weight (lb/lb-mole):	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Daily Avg. Liquid Surface Temp. (deg. R):	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700
Tank Paint Solar Absorptance (Shell):	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800
Tank Paint Solar Absorptance (Roof):	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Daily Vapor Temperature Range (deg. R):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Daily Vapor Pressure Range (psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Daily Avg. Liquid Surface Temp. (deg R):	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700
Daily Min. Liquid Surface Temp. (deg R):	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700
Daily Max. Liquid Surface Temp. (deg R):	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700	659.6700
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026	0.9026
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230

Vapor Space Outage (ft):	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567	16.5567
Working Losses (lb):	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280
Vapor Molecular Weight (lb/lb-mole):	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Net Throughput (gal/mo.):	1,646,258.5000	1,646,258.5000	1,646,258.5000	1,646,258.5000	1,646,258.5000	1,646,258.5000	1,646,258.5000	1,646,258.5000	1,646,258.5000	1,646,258.5000	1,646,258.5000	1,646,258.5000
Annual Turnovers:	280.2100	280.2100	280.2100	280.2100	280.2100	280.2100	280.2100	280.2100	280.2100	280.2100	280.2100	280.2100
Turnover Factor:	0.2737	0.2737	0.2737	0.2737	0.2737	0.2737	0.2737	0.2737	0.2737	0.2737	0.2737	0.2737
Maximum Liquid Volume (gal):	70,500.0000	70,500.0000	70,500.0000	70,500.0000	70,500.0000	70,500.0000	70,500.0000	70,500.0000	70,500.0000	70,500.0000	70,500.0000	70,500.0000
Maximum Liquid Height (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Tank Diameter (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280	123.1280

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-117/118/119 - Vertical Fixed Roof Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Polyisobutylene	1,477.54	0.00	1,477.54

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

Identification

User Identification:	T-155
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Vertical Fixed Roof Tank
Description:	Tank 155

Tank Dimensions

Shell Height (ft):		10.00
Diameter (ft):		10.00
Liquid Height (ft) :		9.00
Avg. Liquid Height (ft):		5.00
Volume (gallons):		5,287.69
Turnovers:		20.00
Net Throughput(gal/yr):		105,754.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-155 - Vertical Fixed Roof Tank
Houston, Texas

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
Triethanolamine	Jan	61.33	56.49	66.17	67.93	0.0001	0.0001	0.0001	149.1900			149.19	Option 1: VP60 = .000111 VP70 = .000166
Triethanolamine	Feb	63.24	57.86	68.61	67.93	0.0001	0.0001	0.0002	149.1900			149.19	Option 1: VP60 = .000111 VP70 = .000166
Triethanolamine	Mar	66.49	61.09	71.90	67.93	0.0001	0.0001	0.0002	149.1900			149.19	Option 1: VP60 = .000111 VP70 = .000166
Triethanolamine	Apr	70.21	64.66	75.75	67.93	0.0002	0.0001	0.0002	149.1900			149.19	Option 1: VP70 = .000166 VP80 = .000244
Triethanolamine	May	73.22	67.46	78.98	67.93	0.0002	0.0002	0.0002	149.1900			149.19	Option 1: VP70 = .000166 VP80 = .000244
Triethanolamine	Jun	75.96	70.18	81.75	67.93	0.0002	0.0002	0.0002	149.1900			149.19	Option 1: VP70 = .000166 VP80 = .000244
Triethanolamine	Jul	76.90	71.00	82.80	67.93	0.0002	0.0002	0.0002	149.1900			149.19	Option 1: VP70 = .000166 VP80 = .000244
Triethanolamine	Aug	76.62	70.81	82.43	67.93	0.0002	0.0002	0.0002	149.1900			149.19	Option 1: VP70 = .000166 VP80 = .000244
Triethanolamine	Sep	74.50	68.97	80.03	67.93	0.0002	0.0002	0.0002	149.1900			149.19	Option 1: VP70 = .000166 VP80 = .000244
Triethanolamine	Oct	70.45	64.55	76.36	67.93	0.0002	0.0001	0.0002	149.1900			149.19	Option 1: VP70 = .000166 VP80 = .000244
Triethanolamine	Nov	66.19	60.93	71.45	67.93	0.0001	0.0001	0.0002	149.1900			149.19	Option 1: VP60 = .000111 VP70 = .000166
Triethanolamine	Dec	62.62	57.63	67.61	67.93	0.0001	0.0001	0.0002	149.1900			149.19	Option 1: VP60 = .000111 VP70 = .000166

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

T-155 - Vertical Fixed Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0013	0.0014	0.0018	0.0020	0.0024	0.0026	0.0028	0.0028	0.0024	0.0022	0.0017	0.0014
Vapor Space Volume (cu ft):	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0331	0.0370	0.0370	0.0378	0.0392	0.0391	0.0399	0.0392	0.0373	0.0405	0.0360	0.0341
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999	1.0000	1.0000	1.0000
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803	400.8803
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Vapor Space Outage (ft):	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042
Tank Shell Height (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Average Liquid Height (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Roof Outage (ft):	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042	0.1042
Roof Height (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Slope (ft/ft):	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Shell Radius (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0331	0.0370	0.0370	0.0378	0.0392	0.0391	0.0399	0.0392	0.0373	0.0405	0.0360	0.0341
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999	1.0000	1.0000	1.0000
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001

Vapor Space Outage (ft):	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042	5.1042
Working Losses (lb):	0.0037	0.0040	0.0046	0.0052	0.0060	0.0067	0.0069	0.0068	0.0063	0.0053	0.0045	0.0039
Vapor Molecular Weight (lb/lb-mole):	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900	149.1900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001
Net Throughput (gal/mo.):	8,812.8333	8,812.8333	8,812.8333	8,812.8333	8,812.8333	8,812.8333	8,812.8333	8,812.8333	8,812.8333	8,812.8333	8,812.8333	8,812.8333
Annual Turnovers:	20.0001	20.0001	20.0001	20.0001	20.0001	20.0001	20.0001	20.0001	20.0001	20.0001	20.0001	20.0001
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	5,287.6851	5,287.6851	5,287.6851	5,287.6851	5,287.6851	5,287.6851	5,287.6851	5,287.6851	5,287.6851	5,287.6851	5,287.6851	5,287.6851
Maximum Liquid Height (ft):	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.0050	0.0055	0.0064	0.0072	0.0084	0.0092	0.0097	0.0096	0.0086	0.0075	0.0062	0.0053

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-155 - Vertical Fixed Roof Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Triethanolamine	0.06	0.02	0.09

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

Identification

User Identification:	T-204/T205/T-206
City:	Houston
State:	Texas
Company:	Texas Petrochemicals LP
Type of Tank:	Vertical Fixed Roof Tank
Description:	Polyisobutylene updated tank ID from T-IP-1/2/3.

Tank Dimensions

Shell Height (ft):	36.00
Diameter (ft):	30.00
Liquid Height (ft) :	34.00
Avg. Liquid Height (ft):	17.00
Volume (gallons):	179,800.00
Turnovers:	119.86
Net Throughput(gal/yr):	21,551,020.00
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good
Roof Color/Shade:	Aluminum/Diffuse
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.51
Slope (ft/ft) (Cone Roof)	0.17

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-204/T205/T-206 - Vertical Fixed Roof Tank
Houston, Texas

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
Polyisobutylene	Jan	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Feb	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Mar	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Apr	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	May	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Jun	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Jul	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Aug	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Sep	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Oct	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Nov	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	
Polyisobutylene	Dec	275.00	275.00	275.00	275.00	0.1230	0.1230	0.1230	93.3000			350.00	

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

T-204/T205/T-206 - Vertical Fixed Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Volume (cu ft):	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134
Vapor Density (lb/cu ft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Expansion Factor:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vented Vapor Saturation Factor:	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134	14,021.7134
Tank Diameter (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Vapor Space Outage (ft):	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367
Tank Shell Height (ft):	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000
Average Liquid Height (ft):	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000
Roof Outage (ft):	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367	0.8367
Roof Height (ft):	2.5100	2.5100	2.5100	2.5100	2.5100	2.5100	2.5100	2.5100	2.5100	2.5100	2.5100	2.5100
Roof Slope (ft/ft):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Shell Radius (ft):	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Molecular Weight (lb/lb-mole):	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Daily Avg. Liquid Surface Temp. (deg. R):	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700
Tank Paint Solar Absorptance (Shell):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Tank Paint Solar Absorptance (Roof):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Daily Vapor Temperature Range (deg. R):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Daily Vapor Pressure Range (psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Daily Avg. Liquid Surface Temp. (deg R):	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700
Daily Min. Liquid Surface Temp. (deg R):	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700
Daily Max. Liquid Surface Temp. (deg R):	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700	734.6700
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855	0.8855
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230

Vapor Space Outage (ft):	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367	19.8367
Working Losses (lb):	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043
Vapor Molecular Weight (lb/lb-mole):	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000	93.3000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
Net Throughput (gal/mo.):	1,795,918.3330	1,795,918.3330	1,795,918.3330	1,795,918.3330	1,795,918.3330	1,795,918.3330	1,795,918.3330	1,795,918.3330	1,795,918.3330	1,795,918.3330	1,795,918.3330	1,795,918.3330
Annual Turnovers:	119.8611	119.8611	119.8611	119.8611	119.8611	119.8611	119.8611	119.8611	119.8611	119.8611	119.8611	119.8611
Turnover Factor:	0.4170	0.4170	0.4170	0.4170	0.4170	0.4170	0.4170	0.4170	0.4170	0.4170	0.4170	0.4170
Maximum Liquid Volume (gal):	179,800.0000	179,800.0000	179,800.0000	179,800.0000	179,800.0000	179,800.0000	179,800.0000	179,800.0000	179,800.0000	179,800.0000	179,800.0000	179,800.0000
Maximum Liquid Height (ft):	34.0000	34.0000	34.0000	34.0000	34.0000	34.0000	34.0000	34.0000	34.0000	34.0000	34.0000	34.0000
Tank Diameter (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043	204.6043

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-204/T205/T-206 - Vertical Fixed Roof Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Polyisobutylene	2,455.25	0.00	2,455.25

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

Identification

User Identification:	T-31 (Fuel Oil)
City:	Houston
State:	Texas
Company:	Texas Petrochemicals LP
Type of Tank:	Internal Floating Roof Tank
Description:	Fuel Oil

Tank Dimensions

Diameter (ft):		25.00
Volume (gallons):		105,000.00
Turnovers:		28.03
Self Supp. Roof? (y/n):	N	
No. of Columns:		1.00
Eff. Col. Diam. (ft):		1.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Shoe-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Ungask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	9
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-31 (Fuel Oil) - Internal Floating Roof Tank
Houston, Texas

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
Fuel Oil	Jan	61.33	56.49	66.17	67.93	0.0400	N/A	N/A	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Feb	63.24	57.86	68.61	67.93	0.0400	N/A	N/A	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Mar	66.49	61.09	71.90	67.93	0.0400	N/A	N/A	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Apr	70.21	64.66	75.75	67.93	0.0405	N/A	N/A	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	May	73.22	67.46	78.98	67.93	0.0480	N/A	N/A	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jun	75.96	70.18	81.75	67.93	0.0549	N/A	N/A	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jul	76.90	71.00	82.80	67.93	0.0572	N/A	N/A	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Aug	76.62	70.81	82.43	67.93	0.0566	N/A	N/A	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Sep	74.50	68.97	80.03	67.93	0.0513	N/A	N/A	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Oct	70.45	64.55	76.36	67.93	0.0411	N/A	N/A	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Nov	66.19	60.93	71.45	67.93	0.0400	N/A	N/A	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Dec	62.62	57.63	67.61	67.93	0.0400	N/A	N/A	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04

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

T-31 (Fuel Oil) - Internal Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	0.2951	0.2951	0.2951	0.2990	0.3546	0.4053	0.4226	0.4175	0.3784	0.3035	0.2951	0.2951
Seal Factor A (lb-mole/ft-yr):	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Value of Vapor Pressure Function:	0.0007	0.0007	0.0007	0.0007	0.0008	0.0009	0.0010	0.0010	0.0009	0.0007	0.0007	0.0007
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	2.2681	2.2681	2.2681	2.2681	2.2681	2.2681	2.2681	2.2681	2.2681	2.2681	2.2681	2.2681
Number of Columns:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Effective Column Diameter (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net Throughput (gal/mo.):	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.6000	6.6000	6.6000	6.6000	6.6000	6.6000	6.6000	6.6000	6.6000	6.6000	6.6000	6.6000
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Deck Fitting Losses (lb):	1.9353	1.9353	1.9353	1.9605	2.3252	2.6578	2.7713	2.7377	2.4810	1.9901	1.9353	1.9353
Value of Vapor Pressure Function:	0.0007	0.0007	0.0007	0.0007	0.0008	0.0009	0.0010	0.0010	0.0009	0.0007	0.0007	0.0007
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	4.4985	4.4985	4.4985	4.5275	4.9478	5.3312	5.4620	5.4232	5.1274	4.5617	4.4985	4.4985

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	3.6538
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	1.4209
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Ungask.	1	47.00	0.00	0.00	4.7703
Ladder Well (36-in. Diam.)/Sliding Cover, Ungasketed	1	76.00	0.00	0.00	7.7137
Roof Leg or Hanger Well/Adjustable	9	7.90	0.00	0.00	7.2163
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	1.2179
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	0.6293

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-31 (Fuel Oil) - Internal Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Fuel Oil	4.06	27.22	26.60	0.00	57.87

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

Identification

User Identification:	T-31 Lean Oil
City:	Houston
State:	Texas
Company:	Texas Petrochemicals LP
Type of Tank:	Internal Floating Roof Tank
Description:	Lean Oil

Tank Dimensions

Diameter (ft):		25.00
Volume (gallons):		105,000.00
Turnovers:		28.03
Self Supp. Roof? (y/n):	N	
No. of Columns:		1.00
Eff. Col. Diam. (ft):		1.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Shoe-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Ungask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	9
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-31 Lean Oil - Internal Floating Roof Tank
Houston, Texas

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
Lean oil	Jan	61.33	56.49	66.17	67.93	1.4665	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Feb	63.24	57.86	68.61	67.93	1.5333	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Mar	66.49	61.09	71.90	67.93	1.6473	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Apr	70.21	64.66	75.75	67.93	1.7783	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	May	73.22	67.46	78.98	67.93	1.8987	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Jun	75.96	70.18	81.75	67.93	2.0085	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Jul	76.90	71.00	82.80	67.93	2.0459	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Aug	76.62	70.81	82.43	67.93	2.0348	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Sep	74.50	68.97	80.03	67.93	1.9502	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Oct	70.45	64.55	76.36	67.93	1.7881	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Nov	66.19	60.93	71.45	67.93	1.6366	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Dec	62.62	57.63	67.61	67.93	1.5118	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77

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

T-31 Lean Oil - Internal Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	11.3804	11.9278	12.8690	13.9608	14.9736	15.9050	16.2247	16.1298	15.4091	14.0428	12.7807	11.7513
Seal Factor A (lb-mole/ft-yr):	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Value of Vapor Pressure Function:	0.0263	0.0275	0.0297	0.0322	0.0346	0.0367	0.0374	0.0372	0.0356	0.0324	0.0295	0.0271
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.4665	1.5333	1.6473	1.7783	1.8987	2.0085	2.0459	2.0348	1.9502	1.7881	1.6366	1.5118
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	2.4399	2.4399	2.4399	2.4399	2.4399	2.4399	2.4399	2.4399	2.4399	2.4399	2.4399	2.4399
Number of Columns:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Effective Column Diameter (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net Throughput (gal/mo.):	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Deck Fitting Losses (lb):	74.6269	78.2163	84.3883	91.5479	98.1891	104.2972	106.3936	105.7713	101.0453	92.0854	83.8094	77.0594
Value of Vapor Pressure Function:	0.0263	0.0275	0.0297	0.0322	0.0346	0.0367	0.0374	0.0372	0.0356	0.0324	0.0295	0.0271
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000	262.3000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	88.4471	92.5839	99.6972	107.9486	115.6025	122.6421	125.0582	124.3409	118.8942	108.5680	99.0300	91.2506

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	150.7314
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	58.6178
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Ungask.	1	47.00	0.00	0.00	196.7883
Ladder Well (36-in. Diam.)/Sliding Cover, Ungasketed	1	76.00	0.00	0.00	318.2108
Roof Leg or Hanger Well/Adjustable	9	7.90	0.00	0.00	297.6946
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	50.2438
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	25.9593

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-31 Lean Oil - Internal Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Lean oil	167.35	29.28	1,097.43	0.00	1,294.06

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

Identification

User Identification:	T-32
City:	Houston
State:	TX
Company:	Texas Petrochemicals Corp
Type of Tank:	Internal Floating Roof Tank
Description:	Tank 32

Tank Dimensions

Diameter (ft):		25.00
Volume (gallons):		109,200.00
Turnovers:		14.00
Self Supp. Roof? (y/n):	Y	
No. of Columns:		0.00
Eff. Col. Diam. (ft):		0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	9
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-32 - Internal Floating Roof Tank
Houston, TX

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
Lean oil	Jan	61.33	56.49	66.17	67.93	1.4665	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Feb	63.24	57.86	68.61	67.93	1.5333	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Mar	66.49	61.09	71.90	67.93	1.6473	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Apr	70.21	64.66	75.75	67.93	1.7783	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	May	73.22	67.46	78.98	67.93	1.8987	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Jun	75.96	70.18	81.75	67.93	2.0085	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Jul	76.90	71.00	82.80	67.93	2.0459	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Aug	76.62	70.81	82.43	67.93	2.0348	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Sep	74.50	68.97	80.03	67.93	1.9502	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Oct	70.45	64.55	76.36	67.93	1.7881	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Nov	66.19	60.93	71.45	67.93	1.6366	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Dec	62.62	57.63	67.61	67.93	1.5118	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77

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

T-32 - Internal Floating Roof Tank
Houston, TX

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	4.2676	4.4729	4.8259	5.2353	5.6151	5.9644	6.0843	6.0487	5.7784	5.2660	4.7928	4.4068
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Value of Vapor Pressure Function:	0.0263	0.0275	0.0297	0.0322	0.0346	0.0367	0.0374	0.0372	0.0356	0.0324	0.0295	0.0271
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.4665	1.5333	1.6473	1.7783	1.8987	2.0085	2.0459	2.0348	1.9502	1.7881	1.6366	1.5118
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	1.2185	1.2185	1.2185	1.2185	1.2185	1.2185	1.2185	1.2185	1.2185	1.2185	1.2185	1.2185
Number of Columns:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Effective Column Diameter (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Net Throughput (gal/mo.):	127,400.0000	127,400.0000	127,400.0000	127,400.0000	127,400.0000	127,400.0000	127,400.0000	127,400.0000	127,400.0000	127,400.0000	127,400.0000	127,400.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Deck Fitting Losses (lb):	39.6322	41.5384	44.8162	48.6185	52.1454	55.3892	56.5026	56.1721	53.6622	48.9039	44.5088	40.9241
Value of Vapor Pressure Function:	0.0263	0.0275	0.0297	0.0322	0.0346	0.0367	0.0374	0.0372	0.0356	0.0324	0.0295	0.0271
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	139.3000	139.3000	139.3000	139.3000	139.3000	139.3000	139.3000	139.3000	139.3000	139.3000	139.3000	139.3000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	45.1184	47.2299	50.8606	55.0723	58.9790	62.5722	63.8054	63.4393	60.6592	55.3885	50.5201	46.5493

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	150.7314
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	58.6178
Roof Leg or Hanger Well/Adjustable	9	7.90	0.00	0.00	297.6946
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	50.2438
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	25.9593

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-32 - Internal Floating Roof Tank
Houston, TX

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Lean oil	62.76	14.62	582.81	0.00	660.19

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

Identification

User Identification:	T-33
City:	Houston
State:	Texas
Company:	Texas Petrochemicals LP
Type of Tank:	Vertical Fixed Roof Tank
Description:	Quench Oil - Annual

Tank Dimensions

Shell Height (ft):		18.00
Diameter (ft):		20.00
Liquid Height (ft) :		17.00
Avg. Liquid Height (ft):		16.00
Volume (gallons):		37,605.00
Turnovers:		5.00
Net Throughput(gal/yr):		188,025.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-33 - Vertical Fixed Roof Tank
Houston, Texas

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
Furfural	Jan	61.33	56.49	66.17	67.93	0.0147	0.0116	0.0185	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Feb	63.24	57.86	68.61	67.93	0.0161	0.0125	0.0207	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Mar	66.49	61.09	71.90	67.93	0.0188	0.0146	0.0240	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Apr	70.21	64.66	75.75	67.93	0.0223	0.0172	0.0285	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	May	73.22	67.46	78.98	67.93	0.0255	0.0196	0.0328	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Jun	75.96	70.18	81.75	67.93	0.0288	0.0222	0.0369	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Jul	76.90	71.00	82.80	67.93	0.0300	0.0231	0.0386	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Aug	76.62	70.81	82.43	67.93	0.0296	0.0229	0.0380	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Sep	74.50	68.97	80.03	67.93	0.0270	0.0211	0.0343	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Oct	70.45	64.55	76.36	67.93	0.0225	0.0172	0.0293	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Nov	66.19	60.93	71.45	67.93	0.0185	0.0145	0.0236	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Dec	62.62	57.63	67.61	67.93	0.0157	0.0123	0.0198	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8

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

T-33 - Vertical Fixed Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.2044	0.2232	0.2861	0.3331	0.4052	0.4408	0.4827	0.4697	0.3970	0.3701	0.2662	0.2234
Vapor Space Volume (cu ft):	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684
Vapor Density (lb/cu ft):	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0004	0.0003	0.0003
Vapor Space Expansion Factor:	0.0376	0.0417	0.0417	0.0426	0.0441	0.0442	0.0450	0.0443	0.0423	0.0454	0.0406	0.0387
Vented Vapor Saturation Factor:	0.9983	0.9981	0.9978	0.9974	0.9970	0.9966	0.9965	0.9965	0.9969	0.9974	0.9978	0.9982
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684	693.7684
Tank Diameter (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Vapor Space Outage (ft):	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083
Tank Shell Height (ft):	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000
Average Liquid Height (ft):	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000
Roof Outage (ft):	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083
Roof Height (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Slope (ft/ft):	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Shell Radius (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0004	0.0003	0.0003
Vapor Molecular Weight (lb/lb-mole):	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4746	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0376	0.0417	0.0417	0.0426	0.0441	0.0442	0.0450	0.0443	0.0423	0.0454	0.0406	0.0387
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0069	0.0082	0.0095	0.0113	0.0131	0.0147	0.0155	0.0151	0.0132	0.0121	0.0091	0.0075
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0116	0.0125	0.0146	0.0172	0.0196	0.0222	0.0231	0.0229	0.0211	0.0172	0.0145	0.0123
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0185	0.0207	0.0240	0.0285	0.0328	0.0369	0.0386	0.0380	0.0343	0.0293	0.0236	0.0198
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9983	0.9981	0.9978	0.9974	0.9970	0.9966	0.9965	0.9965	0.9969	0.9974	0.9978	0.9982
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157

Vapor Space Outage (ft):	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083	2.2083
Working Losses (lb):	0.5281	0.5782	0.6734	0.7982	0.9136	1.0312	1.0742	1.0613	0.9672	0.8071	0.6639	0.5616
Vapor Molecular Weight (lb/lb-mole):	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157
Net Throughput (gal/mo.):	15,668.7500	15,668.7500	15,668.7500	15,668.7500	15,668.7500	15,668.7500	15,668.7500	15,668.7500	15,668.7500	15,668.7500	15,668.7500	15,668.7500
Annual Turnovers:	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	37,605.0000	37,605.0000	37,605.0000	37,605.0000	37,605.0000	37,605.0000	37,605.0000	37,605.0000	37,605.0000	37,605.0000	37,605.0000	37,605.0000
Maximum Liquid Height (ft):	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000
Tank Diameter (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.7325	0.8014	0.9595	1.1313	1.3188	1.4720	1.5569	1.5310	1.3642	1.1772	0.9302	0.7850

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-33 - Vertical Fixed Roof Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Furfural	9.66	4.10	13.76

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

Identification

User Identification:	T-34
City:	Houston
State:	TX
Company:	Texas Petrochemicals Corp
Type of Tank:	Vertical Fixed Roof Tank
Description:	Fuel Oil - Annual

Tank Dimensions

Shell Height (ft):		30.00
Diameter (ft):		25.00
Liquid Height (ft) :		28.40
Avg. Liquid Height (ft):		25.00
Volume (gallons):		109,200.00
Turnovers:		26.95
Net Throughput(gal/yr):		2,943,360.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-34 - Vertical Fixed Roof Tank
Houston, TX

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
Fuel Oil	Jan	61.33	56.49	66.17	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Feb	63.24	57.86	68.61	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Mar	66.49	61.09	71.90	67.93	0.0400	0.0400	0.0447	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Apr	70.21	64.66	75.75	67.93	0.0405	0.0400	0.0544	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	May	73.22	67.46	78.98	67.93	0.0480	0.0400	0.0624	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jun	75.96	70.18	81.75	67.93	0.0549	0.0404	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Jul	76.90	71.00	82.80	67.93	0.0572	0.0425	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Aug	76.62	70.81	82.43	67.93	0.0566	0.0420	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Sep	74.50	68.97	80.03	67.93	0.0513	0.0400	0.0650	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Oct	70.45	64.55	76.36	67.93	0.0411	0.0400	0.0559	130.0000			130.00	Option 1: VP70 = .04 VP80 = .065
Fuel Oil	Nov	66.19	60.93	71.45	67.93	0.0400	0.0400	0.0436	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04
Fuel Oil	Dec	62.62	57.63	67.61	67.93	0.0400	0.0400	0.0400	130.0000			130.00	Option 1: VP60 = .04 VP70 = .04

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

T-34 - Vertical Fixed Roof Tank
Houston, TX

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	2.7347	2.7250	3.0174	3.0410	3.8617	4.2510	4.6353	4.5179	3.8278	3.3940	2.8434	2.8076
Vapor Space Volume (cu ft):	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010
Vapor Density (lb/cu ft):	0.0009	0.0009	0.0009	0.0009	0.0011	0.0012	0.0013	0.0013	0.0012	0.0009	0.0009	0.0009
Vapor Space Expansion Factor:	0.0371	0.0411	0.0414	0.0429	0.0448	0.0449	0.0455	0.0449	0.0431	0.0456	0.0403	0.0382
Vented Vapor Saturation Factor:	0.9890	0.9890	0.9890	0.9888	0.9868	0.9849	0.9843	0.9845	0.9859	0.9887	0.9890	0.9890
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010	2,582.2010
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Space Outage (ft):	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604
Tank Shell Height (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Average Liquid Height (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Roof Outage (ft):	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604	0.2604
Roof Height (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Slope (ft/ft):	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Shell Radius (ft):	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000
Vapor Density												
Vapor Density (lb/cu ft):	0.0009	0.0009	0.0009	0.0009	0.0011	0.0012	0.0013	0.0013	0.0012	0.0009	0.0009	0.0009
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0371	0.0411	0.0414	0.0429	0.0448	0.0449	0.0455	0.0449	0.0431	0.0456	0.0403	0.0382
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0000	0.0000	0.0047	0.0144	0.0224	0.0246	0.0225	0.0230	0.0250	0.0159	0.0036	0.0000
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0400	0.0400	0.0404	0.0425	0.0420	0.0400	0.0400	0.0400	0.0400
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0400	0.0400	0.0447	0.0544	0.0624	0.0650	0.0650	0.0650	0.0650	0.0559	0.0436	0.0400
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9890	0.9890	0.9890	0.9888	0.9868	0.9849	0.9843	0.9845	0.9859	0.9887	0.9890	0.9890
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400

Vapor Space Outage (ft):	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604	5.2604
Working Losses (lb):	30.3680	30.3680	30.3680	30.7632	36.4760	41.6841	43.4616	42.9344	38.9168	31.2274	30.3680	30.3680
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0400	0.0400	0.0400	0.0405	0.0480	0.0549	0.0572	0.0566	0.0513	0.0411	0.0400	0.0400
Net Throughput (gal/mo.):	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000	245,280.0000
Annual Turnovers:	26.9538	26.9538	26.9538	26.9538	26.9538	26.9538	26.9538	26.9538	26.9538	26.9538	26.9538	26.9538
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	109,200.0000	109,200.0000	109,200.0000	109,200.0000	109,200.0000	109,200.0000	109,200.0000	109,200.0000	109,200.0000	109,200.0000	109,200.0000	109,200.0000
Maximum Liquid Height (ft):	28.4000	28.4000	28.4000	28.4000	28.4000	28.4000	28.4000	28.4000	28.4000	28.4000	28.4000	28.4000
Tank Diameter (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	33.1027	33.0930	33.3854	33.8041	40.3377	45.9352	48.0969	47.4523	42.7446	34.6214	33.2114	33.1756

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-34 - Vertical Fixed Roof Tank
Houston, TX

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Fuel Oil	417.30	41.66	458.96

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

Identification

User Identification:	T-77IFR
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Internal Floating Roof Tank
Description:	DIB - Annual

Tank Dimensions

Diameter (ft):		42.50
Volume (gallons):		382,000.00
Turnovers:		48.16
Self Supp. Roof? (y/n):	Y	
No. of Columns:		0.00
Eff. Col. Diam. (ft):		0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Vapor-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical	
Deck Type:	Bolted	
Construction:	Sheet	
Deck Seam:	Sheet: 7 Ft Wide	
Deck Seam Len. (ft):		198.61

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	13
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Stub Drain (1-in. Diameter)/Slit Fabric Seal 10% Open	15
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-77IFR - Internal Floating Roof Tank
Houston, Texas

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
Diisobutylene	Jan	61.33	56.49	66.17	67.93	0.5326	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Feb	63.24	57.86	68.61	67.93	0.5650	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Mar	66.49	61.09	71.90	67.93	0.6204	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Apr	70.21	64.66	75.75	67.93	0.6859	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	May	73.22	67.46	78.98	67.93	0.7707	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Jun	75.96	70.18	81.75	67.93	0.8481	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Jul	76.90	71.00	82.80	67.93	0.8745	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Aug	76.62	70.81	82.43	67.93	0.8667	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Sep	74.50	68.97	80.03	67.93	0.8070	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Oct	70.45	64.55	76.36	67.93	0.6928	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Nov	66.19	60.93	71.45	67.93	0.6152	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Dec	62.62	57.63	67.61	67.93	0.5546	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68

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

T-77IFR - Internal Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	8.0635	8.5642	9.4219	10.4402	11.7671	12.9838	13.4006	13.2769	12.3365	10.5478	9.3416	8.4029
Seal Factor A (lb-mole/ft-yr):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Value of Vapor Pressure Function:	0.0092	0.0098	0.0108	0.0119	0.0135	0.0149	0.0153	0.0152	0.0141	0.0121	0.0107	0.0096
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5326	0.5650	0.6204	0.6859	0.7707	0.8481	0.8745	0.8667	0.8070	0.6928	0.6152	0.5546
Tank Diameter (ft):	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000
Vapor Molecular Weight (lb/lb-mole):	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131
Number of Columns:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Effective Column Diameter (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Net Throughput (gal/mo.):	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200
Tank Diameter (ft):	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000
Deck Fitting Losses (lb):	16.2909	17.3023	19.0352	21.0926	23.7734	26.2315	27.0735	26.8236	24.9237	21.3099	18.8730	16.9767
Value of Vapor Pressure Function:	0.0092	0.0098	0.0108	0.0119	0.0135	0.0149	0.0153	0.0152	0.0141	0.0121	0.0107	0.0096
Vapor Molecular Weight (lb/lb-mole):	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000
Deck Seam Losses (lb):	3.0532	3.2427	3.5675	3.9531	4.4555	4.9162	5.0740	5.0272	4.6711	3.9938	3.5371	3.1817
Deck Seam Length (ft):	198.6100	198.6100	198.6100	198.6100	198.6100	198.6100	198.6100	198.6100	198.6100	198.6100	198.6100	198.6100
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400
Deck Seam Length Factor(ft/sqft):	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400
Tank Diameter (ft):	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000
Vapor Molecular Weight (lb/lb-mole):	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	34.7207	36.4224	39.3377	42.7991	47.3091	51.4446	52.8612	52.4408	49.2444	43.1646	39.0648	35.8744

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	49.5471
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	19.2683
Roof Leg or Hanger Well/Adjustable	13	7.90	0.00	0.00	141.3468
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	16.5157
Stub Drain (1-in. Diameter)/	15	1.20	0.00	0.00	24.7735
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	8.5331

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-77IFR - Internal Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Diisobutylene	128.55	87.76	259.71	48.67	524.68

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

Identification

User Identification:	T-78IFR
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Internal Floating Roof Tank
Description:	DIB - Annual

Tank Dimensions

Diameter (ft):		42.50
Volume (gallons):		382,000.00
Turnovers:		47.92
Self Supp. Roof? (y/n):	Y	
No. of Columns:		0.00
Eff. Col. Diam. (ft):		0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Vapor-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical	
Deck Type:	Bolted	
Construction:	Sheet	
Deck Seam:	Sheet: 7 Ft Wide	
Deck Seam Len. (ft):		198.61

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	13
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Stub Drain (1-in. Diameter)/Slit Fabric Seal 10% Open	15
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-78IFR - Internal Floating Roof Tank
Houston, Texas

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
Diisobutylene	Jan	61.33	56.49	66.17	67.93	0.5326	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Feb	63.24	57.86	68.61	67.93	0.5650	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Mar	66.49	61.09	71.90	67.93	0.6204	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Apr	70.21	64.66	75.75	67.93	0.6859	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	May	73.22	67.46	78.98	67.93	0.7707	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Jun	75.96	70.18	81.75	67.93	0.8481	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Jul	76.90	71.00	82.80	67.93	0.8745	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Aug	76.62	70.81	82.43	67.93	0.8667	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Sep	74.50	68.97	80.03	67.93	0.8070	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Oct	70.45	64.55	76.36	67.93	0.6928	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Nov	66.19	60.93	71.45	67.93	0.6152	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Dec	62.62	57.63	67.61	67.93	0.5546	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68

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

T-78IFR - Internal Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	8.0635	8.5642	9.4219	10.4402	11.7671	12.9838	13.4006	13.2769	12.3365	10.5478	9.3416	8.4029
Seal Factor A (lb-mole/ft-yr):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Value of Vapor Pressure Function:	0.0092	0.0098	0.0108	0.0119	0.0135	0.0149	0.0153	0.0152	0.0141	0.0121	0.0107	0.0096
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5326	0.5650	0.6204	0.6859	0.7707	0.8481	0.8745	0.8667	0.8070	0.6928	0.6152	0.5546
Tank Diameter (ft):	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000
Vapor Molecular Weight (lb/lb-mole):	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131	7.3131
Number of Columns:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Effective Column Diameter (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Net Throughput (gal/mo.):	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200
Tank Diameter (ft):	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000
Deck Fitting Losses (lb):	16.2909	17.3023	19.0352	21.0926	23.7734	26.2315	27.0735	26.8236	24.9237	21.3099	18.8730	16.9767
Value of Vapor Pressure Function:	0.0092	0.0098	0.0108	0.0119	0.0135	0.0149	0.0153	0.0152	0.0141	0.0121	0.0107	0.0096
Vapor Molecular Weight (lb/lb-mole):	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000	188.9000
Deck Seam Losses (lb):	3.0531	3.2427	3.5675	3.9531	4.4555	4.9161	5.0739	5.0271	4.6710	3.9938	3.5371	3.1817
Deck Seam Length (ft):	198.6074	198.6074	198.6074	198.6074	198.6074	198.6074	198.6074	198.6074	198.6074	198.6074	198.6074	198.6074
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400
Deck Seam Length Factor(ft/sqft):	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400
Tank Diameter (ft):	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000	42.5000
Vapor Molecular Weight (lb/lb-mole):	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	34.7207	36.4223	39.3376	42.7991	47.3091	51.4445	52.8611	52.4407	49.2444	43.1646	39.0648	35.8744

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	49.5471
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	19.2683
Roof Leg or Hanger Well/Adjustable	13	7.90	0.00	0.00	141.3468
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	16.5157
Stub Drain (1-in. Diameter)/	15	1.20	0.00	0.00	24.7735
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	8.5331

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-78IFR - Internal Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Diisobutylene	128.55	87.76	259.71	48.67	524.68

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

Identification

User Identification:	T-79
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Internal Floating Roof Tank
Description:	DIB

Tank Dimensions

Diameter (ft):		36.70
Volume (gallons):		285,000.00
Turnovers:		16.78
Self Supp. Roof? (y/n):	Y	
No. of Columns:		0.00
Eff. Col. Diam. (ft):		0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Vapor-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical	
Deck Type:	Bolted	
Construction:	Sheet	
Deck Seam:	Sheet: 7 Ft Wide	
Deck Seam Len. (ft):		148.10

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	11
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Stub Drain (1-in. Diameter)/Slit Fabric Seal 10% Open	11
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-79 - Internal Floating Roof Tank
Houston, Texas

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
Diisobutylene	Jan	61.33	56.49	66.17	67.93	0.5326	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Feb	63.24	57.86	68.61	67.93	0.5650	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Mar	66.49	61.09	71.90	67.93	0.6204	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Apr	70.21	64.66	75.75	67.93	0.6859	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	May	73.22	67.46	78.98	67.93	0.7707	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Jun	75.96	70.18	81.75	67.93	0.8481	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Jul	76.90	71.00	82.80	67.93	0.8745	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Aug	76.62	70.81	82.43	67.93	0.8667	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Sep	74.50	68.97	80.03	67.93	0.8070	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Oct	70.45	64.55	76.36	67.93	0.6928	N/A	N/A	112.2000			112.20	Option 1: VP70 = .68 VP80 = .961921224570353
Diisobutylene	Nov	66.19	60.93	71.45	67.93	0.6152	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68
Diisobutylene	Dec	62.62	57.63	67.61	67.93	0.5546	N/A	N/A	112.2000			112.20	Option 1: VP60 = .51 VP70 = .68

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

T-79 - Internal Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	6.9631	7.3954	8.1361	9.0155	10.1613	11.2119	11.5718	11.4650	10.6529	9.1083	8.0667	7.2562
Seal Factor A (lb-mole/ft-yr):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Value of Vapor Pressure Function:	0.0092	0.0098	0.0108	0.0119	0.0135	0.0149	0.0153	0.0152	0.0141	0.0121	0.0107	0.0096
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5326	0.5650	0.6204	0.6859	0.7707	0.8481	0.8745	0.8667	0.8070	0.6928	0.6152	0.5546
Tank Diameter (ft):	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000
Vapor Molecular Weight (lb/lb-mole):	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	2.2019	2.2019	2.2019	2.2019	2.2019	2.2019	2.2019	2.2019	2.2019	2.2019	2.2019	2.2019
Number of Columns:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Effective Column Diameter (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Net Throughput (gal/mo.):	398,580.0000	398,580.0000	398,580.0000	398,580.0000	398,580.0000	398,580.0000	398,580.0000	398,580.0000	398,580.0000	398,580.0000	398,580.0000	398,580.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200	6.0200
Tank Diameter (ft):	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000
Deck Fitting Losses (lb):	14.5143	15.4155	16.9593	18.7924	21.1808	23.3709	24.1210	23.8984	22.2057	18.9860	16.8148	15.1253
Value of Vapor Pressure Function:	0.0092	0.0098	0.0108	0.0119	0.0135	0.0149	0.0153	0.0152	0.0141	0.0121	0.0107	0.0096
Vapor Molecular Weight (lb/lb-mole):	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	168.3000	168.3000	168.3000	168.3000	168.3000	168.3000	168.3000	168.3000	168.3000	168.3000	168.3000	168.3000
Deck Seam Losses (lb):	2.2767	2.4181	2.6602	2.9478	3.3224	3.6659	3.7836	3.7487	3.4832	2.9781	2.6376	2.3725
Deck Seam Length (ft):	148.1000	148.1000	148.1000	148.1000	148.1000	148.1000	148.1000	148.1000	148.1000	148.1000	148.1000	148.1000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400
Deck Seam Length Factor(ft/sqft):	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400
Tank Diameter (ft):	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000	36.7000
Vapor Molecular Weight (lb/lb-mole):	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000	112.2000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	25.9560	27.4309	29.9575	32.9576	36.8664	40.4506	41.6783	41.3140	38.5437	33.2743	29.7210	26.9560

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	49.5471
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	19.2683
Roof Leg or Hanger Well/Adjustable	11	7.90	0.00	0.00	119.6011
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	16.5157
Stub Drain (1-in. Diameter)/	11	1.20	0.00	0.00	18.1673
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	8.5331

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-79 - Internal Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Diisobutylene	111.00	26.42	231.38	36.29	405.11

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

Identification

User Identification:	T-80
City:	Houston
State:	TX
Company:	Texas Petrochemicals
Type of Tank:	Internal Floating Roof Tank
Description:	MeOH - Annual

Tank Dimensions

Diameter (ft):		40.00
Volume (gallons):		336,000.00
Turnovers:		2,000.00
Self Supp. Roof? (y/n):	Y	
No. of Columns:		0.00
Eff. Col. Diam. (ft):		0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	12
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-80 - Internal Floating Roof Tank
Houston, TX

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
Methyl alcohol	Jan	61.33	56.49	66.17	67.93	1.5036	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Feb	63.24	57.86	68.61	67.93	1.5957	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Mar	66.49	61.09	71.90	67.93	1.7641	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Apr	70.21	64.66	75.75	67.93	1.9746	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	May	73.22	67.46	78.98	67.93	2.1604	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Jun	75.96	70.18	81.75	67.93	2.3426	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Jul	76.90	71.00	82.80	67.93	2.4077	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Aug	76.62	70.81	82.43	67.93	2.3882	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Sep	74.50	68.97	80.03	67.93	2.2442	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Oct	70.45	64.55	76.36	67.93	1.9891	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Nov	66.19	60.93	71.45	67.93	1.7478	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Dec	62.62	57.63	67.61	67.93	1.5655	N/A	N/A	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13

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

T-80 - Internal Floating Roof Tank
Houston, TX

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	1.7278	1.8399	2.0469	2.3093	2.5446	2.7786	2.8630	2.8377	2.6518	2.3276	2.0267	1.8031
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Value of Vapor Pressure Function:	0.0270	0.0287	0.0319	0.0360	0.0397	0.0434	0.0447	0.0443	0.0414	0.0363	0.0316	0.0281
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.5036	1.5957	1.7641	1.9746	2.1604	2.3426	2.4077	2.3882	2.2442	1.9891	1.7478	1.5655
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Vapor Molecular Weight (lb/lb-mole):	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	312.6045	312.6045	312.6045	312.6045	312.6045	312.6045	312.6045	312.6045	312.6045	312.6045	312.6045	312.6045
Number of Columns:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Effective Column Diameter (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Net Throughput (gal/mo.):	56,000,000.000	56,000,000.000	56,000,000.000	56,000,000.000	56,000,000.000	56,000,000.000	56,000,000.000	56,000,000.000	56,000,000.000	56,000,000.000	56,000,000.000	56,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.6300	6.6300	6.6300	6.6300	6.6300	6.6300	6.6300	6.6300	6.6300	6.6300	6.6300	6.6300
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Deck Fitting Losses (lb):	11.7345	12.4958	13.9021	15.6838	17.2819	18.8713	19.4448	19.2730	18.0103	15.8083	13.7647	12.2460
Value of Vapor Pressure Function:	0.0270	0.0287	0.0319	0.0360	0.0397	0.0434	0.0447	0.0443	0.0414	0.0363	0.0316	0.0281
Vapor Molecular Weight (lb/lb-mole):	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Vapor Molecular Weight (lb/lb-mole):	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400	32.0400
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	326.0667	326.9402	328.5535	330.5976	332.4309	334.2544	334.9123	334.7152	333.2666	330.7404	328.3959	326.6536

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	41.6802
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	16.2090
Roof Leg or Hanger Well/Adjustable	12	7.90	0.00	0.00	109.7578
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	13.8934
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	7.1783

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-80 - Internal Floating Roof Tank
Houston, TX

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Methyl alcohol	27.76	3,751.25	188.52	0.00	3,967.53

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

Identification

User Identification:	T-80 Ethanol
City:	Houston
State:	TX
Company:	Texas Petrochemicals
Type of Tank:	Internal Floating Roof Tank
Description:	Ethanol - Annual

Tank Dimensions

Diameter (ft):		40.00
Volume (gallons):		336,000.00
Turnovers:		2,000.00
Self Supp. Roof? (y/n):	Y	
No. of Columns:		0.00
Eff. Col. Diam. (ft):		0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	12
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-80 Ethanol - Internal Floating Roof Tank
Houston, TX

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
Ethyl alcohol	Jan	61.33	56.49	66.17	67.93	0.6884	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Feb	63.24	57.86	68.61	67.93	0.7344	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Mar	66.49	61.09	71.90	67.93	0.8194	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Apr	70.21	64.66	75.75	67.93	0.9266	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	May	73.22	67.46	78.98	67.93	1.0222	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jun	75.96	70.18	81.75	67.93	1.1166	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Jul	76.90	71.00	82.80	67.93	1.1506	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Aug	76.62	70.81	82.43	67.93	1.1404	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Sep	74.50	68.97	80.03	67.93	1.0655	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Oct	70.45	64.55	76.36	67.93	0.9340	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Nov	66.19	60.93	71.45	67.93	0.8111	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52
Ethyl alcohol	Dec	62.62	57.63	67.61	67.93	0.7193	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

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

T-80 Ethanol - Internal Floating Roof Tank
Houston, TX

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	1.1045	1.1803	1.3208	1.4993	1.6596	1.8192	1.8768	1.8595	1.7327	1.5118	1.3071	1.1554
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Value of Vapor Pressure Function:	0.0120	0.0128	0.0143	0.0163	0.0180	0.0197	0.0204	0.0202	0.0188	0.0164	0.0142	0.0125
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6884	0.7344	0.8194	0.9266	1.0222	1.1166	1.1506	1.1404	1.0655	0.9340	0.8111	0.7193
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	311.6615	311.6615	311.6615	311.6615	311.6615	311.6615	311.6615	311.6615	311.6615	311.6615	311.6615	311.6615
Number of Columns:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Effective Column Diameter (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Net Throughput (gal/mo.):	56,000,000.000056,000,000.000056,000,000.000056,000,000.000056,000,000.000056,000,000.000056,000,000.000056,000,000.000056,000,000.000056,000,000.000056,000,000.000056,000,000.000056,000,000.0000											
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.6100	6.6100	6.6100	6.6100	6.6100	6.6100	6.6100	6.6100	6.6100	6.6100	6.6100	6.6100
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Deck Fitting Losses (lb):	7.5011	8.0163	8.9704	10.1825	11.2715	12.3554	12.7465	12.6293	11.7682	10.2673	8.8772	7.8472
Value of Vapor Pressure Function:	0.0120	0.0128	0.0143	0.0163	0.0180	0.0197	0.0204	0.0202	0.0188	0.0164	0.0142	0.0125
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000	163.0000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700	46.0700
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	320.2670	320.8581	321.9528	323.3433	324.5926	325.8361	326.2848	326.1504	325.1624	323.4406	321.8457	320.6641

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	27.0708
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	10.5275
Roof Leg or Hanger Well/Adjustable	12	7.90	0.00	0.00	71.2865
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	9.0236
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	4.6622

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-80 Ethanol - Internal Floating Roof Tank
Houston, TX

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Ethyl alcohol	18.03	3,739.94	122.43	0.00	3,880.40

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

Identification

User Identification:	T-81
City:	Houston
State:	TX
Company:	Texas Petrochemicals Corp
Type of Tank:	Vertical Fixed Roof Tank
Description:	Furfural - Annual

Tank Dimensions

Shell Height (ft):	24.00
Diameter (ft):	30.00
Liquid Height (ft) :	21.00
Avg. Liquid Height (ft):	13.00
Volume (gallons):	111,053.00
Turnovers:	2,840.00
Net Throughput(gal/yr):	315,390,520.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-81 - Vertical Fixed Roof Tank
Houston, TX

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
Furfural	Jan	61.33	56.49	66.17	67.93	0.0147	0.0116	0.0185	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Feb	63.24	57.86	68.61	67.93	0.0161	0.0125	0.0207	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Mar	66.49	61.09	71.90	67.93	0.0188	0.0146	0.0240	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Apr	70.21	64.66	75.75	67.93	0.0223	0.0172	0.0285	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	May	73.22	67.46	78.98	67.93	0.0255	0.0196	0.0328	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Jun	75.96	70.18	81.75	67.93	0.0288	0.0222	0.0369	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Jul	76.90	71.00	82.80	67.93	0.0300	0.0231	0.0386	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Aug	76.62	70.81	82.43	67.93	0.0296	0.0229	0.0380	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Sep	74.50	68.97	80.03	67.93	0.0270	0.0211	0.0343	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Oct	70.45	64.55	76.36	67.93	0.0225	0.0172	0.0293	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Nov	66.19	60.93	71.45	67.93	0.0185	0.0145	0.0236	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Dec	62.62	57.63	67.61	67.93	0.0157	0.0123	0.0198	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8

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

T-81 - Vertical Fixed Roof Tank
Houston, TX

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	2.3396	2.5532	3.2682	3.7982	4.6138	5.0113	5.4842	5.3380	4.5173	4.2197	3.0415	2.5551
Vapor Space Volume (cu ft):	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350
Vapor Density (lb/cu ft):	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0004	0.0003	0.0003
Vapor Space Expansion Factor:	0.0376	0.0417	0.0417	0.0426	0.0441	0.0442	0.0450	0.0443	0.0423	0.0454	0.0406	0.0387
Vented Vapor Saturation Factor:	0.9912	0.9904	0.9889	0.9868	0.9849	0.9830	0.9824	0.9826	0.9841	0.9867	0.9890	0.9907
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350
Tank Diameter (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Vapor Space Outage (ft):	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125
Tank Shell Height (ft):	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000
Average Liquid Height (ft):	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000
Roof Outage (ft):	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125
Roof Height (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Slope (ft/ft):	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Shell Radius (ft):	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0004	0.0003	0.0003
Vapor Molecular Weight (lb/lb-mole):	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0376	0.0417	0.0417	0.0426	0.0441	0.0442	0.0450	0.0443	0.0423	0.0454	0.0406	0.0387
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0069	0.0082	0.0095	0.0113	0.0131	0.0147	0.0155	0.0151	0.0132	0.0121	0.0091	0.0075
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0116	0.0125	0.0146	0.0172	0.0196	0.0222	0.0231	0.0229	0.0211	0.0172	0.0145	0.0123
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0185	0.0207	0.0240	0.0285	0.0328	0.0369	0.0386	0.0380	0.0343	0.0293	0.0236	0.0198
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9912	0.9904	0.9889	0.9868	0.9849	0.9830	0.9824	0.9826	0.9841	0.9867	0.9890	0.9907
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157

Vapor Space Outage (ft):	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125
Working Losses (lb):	156.9917	171.8882	200.1818	237.2976	271.6114	306.5546	319.3375	315.4994	287.5330	239.9384	197.3774	166.9666
Vapor Molecular Weight (lb/lb-mole):	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157
Net Throughput (gal/mo.):	26,282,543.330026,282,543.330026,282,543.330026,282,543.330026,282,543.330026,282,543.330026,282,543.330026,282,543.330026,282,543.330026,282,543.330026,282,543.330026,282,543.3300											
Annual Turnovers:	2,840.0000	2,840.0000	2,840.0000	2,840.0000	2,840.0000	2,840.0000	2,840.0000	2,840.0000	2,840.0000	2,840.0000	2,840.0000	2,840.0000
Turnover Factor:	0.1772	0.1772	0.1772	0.1772	0.1772	0.1772	0.1772	0.1772	0.1772	0.1772	0.1772	0.1772
Maximum Liquid Volume (gal):	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000
Maximum Liquid Height (ft):	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000
Tank Diameter (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	159.3314	174.4415	203.4500	241.0958	276.2252	311.5659	324.8217	320.8374	292.0502	244.1581	200.4189	169.5217

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-81 - Vertical Fixed Roof Tank
Houston, TX

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Furfural	2,871.18	46.74	2,917.92

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

Identification

User Identification:	T-82
City:	Houston
State:	TX
Company:	Texas Petrochemicals Corp
Type of Tank:	Vertical Fixed Roof Tank
Description:	DMF - Annual

Tank Dimensions

Shell Height (ft):	24.00
Diameter (ft):	30.00
Liquid Height (ft) :	21.00
Avg. Liquid Height (ft):	13.00
Volume (gallons):	111,053.00
Turnovers:	4,686.00
Net Throughput(gal/yr):	520,394,358.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-82 - Vertical Fixed Roof Tank
Houston, TX

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
Dimethyl formamide	Jan	61.33	56.49	66.17	67.93	0.0426	0.0351	0.0514	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Feb	63.24	57.86	68.61	67.93	0.0459	0.0371	0.0565	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Mar	66.49	61.09	71.90	67.93	0.0521	0.0422	0.0639	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Apr	70.21	64.66	75.75	67.93	0.0600	0.0485	0.0738	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	May	73.22	67.46	78.98	67.93	0.0672	0.0540	0.0830	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Jun	75.96	70.18	81.75	67.93	0.0744	0.0599	0.0917	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Jul	76.90	71.00	82.80	67.93	0.0770	0.0618	0.0952	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Aug	76.62	70.81	82.43	67.93	0.0762	0.0614	0.0940	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Sep	74.50	68.97	80.03	67.93	0.0705	0.0573	0.0862	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Oct	70.45	64.55	76.36	67.93	0.0606	0.0483	0.0755	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Nov	66.19	60.93	71.45	67.93	0.0515	0.0419	0.0629	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43
Dimethyl formamide	Dec	62.62	57.63	67.61	67.93	0.0448	0.0367	0.0544	73.0900			73.09	Option 2: A=6.928, B=1400.87, C=196.43

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

T-82 - Vertical Fixed Roof Tank
Houston, TX

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	5.1451	5.5281	6.8950	7.7879	9.2514	9.8516	10.7099	10.4449	8.9736	8.6365	6.4321	5.5596
Vapor Space Volume (cu ft):	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350
Vapor Density (lb/cu ft):	0.0006	0.0006	0.0007	0.0008	0.0009	0.0009	0.0010	0.0010	0.0009	0.0008	0.0007	0.0006
Vapor Space Expansion Factor:	0.0383	0.0425	0.0426	0.0436	0.0452	0.0454	0.0463	0.0455	0.0434	0.0464	0.0415	0.0394
Vented Vapor Saturation Factor:	0.9751	0.9732	0.9697	0.9653	0.9613	0.9573	0.9559	0.9563	0.9595	0.9650	0.9701	0.9738
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350	7,996.3350
Tank Diameter (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Vapor Space Outage (ft):	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125
Tank Shell Height (ft):	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000	24.0000
Average Liquid Height (ft):	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000
Roof Outage (ft):	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125
Roof Height (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Slope (ft/ft):	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Shell Radius (ft):	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0006	0.0006	0.0007	0.0008	0.0009	0.0009	0.0010	0.0010	0.0009	0.0008	0.0007	0.0006
Vapor Molecular Weight (lb/lb-mole):	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0426	0.0459	0.0521	0.0600	0.0672	0.0744	0.0770	0.0762	0.0705	0.0606	0.0515	0.0448
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0383	0.0425	0.0426	0.0436	0.0452	0.0454	0.0463	0.0455	0.0434	0.0464	0.0415	0.0394
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0164	0.0194	0.0218	0.0253	0.0290	0.0318	0.0334	0.0325	0.0290	0.0272	0.0210	0.0177
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0426	0.0459	0.0521	0.0600	0.0672	0.0744	0.0770	0.0762	0.0705	0.0606	0.0515	0.0448
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0351	0.0371	0.0422	0.0485	0.0540	0.0599	0.0618	0.0614	0.0573	0.0483	0.0419	0.0367
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0514	0.0565	0.0639	0.0738	0.0830	0.0917	0.0952	0.0940	0.0862	0.0755	0.0629	0.0544
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9751	0.9732	0.9697	0.9653	0.9613	0.9573	0.9559	0.9563	0.9595	0.9650	0.9701	0.9738
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0426	0.0459	0.0521	0.0600	0.0672	0.0744	0.0770	0.0762	0.0705	0.0606	0.0515	0.0448

Vapor Space Outage (ft):	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125	11.3125
Working Losses (lb):	555.8644	599.2540	680.1715	783.8301	877.5895	971.3561	1,005.2763	995.1118	920.5116	791.1115	672.2305	584.9836
Vapor Molecular Weight (lb/lb-mole):	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900	73.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0426	0.0459	0.0521	0.0600	0.0672	0.0744	0.0770	0.0762	0.0705	0.0606	0.0515	0.0448
Net Throughput (gal/mo.):	43,366,196.500043,366,196.500043,366,196.500043,366,196.500043,366,196.500043,366,196.500043,366,196.500043,366,196.500043,366,196.500043,366,196.500043,366,196.500043,366,196.5000											
Annual Turnovers:	4,686.0000	4,686.0000	4,686.0000	4,686.0000	4,686.0000	4,686.0000	4,686.0000	4,686.0000	4,686.0000	4,686.0000	4,686.0000	4,686.0000
Turnover Factor:	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731
Maximum Liquid Volume (gal):	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000	111,053.0000
Maximum Liquid Height (ft):	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000
Tank Diameter (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	561.0095	604.7821	687.0666	791.6180	886.8409	981.2077	1,015.9862	1,005.5567	929.4852	799.7481	678.6626	590.5432

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-82 - Vertical Fixed Roof Tank
Houston, TX

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Dimethyl formamide	9,437.29	95.22	9,532.51

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

Identification

User Identification:	T-84 (IFR)
City:	Houston
State:	Texas
Company:	Texas Petrochemicals LP
Type of Tank:	Internal Floating Roof Tank
Description:	Lean Oil

Tank Dimensions

Diameter (ft):		20.00
Volume (gallons):		54,057.00
Turnovers:		37.29
Self Supp. Roof? (y/n):	N	
No. of Columns:		1.00
Eff. Col. Diam. (ft):		1.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Shoe-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Ungask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	8
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-84 (IFR) - Internal Floating Roof Tank
Houston, Texas

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
Lean oil	Jan	61.33	56.49	66.17	67.93	1.4665	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Feb	63.24	57.86	68.61	67.93	1.5333	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Mar	66.49	61.09	71.90	67.93	1.6473	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Apr	70.21	64.66	75.75	67.93	1.7783	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	May	73.22	67.46	78.98	67.93	1.8987	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Jun	75.96	70.18	81.75	67.93	2.0085	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Jul	76.90	71.00	82.80	67.93	2.0459	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Aug	76.62	70.81	82.43	67.93	2.0348	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Sep	74.50	68.97	80.03	67.93	1.9502	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Oct	70.45	64.55	76.36	67.93	1.7881	N/A	N/A	130.0000			188.00	Option 1: VP70 = 1.77 VP80 = 2.17
Lean oil	Nov	66.19	60.93	71.45	67.93	1.6366	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77
Lean oil	Dec	62.62	57.63	67.61	67.93	1.5118	N/A	N/A	130.0000			188.00	Option 1: VP60 = 1.42 VP70 = 1.77

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

T-84 (IFR) - Internal Floating Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	9.1043	9.5422	10.2952	11.1686	11.9788	12.7240	12.9798	12.9039	12.3273	11.2342	10.2246	9.4011
Seal Factor A (lb-mole/ft-yr):	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Value of Vapor Pressure Function:	0.0263	0.0275	0.0297	0.0322	0.0346	0.0367	0.0374	0.0372	0.0356	0.0324	0.0295	0.0271
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.4665	1.5333	1.6473	1.7783	1.8987	2.0085	2.0459	2.0348	1.9502	1.7881	1.6366	1.5118
Tank Diameter (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	2.1090	2.1090	2.1090	2.1090	2.1090	2.1090	2.1090	2.1090	2.1090	2.1090	2.1090	2.1090
Number of Columns:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Effective Column Diameter (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net Throughput (gal/mo.):	168,000.0000	168,000.0000	168,000.0000	168,000.0000	168,000.0000	168,000.0000	168,000.0000	168,000.0000	168,000.0000	168,000.0000	168,000.0000	168,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Deck Fitting Losses (lb):	72.3793	75.8605	81.8467	88.7907	95.2318	101.1559	103.1892	102.5856	98.0020	89.3119	81.2852	74.7385
Value of Vapor Pressure Function:	0.0263	0.0275	0.0297	0.0322	0.0346	0.0367	0.0374	0.0372	0.0356	0.0324	0.0295	0.0271
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	254.4000	254.4000	254.4000	254.4000	254.4000	254.4000	254.4000	254.4000	254.4000	254.4000	254.4000	254.4000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	83.5926	87.5118	94.2509	102.0683	109.3197	115.9890	118.2780	117.5985	112.4383	102.6551	93.6188	86.2486

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	150.7314
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	58.6178
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Ungask.	1	47.00	0.00	0.00	196.7883
Ladder Well (36-in. Diam.)/Sliding Cover, Ungasketed	1	76.00	0.00	0.00	318.2108
Roof Leg or Hanger Well/Adjustable	8	7.90	0.00	0.00	264.6174
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	50.2438
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	25.9593

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-84 (IFR) - Internal Floating Roof Tank
Houston, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Lean oil	133.88	25.31	1,064.38	0.00	1,223.57

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

Identification

User Identification:	T-85
City:	Houston
State:	TX
Company:	Texas Petrochemicals Corp
Type of Tank:	Vertical Fixed Roof Tank
Description:	AS-110

Tank Dimensions

Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		18.00
Avg. Liquid Height (ft):		11.00
Volume (gallons):		15,230.00
Turnovers:		60.81
Net Throughput(gal/yr):		926,100.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-85 - Vertical Fixed Roof Tank
Houston, TX

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
AS-110 Oil	Jan	61.33	56.49	66.17	67.93	0.0039	0.0038	0.0039	130.0000			188.00	Option 1: VP60 = .0039 VP70 = .0039
AS-110 Oil	Feb	63.24	57.86	68.61	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP60 = .0039 VP70 = .0039
AS-110 Oil	Mar	66.49	61.09	71.90	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP60 = .0039 VP70 = .0039
AS-110 Oil	Apr	70.21	64.66	75.75	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP70 = .0039 VP80 = .0039
AS-110 Oil	May	73.22	67.46	78.98	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP70 = .0039 VP80 = .0039
AS-110 Oil	Jun	75.96	70.18	81.75	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP70 = .0039 VP80 = .0039
AS-110 Oil	Jul	76.90	71.00	82.80	67.93	0.0039	0.0039	0.0040	130.0000			188.00	Option 1: VP70 = .0039 VP80 = .0039
AS-110 Oil	Aug	76.62	70.81	82.43	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP70 = .0039 VP80 = .0039
AS-110 Oil	Sep	74.50	68.97	80.03	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP70 = .0039 VP80 = .0039
AS-110 Oil	Oct	70.45	64.55	76.36	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP70 = .0039 VP80 = .0039
AS-110 Oil	Nov	66.19	60.93	71.45	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP60 = .0039 VP70 = .0039
AS-110 Oil	Dec	62.62	57.63	67.61	67.93	0.0039	0.0039	0.0039	130.0000			188.00	Option 1: VP60 = .0039 VP70 = .0039

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

T-85 - Vertical Fixed Roof Tank
Houston, TX

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.1076	0.1072	0.1177	0.1154	0.1224	0.1177	0.1237	0.1218	0.1132	0.1268	0.1111	0.1104
Vapor Space Volume (cu ft):	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Vapor Space Expansion Factor:	0.0371	0.0411	0.0411	0.0419	0.0432	0.0432	0.0440	0.0433	0.0414	0.0445	0.0400	0.0382
Vented Vapor Saturation Factor:	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132	1,032.0132
Tank Diameter (ft):	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000
Vapor Space Outage (ft):	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250
Tank Shell Height (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Average Liquid Height (ft):	11.0000	11.0000	11.0000	11.0000	11.0000	11.0000	11.0000	11.0000	11.0000	11.0000	11.0000	11.0000
Roof Outage (ft):	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250
Roof Height (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Slope (ft/ft):	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Shell Radius (ft):	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0371	0.0411	0.0411	0.0419	0.0432	0.0432	0.0440	0.0433	0.0414	0.0445	0.0400	0.0382
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0038	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0040	0.0039	0.0039	0.0039	0.0039	0.0039
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039

Vapor Space Outage (ft):	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250	9.1250
Working Losses (lb):	0.6149	0.6149	0.6149	0.6149	0.6149	0.6149	0.6149	0.6149	0.6149	0.6149	0.6149	0.6149
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039
Net Throughput (gal/mo.):	77,175.0000	77,175.0000	77,175.0000	77,175.0000	77,175.0000	77,175.0000	77,175.0000	77,175.0000	77,175.0000	77,175.0000	77,175.0000	77,175.0000
Annual Turnovers:	60.8076	60.8076	60.8076	60.8076	60.8076	60.8076	60.8076	60.8076	60.8076	60.8076	60.8076	60.8076
Turnover Factor:	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
Maximum Liquid Volume (gal):	15,230.0000	15,230.0000	15,230.0000	15,230.0000	15,230.0000	15,230.0000	15,230.0000	15,230.0000	15,230.0000	15,230.0000	15,230.0000	15,230.0000
Maximum Liquid Height (ft):	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000
Tank Diameter (ft):	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.7225	0.7221	0.7326	0.7303	0.7373	0.7326	0.7386	0.7367	0.7281	0.7416	0.7260	0.7253

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-85 - Vertical Fixed Roof Tank
Houston, TX

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
AS-110 Oil	7.38	1.39	8.77

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

Identification

User Identification:	T-86
City:	Houston
State:	TX
Company:	Texas Petrochemicals Corp
Type of Tank:	Vertical Fixed Roof Tank
Description:	Furfural

Tank Dimensions

Shell Height (ft):	27.00
Diameter (ft):	20.00
Liquid Height (ft) :	24.30
Avg. Liquid Height (ft):	15.00
Volume (gallons):	57,113.00
Turnovers:	1,697.00
Net Throughput(gal/yr):	96,920,761.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-86 - Vertical Fixed Roof Tank
Houston, TX

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
Furfural	Jan	61.33	56.49	66.17	67.93	0.0147	0.0116	0.0185	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Feb	63.24	57.86	68.61	67.93	0.0161	0.0125	0.0207	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Mar	66.49	61.09	71.90	67.93	0.0188	0.0146	0.0240	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Apr	70.21	64.66	75.75	67.93	0.0223	0.0172	0.0285	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	May	73.22	67.46	78.98	67.93	0.0255	0.0196	0.0328	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Jun	75.96	70.18	81.75	67.93	0.0288	0.0222	0.0369	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Jul	76.90	71.00	82.80	67.93	0.0300	0.0231	0.0386	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Aug	76.62	70.81	82.43	67.93	0.0296	0.0229	0.0380	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Sep	74.50	68.97	80.03	67.93	0.0270	0.0211	0.0343	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Oct	70.45	64.55	76.36	67.93	0.0225	0.0172	0.0293	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Nov	66.19	60.93	71.45	67.93	0.0185	0.0145	0.0236	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8
Furfural	Dec	62.62	57.63	67.61	67.93	0.0157	0.0123	0.0198	96.0900			96.09	Option 2: A=6.575, B=1198.7, C=162.8

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

T-86 - Vertical Fixed Roof Tank
Houston, TX

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	1.1214	1.2237	1.5662	1.8198	2.2103	2.4004	2.6268	2.5568	2.1639	2.0218	1.4576	1.2246
Vapor Space Volume (cu ft):	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610
Vapor Density (lb/cu ft):	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0004	0.0003	0.0003
Vapor Space Expansion Factor:	0.0376	0.0417	0.0417	0.0426	0.0441	0.0442	0.0450	0.0443	0.0423	0.0454	0.0406	0.0387
Vented Vapor Saturation Factor:	0.9906	0.9897	0.9880	0.9858	0.9838	0.9817	0.9810	0.9812	0.9828	0.9856	0.9882	0.9900
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610	3,835.3610
Tank Diameter (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Vapor Space Outage (ft):	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083
Tank Shell Height (ft):	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000
Average Liquid Height (ft):	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000
Roof Outage (ft):	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083
Roof Height (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Slope (ft/ft):	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Shell Radius (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0004	0.0003	0.0003
Vapor Molecular Weight (lb/lb-mole):	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0376	0.0417	0.0417	0.0426	0.0441	0.0442	0.0450	0.0443	0.0423	0.0454	0.0406	0.0387
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0069	0.0082	0.0095	0.0113	0.0131	0.0147	0.0155	0.0151	0.0132	0.0121	0.0091	0.0075
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0116	0.0125	0.0146	0.0172	0.0196	0.0222	0.0231	0.0229	0.0211	0.0172	0.0145	0.0123
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0185	0.0207	0.0240	0.0285	0.0328	0.0369	0.0386	0.0380	0.0343	0.0293	0.0236	0.0198
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9906	0.9897	0.9880	0.9858	0.9838	0.9817	0.9810	0.9812	0.9828	0.9856	0.9882	0.9900
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157

Vapor Space Outage (ft):	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083	12.2083
Working Losses (lb):	50.1809	54.9425	63.9863	75.8500	86.8180	97.9873	102.0733	100.8464	91.9072	76.6941	63.0898	53.3693
Vapor Molecular Weight (lb/lb-mole):	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900	96.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0147	0.0161	0.0188	0.0223	0.0255	0.0288	0.0300	0.0296	0.0270	0.0225	0.0185	0.0157
Net Throughput (gal/mo.):	8,076,730.0830	8,076,730.0830	8,076,730.0830	8,076,730.0830	8,076,730.0830	8,076,730.0830	8,076,730.0830	8,076,730.0830	8,076,730.0830	8,076,730.0830	8,076,730.0830	8,076,730.0830
Annual Turnovers:	1,697.0000	1,697.0000	1,697.0000	1,697.0000	1,697.0000	1,697.0000	1,697.0000	1,697.0000	1,697.0000	1,697.0000	1,697.0000	1,697.0000
Turnover Factor:	0.1843	0.1843	0.1843	0.1843	0.1843	0.1843	0.1843	0.1843	0.1843	0.1843	0.1843	0.1843
Maximum Liquid Volume (gal):	57,113.0000	57,113.0000	57,113.0000	57,113.0000	57,113.0000	57,113.0000	57,113.0000	57,113.0000	57,113.0000	57,113.0000	57,113.0000	57,113.0000
Maximum Liquid Height (ft):	24.3000	24.3000	24.3000	24.3000	24.3000	24.3000	24.3000	24.3000	24.3000	24.3000	24.3000	24.3000
Tank Diameter (ft):	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	51.3023	56.1662	65.5524	77.6698	89.0284	100.3877	104.7000	103.4032	94.0712	78.7159	64.5474	54.5939

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-86 - Vertical Fixed Roof Tank
Houston, TX

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Furfural	917.75	22.39	940.14

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

Identification

User Identification:	T-Diesel
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Horizontal Tank
Description:	Boilerhouse Emergency Generator Diesel Tank

Tank Dimensions

Shell Length (ft):	6.00
Diameter (ft):	4.00
Volume (gallons):	563.97
Turnovers:	79.79
Net Throughput(gal/yr):	45,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-Diesel - Horizontal Tank
Houston, Texas

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
Distillate fuel oil no. 2	Jan	61.33	56.49	66.17	67.93	0.0076	0.0064	0.0084	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009
Distillate fuel oil no. 2	Feb	63.24	57.86	68.61	67.93	0.0079	0.0068	0.0088	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009
Distillate fuel oil no. 2	Mar	66.49	61.09	71.90	67.93	0.0084	0.0076	0.0096	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009
Distillate fuel oil no. 2	Apr	70.21	64.66	75.75	67.93	0.0091	0.0081	0.0107	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	May	73.22	67.46	78.98	67.93	0.0100	0.0086	0.0117	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Jun	75.96	70.18	81.75	67.93	0.0108	0.0091	0.0127	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Jul	76.90	71.00	82.80	67.93	0.0111	0.0093	0.0131	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Aug	76.62	70.81	82.43	67.93	0.0110	0.0092	0.0130	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Sep	74.50	68.97	80.03	67.93	0.0104	0.0088	0.0120	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Oct	70.45	64.55	76.36	67.93	0.0091	0.0081	0.0109	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Nov	66.19	60.93	71.45	67.93	0.0084	0.0075	0.0094	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009
Distillate fuel oil no. 2	Dec	62.62	57.63	67.61	67.93	0.0078	0.0067	0.0086	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009

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

T-Diesel - Horizontal Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0087	0.0092	0.0107	0.0113	0.0133	0.0138	0.0149	0.0146	0.0127	0.0126	0.0100	0.0092
Vapor Space Volume (cu ft):	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Vapor Space Expansion Factor:	0.0332	0.0372	0.0371	0.0380	0.0394	0.0394	0.0402	0.0395	0.0375	0.0406	0.0361	0.0343
Vented Vapor Saturation Factor:	0.9992	0.9992	0.9991	0.9990	0.9989	0.9989	0.9988	0.9988	0.9989	0.9990	0.9991	0.9992
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243	48.0243
Tank Diameter (ft):	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Effective Diameter (ft):	5.5293	5.5293	5.5293	5.5293	5.5293	5.5293	5.5293	5.5293	5.5293	5.5293	5.5293	5.5293
Vapor Space Outage (ft):	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
Tank Shell Length (ft):	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0076	0.0079	0.0084	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0084	0.0078
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0332	0.0372	0.0371	0.0380	0.0394	0.0394	0.0402	0.0395	0.0375	0.0406	0.0361	0.0343
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0020	0.0020	0.0020	0.0026	0.0031	0.0036	0.0038	0.0037	0.0032	0.0028	0.0019	0.0019
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0076	0.0079	0.0084	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0084	0.0078
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0064	0.0068	0.0076	0.0081	0.0086	0.0091	0.0093	0.0092	0.0088	0.0081	0.0075	0.0067
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0084	0.0088	0.0096	0.0107	0.0117	0.0127	0.0131	0.0130	0.0120	0.0109	0.0094	0.0086
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9992	0.9992	0.9991	0.9990	0.9989	0.9989	0.9988	0.9988	0.9989	0.9990	0.9991	0.9992
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0076	0.0079	0.0084	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0084	0.0078
Vapor Space Outage (ft):	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
Working Losses (lb):	0.0479	0.0499	0.0532	0.0571	0.0628	0.0680	0.0697	0.0692	0.0652	0.0575	0.0528	0.0493
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0076	0.0079	0.0084	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0084	0.0078
Net Throughput (gal/mo.):	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000

Annual Turnovers:	79.7915	79.7915	79.7915	79.7915	79.7915	79.7915	79.7915	79.7915	79.7915	79.7915	79.7915	79.7915
Turnover Factor:	0.5426	0.5426	0.5426	0.5426	0.5426	0.5426	0.5426	0.5426	0.5426	0.5426	0.5426	0.5426
Tank Diameter (ft):	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.0567	0.0590	0.0639	0.0684	0.0760	0.0818	0.0846	0.0838	0.0779	0.0702	0.0629	0.0585

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-Diesel - Horizontal Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.70	0.14	0.84

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

Identification

User Identification:	T-Diesel2
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Horizontal Tank
Description:	Boilerhouse Emergency Generator Diesel Tank

Tank Dimensions

Shell Length (ft):		10.00
Diameter (ft):		10.00
Volume (gallons):		4,998.00
Turnovers:		9.00
Net Throughput(gal/yr):		45,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-Diesel2 - Horizontal Tank
Houston, Texas

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
Distillate fuel oil no. 2	Jan	61.33	56.49	66.17	67.93	0.0076	0.0064	0.0084	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009
Distillate fuel oil no. 2	Feb	63.24	57.86	68.61	67.93	0.0079	0.0068	0.0088	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009
Distillate fuel oil no. 2	Mar	66.49	61.09	71.90	67.93	0.0084	0.0076	0.0096	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009
Distillate fuel oil no. 2	Apr	70.21	64.66	75.75	67.93	0.0091	0.0081	0.0107	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	May	73.22	67.46	78.98	67.93	0.0100	0.0086	0.0117	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Jun	75.96	70.18	81.75	67.93	0.0108	0.0091	0.0127	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Jul	76.90	71.00	82.80	67.93	0.0111	0.0093	0.0131	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Aug	76.62	70.81	82.43	67.93	0.0110	0.0092	0.0130	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Sep	74.50	68.97	80.03	67.93	0.0104	0.0088	0.0120	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Oct	70.45	64.55	76.36	67.93	0.0091	0.0081	0.0109	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Nov	66.19	60.93	71.45	67.93	0.0084	0.0075	0.0094	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009
Distillate fuel oil no. 2	Dec	62.62	57.63	67.61	67.93	0.0078	0.0067	0.0086	130.0000			188.00	Option 1: VP60 = .0074 VP70 = .009

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

T-Diesel2 - Horizontal Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0909	0.0953	0.1116	0.1178	0.1379	0.1437	0.1552	0.1515	0.1319	0.1313	0.1044	0.0962
Vapor Space Volume (cu ft):	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Vapor Space Expansion Factor:	0.0332	0.0372	0.0371	0.0380	0.0394	0.0394	0.0402	0.0395	0.0375	0.0406	0.0361	0.0343
Vented Vapor Saturation Factor:	0.9980	0.9979	0.9978	0.9976	0.9974	0.9971	0.9971	0.9971	0.9973	0.9976	0.9978	0.9979
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536	500.2536
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Effective Diameter (ft):	11.2867	11.2867	11.2867	11.2867	11.2867	11.2867	11.2867	11.2867	11.2867	11.2867	11.2867	11.2867
Vapor Space Outage (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Tank Shell Length (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0076	0.0079	0.0084	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0084	0.0078
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0332	0.0372	0.0371	0.0380	0.0394	0.0394	0.0402	0.0395	0.0375	0.0406	0.0361	0.0343
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0020	0.0020	0.0020	0.0026	0.0031	0.0036	0.0038	0.0037	0.0032	0.0028	0.0019	0.0019
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0076	0.0079	0.0084	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0084	0.0078
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0064	0.0068	0.0076	0.0081	0.0086	0.0091	0.0093	0.0092	0.0088	0.0081	0.0075	0.0067
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0084	0.0088	0.0096	0.0107	0.0117	0.0127	0.0131	0.0130	0.0120	0.0109	0.0094	0.0086
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9980	0.9979	0.9978	0.9976	0.9974	0.9971	0.9971	0.9971	0.9973	0.9976	0.9978	0.9979
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0076	0.0079	0.0084	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0084	0.0078
Vapor Space Outage (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Working Losses (lb):	0.0884	0.0919	0.0980	0.1052	0.1157	0.1252	0.1285	0.1275	0.1201	0.1060	0.0974	0.0908
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0076	0.0079	0.0084	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0084	0.0078
Net Throughput (gal/mo.):	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000	3,750.0000

Annual Turnovers:	9.0036	9.0036	9.0036	9.0036	9.0036	9.0036	9.0036	9.0036	9.0036	9.0036	9.0036	9.0036
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.1793	0.1872	0.2095	0.2230	0.2536	0.2689	0.2837	0.2790	0.2520	0.2373	0.2018	0.1870

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-Diesel2 - Horizontal Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.29	1.47	2.76

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

Identification

User Identification:	T-P1WW1
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Vertical Fixed Roof Tank
Description:	PIB Wastewater

Tank Dimensions

Shell Height (ft):		32.00
Diameter (ft):		18.00
Liquid Height (ft) :		31.00
Avg. Liquid Height (ft):		31.00
Volume (gallons):		60,200.00
Turnovers:		72.76
Net Throughput(gal/yr):		4,380,000.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		1.00
Slope (ft/ft) (Cone Roof)		0.11

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-P1WW1 - Vertical Fixed Roof Tank
Houston, Texas

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
PIB Wastewater	Jan	61.33	56.49	66.17	67.93	0.5022	0.5010	0.5037	18.0221			18.08	
Ammonia solution						0.6479	0.5674	0.7495	17.9800	0.0150	0.0194	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9790	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Feb	63.24	57.86	68.61	67.93	0.5028	0.5013	0.5045	18.0221			18.08	
Ammonia solution						0.6880	0.5879	0.8009	17.9800	0.0150	0.0206	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9779	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Mar	66.49	61.09	71.90	67.93	0.5038	0.5021	0.5056	18.0220			18.08	
Ammonia solution						0.7564	0.6429	0.8698	17.9800	0.0150	0.0226	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9759	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Apr	70.21	64.66	75.75	67.93	0.5050	0.5033	0.5068	18.0219			18.08	
Ammonia solution						0.8344	0.7179	0.9509	17.9800	0.0150	0.0249	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9736	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	May	73.22	67.46	78.98	67.93	0.5060	0.5041	0.5078	18.0218			18.08	
Ammonia solution						0.8976	0.7766	1.0185	17.9800	0.0150	0.0267	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9718	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Jun	75.96	70.18	81.75	67.93	0.5068	0.5050	0.5777	18.0218			18.08	
Ammonia solution						0.9552	0.8337	1.0959	17.9800	0.0150	0.0284	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5698	18.0000	0.9800	0.9701	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Jul	76.90	71.00	82.80	67.93	0.5071	0.5053	0.6197	18.0217			18.08	
Ammonia solution						0.9749	0.8510	1.1295	17.9800	0.0150	0.0289	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.6119	18.0000	0.9800	0.9695	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Aug	76.62	70.81	82.43	67.93	0.5071	0.5052	0.6049	18.0217			18.08	
Ammonia solution						0.9690	0.8471	1.1177	17.9800	0.0150	0.0288	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5971	18.0000	0.9800	0.9697	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Sep	74.50	68.97	80.03	67.93	0.5064	0.5046	0.5095	18.0218			18.08	
Ammonia solution						0.9246	0.8085	1.0411	17.9800	0.0150	0.0275	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5013	18.0000	0.9800	0.9710	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Oct	70.45	64.55	76.36	67.93	0.5051	0.5032	0.5070	18.0219			18.08	
Ammonia solution						0.8395	0.7155	0.9635	17.9800	0.0150	0.0250	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9734	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Nov	66.19	60.93	71.45	67.93	0.5037	0.5021	0.5054	18.0220			18.08	

Ammonia solution						0.7500	0.6395	0.8605	17.9800	0.0150	0.0224	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9760	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Dec	62.62	57.63	67.61	67.93	0.5026	0.5013	0.5042	18.0221			18.08	
Ammonia solution						0.6751	0.5845	0.7799	17.9800	0.0150	0.0202	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9782	18.00	Option 1: VP60 = .5 VP70 = .5

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

T-P1WW1 - Vertical Fixed Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5444	0.5500	0.6056	0.5961	0.6357	0.6885	0.7706	0.7434	0.5870	0.6594	0.5699	0.5616
Vapor Space Volume (cu ft):	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920
Vapor Density (lb/cu ft):	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Vapor Space Expansion Factor:	0.0331	0.0371	0.0371	0.0379	0.0393	0.0441	0.0478	0.0461	0.0375	0.0406	0.0360	0.0342
Vented Vapor Saturation Factor:	0.9657	0.9657	0.9656	0.9655	0.9655	0.9654	0.9654	0.9654	0.9655	0.9655	0.9656	0.9657
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920
Tank Diameter (ft):	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000
Vapor Space Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Tank Shell Height (ft):	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000
Average Liquid Height (ft):	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000
Roof Outage (ft):	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333
Roof Height (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Roof Slope (ft/ft):	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100
Shell Radius (ft):	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Vapor Molecular Weight (lb/lb-mole):	18.0221	18.0221	18.0220	18.0219	18.0218	18.0218	18.0217	18.0217	18.0218	18.0219	18.0220	18.0221
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0331	0.0371	0.0371	0.0379	0.0393	0.0441	0.0478	0.0461	0.0375	0.0406	0.0360	0.0342
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0027	0.0032	0.0034	0.0035	0.0036	0.0727	0.1144	0.0997	0.0048	0.0037	0.0033	0.0029
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5010	0.5013	0.5021	0.5033	0.5041	0.5050	0.5053	0.5052	0.5046	0.5032	0.5021	0.5013
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.5037	0.5045	0.5056	0.5068	0.5078	0.5777	0.6197	0.6049	0.5095	0.5070	0.5054	0.5042
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9657	0.9657	0.9656	0.9655	0.9655	0.9654	0.9654	0.9654	0.9655	0.9655	0.9656	0.9657
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026

Vapor Space Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Working Losses (lb):	45.5416	45.5963	45.6897	45.7961	45.8824	45.9610	45.9879	45.9799	45.9193	45.8031	45.6809	45.5787
Vapor Molecular Weight (lb/lb-mole):	18.0221	18.0221	18.0220	18.0219	18.0218	18.0218	18.0217	18.0217	18.0218	18.0219	18.0220	18.0221
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026
Net Throughput (gal/mo.):	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000
Annual Turnovers:	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575
Turnover Factor:	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790
Maximum Liquid Volume (gal):	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000
Maximum Liquid Height (ft):	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000
Tank Diameter (ft):	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	46.0860	46.1463	46.2953	46.3922	46.5181	46.6495	46.7585	46.7233	46.5062	46.4626	46.2508	46.1402

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-P1WW1 - Vertical Fixed Roof Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
PIB Wastewater	549.42	7.51	556.93
Ammonia solution	13.53	0.19	13.72
Polyisobutylene (HOF)	0.85	0.01	0.86
Water	535.04	7.31	542.35

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

Identification

User Identification:	T-P1WW2
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Vertical Fixed Roof Tank
Description:	PIB Wastewater

Tank Dimensions

Shell Height (ft):	22.50
Diameter (ft):	16.00
Liquid Height (ft) :	21.00
Avg. Liquid Height (ft):	21.00
Volume (gallons):	30,100.00
Turnovers:	145.51
Net Throughput(gal/yr):	4,380,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	1.00
Slope (ft/ft) (Cone Roof)	0.12

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-P1WW2 - Vertical Fixed Roof Tank
Houston, Texas

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
PIB Wastewater	Jan	61.33	56.49	66.17	67.93	0.5022	0.5010	0.5037	18.0221			18.08	
Ammonia solution						0.6479	0.5674	0.7495	17.9800	0.0150	0.0194	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9790	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Feb	63.24	57.86	68.61	67.93	0.5028	0.5013	0.5045	18.0221			18.08	
Ammonia solution						0.6880	0.5879	0.8009	17.9800	0.0150	0.0206	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9779	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Mar	66.49	61.09	71.90	67.93	0.5038	0.5021	0.5056	18.0220			18.08	
Ammonia solution						0.7564	0.6429	0.8698	17.9800	0.0150	0.0226	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9759	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Apr	70.21	64.66	75.75	67.93	0.5050	0.5033	0.5068	18.0219			18.08	
Ammonia solution						0.8344	0.7179	0.9509	17.9800	0.0150	0.0249	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9736	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	May	73.22	67.46	78.98	67.93	0.5060	0.5041	0.5078	18.0218			18.08	
Ammonia solution						0.8976	0.7766	1.0185	17.9800	0.0150	0.0267	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9718	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Jun	75.96	70.18	81.75	67.93	0.5068	0.5050	0.5777	18.0218			18.08	
Ammonia solution						0.9552	0.8337	1.0959	17.9800	0.0150	0.0284	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5698	18.0000	0.9800	0.9701	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Jul	76.90	71.00	82.80	67.93	0.5071	0.5053	0.6197	18.0217			18.08	
Ammonia solution						0.9749	0.8510	1.1295	17.9800	0.0150	0.0289	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.6119	18.0000	0.9800	0.9695	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Aug	76.62	70.81	82.43	67.93	0.5071	0.5052	0.6049	18.0217			18.08	
Ammonia solution						0.9690	0.8471	1.1177	17.9800	0.0150	0.0288	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5971	18.0000	0.9800	0.9697	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Sep	74.50	68.97	80.03	67.93	0.5064	0.5046	0.5095	18.0218			18.08	
Ammonia solution						0.9246	0.8085	1.0411	17.9800	0.0150	0.0275	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5013	18.0000	0.9800	0.9710	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Oct	70.45	64.55	76.36	67.93	0.5051	0.5032	0.5070	18.0219			18.08	
Ammonia solution						0.8395	0.7155	0.9635	17.9800	0.0150	0.0250	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9734	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Nov	66.19	60.93	71.45	67.93	0.5037	0.5021	0.5054	18.0220			18.08	

Ammonia solution						0.7500	0.6395	0.8605	17.9800	0.0150	0.0224	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9760	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Dec	62.62	57.63	67.61	67.93	0.5026	0.5013	0.5042	18.0221			18.08	
Ammonia solution						0.6751	0.5845	0.7799	17.9800	0.0150	0.0202	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9782	18.00	Option 1: VP60 = .5 VP70 = .5

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

T-P1WW2 - Vertical Fixed Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5840	0.5900	0.6496	0.6393	0.6818	0.7384	0.8265	0.7973	0.6296	0.7073	0.6112	0.6023
Vapor Space Volume (cu ft):	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135
Vapor Density (lb/cu ft):	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Vapor Space Expansion Factor:	0.0331	0.0371	0.0371	0.0379	0.0393	0.0441	0.0478	0.0461	0.0375	0.0406	0.0360	0.0342
Vented Vapor Saturation Factor:	0.9535	0.9534	0.9533	0.9532	0.9531	0.9531	0.9530	0.9530	0.9531	0.9532	0.9533	0.9534
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135	368.6135
Tank Diameter (ft):	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000
Vapor Space Outage (ft):	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333
Tank Shell Height (ft):	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000
Average Liquid Height (ft):	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000
Roof Outage (ft):	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333
Roof Height (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Roof Slope (ft/ft):	0.1200	0.1200	0.1200	0.1200	0.1200	0.1200	0.1200	0.1200	0.1200	0.1200	0.1200	0.1200
Shell Radius (ft):	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Vapor Molecular Weight (lb/lb-mole):	18.0221	18.0221	18.0220	18.0219	18.0218	18.0218	18.0217	18.0217	18.0218	18.0219	18.0220	18.0221
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0331	0.0371	0.0371	0.0379	0.0393	0.0441	0.0478	0.0461	0.0375	0.0406	0.0360	0.0342
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0027	0.0032	0.0034	0.0035	0.0036	0.0727	0.1144	0.0997	0.0048	0.0037	0.0033	0.0029
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5010	0.5013	0.5021	0.5033	0.5041	0.5050	0.5053	0.5052	0.5046	0.5032	0.5021	0.5013
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.5037	0.5045	0.5056	0.5068	0.5078	0.5777	0.6197	0.6049	0.5095	0.5070	0.5054	0.5042
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9535	0.9534	0.9533	0.9532	0.9531	0.9531	0.9530	0.9530	0.9531	0.9532	0.9533	0.9534
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026

Vapor Space Outage (ft):	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333
Working Losses (lb):	29.3255	29.3607	29.4208	29.4894	29.5449	29.5956	29.6129	29.6077	29.5687	29.4939	29.4152	29.3494
Vapor Molecular Weight (lb/lb-mole):	18.0221	18.0221	18.0220	18.0219	18.0218	18.0218	18.0217	18.0217	18.0218	18.0219	18.0220	18.0221
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026
Net Throughput (gal/mo.):	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000
Annual Turnovers:	145.5150	145.5150	145.5150	145.5150	145.5150	145.5150	145.5150	145.5150	145.5150	145.5150	145.5150	145.5150
Turnover Factor:	0.3728	0.3728	0.3728	0.3728	0.3728	0.3728	0.3728	0.3728	0.3728	0.3728	0.3728	0.3728
Maximum Liquid Volume (gal):	30,100.0000	30,100.0000	30,100.0000	30,100.0000	30,100.0000	30,100.0000	30,100.0000	30,100.0000	30,100.0000	30,100.0000	30,100.0000	30,100.0000
Maximum Liquid Height (ft):	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000	21.0000
Tank Diameter (ft):	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	29.9095	29.9507	30.0704	30.1287	30.2268	30.3340	30.4394	30.4050	30.1982	30.2012	30.0264	29.9517

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-P1WW2 - Vertical Fixed Roof Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
PIB Wastewater	353.78	8.06	361.84
Ammonia solution	8.71	0.20	8.91
Polyisobutylene (HOF)	0.54	0.01	0.56
Water	344.53	7.84	352.37

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

Identification

User Identification:	T-P2WW1
City:	Houston
State:	Texas
Company:	Texas Petrochemicals
Type of Tank:	Vertical Fixed Roof Tank
Description:	PIB Wastewater

Tank Dimensions

Shell Height (ft):	32.00
Diameter (ft):	18.00
Liquid Height (ft) :	31.00
Avg. Liquid Height (ft):	31.00
Volume (gallons):	60,200.00
Turnovers:	72.76
Net Throughput(gal/yr):	4,380,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	1.00
Slope (ft/ft) (Cone Roof)	0.11

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

T-P2WW1 - Vertical Fixed Roof Tank
Houston, Texas

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
PIB Wastewater	Jan	61.33	56.49	66.17	67.93	0.5022	0.5010	0.5037	18.0221			18.08	
Ammonia solution						0.6479	0.5674	0.7495	17.9800	0.0150	0.0194	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9790	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Feb	63.24	57.86	68.61	67.93	0.5028	0.5013	0.5045	18.0221			18.08	
Ammonia solution						0.6880	0.5879	0.8009	17.9800	0.0150	0.0206	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9779	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Mar	66.49	61.09	71.90	67.93	0.5038	0.5021	0.5056	18.0220			18.08	
Ammonia solution						0.7564	0.6429	0.8698	17.9800	0.0150	0.0226	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9759	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Apr	70.21	64.66	75.75	67.93	0.5050	0.5033	0.5068	18.0219			18.08	
Ammonia solution						0.8344	0.7179	0.9509	17.9800	0.0150	0.0249	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9736	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	May	73.22	67.46	78.98	67.93	0.5060	0.5041	0.5078	18.0218			18.08	
Ammonia solution						0.8976	0.7766	1.0185	17.9800	0.0150	0.0267	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9718	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Jun	75.96	70.18	81.75	67.93	0.5068	0.5050	0.5777	18.0218			18.08	
Ammonia solution						0.9552	0.8337	1.0959	17.9800	0.0150	0.0284	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5698	18.0000	0.9800	0.9701	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Jul	76.90	71.00	82.80	67.93	0.5071	0.5053	0.6197	18.0217			18.08	
Ammonia solution						0.9749	0.8510	1.1295	17.9800	0.0150	0.0289	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.6119	18.0000	0.9800	0.9695	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Aug	76.62	70.81	82.43	67.93	0.5071	0.5052	0.6049	18.0217			18.08	
Ammonia solution						0.9690	0.8471	1.1177	17.9800	0.0150	0.0288	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5971	18.0000	0.9800	0.9697	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Sep	74.50	68.97	80.03	67.93	0.5064	0.5046	0.5095	18.0218			18.08	
Ammonia solution						0.9246	0.8085	1.0411	17.9800	0.0150	0.0275	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5013	18.0000	0.9800	0.9710	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Oct	70.45	64.55	76.36	67.93	0.5051	0.5032	0.5070	18.0219			18.08	
Ammonia solution						0.8395	0.7155	0.9635	17.9800	0.0150	0.0250	17.98	Option 1: VP70 = .83 VP80 = 1.04
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP70 = .432 VP80 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9734	18.00	Option 1: VP70 = .5 VP80 = .5
PIB Wastewater	Nov	66.19	60.93	71.45	67.93	0.5037	0.5021	0.5054	18.0220			18.08	

Ammonia solution						0.7500	0.6395	0.8605	17.9800	0.0150	0.0224	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9760	18.00	Option 1: VP60 = .5 VP70 = .5
PIB Wastewater	Dec	62.62	57.63	67.61	67.93	0.5026	0.5013	0.5042	18.0221			18.08	
Ammonia solution						0.6751	0.5845	0.7799	17.9800	0.0150	0.0202	17.98	Option 1: VP60 = .62 VP70 = .83
Polyisobutylene (HOF)						0.4320	0.4320	0.4320	93.3000	0.0050	0.0015	260.00	Option 1: VP60 = .432 VP70 = .432
Water						0.5000	0.5000	0.5000	18.0000	0.9800	0.9782	18.00	Option 1: VP60 = .5 VP70 = .5

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

T-P2WW1 - Vertical Fixed Roof Tank
Houston, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5444	0.5500	0.6056	0.5961	0.6357	0.6885	0.7706	0.7434	0.5870	0.6594	0.5699	0.5616
Vapor Space Volume (cu ft):	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920
Vapor Density (lb/cu ft):	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Vapor Space Expansion Factor:	0.0331	0.0371	0.0371	0.0379	0.0393	0.0441	0.0478	0.0461	0.0375	0.0406	0.0360	0.0342
Vented Vapor Saturation Factor:	0.9657	0.9657	0.9656	0.9655	0.9655	0.9654	0.9654	0.9654	0.9655	0.9655	0.9656	0.9657
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920	339.2920
Tank Diameter (ft):	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000
Vapor Space Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Tank Shell Height (ft):	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000	32.0000
Average Liquid Height (ft):	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000
Roof Outage (ft):	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333
Roof Height (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Roof Slope (ft/ft):	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100
Shell Radius (ft):	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Vapor Molecular Weight (lb/lb-mole):	18.0221	18.0221	18.0220	18.0219	18.0218	18.0218	18.0217	18.0217	18.0218	18.0219	18.0220	18.0221
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0331	0.0371	0.0371	0.0379	0.0393	0.0441	0.0478	0.0461	0.0375	0.0406	0.0360	0.0342
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0027	0.0032	0.0034	0.0035	0.0036	0.0727	0.1144	0.0997	0.0048	0.0037	0.0033	0.0029
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.5010	0.5013	0.5021	0.5033	0.5041	0.5050	0.5053	0.5052	0.5046	0.5032	0.5021	0.5013
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.5037	0.5045	0.5056	0.5068	0.5078	0.5777	0.6197	0.6049	0.5095	0.5070	0.5054	0.5042
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9657	0.9657	0.9656	0.9655	0.9655	0.9654	0.9654	0.9654	0.9655	0.9655	0.9656	0.9657
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026

Vapor Space Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Working Losses (lb):	45.5416	45.5963	45.6897	45.7961	45.8824	45.9610	45.9879	45.9799	45.9193	45.8031	45.6809	45.5787
Vapor Molecular Weight (lb/lb-mole):	18.0221	18.0221	18.0220	18.0219	18.0218	18.0218	18.0217	18.0217	18.0218	18.0219	18.0220	18.0221
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5022	0.5028	0.5038	0.5050	0.5060	0.5068	0.5071	0.5071	0.5064	0.5051	0.5037	0.5026
Net Throughput (gal/mo.):	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000	365,000.0000
Annual Turnovers:	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575	72.7575
Turnover Factor:	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790	0.5790
Maximum Liquid Volume (gal):	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000	60,200.0000
Maximum Liquid Height (ft):	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000
Tank Diameter (ft):	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000	18.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	46.0860	46.1463	46.2953	46.3922	46.5181	46.6495	46.7585	46.7233	46.5062	46.4626	46.2508	46.1402

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-P2WW1 - Vertical Fixed Roof Tank
Houston, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
PIB Wastewater	549.42	7.51	556.93
Ammonia solution	13.53	0.19	13.72
Polyisobutylene (HOF)	0.85	0.01	0.86
Water	535.04	7.31	542.35

TANKS 4.0.9d
Emissions Report - Detail Format
Total Emissions Summaries - All Tanks in Report

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

Tank Identification				Losses (lbs)
1F-511	Texas Petrochemicals	Horizontal Tank	Houston, Texas	10.11
Gas-2	Texas Petrochemicals	Horizontal Tank	Houston, Texas	1,555.47
T-103 ETBE	Texas Petrochemicals	Domed External Floating Roof Tank	Houston, Texas	1,474.56
T-103 MTBE	Texas Petrochemicals	Domed External Floating Roof Tank	Houston, Texas	2,556.38
T-111	Texas Petrochemicals Corp	Horizontal Tank	Houston, Texas	18.08
T-112	Texas Petrochemicals Corp	Horizontal Tank	Houston, Texas	18.08
T-114 ETBE	Texas Petrochemicals Corp	Domed External Floating Roof Tank	Houston, Texas	1,326.53
T-114 MTBE	Texas Petrochemicals Corp	Domed External Floating Roof Tank	Houston, Texas	2,231.44
T-115 ETBE	Texas Petrochemicals Corp	Domed External Floating Roof Tank	Houston, Texas	1,326.53
T-115 MTBE	Texas Petrochemicals Corp	Domed External Floating Roof Tank	Houston, Texas	2,231.44
T-117/118/119	Texas Petrochemicals LP	Vertical Fixed Roof Tank	Houston, Texas	1,477.54
T-155	Texas Petrochemicals	Vertical Fixed Roof Tank	Houston, Texas	0.09
T-204/T205/T-206	Texas Petrochemicals LP	Vertical Fixed Roof Tank	Houston, Texas	2,455.25
T-31 (Fuel Oil)	Texas Petrochemicals LP	Internal Floating Roof Tank	Houston, Texas	57.87
T-31 Lean Oil	Texas Petrochemicals LP	Internal Floating Roof Tank	Houston, Texas	1,294.06

T-32	Texas Petrochemicals Corp	Internal Floating Roof Tank	Houston, TX	660.19
T-33	Texas Petrochemicals LP	Vertical Fixed Roof Tank	Houston, Texas	13.76
T-34	Texas Petrochemicals Corp	Vertical Fixed Roof Tank	Houston, TX	458.96
T-77IFR	Texas Petrochemicals	Internal Floating Roof Tank	Houston, Texas	524.68
T-78IFR	Texas Petrochemicals	Internal Floating Roof Tank	Houston, Texas	524.68
T-79	Texas Petrochemicals	Internal Floating Roof Tank	Houston, Texas	405.11
T-80	Texas Petrochemicals	Internal Floating Roof Tank	Houston, TX	3,967.53
T-80 Ethanol	Texas Petrochemicals	Internal Floating Roof Tank	Houston, TX	3,880.40
T-81	Texas Petrochemicals Corp	Vertical Fixed Roof Tank	Houston, TX	2,917.92
T-82	Texas Petrochemicals Corp	Vertical Fixed Roof Tank	Houston, TX	9,532.51
T-84 (IFR)	Texas Petrochemicals LP	Internal Floating Roof Tank	Houston, Texas	1,223.57
T-85	Texas Petrochemicals Corp	Vertical Fixed Roof Tank	Houston, TX	8.77
T-86	Texas Petrochemicals Corp	Vertical Fixed Roof Tank	Houston, TX	940.14
T-Diesel	Texas Petrochemicals	Horizontal Tank	Houston, Texas	0.84
T-Diesel2	Texas Petrochemicals	Horizontal Tank	Houston, Texas	2.76
T-P1WW1	Texas Petrochemicals	Vertical Fixed Roof Tank	Houston, Texas	556.93
T-P1WW2	Texas Petrochemicals	Vertical Fixed Roof Tank	Houston, Texas	361.84
T-P2WW1	Texas Petrochemicals	Vertical Fixed Roof Tank	Houston, Texas	556.93
Total Emissions for all Tanks:				44,570.95

Print Form

458423

2011

AIR, PESTICIDES, AND TOXICS
6TH FLOOR RECORDS CENTER
INFILING / NEW FILE FORM

New File ☐ OR Infiling ☐

Choose from the file types below:

AIR FACILITY:

(☐) AR - Acid Rain

(☐) CB - Confidential Business

(☐) CO - Compliance
(☐) EN - **Enforcement
(☐) GE - General
(☒) PE - Permit
(☐) RA - Regulatory Applicability
(☐) Other _____

TSCA:

(☐) AH - Asbestos Hazard Emergency Response Act

(☐) AS or AW - Asbestos or Asbestos Worker Protection

(☐) CB - Confidential
(☐) FI - Site Specific
(☐) FO - Non Site Specific
(☐) IM - **Section 5 & 8
(☐) LB - **Lead
(☐) PC - **PCB

** Extension of file type (if needed): (☐) ES - Enforcement Sensitive
(☐) DO - Docket Number

EPCRA / SARA (☐) ***FIFRA*** (☐)

Current FRS Number: 110000461134
(Found in EnviroFacts)

Facility Name & Physical Address: TPC Group
8600 Park Place Blvd.
Houston, Harris Co., TX 77017

Remarks:
Permit 46426

Requestor's Name & Phone Number:
Stephanie Kordzi 5-7520

TPC Group
Houston Operations

TEL 713.477.9211
FAX 713.475.6008

8600 Park Place Boulevard, Houston, Texas 77017
www.tpcgrp.com

August 11, 2011

CERTIFIED MAIL NO.:
7006 2150 0001 2944 1013
RETURN RECEIPT REQUESTED

Air Permit Initial Review Team (APIRT)
Texas Commission on Environmental Quality (TCEQ)
Mail Code 161, P.O. Box 13087
Austin, Texas 78711-3087

Subject: Permit Amendment and Alteration Application, Permit No. 46426 and PSD-TX-999
TPC Group, L.L.C.
Houston, Harris County, Texas
Customer Reference Number: CN603624289
Regulated Entity Number: RN100219526

To Whom It May Concern:

This permit amendment and alteration application is being submitted by TPC Group, L.L.C. for their Houston Plant located in Harris County, Texas. This plant currently has units that produce various light olefin products including butadiene, butenes, and isobutylenes, as well as MTBE. TPC requests with this application, via alteration, that the EPN Auxboil1 is changed to Boiler 10 and renamed from Auxiliary Steam Boiler 1 to Boiler 10; that EPN Auxboil2 is changed to Boiler 11 and renamed from Auxiliary Steam Boiler 2 to Boiler 11; and all EPN's be removed from the MAERT except for Boilers 9, 10 & 11. In addition to the above changes, this air permit application requests the removal or changing of several Special Conditions of the existing permit via permit alteration as described in Section 1 of this document.

TPC Group, L.L.C. is submitting the attached air permit amendment and alteration application in accordance with 30 Texas Administrative Code (TAC), Chapter 116. The amendment and alteration contains updated emission calculations that reflect current process knowledge and the latest emission calculation factors.

The permit amendment application fee check of $900.00 for the amendment fee is being sent to the TCEQ under a separate cover to the TCEQ Revenue Section concurrently with this permit application.

TPC Group, L.L.C. would like to thank you in advance for your review and approval of this permit amendment and alteration. If you have any questions, please do not hesitate to contact me at 713-475-7422 or Geri.Shoop@TPCGRP.com.

RECEIVED
AUG 16 PM 2:46
AIR PERMITS SECTION
6PD-R

Sincerely,

TPC GROUP LLC
Geri Ann Shoop
Geri Shoop
Staff Environmental Engineer

Attachments:

Permit Renewal and Amendment Application, Permit No. 46426 and PSD-TX-999

cc:

Environmental Protection Agency Region 6 Air Permit Division 1445 Ross Avenue Dallas, TX 75202-2733	CERTIFIED MAIL NO. 7007 1490 0000 4468 5575
TCEQ, Region 12 5425 Polk Avenue, Suite H Houston, TX 77023-1486	CERTIFIED MAIL NO. 7007 1490 0000 4468 5483
City of Houston Bureau Chief of Air Quality Control Health and Human Services 7411 Park Place Blvd, Room 108 Houston, Texas 77087-4441	CERTIFIED MAIL NO. 7007 1490 0000 4468 5490
Harris County Environmental Public Health Division 101 South Richey Street, Suite G Pasadena, Texas 77506-1023	CERTIFIED MAIL NO. 7007 1490 0000 4468 5506

New Source Review Permit Alteration and Amendment Application

Permit Number: 46426

TPC Group

TPC Group LLC
Houston Plant
8600 Park Place Blvd.
Houston, Texas 77017

CN: 603624289
RN: 100219526

TITAN Engineering, Inc.
Environmental Consulting and Management

August 2011

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1. INTRODUCTION

The TPC Group, Inc.'s (TPC) Houston Plant (TPC or Plant) is located in Houston, Harris County, Texas at 8600 Park Place Blvd. TPC is applying to the Texas Commission on Environmental Quality (TCEQ) to alter and amend New Source Review (NSR) and Prevention of Significant Deterioration (PSD) Permit No. 46426 and PSD-TX-999 (Permit). Included in this alteration and amendment application are updated calculation methodologies for new streams to the boilers and maintenance, startup, and shutdown (MSS) emissions for the boilers, as needed. Therefore, this August 2011 air permit alteration and amendment application requests that the TCEQ alter and amend the Permit in accordance with 30 Texas Administrative Code (TAC) Chapter 116.

1.1 Permit Alterations to the Maximum Allowable Emissions Rate Table (MAERT)

The permit was originally issued to construct cogeneration systems to provide power and steam to TPC's Houston Plant. A permit alteration was approved last month to move Boiler 9 from TPC's NSR Permit Number 19806 to this permit. We are requesting that here, via permit alteration, that following Emission Point Numbers (EPNs) be changed on the Maximum Allowable Emission Rate Table (MAERT):

- Change EPN FROM Auxboil1 TO Boiler 10 and renamed FROM Auxiliary Steam Boiler 1 TO Boiler 10;
- Change EPN FROM Auxboil2 TO Boiler 11 and renamed FROM Auxiliary Steam Boiler 2 TO Boiler 11; and
- All EPNs be removed from the MAERT except for Boilers 9, 10, 11.

1.2 Permit Alterations to the Special Conditions

We are also requesting, via permit alteration, that following changes be made to the Special Conditions of the permit. These changes are generally due to the elimination of sources in the permit as requested in the previous of this document. The specific reason for each condition is stated below and is as follows:

- All references of Turbines, duct burners, or HRSG's be removed from the conditions;
- S.C.1.A. Remove as there are no turbines in this permit;
- S.C.1.B. Remove HRSG duct burners and "auxiliary" and replace with Boilers 10 and 11;
- S.C.1.B.(2) Remove duct burner requirements and change "auxiliary boiler" to Boilers 10 and 11;
- S.C.2. Remove the condition as there are no duct burners;
- S.C.3. Change "auxiliary boiler" to Boilers 10 and 11;
- S.C.4. Should read as follows: NOx from Boilers 10 and 11 shall not exceed a one-hour rolling average of 0.02 lb/MMBtu except during periods of start-up, shutdown, or maintenance operations;
- S.C.7. – S.C.10. Remove these conditions as they do not apply because there are no turbines and subsequently, so ammonia slip or ammonia storage;

- S.C.11.B. Remove the condition as there are no duct burners;
- S.C.11.C. Remove the condition as there are no turbines;
- S.C.12. Remove the condition as the time period for construction has lapsed and a new permit will be required for construction of the facilities not yet constructed;
- S.C.13. – S.C.14. Remove these conditions as no they longer apply;
- S.C.15. Remove "(EPNs GT-1, GT-2, and AUXBOIL1 through AUXBOIL4)" and replace it with "(EPNs Boiler 10 and Boiler 11)";
- S.C.15.C. Remove "EPNs GT-1, GT-2, and AUXBOIL1 through AUXBOIL4" and replace it with "EPNs Boiler 10 and Boiler 11";
- S.C.15.E. Remove the condition as there are no turbines;
- S.C.17. Remove "turbines, duct burners, and auxiliary boilers" and replace with "Boiler 10 and Boiler 11";
- S.C.18. Remove "HRSG stack and auxiliary boilers" and replace with "Boiler 10 and Boiler 11";
- S.C.19. Remove the condition as there are no turbines;
- S.C.21.D. Change to "A complete copy of the testing reports and records of the initial performance testing pursuant to Special Condition No. 14 in the permit dated August 23, 2007 to demonstrate initial compliance";
- S.C.22.C. Remove "turbines, duct burners, and auxiliary boilers" and replace with "Boiler 10 and Boiler 11";
- S.C.22.D. Remove the condition as there are no turbines and this rule does not apply;
- S.C.22.E. – S.C.22.G. Remove these condition as there are no turbines or ammonia slip;
- S.C.22.H. Remove "Special Condition Nos. 2 and 3" and replace with "Special Condition No. 3" (or the appropriate number after the changes are made); and
- S.C.25. For consistency with S.C.24.A., add to the beginning "Except during periods of start-up, shutdown, upset, or maintenance,".

1.3 Application Content

This air permit application has been prepared based upon information provided by TPC Group, Inc. and TCEQ guidance. The remainder of this document is structured as follows:

- Section 2 presents a process description of the Plant;
- Section 3 presents a discussion of the Plant air emissions and BACT;
- Section 4 identifies the state and federal regulations that apply to the Plant for Permit Amendment and Renewal requirements demonstration; and
- Section 5 presents a list of references used in the preparation of this air permit application document.

This document also contains the following appendices:

- Appendix A contains the applicable TCEQ permit application forms; and

- Appendix B contains the calculations required for this permit application.

1.4 Permit Fee

For the amendment, TPC is submitting a fee of $900.00 as calculated in TCEQ's Table 30. The Table 30 form is presented in Appendix A of this permit application.

1.5 Figures

The figures required for this permit application and an explanation of these figures are described below.

1.5.1 Area Map

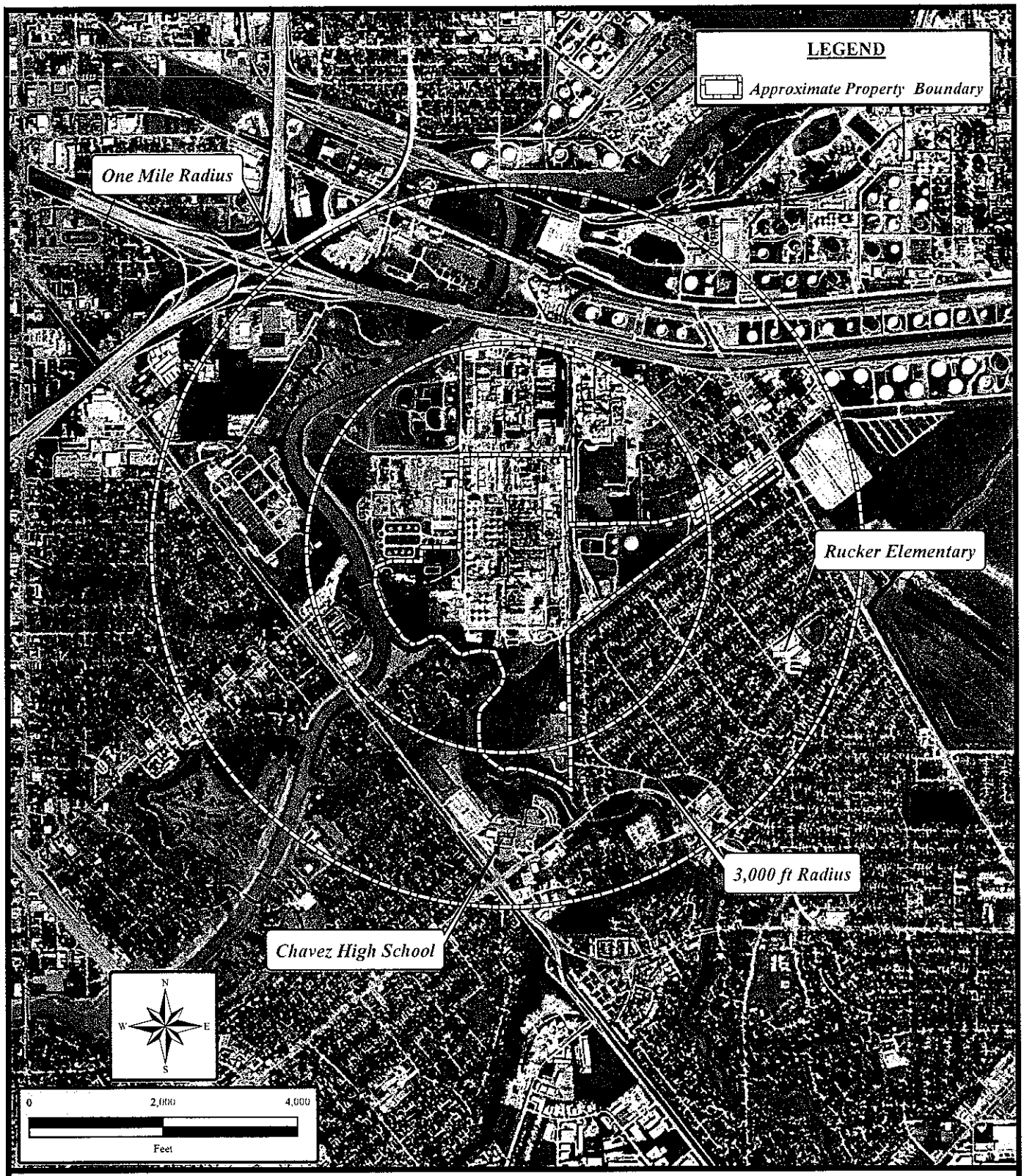
An area map showing the location of the property is provided on the following pages.

1.5.2 Plot Plan

A plot plan of the property boundaries and facilities in the plant are provided on the following pages.

1.5.3 Process Flow Diagram

A process flow diagram is not included in this submittal because the operations in this submittal do not function to manufacture or produce materials.



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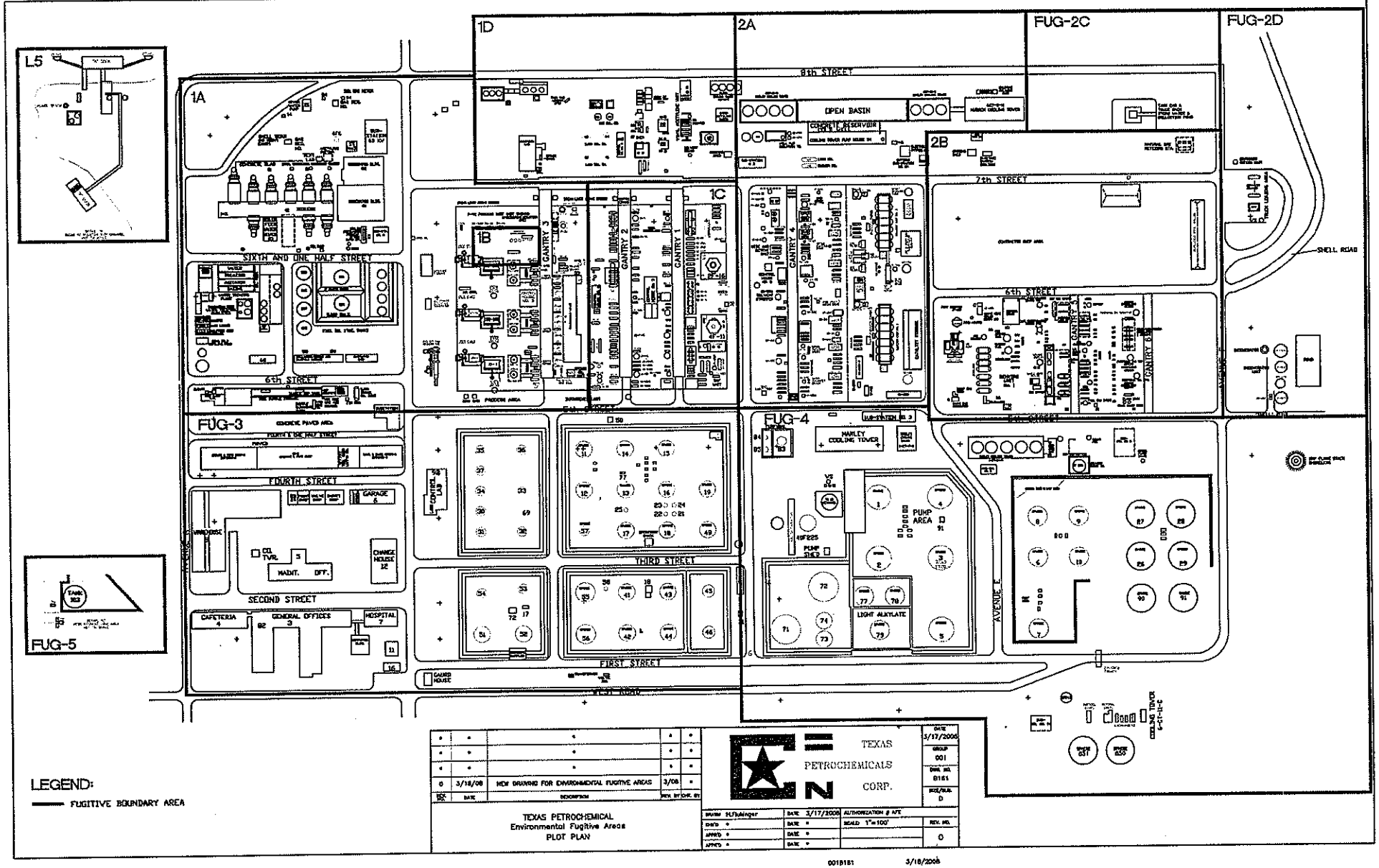
TPC Group

FIGURE 1-1 AREA MAP

TPC Group LLC
8600 Park Place Blvd
Houston, Texas 77017
August 2011
from USGS Quadrangles Pasadena & Park Place, Texas
Ground Condition Depicted October 2007
Digital Data Courtesy of ESRI Online Datasets



L5
1A
1B
1C
1D
2A
2B
FUG-2C
FUG-2D
FUG-3
FUG-4
FUG-5
8th STREET
7th STREET
6th STREET
SIXTH AND ONE HALF STREET
FOURTH STREET
SECOND STREET
THIRD STREET
FIRST STREET
AVENUE E
SHELL ROAD
OPEN BASIN
CONCRETE RESERVOIR
GANTRY 1
GANTRY 2
GANTRY 3
GANTRY 4
GANTRY 6
MARLEY COOLING TOWER
PUMP AREA
LIGHT ALKYLATE
CAFETERIA
GENERAL OFFICES
HOSPITAL
CHANGE HOUSE
GARAGE
MAINT. OFF.
CONTROL LAB
GUARD HOUSE
LEGEND:
FUGITIVE BOUNDARY AREA
0 3/18/08 NEW DRAWING FOR ENVIRONMENTAL FUGITIVE AREAS 3/08
TEXAS PETROCHEMICAL
Environmental Fugitive Areas
PLOT PLAN
TEXAS PETROCHEMICALS CORP.
DATE 3/17/2008
GROUP 001
DWG. NO. B181
SIZE/SUB. D
DRAWN H.Flubinger
DATE 3/17/2008
AUTHORIZATION # AFE
SCALE 1"=100'
REV. NO. 0
0018181
3/18/2008

2. PROCESS / PROJECT DESCRIPTION

This section provides an overview of the Plant operations. The Plant is a petrochemical production facility located in Houston, Harris County, Texas. The following is the process description of the Plant.

TPC operates a petrochemical production facility in Houston, Harris County, Texas. The plant currently manufactures various light olefin products including butadiene, butenes, and isobutlyenes, as well as methyl tert-butyl ether (MTBE). Steam and electricity for these production units and other plant needs are currently supplied by TPC's on-site boilers. TPC installed the facilities covered by this application to generate electricity and steam with energy efficient equipment designed to minimize NOx emissions.

This air permit application requests the alteration of several sections of the existing via permit alteration as described in Section 1 of this document. This air permit application also requests the addition of Maintenance, Start-up, and Shutdown (MSS) emissions via permit amendment. Finally, this air permit application includes representations and is notification of additional streams being routed to the Boilers, but will not increase annual emissions.

3. AIR EMISSIONS CALCULATIONS AND BACT

This Section describes the air emissions associated with this permit amendment application. The detailed calculations, calculation methodologies, and equipment tables are presented in Appendix B.

This Section also presents proposed Best Available Control Technologies (BACT) for controlling air emissions from the equipment at the Plant. The detailed equipment tables that contain information about some of the control equipment used to minimize air emission are presented in Appendix B.

3.1 Air Emissions Calculations

This section describes the air emissions calculations associated with this permit application. TPC has elected to continue to comply with its existing annual limits for all three boilers. Specifically, three main fuels are fed to Boilers 10 & 11: Plant/Natural Gas; DH2 Off-Gas with Natural Gas; and Purge Gas. Also, emissions from Boilers 10 & 11 due to Maintenance, Start-up, and Shutdown (MSS) activities are represented in this permit application. Boiler 9 emissions from Plant/Natural Gas and from DH2 Off-Gas with Natural Gas are represented in this permit application as well. Only hourly increases in emissions are proposed in this permit application, annual emissions will remain as currently represented. A summary of the air emissions are presented in Table B-1 and detailed calculations are presented in Appendix B. Table 1(a) is presented in Appendix A.

3.1.1 Air Emissions Calculations of Boilers Combusting DH2 Off-Gas w/Natural Gas

Only hourly emissions for compounds that had emission increases are presented in this permit application. Hence, calculations for sulfur dioxide are presented for Boilers 9, 10 and 11 for the DH2 Off-Gas with Natural Gas stream. Sulfur dioxide emissions were calculated using scientific calculations to estimate emissions. Only Boiler 9 had increased hourly sulfuric acid emissions. These emissions were also calculated using scientific calculations to estimate emissions. The detailed calculations are presented in Appendix B of this permit application.

3.1.2 Air Emissions Calculations of Boilers Combusting Purge Gas Nitrogen

Only hourly emissions for compounds that had emission increases are presented in this permit application. Because of this, calculations for oxides of nitrogen are presented for Boilers 10 and 11 for the Purge Gas Nitrogen stream. Oxides of nitrogen emissions were calculated using scientific calculations to estimate emissions. The detailed calculations are presented in Appendix B of this permit application.

3.1.3 Air Emissions from Maintenance, Start-up, and Shutdown (MSS) Activities of the Boilers

Maintenance, Start-up, and Shutdown (MSS) hourly emissions for Boilers 10 and 11 were calculated using scientific calculations based on the highest estimated part per million (ppm) concentrations. The ppm concentrations were based on a review of available emissions data from the boilers. TPC expects to continue to comply with the existing emissions limits for Boiler 9 even during periods of MSS activities, thus additional MSS specific emissions are not being sought for this source. The detailed calculations are presented in Appendix B of this permit application.

3.2 Best Available Control Technology (BACT)

The Texas Clean Air Act (TCAA) and 30 TAC 116.111(a)(2)(C) require facilities to utilize Best Available Control Technology (BACT), with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facilities. TPC believes that the techniques and methods of operation described below constitute BACT for the Plant operations described in this permit application.

3.2.1 BACT Approach

BACT requirements are intended to ensure that a proposed Plant will incorporate air pollution control systems reflecting the latest demonstrated practical techniques for a particular emission unit, and do not result in the exceedance of a National Ambient Air Quality Standard (NAAQS), PSD Increment, or other standards imposed at the state level. The BACT evaluation requires the documentation of performance levels achievable for each air pollution control technology applicable to this power generation system. The TCEQ uses a "Tiered" approach when evaluating available air pollution control technologies. This approach to the BACT process involves three Tiers to determine BACT. All three Tiers are discussed in detail below; however, the Tier I approach for BACT will be used in this permit application.

Tier I

The first Tier (Tier I) of this approach is basically the claim that the control technology being used is BACT. The claim of BACT is based on controls that have been accepted as BACT by the TCEQ, EPA, or other state regulatory agencies in recent permits for the same process or industry. This approach has the assumption that no new technical developments have been made that would justify additional controls. The TCEQ publishes BACT guidance for some common industries and sources. TCEQ has published BACT guidelines for boilers. Also, the EPA RACT/BACT/LAER Clearinghouse (RBLC) database includes recently accepted BACT for gas turbines. Due to this, only a Tier I analysis will be demonstrated in this air permit application.

Tier II

The second Tier (Tier II) of the approach is the consideration of control technologies which have been accepted as BACT in recent permits for the same exhaust stream in a different process or industry. This

is known as technology transfer. As in Tier I, Tier II approval is based on the TCEQ, EPA, or other state regulatory agencies having accepted the control technology as BACT in recent permits along with the assumption that no new technical developments have been made that would justify additional controls. Detailed documentation of technical feasibility or economic reasonability is not needed for this tier of analysis.

Tier III

The third Tier (Tier III) is a detailed analysis of technical and economic documentation of all control options available for the process under review. Considerations for controls included the demonstration of the control technology being successful in similar applications and economic reasonability based on initial and operational costs demonstrated in dollars per pound of pollutant removed. This Tier is not often used as BACT for most process or industries have been established, as in Tier I, or the BACT control technology can be transferred, as in Tier II.

3.2.1.1 Normal Operations BACT for Boilers

The following are proposed BACT for the emissions and process in this permit application for normal operations. In all cases in this permit application Tier I, which is BACT, is presented for normal operations.

3.2.1.1.1 BACT for Oxides of Nitrogen (NOx) for Boilers

Increases in Oxides of Nitrogen (NOx) emissions are only from Boiler 10 and Boiler 11. Due to this, the following operational controls implemented in Boiler 10 and Boiler 11 constitutes BACT for NOx emissions from Boiler 10 and Boiler 11.

- Low NOx burners

3.2.1.1.2 BACT for Sulfur Dioxide (SO_2) for Boilers

SO_2 is exclusively formed through the oxidation of sulfur present in the fuel. The emission rate is a function of the sulfur content of the fuel, since virtually all fuel sulfur is converted to SO_2.

- Good combustion practices

3.2.1.2 Maintenance, Start-up, and Shutdown (MSS) BACT for Boilers

Because MSS emissions are generally exempt from emission standards in both NSPS rules and SIP rules, we are proposing the currently permitted BACT as MSS BACT for Boiler 10 and Boiler 11. BACT is proposed to be a combination of good combustion practices on the front end with Low NOx burners. The Plant will make every effort to minimize the time required for startup and shutdown. However, The Plant must retain the ability to undertake planned startup and shutdown events for proper maintenance and operation of the boilers as needed while maintaining the current annual emissions. Consistent with any

boiler, as firing is first begun after a turnaround, the boiler emissions are higher due to a need to warm up the equipment at a slow rate and due to flame instability. The same effect occurs during a planned shutdown, but in reverse. As the boiler heat generation rate reduces the flame can become unstable, thus resulting in higher emissions during a shutdown until the burner is completely shut-off.

Emissions are impacted during periods of MSS due to lower combustion efficiencies caused by lower than normal temperatures (i.e., during heat up and cool down periods). A review of the RACT/BACT/LAER Clearinghouse (RBLC) database revealed BACT was to complete the events as quickly as possible. Due to this, The Plant proposes that during periods of MSS that BACT is completing the event as quickly as possible.

3.2.1.2.1 BACT for NOx for MSS for Boilers

Increases in Oxides of Nitrogen (NOx) emissions are only from Boiler 10 and Boiler 11. Due to this, the following operational controls implemented in Boiler 10 and Boiler 11 constitutes BACT for NOx emissions from Boiler 10 and Boiler 11.

- Low NOx burners

3.2.1.2.2 BACT for CO for MSS for Boilers

The following operational controls implemented at the site constitute BACT for carbon monoxide (CO) emissions from the boilers.

- Good combustion practices

4. REGULATORY APPLICABILITY

The following sections demonstrate that the Plant, as represented in this permit application, will meet 30 TAC §116.311 for the permit renewal. Furthermore, the following sections also demonstrate that the Plant will be operated in accordance with the intent of the Texas Clean Air Act, including protection of the health and physical property of the people.

4.1 Alteration and Amendment Review – 30 TAC §§116.111 and 116.116

The following sections demonstrate that the Plant has met and is meeting the federal and state air quality rules and regulations and the requirements to alter and amend an air permit as listed in 30 TAC §§116.111 and 116.116.

The following sections demonstrate that the Plant has met and is meeting the state air quality rules and regulations.

4.1.1 30 TAC 101 - General Air Quality Rules (effective 5/15/11)

The Plant will be operated in accordance with the General Rules relating to circumvention, nuisance, traffic hazard, notification requirements for major upset, notification requirements for maintenance, sampling, sampling ports, emissions inventory requirements, sampling procedures and terminology, compliance with Environmental Protection Agency Standards, the National Primary and Secondary Air Quality Standards, inspection fees, emissions fees, and all other applicable General Rules.

4.1.2 30 TAC 111 - Control of Air Pollution from Visible Emissions and Particulate Matter (effective 7/19/06)

The potential applicability of this chapter to the Plant is explained in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§111.111-113	Visible Emissions	Yes	The Plant will not exceed 30% opacity for any six-minute period from any building, enclosed facility, or other structure.
§§111.121-129	Solid Waste Incineration	No	The Plant will not conduct solid waste incineration activities under this application.

Section Number	Reference	Applicability	Compliance Explanation
§§111.131-139	Abrasive Blasting of Water Storage Tanks Performed by Portable Operations	No	Abrasive blasting of water storage tanks will not be conducted as part of this permit application.
§§111.141-149	Materials Handling, Construction, Roads, Streets, Alleys and Parking Lots	Yes	The Plant is located in Harris County, which is within the geographic area of applicability.
§111.151	Allowable Emission Limits on Nonagricultural Processes	Yes	The Plant's particulate emissions will be less than the allowable emission limits specified in §111.151.
§111.153	Emission Limits for Steam Generators	Yes	The Plant is proposing to operate a steam generator, as defined in this section, as part of this application.
§§111.171-175	Emission Limits on Agricultural Processes	No	The Plant will not conduct agricultural processes as part of this application.
§§111.181-183	Exemptions for Portable or Transient Operations	No	The Plant is not a portable or transient operation.
§§111.201-221	Outdoor Burning	Yes	Any outdoor burning that may be conducted at the Plant will be done in accordance with these requirements.

4.1.3 30 TAC 112 - Control of Air Pollution from Sulfur Compounds (effective 7/12/01)

30 TAC 112 governs various sulfur compound emissions including sulfur dioxide, hydrogen sulfide, sulfuric acid, and total reduced sulfur compounds. The potential applicability of this chapter to sources in this application is explained in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§112.3-4	SO_2 Net Ground Level Concentrations	Yes	Upon TCEQ request, air dispersion modeling activities will be undertaken to demonstrate that the ground-level SO_2 concentration standards specified in §112.3 will not be exceeded.
§§112.5-7	Allowable SO_2 Emission Rates	No	There are no sulfuric acid or sulfur recovery plants in this permit application.
§112.8	Allowable SO_2 Emission Rates	No	There are no solid fossil fuel-fired steam generators in this permit application.
§112.9	Allowable SO_2 Emission Rates	No	There will be no liquid fuel-fired steam generators, furnaces, or heaters in this permit application.
§112.14	Allowable SO_2 Emission Rates	No	The Plant will not include any nonferrous smelters.
§§112.15-18	Temporary Fuel Shortage Plan	No	The Plant does not anticipate a shortage of low sulfur fuel.
§§112.19-21	Area Control Plan	No	The Plant does not anticipate needing relief from the requirements of §112.3.
§§112.31-34	Allowable Emissions of H_2S	No	The Plant in this application does not anticipate producing H_2S emissions.
§§112.41-47	Allowable Emissions of H_2SO_4	No	The Plant is not anticipated to emit H_2SO_4.
§§112.51-59	Emission Limits for Total Reduced Sulfur Compounds	No	The Plant will not include a Kraft Pulp Mill.

4.1.4 30 TAC 113 - Hazardous Air Pollutant (HAP) Standards (effective 5/14/09)

30 TAC 113 addresses the control of air pollution from HAPs and other designated facilities, defined within this chapter to be certain air emissions from municipal solid waste landfills (MSWLFs), medical waste incinerators, and certain other processes/emissions regulated under 40 CFR Parts 61 and 63. The Plant will not include a MSWLF or medical waste incinerator, nor is the Plant anticipated to produce radon emissions. Consequently, Subchapters B and D are not applicable.

30 TAC 113 Subchapter C implements 40 CFR Part 63 by regulating HAP emissions released from source categories listed in this rule. Though the Plant is a major source of HAPs, no facilities in this

application will be subject to the source category regulations. However, when 40 CFR Part 63 Subpart DDDDD becomes effective, this rule will apply. A detailed discussion of MACT DDDDD applicability and compliance dates is in the federal rules subsection of this section.

4.1.5 30 TAC 114 - Control of Air Pollution from Motor Vehicles (effective 12/13/10)

The Plant production operations will include a motor vehicle fleet. Therefore, this chapter does apply. TPC will comply with these rules.

4.1.6 30 TAC 115 - Control of Air Pollution from Volatile Organic Compounds (VOC) (effective 2/17/11)

30 TAC Chapter 115 regulates VOC emissions according to source type and Plant location (county). The Plant is located in Harris County, which is included in the "Houston/Galveston Nonattainment Area" under this rule. Therefore, the potential applicability of the 30 TAC 115 sections is addressed in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§115.112-119	Storage of VOC	No	The Plant will not have VOC storage vessels associated with this application.
§§115.120-129	Vent Gas Control	No	The Plant will not have vents covered by this rule associated with this application.
§§115.131-139	Water Separation	No	The Plant will not have any volatile organic compound water separators as part of this application.
§§115.140-149	Industrial Wastewater	No	The Plant will not handle industrial wastewater as defined in this section as part of this application.
§§115.152-159	Municipal Solid Waste Landfills	No	The Plant does not have a Municipal Solid Waste Landfill as part of this application.
§§115.160-169	Batch Processes	No	The Plant is not considered to be a Batch Process as part of this application.
§§115.211-259	VOC Transfer Operations	No	The Plant will not conduct transfer operations as defined in this section as part of this application.

Section Number	Reference	Applicability	Compliance Explanation
§§115.311-359	Petroleum Refining, Natural Gas Processing, and Petrochemical Processes	No	The Plant will not conduct any of the referenced processes as part of this application.
§§115.412-419	Degreasing Processes	No	No degreasing process operations as defined in this section will be conducted as part of this application.
§§115.420-429	Surface Coating Processes	No	The Plant will not conduct surface coating process operations as defined in this section as part of this application.
§§115.430-449	Printing Processes	No	Facilities in this application will not conduct printing operations as defined in these sections as part of this application.
§§115.510-559	Miscellaneous Industrial Sources	No	Facilities in this application will not conduct any of the miscellaneous industrial activities defined in this section as part of this application.
§§115.600-619	Consumer-Related Sources and Products	No	Facilities in this application will not produce consumer products as part of this application.
§§115.720-729	HRVOC - Vent Gas Control	No	Facilities in this application do not emit HRVOC's.
§§115.760-769	HRVOC – Cooling Tower Heat Exchange Systems	No	Facilities in this application do not emit HRVOC's.
§§115.780-789	HRVOC – Fugitive Emissions	No	Facilities in this application do not emit HRVOC's.
§§115.901-916	Alternates Means of Control	No	Facilities in this application are not requesting alternate means of control.
§§115.920-923	Early Reductions	No	Facilities in this application are not requesting early reductions.
§§115.930-940	Compliance and Control Plan Requirements	No	No facilities in this application are affected by 30 TAC 115; therefore this section does not apply.

Section Number	Reference	Applicability	Compliance Explanation
§§115.950	Emissions Trading	No	No facilities in this application are affected by 30 TAC 115; therefore this section does not apply.

4.1.7 30 TAC 117 - Control of Air Pollution from Nitrogen Compounds (effective 5/5/11)

30 TAC 117 governs NO_X emissions from the following types of facilities: Major Sources in an applicable ozone nonattainment area, acid manufacturers, and gas-fired combustion unit manufacturers, distributors, retailers, and installers. 30 TAC 117 also governs NO_X emissions from Minor Sources located in the Houston/Galveston ozone nonattainment area and sources located in specified counties in Central and East Texas. The Plant will be located in Houston, Harris County, which is part of the Houston/Galveston ozone nonattainment area. Therefore, the potential applicability of 30 TAC 117 sections is addressed in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§117.100-156	Combustion Control Beaumont–Port Arthur	No	The Plant will not be within the geographic area of applicability.
§§117.200-256	Combustion Control Dallas-Fort Worth	No	The Plant will not be within the geographic area of applicability.
§§117.300-356	Combustion Control Houston-Galveston-Brazoria	Yes	The Plant will comply with this rule.
§§117.400-456	Combustion Control Dallas/Fort Worth 8-HR	No	The Plant will not be within the geographic area of applicability.
§§117.1000-1056	Combustion Control at Major Utility Electric Generation Sources Beaumont-Port Arthur	No	The Plant will not be within the geographic area of applicability.

Section Number	Reference	Applicability	Compliance Explanation
§§117.1100-1156	Combustion Control at Major Utility Electric Generation Sources Dallas-Fort Worth	No	The Plant will not be within the geographic area of applicability.
§§117.1200-1256	Combustion Control at Major Utility Electric Generation Sources Houston-Galveston-Brazoria	No	The Plant will be within the geographic area of applicability, but is not owned or operated by an electric cooperative, municipality, river authority, public utility, or a Public Utility Commission of Texas regulated utility.
§§117.1300-1356	Combustion Control at Major Utility Electric Generation Sources Dallas-Fort Worth 8-HR	No	The Plant will not be within the geographic area of applicability.
§§117.2000-2145	Combustion Control at Minor Sources	No	The Plant is a major source, and not a minor source. Therefore, this section of 30 TAC 117 does not apply.
§§117.3000-3345	Multi-Region Combustion Control	No	The Plant will be located in Harris County which is part of the Houston/Galveston area which is not within the geographic area of applicability.
§§117.4000-4210	Acid Manufacturing	No	The Plant is not an acid manufacturer. Therefore, this section of 30 TAC 117 does not apply.
§§117.8000-8140	General Monitoring and Testing Requirements	Yes	The Plant will perform monitoring and testing as defined in these sections as a part of this application and will comply with these rules.
§§117.9000-9810	Compliance Schedule and Compliance Flexibility	Yes	The Plant will follow the compliance schedule and compliance flexibility, if used, as defined in these sections as a part of this application.

4.1.8 30 TAC 118 - Control of Air Pollution Episodes (effective 5/14/04)

The Plant will operate in compliance with the TCEQ General Rules and the Air Pollution Episodic Requirements of 30 TAC 118.

4.1.9 30 TAC 122 - Federal Operating Permits (effective 8/3/06), Acid Rain, CAIR

30 TAC 122 addresses the Texas implementation of the federal operating permits program promulgated under Title V of the Clean Air Act. Based on its potential to emit, as reflected by this application, the Plant will be classified as a Major Source. Consequently, the Plant will submit a revision notification application, if required, for a Title V operating.

4.1.10 Impact on Nearby Schools

As shown on the Figure 1-2 Area Map, there is a school located within 3,000 feet of the Plant.

4.2 Measurement of Emissions - §116.111(a)(2)(B)

At the request of the Executive Director of the TCEQ, TPC will provide provisions for the measurement of significant emissions, including the installation of sampling ports, platforms, etc.

4.3 Best Available Control Technology (BACT) - §116.111(a)(2)(C)

Refer to Section 3.0 for a BACT analysis.

4.4 New Source Performance Standards (NSPS) - §116.111(a)(2)(D)

NSPS (40 CFR Part 60) outlines specific requirements for certain types of new or modified sources. The following paragraphs describe the NSPS that with potential applicability to the Plant.

4.4.1 NSPS Db

NSPS Db (40 CFR Part 60, Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) outlines specific requirements for steam generating units built after 1984 with a heat duty of 100 MMBtu or greater. The Boiler 10 and Boiler 11 in this permit application are over 100 MMBtu and were built after 1984. Therefore, this rule does apply and TPC will comply with this rule.

4.5 National Emission Standards for Hazardous Air Pollutants -§116.111(a)(2)(E)

National Emission Standards for Hazardous Air Pollutants (NESHAPs) have been established in 40 CFR Part 61 for various materials, including radon, beryllium, mercury, vinyl chloride, radionuclides, benzene, asbestos, and inorganic arsenic emissions from various types of sources. However, these standards are

not applicable because the Plant will not be a source that emits one of these materials listed in these rules.

4.6 NESHAPs for Source Categories - §116.111 (a)(2)(F)

Additional NESHAPs (also known as MACT standards) have been established in 40 CFR Part 63 for various source categories and/or industries. Though the facilities in this air permit application will not constitute a major source of HAPs, the site is major source of HAPs. Therefore, the facilities in this air permit application will be subject to, and will comply with, MACT standards applicable to major HAP sources.

The site is a major source of HAPs, and therefore may have applicable MACT standards for major HAP sources. However, a few MACT standards apply to non-major "area sources" that meet the criteria of the rule, but are not major sources of HAPs. Because the site is a major source of HAPs, these rules will generally not apply.

The following paragraphs describe both the "major source" and "area source" MACT standards with potential applicability to the Plant.

4.6.1 MACT DDDDD

The boilers would have been potentially subject to 40 CFR Part 63 Subpart DDDDD for industrial-institutional-commercial boilers and process heaters. However, the Environmental Protection Agency (EPA) has delayed the effective dates of 40 CFR Part 63 Subpart DDDDD as promulgated in the May 18, 2011 Federal Register (76 FR 28662).

4.7 Performance Demonstration - §116.111 (a)(2)(G)

The Plant will be operated as represented in this application and will achieve the specified performance levels. Upon TCEQ request, additional information can be submitted to further demonstrate that operational levels and emission limitations are being upheld.

4.8 Nonattainment Review - §116.111(a)(2)(H)

The Plant will be located in Harris County which is in the Houston/Galveston area for ozone nonattainment. The nonattainment review provisions specified in §116.150 are not applicable to the Plant because only hourly emissions are being increased. Due to this, nonattainment review will not be triggered.

4.9 Permit Alteration - §116.116(c)

This permit application includes a request for permit alteration. Permit alterations are allowed for various changes in an air permit including changes in special conditions that do not change the control or character of emissions or result in an increase in emissions. As indicated in Section 1 of this air permit application, EPN's are being requested to be removed from this permit because they were never

constructed. Due to this, several special conditions that would have applied to these EPN's are being requested to be removed. Therefore, this rule applies to the Plant and the Plant will comply with this rule.

5. REFERENCES

The following references have been used in the preparation of this air permit application document. Where appropriate, certain materials have been included in Appendix C.

- State of Texas. Texas Administrative Code. Title 30, Chapter 101. *General Air Quality Rules.* January 1, 2009.
- State of Texas. Texas Administrative Code. Title 30, Chapter 111. *Control of Air Pollution from Visible Emissions and Particulate Matter.* July 19, 2006.
- State of Texas. Texas Administrative Code. Title 30, Chapter 112. *Control of Air Pollution from Sulfur Compounds.* July 12, 2001.
- State of Texas. Texas Administrative Code. Title 30, Chapter 113. *Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants.* May 14, 2009.
- State of Texas. Texas Administrative Code. Title 30, Chapter 114. *Control of Air Pollution from Motor Vehicles.* December 13, 2010.
- State of Texas. Texas Administrative Code. Title 30, Chapter 115. *Control of Air Pollution from Volatile Organic Compounds (VOCs).* February 17, 2011.
- State of Texas. Texas Administrative Code. Title 30, Chapter 116. *Control of Air Pollution by Permits for New Construction or Modification.* March 17, 2011.
- State of Texas. Texas Administrative Code. Title 30, Chapter 117. *Control of Air Pollution from Nitrogen Compounds.* May 15, 2011.
- United States. Code of Federal Regulations. Title 40, Part 60. *New Source Performance Standards.* July 2011.
- United States. Code of Federal Regulations. Title 40, Part 61. *National Emission Standards for Hazardous Air Pollutants.* July 2011.
- United States. Code of Federal Regulations. Title 40, Part 63. *National Emission Standards for Hazardous Air Pollutants for Source Categories.* July 2011.

APPENDIX A

TCEQ FORMS AND TABLES

TCEQ Form **Page**

PI-1 – General Application for Air Permits A-1
Table 1(a) – Emission Point Summary A-11
Table 30 Permit Application Fee A-12

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Update: The TCEQ **requires** that a Core Data Form be submitted on all incoming applications unless a Regulated Entity and Customer Reference Number have been issued by the TCEQ and no core data information has changed. For more information regarding the Core Data Form, call (512) 239-5175 or go to the TCEQ Web site at www.tceq.state.tx.us/permitting/central_registry/guidance.html.

I. APPLICANT INFORMATION		
A. Company or Other Legal Name: **TPC Group L.L.C.**		
Texas Secretary of State Charter/Registration Number (*if applicable*):		
B. Company Official Contact Name (☒ Mr. ☐ Mrs. ☐ Ms. ☐ Dr.): **Charles Kirk Johnson**		
Title: **Plant Manager**		
Mailing Address: **8600 Park Place Blvd.**		
City: **Houston**	State: **Texas**	ZIP Code: **77017**
Telephone No: **713-740-4238**	Fax No.: **713-475-6008**	E-mail Address: **kirk.johnson@tpcgrp.com**
C. Technical Contact Name (☐ Mr. ☐ Mrs. ☒ Ms. ☐ Dr.): **Geri Shoop**		
Title: **Staff Environmental Engineer**		
Company Name: **TPC Group LLC**		
Mailing Address: **8600 Park Place Blvd.**		
City: **Houston**	State: **Texas**	ZIP Code: **77017**
Telephone No.: **713-475-7422**	Fax No.: **713-475-7463**	E-mail Address: **geri.shoop@tpcgrp.com**
D. Facility Location Information:		
Street Address: **8600 Park Place Blvd.**		
If no street address, provide clear driving directions to the site in writing:		
City: **Houston**	County: **Harris**	ZIP Code: **77017**
E. TCEQ Account Identification Number (leave blank if new site or facility): **HG-0562-P**		
F. Is a TCEQ Core Data Form (TCEQ Form No. 10400) attached?		☐ YES ☒ NO
G. TCEQ Customer Reference Number *(leave blank if unknown)*: **CN603624289**		
H. TCEQ Regulated Entity Number *(leave blank if unknown)*: **RN100219526**		
II. IMPORTANT GENERAL INFORMATION		
A. Is confidential information submitted with this application?		☐ YES ☒ NO
If "YES," is each "confidential" page marked "**CONFIDENTIAL**" in large red letters?		☐ YES ☐ NO

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II. IMPORTANT GENERAL INFORMATION ***(continued)***		
B. Is this application in response to a TCEQ investigation or enforcement action?		☐ YES ☒ NO
If "YES", attach a copy of any correspondence from the TCEQ		
C. Number of New Jobs: **0**		
D. Names of the State Senator and district number for this facility site: **Senator Mario Gallegos – District 6**		
Names of State Representative and district number for this facility site: **Representative Carol Alvarado – District 145**		
E. For Concrete Batch Plants, and PSD, or Nonattainment Permits that require public notice, name of the County Judge for this facility site:		
Mailing Address:		
City:	State:	ZIP Code:
F. For Concrete Batch Plants, is the facility located in a municipality or an extraterritorial jurisdiction of a municipality?		☐ YES ☐ NO
If "YES," list the name(s) of the Presiding Officer(s) for this facility site: **N/A**		
Mailing Address		
City:	State:	ZIP Code:
III. FACILITY AND SOURCE INFORMATION		
A. Site Name: **Houston Plant**		
B. Area Name/Type of Facility: **Cogen Unit**		☒ Permanent ☐ Portable
C. Principal Company Product or Business: **1,3 Butadiene, MTBE, Isobutylene, and other C4 products**		
Principal Standard Industrial Classification Code: **2869**		
D. Projected Start of Construction Date: N/A	Projected Start of Operation Date: N/A	
IV. TYPE OF PERMIT ACTION REQUESTED		
A. Permit Number *(if existing)*: **46426 and PSD-TX-999**		
B. Is this an initial permit application?		☐ YES ☒ NO
If "YES," check the type of permit requested *(check all that apply)*: ☐ State Permit ☐ Nonattainment Federal Permit ☐ Flexible Permit ☐ Prevention of Significant Deterioration Federal Permit ☐ Multiple Plant Permit ☐ Hazardous Air Pollutants Permit Federal Clean Air Act § 112(g) Other: _____		

IV. TYPE OF PERMIT ACTION REQUESTED *(continued)*	
C. Is this a permit amendment?	☒ YES ☐ NO
If "YES," check the type of permit requested *(check all that apply):* ☒ State Permit Amendment ☐ Flexible Permit Amendment ☐ Multiple Plant Permit Amendment ☐ Nonattainment Major Modification ☐ Prevention of Significant Deterioration Major Modification ☐ Hazardous Air Pollutants Permit Federal Clean Air Act § 112(g) Modification Other:_____	
D. Is a permit renewal application being submitted in conjunction with this amendment in accordance with Senate Bill 1673? [THSC 382.055(a)(2)](80th Legislative)	☐ YES ☒ NO
E. Is this application for a change of location of previously permitted facilities?	☐ YES ☒ NO
If "YES," answer IVE. 1. - IVE. 4.	
1. Current location of facility:	
Street Address *(If no street address, provide clear driving directions to the site in writing.)*:	
City: / County:	ZIP Code:
2. Proposed location of facility:	
Street Address *(If no street address, provide clear driving directions to the site in writing.)*:	
City: / County:	ZIP Code:
3. Will the proposed facility, site, and plot plan meet all current technical requirements of the permit special conditions?	☐ YES ☐ NO
If "NO," attach detailed information.	
4. Is the site where the facility is moving considered major?	☐ YES ☐ NO
F. Is this a relocation?	☐ YES ☒ NO
G. Are there any standard permits, exemptions or permits by rule to be consolidated into this permit?	☐ YES ☒ NO

IV. TYPE OF PERMIT ACTION REQUESTED *(continued)*	
H. Are you permitting a facility or group of facilities that have planned maintenance, startup and shutdown emissions that cannot be authorized by a permit by rule or standard permit or that are authorized by a permit by rule or standard permit and are being rolled into this permit?	☐ YES ☒ NO
If "YES," attach information on any changes to emissions under this application as specified in Sections IX, and X.	
If "YES," answer IVH. 1 -IVH. 3.	
1. Are the activities to be included in this permit covered by any previously existing MSS authorizations?	☐ YES ☒ NO
If "YES," provide a listing of all other authorizations (permit by rule or standard permit and the associated registration number if any).	
2. Have the emissions been previously submitted as part of an emissions inventory?	☒ YES ☐ NO
3. List which years the MSS activities were included in emissions inventory submittals:	
I. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability)	
Is this facility located at a site required to obtain a federal operating permit under 30 TAC Chapter 122?	☒ YES ☐ NO ☐ To be Determined
1. Identify the requirements of 30 TAC Chapter 122 that will be triggered if this PI-1 application is approved. ☐ FOP Significant Revision ☐ FOP Minor ☐ Application for an FOP Revision ☒ Operational Flexibility/Off-Permit Notification ☐ Streamlined Revision for GOP ☐ To be determined ☐ None	
2. Identify the type(s) of FOP(s) issued and/or FOP application(s) submitted/pending for the site (check all that apply)	
☐ GOP Issued ☐ GOP application/revision application: submitted or under APD review ☒ SOP Issued ☐ SOP application/revision application:	
V. PERMIT FEE INFORMATION	
A. Fee paid for this application:	**$900.00**
1. Is a copy of the check or money order attached to the original submittal of this application?	☒ YES ☐ NO ☐ N/A
2. Is a Table 30 entitled, "Certification of estimated Capital Cost and Fee Verification," attached?	☒ YES ☐ NO ☐ N/A

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VI. PUBLIC NOTICE APPLICABILITY	
A. Is this a new permit application or a change of location application?	☐ YES ☒ NO
B. Is this an application for a major modification of a PSD, NA or 30 TAC § 112(g) permit?	☐ YES ☒ NO
C. Is this a state permit amendment application?	☒ YES ☐ NO
If "YES," answer VIC. 1. - VIC. 3.	
1. Is there any change in character of emissions in this application?	☐ YES ☒ NO
Is there a new air contaminant in this application?	☐ YES ☒ NO
2. Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetables fibers (agricultural facilities)?	☐ YES ☒ NO
3. List the total annual emission increases associated with the application (*list all that apply*):	
Volatile Organic Compounds (VOC):	0.00 tpy
Sulfur Dioxide (SO_2):	0.00 tpy
Carbon Monoxide (CO):	0.00 tpy
Hazardous Air Pollutants (HAPs):	0.00 tpy
Nitrogen Oxides (NO_x):	0.00 tpy
Particulate Matter (PM):	0.00 tpy
PM_{10}:	0.00 tpy
$PM_{2.5}$:	0.00 tpy
Lead (Pb):	0.00 tpy
Other air contaminants not listed above:	0.00 tpy

VII. PUBLIC NOTICE INFORMATION ***(complete if applicable)***		
A. Responsible Person:		
Name (☐ Mr. ☐Mrs. ☐Ms. ☐Dr.):		
Title:		
Mailing Address:		
City:	State:	ZIP Code:
Telephone No.:	Fax No.:	E-mail Address:

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VII. PUBLIC NOTICE INFORMATION ***(complete if applicable)***		
B. Technical Contact:		
Company Name :		
Name (☐ Mr. ☐Mrs. ☐Ms. ☐Dr.):		
Title:		
Mailing Address:		
City:	State:	ZIP Code:
Telephone No.:	Fax No.:	E-mail Address:
C. Application in Public Place:		
Name of Public Place:		
Physical Address:		
City	County:	
The public place has granted authorization to place the application for public viewing and copying?		☐ YES ☐ NO
The public place has internet access available for the public?		☐ YES ☐ NO ☐ N/A
Complete VII.D. 1. - VII.D. 3., as applicable.		
D.1. Name of the Mayor for this facility site:		
Mailing Address:		
City:	State:	ZIP Code:
D.2. Name of the Federal Land Manager for this facility site:		
Mailing Address:		
City:	State:	ZIP Code:
D.3. Name of the Indian Governing Body for this facility site:		
Mailing Address:		
City:	State:	ZIP Code:

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VII. PUBLIC NOTICE INFORMATION ***(complete if applicable)***				
E. Is a bilingual program **required** by the Texas Education Code in the School District?				☐ YES ☐ NO
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?				☐ YES ☐ NO
If "YES," which language is **required** by the bilingual program?				
VIII. SMALL BUSINESS CLASSIFICATION ***(required)***				
A. Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?				☐ YES ☒ NO
B. Is the site a major source under 30 TAC Chapter 122, Federal Operating Permit Program?				☒ YES ☐ NO
C. Are the site emissions of any individual air contaminant greater than 50 tpy?				☒ YES ☐ NO
D. Are the site emissions of all air contaminants combined greater than 75 tpy?				☒ YES ☐ NO
IX. TECHNICAL INFORMATION				
A. Is a current area map attached?				☒ YES ☐ NO
Are any schools located within 3,000 feet of this facility?				☒ YES ☐ NO
B. Is a plot plan of the plant property attached?				☒ YES ☐ NO
C. Is a process flow diagram and a process description attached?				☒ YES ☐ NO
D. Maximum Operating Schedule:	Hours:24	Day(s):7	Week(s):52	Year(s):
Seasonal Operation?				☐ YES ☒ NO
If "YES," please describe.				
E. Are worst-case emissions data and calculations attached?				☒ YES ☐ NO
1. Is a Table 1(a) entitled, "Emission Point Summary Table," attached?				☒ YES ☐ NO
2. Is a Table 2 entitled, "Material Balance Table," attached? (available upon request)				☐ YES ☒ NO
3. Are equipment, process, or control device tables attached? (available upon request)				☐ YES ☒ NO
F. Are actual emissions for the last two years (determination federal applicability) attached?				☐ YES ☒ NO

X. STATE REGULATORY REQUIREMENTS *Applicants must be in compliance with all applicable state regulations to obtain a permit or amendment.*	
A. The emissions from the proposed facility will comply with all rules and regulations of the TCEQ and details are attached?	☒ YES ☐ NO
B. The proposed facility will be able to measure emissions of significant air contaminants and details are attached?	☒ YES ☐ NO
C. A demonstration of Best Available Control Technology (BACT) is attached?	☒ YES ☐ NO
D. The proposed facilities will achieve the performance in the permit application and compliance demonstration or record keeping information is attached?	☒ YES ☐ NO
E. Is atmospheric dispersion modeling attached?	☐ YES ☒ NO
F. Does this application involve any air contaminants for which a "disaster review" is required?	☐ YES ☒ NO
If "YES," details must be attached.	
Note: For a list of air contaminants for which a "disaster review" will be required, refer to the NSRPD Disaster Review Guidance Document at www.tceq.state.tx.us/permitting/air/rules/federal/63/63hmpg.html.	
G. Is this facility or group of facilities located at a site within an Air Pollutant Watch List (APWL) area?	☐ YES ☒ NO
If "YES," answer X.G. 1. - X.G. 3.	
1. List the APWL Site Number:	
2. Does the site emit a pollutant of concern for the APWL area in which the site is located?	☐ YES ☐ NO
3. If "YES," list the pollutant(s) of concern emitted by this site:	
H. Is this facility or group of facilities located at a site within the Houston/Galveston nonattainment area? (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, or Waller Counties)	☒ YES ☐ NO
If "YES," answer X.H. 1. - X.H. 4.	
1. Does the facility or group of facilities located at this site have an uncontrolled design capacity to emit 10 tpy or more of NO_X?	☒ YES ☐ NO
2. Is this site subject to 30 TAC Chapter 101, Subchapter H, Division 3 (Mass Emissions Cap and Trade)?	☒ YES ☐ NO
3. Does this action make the site subject to 30 TAC Chapter 101, Subchapter H, Division 3 (Mass Emissions Cap and Trade)?	☐ YES ☒ NO
4. Does this action require the site to obtain additional emission allowances?	☐ YES ☒ NO

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XI. FEDERAL REGULATORY REQUIREMENTS **Applicants must be in compliance with all applicable federal regulations to obtain a permit or amendment.** ***If any of the following questions are answered "YES, the application must contain detailed attachments addressing applicability, identify federal regulation Subparts, show how requirements are met, and include compliance information.***	
A. Does a Title 40 Code of Federal Regulations Part 60, (40 CFR Part 60) New Source Performance Standard (NSPS) apply to a facility in this application?	☒ YES ☐ NO
B. Does 40 CFR Part 61, National Emissions Standard for Hazardous Air Pollutants (NESHAP) apply to a facility in this application?	☐ YES ☒ NO
C. Does a 40 CFR Part 63, Maximum Achievable Control Technology (MACT) standard apply to a facility in this application?	☐ YES ☒ NO
D. Does nonattainment permitting requirements apply to this application?	☐ YES ☒ NO
E. Does prevention of significant deterioration permitting requirements apply to this application?	☐ YES ☒ NO
F. Does Hazardous Air Pollutant Major Source [FAA § 112(g)] requirements apply to this application?	☐ YES ☒ NO
XII. COPIES OF THIS APPLICATION	
A. Has the required fee been sent separately with a copy of this Form PI-1 to the TCEQ Revenue Section? *(MC 214, P.O. Box 13088, Austin, Texas 78711).*	☒ YES ☐ NO ☐ NA
B. Are the Core Data Form, Form PI-1, and all attachments being sent to the TCEQ in Austin?	☒ YES ☐ NO
OPTIONAL: Has an extra copy of the Core Data Form, Form PI-1 and all attachments been sent to the TCEQ in Austin?	☐ YES ☒ NO
If "YES," please mark this application as "COPY."	
C. Is a copy of the Core Data Form, the Form PI-1, and all attachments being sent to the appropriate TCEQ regional office?	☒ YES ☐ NO
D. Is a copy of the Core Data Form, the Form PI-1, and all attachments being sent to each appropriate local air pollution control program(s)?	☒ YES ☐ NO
List all local air pollution control program(s): **Harris County Public Health and Environmental Services**	
E. Is a copy of the Core Data Form, Form PI-1, and all attachments (without confidential information) being sent to the EPA Region 6 office in Dallas, Texas? (federal applications only)	☐ YES ☒ NO
F. This facility is located within 100 kilometers of the Rio Grande River and a copy of the application was sent to the International Boundary and Water Commission (IBWC):	☐ YES ☒ NO
G. This facility is located within 100 kilometers of a federally-designated Class I area and a copy of the application was sent to the appropriate Federal Land Manager:	☐ YES ☒ NO

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XIII. PROFESSIONAL ENGINEER (P.E.) SEAL	
Is the estimated capital cost of the project greater than $2 million dollars?	No
If "YES," the application must be submitted under the seal of a Texas licensed Professional Engineer (P.E.).	

XIV. DELINQUENT FEES AND PENALTIES

Notice: This form will not be processed until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the "Delinquent Fee and Penalty Protocol." For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: www.tceq.state.tx.us/agency/delin/index.html.

XV. SIGNATURE

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations of the Texas Commission on Environmental Quality or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. I further state that I have read and understand TWC §§ 7.177-7.183, which defines CRIMINAL OFFENSES for certain violations, including intentionally or knowingly making or causing to be made false material statements or representations in this application, and TWC § 7.187, pertaining to CRIMINAL PENALTIES.

NAME: Charles Kirk Johnson

SIGNATURE: _____
Original Signature Required

DATE: 8/11/11

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	46426	RN Number:	RN100219526	Date:	Aug-2011
Company Name:	SIMS Bayou Cogeneration Facility				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS										
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant		4. UTM Coordinates of Emission Point			5. Building Height (ft)	6. Height Above Ground (ft)	Source 7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees [b] (C)
Proposed Operations																
EP-H9	EP-H9	Boiler 9	CO	--	--	15	282,002	3,287,868	--	55	10	14.8	375	--	--	--
			NO_X	--	--											
			PM/PM_{10}	--	--											
			SO_2	8.31	--											
			VOC	--	--											
BOILER 10	BOILER 10	Boiler 10	CO	--	--	15	282,038	3,287,889	50.0	180	6.9	97.1	325	--	--	--
			NO_X	13.40	--											
			PM/PM_{10}	--	--											
			SO_2	12.27	--											
			VOC	--	--											
			H_2SO_4	0.00	0.00											
BOILER 10	BOILER 10	Boiler 10 MSS Emissions	CO	65.76	--	15	282,038	3,287,889	50.0	180	6.9	97.1	325	--	--	--
			NO_X	17.24	--											
BOILER 11	BOILER 11	Boiler 11	CO	--	--	15	282,067	3,287,889	50.0	180	6.9	97.1	325	--	--	--
			NO_X	13.40	--											
			PM/PM_{10}	--	--											
			SO_2	12.27	--											
			VOC	--	--											
			H_2SO_4	0.00	0.00											
BOILER 11	BOILER 11	Boiler 11 MSS Emissions	CO	65.76	--	15	282,067	3,287,889	50.0	180	6.9	97.1	325	--	--	--
			NO_X	17.24	--											

NOTE: Only hourly increases (and NOT annual increases) are being requested with this permit application, thus no annual emissions are presented.

Texas Commission on Environmental Quality
Table 30
Estimated Capital Cost and Fee Verification

Include estimated cost of the equipment and services that would normally be capitalized according to standard and generally accepted corporate financing and accounting procedures. Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality, Air Permits Division Web site at www.tceq.state.tx.us/nav/permits/air_permits.html.

I. DIRECT COSTS [30 TAC § 116.141(c)(1)]	Estimated Capital Cost
A. A process and control equipment not previously owned by the applicant and not currently authorized under this chapter	$
B. Auxiliary equipment, including exhaust hoods, ducting, fans, pumps, piping, conveyors, stacks, storage tanks, waste disposal facilities, and air pollution control equipment specifically needed to meet permit and regulation requirements	$
C. Freight charges	$
D. Site preparation, including demolition, construction of fences, outdoor lighting, road and parking areas	$
E. Installation, including foundations, erection of supporting structures, enclosures or weather protection, insulation and painting, utilities and connections, process integration, and process control equipment	$
F. Auxiliary buildings, including materials storage, employee facilities, and changes to existing structures	$
G. Ambient air monitoring network	$
II. INDIRECT COSTS [30 TAC § 116.141(c)(2)]	**Estimated Capital Cost**
A. Final engineering design and supervision, and administrative overhead	$
B. Construction expense, including construction liaison, securing local building permits, insurance, temporary construction facilities, and construction clean-up	$
C. Contractor's fee and overhead	$
TOTAL ESTIMATED CAPITAL COST	$ 0

I certify that the total estimated capital cost of the project as defined in 30 TAC § 116.141 is equal to or less than the above figure. I further state that I have read and understand Texas Water Code § 7.179, which defines CRIMINAL OFFENSES for certain violations, including intentionally or knowingly making, or causing to be made, false material statements or representations.

Company Name: TPC Group L.L.C.

Company Representative Name (please print): Charles Kirk Johnson Title: Plant Manager

Company Representative Signature: CK Johnson

Estimated Capital Cost	Permit Application Fee	PSD/Nonattainment Application Fee
Less than $300,000	$900 (minimum fee)	$3,000 (minimum fee)
$300,000 to $25,000,000	0.30% of capital cost	
$300,000 to $7,500,000		1.0% of capital cost
Greater than $25,000,000	$75,000 (maximum fee)	
Greater than $7,500,000		$75,000 (maximum fee)

PERMIT APPLICATION FEE (from table above) = $ 900 Date:

TCEQ-10196 (Revised 05/07) Table 30
This form is for use by facilities subject to Air New Source Review permit requirements and may be revised. (APDG 5846 v1)

Check Date: 05-AUG-2011 No. 65559

Vendor No.: 911 Vendor Name: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INVOICE NO.	INVOICE DATE	DESCRIPTION	DISCOUNT AMOUNT	NET AMOUNT
COGEN PERMIT APPLICATION FEE 2011	25-JUL-2011		0.00	900.00
			0.00	**900.00**

PLEASE DETACH AND RETAIN THIS STATEMENT AS YOUR RECORD OF PAYMENT. *Thank You*

WARNING – THIS CHECK IS PROTECTED BY SPECIAL SECURITY GUARD PROGRAM™ FEATURES

TPC Group

5151 San Felipe, Suite 800
Houston, Texas 77056
(713) 627-7474

Bank of America
Chicago, Illinois 60603

70-2328 / 719 IL

DATE	CHECK NO.	AMOUNT
05-Aug-2011	65559	$900.00

PAY Nine Hundred Dollars And Zero Cents*****

VOID AFTER 90 DAYS

TO THE ORDER OF
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P O Box 13089
Austin, TX 78711

Robert R Whitlow Jr.

AUTHORIZED SIGNATURE(S)

SECURE FEATURES INCLUDE INVISIBLE FIBERS, MICROPRINTING, VOID FEATURE PANTOGRAPH, ENDORSEMENT BACKER, BROWNSTAIN CHEMICAL REACTANT

⑈065559⑈ ⑆071923284⑆ 5590095252⑈

APPENDIX B

EMISSION CALCULATIONS

TCEQ FORMS AND TABLES

Emission Calculations and TCEQ Forms and Tables **Page**

Table B-1 Emissions Summary B-1
Boiler MSS Emission Calculations B-2
Boiler Normal Operations Emission Calculations B-3

TABLE B-1
TPC GROUP, L.L.C.
SIMS BAYOU COGENERATION FACILITY
PERMIT NUMBER 46426 REVISION

			Allowable Emissions											
			CO		NO_X		$PM/PM_{10}/PM_{2.5}$		SO_2		VOC		H_2SO_4	
FIN	EPN	Description	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)[a]	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)
Current Permitted Emission Rates														
EP-H9	EP-H9	Boiler 9	74.12	95.72	247.06	658.08	6.71	29.37	0.53	2.32	4.85	21.26	-	-
BOILER 10	BOILER 10	Boiler 10	47.9	200.4	13.3	55.5	4.95	20.7	8.95	4.2	3.58	15	1.4	0.6
BOILER 11	BOILER 11	Boiler 11	47.9	200.4	13.3	55.5	4.95	20.7	8.95	4.2	3.58	15	1.4	0.6
Proposed Permit Emission Rates														
EP-H9	EP-H9	Boiler 9	--	--	--	--	--	--	8.31	--	--	--	--	--
BOILER 10	BOILER 10	Boiler 10	--	--	13.4	--	--	--	12.27	--	--	--	0.00	0.00
BOILER 10	BOILER 10	Boiler 10 - MSS Emissions	65.76	--	17.24	--	--	--	--	--	--	--	--	--
BOILER 11	BOILER 11	Boiler 11	--	--	13.4	--	--	--	12.27	--	--	--	0.00	0.00
BOILER 11	BOILER 11	Boiler 11 - MSS Emissions	65.76	--	17.24	--	--	--	--	--	--	--	--	--
Net Change Emission Rates														
Normal Operating Emissions			0.0	--	0.02	--	--	--	14.42	--	--	--	-2.80	-1.20

[a] NSR Permit MAERT has 13.3 lbs/hr of NOx for Boilers 10 & 11. It is assumed that this is 13.39.
NOTE: Only hourly increases (and NOT annual increases) are being requested with this permit application, thus no annual emissions are presented.

BOILER MSS MAXIMUM HOURLY POTENTIAL TO EMIT CALCULATIONS
BOILER 10 & BOILER 11
TPC GROUP, L.L.C.
SIMS BAYOU COGENERATION FACILITY
PERMIT NUMBER 46426 REVISION

Contaminant	Maximum Concentration	Oxygen Concentration	Fuel Flowrate	Emission Rate
	ppmv	%	scfh	lb/hr
NOx	70	7.3	151467.8	17.24
CO	200	14.7	151467.8	65.76

Emission Calculation:
$E = C * MW / (385.3 * 10^6) * F * HHV * 20.9 / (20.9 - \%O_2) * Q$
C = concentration in ppm
MW = molecular weight of component C
F = Volume of combustion components per unit of heat content (dscf/MMBtu)
HHV = Higher heating value of fuel (Btu/scf) = 1020
$\%O_2$ = oxygen concentration
Q = Fuel flowrate in MMscf/hr

F Factor Calculation for Natural Gas:

Constituent	Molar Exhaust Volume, MEV [1] dscf/mol	Molar Heat Content, MHC [1] Btu/mol	Mole Percent	Exhaust Volume dscf	Heat Content Btu
Methane	7.28	842	93.89	6.84	791
Ethane	12.94	1475	2.40	0.31	35
Propane	18.61	2100	0.34	0.06	7
Butane	24.28	2717	0.08	0.02	2
Inerts	0.85	0	3.30	0.03	0
		TOTAL:	**100.00**	**7.25**	**835**

[1] Values from Table 4-2 in "Emission Estimation Protocol for Petroleum Refineries" dated March 2011

$F = \Sigma (X_i * MEV_i) / \Sigma (X_i * MHC_i) =$ 7.25 dscf / 835 Btu * 10^6 Btu/MMBtu = 8,688 dscf/MMBtu
Xi = Constituent Mole Fraction
MEV & MHC are defined in the table above.

Sample Calculation for NOx:
(70 lbmol NOx/MMlbmol)*(46 lb NOx/lbmol NOx)/(385.3 scf/lbmol)/(10^6 lbmol/MMlbmol*(8,688 dscf/MMBtu)*(1,020 Btu/scf)*20.9/(20.9 - 7.3)*(0.15 MMscfh) = 17.24 lb/hr

BOILER MAXIMUM HOURLY POTENTIAL TO EMIT CALCULATIONS
TPC GROUP, L.L.C.
SIMS BAYOU COGENERATION FACILITY
PERMIT NUMBER 46426 REVISION

EPN	Description	Rated Duty (MMBtu/hr)	Fuel Burned	Fuel Higher Heating Value (Btu/scf)	Pollutant		Emission Factor	Unit	Maximum Hourly (lb/hr)
EP-H9	Boiler No. 9	450	Natural Gas	1,020	SO_2	a	0.25	gr S/100 scf	0.32
			DH2 Off-Gas w/Natural Gas	749.5	SO_2	b,c	82	ppm S	8.31
					SO_2	d	**MAX Hourly Emissions:**		**8.31**
BOILER10	Boiler No. 10	664	Natural Gas	1,020	SO_2	a	0.25	gr S/100 scf	0.46
			DH2 Off-Gas w/Natural Gas	749.5	SO_2	b,c	82	ppm S	12.27
					SO_2	d	**MAX Hourly Emissions:**		**12.27**
			Purge Gas Nitrogen	N/A	NO_X	e	-	-	0.01
						f	**MAX Hourly Emissions:**		**13.40**
BOILER11	Boiler No. 11	664	Natural Gas	1,020	SO_2	a	0.25	gr S/100 scf	0.46
			DH2 Off-Gas w/Natural Gas	749.5	SO_2	b,c	82	ppm S	12.27
						d	**MAX Hourly Emissions:**		**12.27**
			Purge Gas Nitrogen	N/A	NO_X	e	-	-	0.01
						f	**MAX Hourly Emissions:**		**13.40**

[a] SO_2 emission factor is based on typical pipeline quality natural gas. This is not intended to be a limit.

[b] SO_2 emission factor is based on an 50/50 split of Natural Gas with 4ppm S and DH2 Off-Gas with 160 ppm S. This is not intended to be a limit.

[c] Example SO_2 calculations:

SO_2 (lb/hr) = (Sulfur, gr S/100 dscf) / (7,000 gr/lb) * (Rated Duty, Btu/hr) / (Fuel HHV, Btu/scf) * (64 lb SO2/32 lb S) =
(0.25gr S/100 scf gas) / (7,000 gr/lb) * (664 10^6 Btu/hr) / (1,020 Btu/scf) * (64 lb SO2/32 lb S) = 0.46 lb/hr
or SO_2 (lb/hr) = (ppm S) * (Rated Duty, MMBtu/hr) / (Fuel HHV, Btu/scf) / (379 scf/lbmol) * (64 lb SO2/lbmol S) =
(82scf S/MMscf gas) * (664 MMBtu/hr) / (1,020 Btu/scf) / (379 scf/lbmol) * (64 lb SO2/lbmol S) = 12.27 lb/hr

[d] SO_2 maximum hourly emission rate is based on the highest emission rate of the various streams that may be combusted in the boiler.

[e] Example NOx calculations:
NOx (lb/hr) = (3 lbmol N/lbmol gas) / (155 lb/lbmol gas) * (0.35 lb gas/day) / (24 hr/day) * (46 lb NOx/lbmol N)

[f] NOx maximum hourly emission rate is the current emission rate (13.3 lbs/hr is listed in the MAERT so it is assumed to be 13.39 lbs/hr) plus the additional NOx produced by the Purge Gas.

T134 v.2

Print Form

AIR, PESTICIDES, AND TOXICS
6TH FLOOR RECORDS CENTER
INFILING / NEW FILE FORM

New File ☐ OR Infiling ☒

Choose from the file types below:

AIR FACILITY:

(☐) AR - Acid Rain

(☐) CB - Confidential Business

(☐) CO - Compliance
(☐) EN - **Enforcement
(☐) GE - General
(☒) PE - Permit
(☐) RA - Regulatory Applicability
(☐) Other _____

TSCA:

(☐) AH - Asbestos Hazard Emergency Response Act
(☐) AS or AW - Asbestos or Asbestos Worker Protection
(☐) CB - Confidential
(☐) FI - Site Specific
(☐) FO - Non Site Specific
(☐) IM - **Section 5 & 8
(☐) LB - **Lead
(☐) PC - **PCB

** Extension of file type (if needed): (☐) ES - Enforcement Sensitive
(☐) DO - Docket Number

EPCRA / SARA (☐)

FIFRA (☐)

EPA Registry I.D.

Current FRS Number: 110000461134
(Found in EnviroFacts)

Facility Name & Physical Address: TPC Group LLC
8600 Park Place Blvd.
Houston, Tx. 77017

Remarks: Dehydro 2 Unit

Requestor's Name & Phone Number:

Les Koval X6733

Program Management Files:

A current listing of these file types and their numeric codes are located in a blue binder on the top shelf of the "APT" file cabinet in the 9th Floor Records Center.

AIRS - Aerometric Information Retrieval System
ATO - Air Toxics
EMR - Emergency Response
ENF - Enforcement -
ENF 5-5-1 requires Month and Fiscal Year accompany file code.
ENF 5-6-5 requires Fiscal Year accompany file code.
EXR - External Relations
GEO - Geographical Summary Data
GRA - Grants Administration
The majority of this section requires the Fiscal Year accompany file code.
Project Officer Grants require the Grant number and Fiscal Year accompany file code.
LAB - Laboratory Support
LBP - Lead Based Paint
LBP 12-3 requires the facility name in which document refers to be either highlighted or circled on the top page.
LEL - Legal and Legislative
MON – Monitoring NES - National Emission Standards
NSP - New Source Performance
NSR - New Source Review
OPP - Operating Permits Program
PEA - Permits Administration Program
PES - Pesticides
PLA - Planning
PUA - Public Affairs
RAD - Radiation
RCR - Resource Conservation and Recovery Act - Regulatory Development
RDE - Research and Development
REG - Registration
SIP - State Implementation Plan
SUP - Superfund
TITL - Title III
TSC - Toxic Substance Control
TSC 1-1-4 requires the facility name in which document refers to be either highlighted or circled on the top page.
TSU - Technical Support
VRP - Voluntary Reduction Program

EPA

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 26, 2011

MR CHARLES KIRK JOHNSON
PLANT MANAGER
TPC GROUP LLC
8600 PARK PLACE BLVD
HOUSTON TX 77017-2513

RECEIVED - 6PDL
AIR PLANNING SEC.
11 MAY -5 PM 3: 33

Re: Permit Amendment Application
Permit Number: 19806
Dehydro 2 Unit
Houston, Harris County
Regulated Entity Number: RN100219526
Customer Reference Number: CN603624289

Dear Mr. Johnson:

The executive director has completed the technical review of your application and has prepared a preliminary decision and draft permit.

You are now required to publish notice of your proposed activity. To help you meet the regulatory requirements associated with this notice, we have included the following items:

- Notices for Newspaper Publication (Examples A and B)
- Public Notice Checklist
- Instructions for Public Notice
- Affidavit of Publication for Air Permitting (Form TCEQ-20533) and Alternative Language Affidavit of Publication for Air Permitting (Form TCEQ-20534)
- Notification List
- Draft Permit

Please note that it is **very important** that you follow **all** directions in the enclosed instructions. If you do not, you may be required to republish the notice. A common mistake is the unauthorized changing of notice wording or font. If you have any questions, please contact us before you proceed with publication.

A "Public Notice Checklist" is enclosed which notes the time limitations for each step of the public notice process. This checklist should be used as a tool in conjunction with the enclosed, detailed instructions.

If you do not comply with **all** requirements described in the instructions, further processing of your application may be suspended or the agency may take other actions.

Re: Permit Number 19806

If you have any questions regarding publication requirements, please contact the Office of the Chief Clerk at (512) 239-3300. If you have any other questions, please contact Ms. Kristi Mills-Jurach at (512) 239-1261.

Sincerely,

LaDonna Castañuela
Office of the Chief Clerk
Texas Commission on Environmental Quality

LDC/KM/

Enclosures

cc: Larry Darcey, Vice President, Sage Environmental Consulting, Houston
Bureau Chief of Air Quality Control, Health and Human Services Department, City of Houston, Houston
Director, Environmental Public Health Division, Harris County Public Health and Environmental Services, Pasadena
Air Section Manager, Region 12 - Houston
Air Permits Section Chief, New Source Review, Section (6PD-R), U.S. Environmental Protection Agency, Region 6, Dallas

Project Number: 160152

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

EXAMPLE A

NOTICE OF APPLICATION AND PRELIMINARY DECISION FOR AN AIR QUALITY PERMIT

PERMIT NUMBER: 19806

APPLICATION AND PRELIMINARY DECISION. TPC Group LLC, 8600 Park Place Blvd, Houston, Texas 77017-2513, has applied to the Texas Commission on Environmental Quality (TCEQ) for an amendment to Air Quality Permit Number 19806, which would authorize construction of a Dehydro 2 Unit at 8600 Park Place Blvd, Houston, Harris County, Texas 77017. This application was submitted to the TCEQ on September 17, 2010. The amendment will authorize an increase in emissions of the following air contaminants: particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less, carbon monoxide, nitrogen oxides, organic compounds, ammonia and sulfur dioxide.

The executive director has completed the technical review of the application and prepared a draft permit which, if approved, would establish the conditions under which the facility must operate. The executive director has made a preliminary decision to issue the permit because it meets all rules and regulations. The permit application, executive director's preliminary decision, and draft permit will be available for viewing and copying at the TCEQ central office, the TCEQ Houston regional office, and at the Melcher Neighborhood Library, 7200 Keller Street, Houston, Harris County, Texas, beginning the first day of publication of this notice. The facility's compliance file, if any exists, is available for public review at the TCEQ Houston Regional Office, 5425 Polk St Ste H, Houston, Texas.

PUBLIC COMMENT/PUBLIC MEETING. You may submit public comments or request a public meeting about this application. The purpose of a public meeting is to provide the opportunity to submit comment or to ask questions about the application. The TCEQ will hold a public meeting if the executive director determines that there is a significant degree of public interest in the application or if requested by a local legislator. A public meeting is not a contested case hearing.

You may submit additional written public comment either electronically at www.tceq.texas.gov/about/comments.html or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087, within 30 days of the date of newspaper publication of this notice.

RESPONSE TO COMMENTS AND EXECUTIVE DIRECTOR ACTION. After the deadline for public comments, the executive director will consider the comments and prepare a response to all relevant and material or significant public comments. Because no timely hearing requests have been received, after preparing the response to comments, the executive director may then issue final approval of the application. **The response to**

comments, along with the executive director's decision on the application will be mailed to everyone who submitted public comments or is on a mailing list for this application, and will be posted electronically to the Commissioners' Integrated Database (CID).

ELECTRONICALLY AVAILABLE INFORMATION. When they become available, the executive director's response to comments and the final decision on this application will be accessible through the Commission's Web site at www.tceq.texas.gov/goto/cid. Once you have access to the CID using the above link, enter the permit number for this application which is provided at the top of this notice.

MAILING LIST. You may ask to be placed on a mailing list to obtain additional information on this application by sending a request to the Office of the Chief Clerk at the address below.

AGENCY CONTACTS AND INFORMATION. All public comments and requests must be submitted either electronically at www.tceq.texas.gov/about/comments.html, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. If you choose to communicate with the TCEQ electronically, please be aware that your email address, like your physical mailing address, will become part of the agency's public record. For more information about this permit application or the permitting process, please call the Office of Public Assistance, Toll Free, at 1-800-687-4040. Si desea información en Español, puede llamar al 1-800-687-4040. General information regarding the TCEQ can be found at www.tceq.texas.gov.

Further information may also be obtained from TPC Group LLC at the address stated above or by calling Ms. Geri Shoop, Staff Environmental Engineer at (713) 475-7422.

Notice Issuance Date: April 26, 2011

EXAMPLE B

Publication Elsewhere in the Newspaper:

TO ALL INTERESTED PERSONS AND PARTIES:

TPC Group LLC, has applied to the Texas Commission on Environmental Quality (TCEQ) for an amendment to Air Quality Permit Number 19806, which would authorize construction of a Dehydro 2 Unit at 8600 Park Place Blvd, Houston, Harris County, Texas 77017. Additional information concerning this application is contained in the public notice section of this newspaper.

3" minimum

Minimum 2 column widths or 4 inches

PUBLIC NOTICE CHECKLIST

Notice of Application and Preliminary Decision for an Air Quality Permit

(*2nd Notice*)

The following tasks must be completed for public notice. If publication in an alternative language is required, please complete the tasks for both the English and alternative language publications. Detailed instructions are included in the "Instructions for Public Notice" section of this package.

Within 33 calendar days after date of this letter
Publish *Notice of Application and Preliminary Decision for an Air Quality Permit* in the same newspaper(s) in which you published *Notice of Receipt of Intent to Obtain Permit* for this application. - Example A must be published in "public notice" section of newspaper. Review for accuracy prior to publishing. - Example B (if applicable) must be published in prominent location (other than "public notice") in same issue of newspaper Provide copy of the complete application (including any subsequent revisions) and the executive director's preliminary decision (including the draft permit) at a public place for review and copying. Keep them there for duration of the designated comment period.
First day of newspaper publication
Review published newspaper notice for accuracy. If errors, contact Air Permits Division. Ensure copy of the complete application (including any subsequent revisions) and the executive director's preliminary decision (including the draft permit) are at the public place.
Within 10 business days after date of publication
Mail original newspaper clippings showing publication date and newspaper name to: Texas Commission on Environmental Quality Office of the Chief Clerk, MC-105 Attn: Notice Team P.O. Box 13087 Austin, Texas 78711-3087 Mail photocopies of newspaper clippings showing publication date and newspaper name to persons listed on *Notification List*.
Within 30 calendar days after date of publication
Mail original affidavit of publication for air permitting and alternative language affidavit of publication for air permitting (if applicable) to: Texas Commission on Environmental Quality Office of the Chief Clerk, MC-105 Attn: Notice Team P.O. Box 13087 Austin, Texas 78711-3087 Mail photocopies of affidavits to persons listed on *Notification List*.
Within 10 business days after end of the designated comment period
Mail Public Notice Verification Form to: Texas Commission on Environmental Quality Office of the Chief Clerk, MC-105 Attn: Notice Team P.O. Box 13087 Austin, Texas 78711-3087 Mail photocopies of Public Notice Verification Form to persons listed on *Notification List*.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INSTRUCTIONS FOR PUBLIC NOTICE
For New Source Review Air Permit

NOTICE OF APPLICATION AND PRELIMINARY DECISION

We have completed the technical review of your application and issued a preliminary decision. You must comply with the following instructions:

Review Notice

Included in the notice is all of the information which the commission believes is necessary to effectuate compliance with applicable public notice requirements. Please read it carefully and notify the Texas Commission on Environmental Quality (TCEQ) immediately if it contains any errors or omissions. You are responsible for ensuring the accuracy of all information published. You may not change the text of the notice without prior approval from the TCEQ.

Newspaper Notice

- You must publish the enclosed *Notice of Application and Preliminary Decision for an Air Quality Permit* within **33 calendar days** after the date this information was mailed to you (see date of letter).

- You must publish the enclosed *Notice of Application and Preliminary Decision for an Air Quality Permit* at your expense, in the same newspaper(s) in which you published the *Notice of Receipt and Intent to Obtain Permit* for this application. The newspaper must be a newspaper that is of general circulation in the municipality where the facility is or will be located. If the facility is not located within a municipality, the newspaper must be of general circulation in the municipality nearest the location.

- You must publish this notice in one issue of any applicable newspaper.

- You will find two example notices enclosed in this package. *Example A* must be published in the "public notice" section of the newspaper. *Example B* must be published in the **same issue** of the newspaper as *Example A*; however, it must be published in a prominent location (other than the public notice section). *Example B* refers the public to the "public notice" section of the newspaper where *Example A* provides more information regarding the permit application.

- *Example B* must be a total of at least **6 column inches (standard advertising units)** with a height of at least **3 inches** and a horizontal dimension of **2 column widths.** If

the newspaper chosen does not use standard advertising units for measurement, the notice must be at least **12 square inches** with the shortest side of at least **3 inches**.

- The bold text of the enclosed notice **must** be printed in the newspaper in a font style or size that distinguishes it from the rest of the notice (i.e., **bold**, *italics*). **Failure to do so may require re-notice.**

Alternative Language Notice

In certain circumstances, applicants for air permits must complete notice in alternative languages.

- Public notice rules require the applicant to determine whether a bilingual program is required at either the elementary or middle school nearest to the facility or proposed facility location. Bilingual education programs are determined on a district-wide basis. When students who are required to attend either school are eligible to be enrolled in a bilingual education program, some alternative language notice is required (newspaper notice).

- Since the school district, and not the schools, must provide the bilingual education program, these programs do not have to be located at the elementary or middle school nearest to the facility or proposed facility to trigger the alternative language notice requirement. If there are students who would normally attend the nearest schools eligible to be taught in a bilingual education program at a different location, alternative language notice is required.

- If triggered, publications of alternative language notices must be made in a newspaper or publication printed primarily in each language taught in the bilingual education program. The same newspaper(s) used for *Notice of Receipt and Intent to Obtain Permit* must be used for publication of the *Notice of Application and Preliminary Decision for an Air Quality Permit.* This notice is required if such a newspaper or publication exists in the municipality or the county where the facility is or will be located.

- The applicant must demonstrate a good faith effort to identify a newspaper or publication in the required language. If a newspaper or publication of general circulation published at least once a month in such language cannot be found, publishing in that language is not required, but signs must still be posted adjacent to each English language sign.

- Publication in an alternative language section or insertion within an English language newspaper does not satisfy these requirements.

- The applicant has the burden to demonstrate compliance with these requirements. You must fill out the ***Public Notice Verification Form (Form TCEQ-20244)*** indicating your compliance with the requirements regarding publication in an alternative language. **This form is available at www.tceq.texas.gov/permitting/air/nav/air_publicnotice.html.**

- It is suggested the applicant work with the local school district to do the following:

  (a) determine if a bilingual program is required in the district;
  (b) determine which language is required by the bilingual program;
  (c) locate the nearest elementary and middle schools; and
  (d) determine if any students attending either school are entitled to be enrolled in a bilingual educational program.

- **If you determine that you must meet the alternative language notice requirements, you are responsible for ensuring that the publication in the alternative language is complete and accurate in that language.** Since the most common bilingual programs are in Spanish, the TCEQ has provided example Spanish notice templates for your use. All italic notes should be replaced with the corresponding Spanish translations for the specific application and published in the alternative language publication. Electronic versions of the Spanish templates are available through the Air Permits Division Web site at www.tceq.texas.gov/goto/air/publicnotice.

- If you are required to publish notice in a language other than Spanish, you must translate the entire public notice at your own expense.

Public Comment Period

- The public comment period will last at least **30 calendar days after publication of the last notice**.

- The comment period will be longer if the last day of the public comment period ends on a weekend or a holiday. In this case, the comment period will end on the next business day.

- The comment period for the permit may lengthen depending on whether a public meeting is held. If a public meeting is held, the comment period will be extended to the later of either the date of the public meeting or the end of the second notice period.

Proof of Publication

- Check each publication to ensure that the articles were accurately published. If a notice was not published correctly you may be required to republish.

- For each newspaper in which you published, you must submit **original newspaper clippings or tear sheets** of each published notice which shows the complete notice that was published, the date of publication, and the name of the newspaper to the TCEQ Office of the Chief Clerk within **10 business days** after the date of publication.

- You must submit an **original affidavit of publication for air permitting and alternate language affidavit of publication for air permitting (if applicable)** to the Office of the Chief Clerk within **30 calendar days** after the date of publication. **You must use the enclosed affidavit forms.** The affidavits must clearly identify the

applicant's name and permit number. You are encouraged to submit the affidavit with the original newspaper clippings described above.

- You must submit the ***Public Notice Verification Form (Form TCEQ-20244)*** to the Office of the Chief Clerk within **10 business days** of the end of this public comment period. You must use this form to certify that you have met bilingual notice requirements. **This form is available at www.tceq.texas.gov/permitting/air/nav/air_publicnotice.html.**

- The **original affidavits of publication, *Public Notice Verification Form,* and original newspaper clippings of the published notices** must be mailed to:

  Texas Commission on Environmental Quality
  Office of the Chief Clerk, MC-105
  Attn: Notice Team
  P.O. Box 13087
  Austin, Texas 78711-3087

- Please ensure that the affidavit and newspaper clippings you send to the Chief Clerk are originals and that all blanks on the affidavit are filled in correctly. Photocopies of newspaper clippings and affidavits will not be accepted.

- Photocopies of newspaper clippings, affidavits, and verifications must also be sent to those listed on the enclosed *Notification List* within the deadlines specified above.

Failure to Publish and Submit Proof of Publication

You must meet all publication requirements. **If you fail to publish the notice or submit proof of publication *on time,*** the TCEQ may suspend further processing on your application or take other actions.

Sign Posting

Signs must remain in place and be legible and be visible from the street for the entire duration of the comment period, from the beginning of the *Notice of Receipt and Intent* until the close of the comment period after publication of the *Notice of Application and Preliminary Decision*.

Application in a Public Place

- You must provide a copy of the complete application (including any subsequent revisions) and the executive director's preliminary decision (including the draft permit), at a public place for review and copying by the public. This place must be in the county in which the facility is located or proposed to be located.

- A public place is one that is publicly owned or operated (ex: libraries, county courthouses, or city halls.)

- This copy must be accessible to the public for review and copying. The copy must be available beginning on the first day of newspaper publication and remain in place until the commission has taken action on the application or the commission refers issues to the State Office of Administrative Hearings.

- If the application is submitted to the TCEQ with information marked as "CONFIDENTIAL," you are required to indicate which specific portions of the application are not being made available to the public. These portions of the application must be accompanied with the following statement: "Any request for portions of this application that are marked as confidential must be submitted in writing, pursuant to the Public Information Act, to the Texas Commission on Environmental Quality, Public Information Coordinator, MC-197, P.O. Box 13087, Austin, Texas 78711-3087."

- You must submit verification of file availability using the ***Public Notice Verification Form (Form TCEQ-20244)*** within **10 business days** after end of the publications' designated comment period. Do not submit the form verifying that the application was in a public place until after the comment period is complete. If a public meeting is held or second notice is required causing the public comment period to be extended, at a later date you will be required to verify that the application was in a public place during the entire public comment period. **This form is available at www.tceq.texas.gov/permitting/air/nav/air_publicnotice.html.**

General Information

When contacting the Commission regarding this application, please refer to the permit number at the top of the *Notice of Application and Preliminary Decision*.

If you have questions or need assistance regarding publication requirements, please contact the Office of the Chief Clerk at (512) 239-3300 or the project reviewer listed in the cover letter.

TCEQ-Office of the Chief Clerk
MC-105 Attn: Notice Team
P.O. Box 13087
Austin, Texas 78711-3087

Applicant Name: TPC Group LLC

Permit No.: 19806

AFFIDAVIT OF PUBLICATION FOR AIR PERMITTING

STATE OF TEXAS §

COUNTY OF _____ §

Before me, the undersigned authority, on this day personally appeared

_____, who being by me duly sworn,
(name of newspaper representative)

deposes and says that (s)he is the _____
(title of newspaper representative)

of the _____; that said newspaper is generally circulated
(name of newspaper)

in _____, Texas;
(in the municipality or nearest municipality to the location of the facility or the proposed facility)

that the attached notice was published in said newspaper on the following date(s):

_____.

_____
(newspaper representative's signature)

Subscribed and sworn to before me this the _____ day of _____, 20_____,

to certify which witness my hand and seal of office.

_____
Notary Public in and for the State of Texas

(Seal)

_____
Print or Type Name of Notary Public

_____
My Commission Expires

TCEQ-Office of the Chief Clerk
MC-105 Attn: Notice Team
P.O. Box 13087
Austin, Texas 78711-3087

Applicant Name: TPC Group LLC

Permit No.: 19806

ALTERNATIVE LANGUAGE AFFIDAVIT OF PUBLICATION FOR AIR PERMITTING

STATE OF TEXAS §

COUNTY OF _____ §

Before me, the undersigned authority, on this day personally appeared

_____, who being by me duly sworn, deposes
(name of newspaper or publication representative)

and says that (s)he is the _____
(title of newspaper or publication representative)

of the _____; that said newspaper or publication is generally circulated
(name of newspaper or publication)

in _____, Texas;
(in the municipality or the same county as the location of the facility or the proposed facility)

that the attached notice was published in said newspaper or publication on the following date(s):

_____.

_____
(newspaper or publication representative's signature)

Subscribed and sworn to before me this the _____ day of _____, 20_____,

to certify which witness my hand and seal of office.

_____
Notary Public in and for the State of Texas

(Seal)

_____
Print or Type Name of Notary Public

_____
My Commission Expires

NOTIFICATION LIST

It is the responsibility of the applicant to furnish the following offices with copies of the notices published, the *Affidavit of Publication for Air Permitting*, the *Alternative Language Affidavit of Publication for Air Permitting (if applicable)*, and a completed copy of the *Public Notice Verification Form (Form TCEQ-20244)*. Originals should be sent to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. **Copies** should be sent to the following:

U.S. Environmental Protection Agency
Region 6
Attn: Air Permits Section (6PD-R)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Texas Commission on Environmental Quality
Houston Regional Office
5425 Polk St Ste H
Houston, Texas 77023-1452

Texas Commission on Environmental Quality
Office of Permitting and Registration
Air Permits Division, MC-163
Ms. Kristi Mills-Jurach
P.O. Box 13087
Austin, Texas 78711-3087

Bureau Chief of Air Quality Control
Health and Human Services Department
City of Houston
7411 Park Place Blvd, Rm 108
Houston, Texas 77087-4441

Director
Environmental Public Health Division
Harris County Public Health and
Environmental Services
101 S Richey St Ste G
Pasadena, Texas 77506-

SPECIAL CONDITIONS

Permit Number 19806

EMISSION STANDARDS

1. This permit authorizes chemical manufacturing and associated operations located at 8600 Park Place Boulevard, Houston, Harris County. **(05/11)**

2. This permit authorizes emissions only from those points listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," and the facilities covered by this permit are authorized to emit subject to the emission rate limits on that table and other operating requirements specified in the special conditions.

3. All sources of air contaminants shall be physically marked in a conspicuous location with the emission point numbers (EPNs) and/or the source names as identified on the Maximum Allowable Emission Rates Table (MAERT). **(05/11)**

FEDERAL APPLICABILITY

4. These facilities shall comply with all applicable requirements of the U.S. Environmental Protection Agency (EPA) regulations on Standards of Performance for New Stationary Sources (NSPS) promulgated in Title 40 Code of Federal Regulations (40 CFR) Part 60 for: **(05/11)**

   A. Subpart A - General Provisions;

   B. Subpart Db - Industrial-Commercial-Institutional Steam Generating Units;

   C. Subpart Kb - Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984; and

   D. Subpart VV - Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry.

5. These facilities shall comply with all applicable requirements of EPA regulations on National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP) in 40 CFR Part 63, promulgated for: **(05/11)**

   A. Subpart A - General Provisions;

   B. Subpart G - Organic Hazardous Air Pollutants From Synthetic Organic Chemical Manufacturing Industry Process Vents, Storage Vessels, Transfer Operations, and Wastewater; and

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C. Subpart H - Organic Hazardous Air Pollutants for Equipment Leaks

6. If any condition of this permit is more stringent than the regulations so incorporated, the permit shall govern and be the standard by which compliance shall be demonstrated. **(05/11)**

EMISSIONS LIMITATIONS

7. Authorized fuels are limited to the following for fired sources associated with the Dehydro #2 (DH2) unit: **(05/11)**

   A. Fuel for the DH2 Feed Heater [Facility Identification Number (FIN) EB-1B-2501], DH2 Air Heater (FIN 1B-2502), DH2 Regen Gas Generator Turbine (FIN 1G-2520), DH2 Turbine (FIN 1G-2502T), and DH2 Heat Recovery Boilers (FINs 1B-505 and 1B-506) authorized by this permit shall be limited to pipeline-quality, sweet natural gas or fuel gas containing no more than 5.0 grains total sulfur per 100 dry standard cubic feet (dscf) on an hourly basis and 0.5 grains total sulfur per 100 dscf on an annual basis.

   B. The permit holder shall monitor fuel consumption for the sources listed in Special Condition No. 7A continuously using a monitoring device that is accurate to ± 5 percent and maintained, calibrated, and operated in accordance with the manufacturer's specifications. The monitoring device shall be calibrated in accordance with the manufacturer's recommendations or at least annually. Maximum fuel usage shall not exceed 12,500 million standard cubic feet per year for natural gas and plant gas combined.

   C. Upon request by the Executive Director of the Texas Commission on Environmental Quality (TCEQ) or any air pollution control program having jurisdiction, the holder of this permit shall provide a sample and/or an analysis of the fuel fired in the sources listed in Special Condition No. 7A or shall allow air pollution control agency representatives to obtain a sample for analysis.

8. Emissions from the DH2 Feed Heater (EPN EB-1B-2501) shall not exceed the following except during periods of maintenance and start-up: **(05/11)**

   A. Nitrogen Oxides (NO_x): 0.04 lb/MMBtu on a rolling 30-day average.

   B. Carbon Monoxide (CO): 50 parts per million by volume dry (ppmvd) at 3 percent oxygen (O_2) on a rolling 30-day average.

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9. Emissions from the DH2 Heat Recovery Boiler Stack (EPN EB-1B-505) shall not exceed the following except during periods of maintenance and start-up: **(05/11)**

   A. NO_x: 5 ppmvd at 15 percent O_2 on a rolling 30-day average.

   B. Ammonia (NH_3): 10 ppmvd at 3 percent O_2 on a three-hour rolling average.

   C. CO: 50 ppmvd at 15 percent O_2 on a rolling 30-day average.

10. Emissions from the DH2 Heat Recovery Boiler Stacks (EPN EB-1B-506) shall not exceed the following except during periods of maintenance and start-up: **(05/11)**

   A. NO_x: 5 ppmvd at 15 percent O_2 on a rolling 30-day average.

   B. Ammonia (NH_3): 10 ppmvd at 3 percent O_2 on a three-hour rolling average.

   C. CO: 50 ppmvd at 15 percent O_2 on a rolling 30-day average.

11. Within twenty four months of the start of operation of DH2, the permit holder shall evaluate the CO concentration from EPNs EB-1B-505 and EB-1B-506. If the concentration is less than 50 percent of the limits in Special Conditions Nos. 9C or 10C, the permit holder shall submit an alteration request to revise the concentration limits.

12. A selective catalytic reduction (SCR) system using aqueous NH_3 and an oxidation catalyst shall be installed and operated on the DH2 Heat Recovery Boiler Stacks (EPNs EB-1B-505 and EB-1B-506) to meet the NO_x, NH_3 and CO emission limits of Special Condition No. 9 and 10 and the MAERT. **(05/11)**

13. In the event that the continuous emission monitoring system (CEMS) for NO_x is not operating for a period longer than one hour while the sources emitting through EPNs EB-1B-505 and EB-1B-506 are operating, the permit holder shall operate at no less than the NH_3 feed rate to the SCR that was measured prior to the outage of the CEMS, adjusted for load or other operating parameters. **(05/11)**

14. Opacity of emissions from any one stack authorized by this permit shall not exceed 5 percent averaged over a six-minute period. During periods of start-up, shutdown, or maintenance, the opacity shall not exceed 15 percent. This determination shall be made by first observing for visible emissions while each facility is in operation. Observations shall be made at least 15 feet and no more than 0.25 miles from the emission point(s). If visible emissions are observed from an emission point, then the opacity shall be determined for that emission point by Title 40 Code of Federal Regulations Part 60 (40 CFR Part 60), Appendix A, Test Method 9. Contributions from uncombined water shall not be included

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in determining compliance with this condition. Observations shall be performed and recorded quarterly. **(05/11)**

15. The feedstock to the DH2 unit shall be limited to 160 parts per million by weight (ppmw) sulfur on a 30-day rolling average and 47 ppmw sulfur on a 12-month rolling average. Compliance with the sulfur limits must be demonstrated by collecting and analyzing daily samples of the feedstock to the DH2 unit for any day when the unit is operating. **(05/11)**

OPERATIONAL LIMITATIONS

16. Non-fugitive emissions from relief valves, safety valves, or rupture discs of gases containing VOC at a concentration of greater than 1 percent are not authorized by this permit unless authorized on the MAERT. Any releases directly to atmosphere from relief valves, safety valves, or rupture discs of gases containing VOC at a concentration greater than 1 weight percent are not consistent with good practice for minimizing emissions.

17. Safety relief valves that discharge to the atmosphere only as a result of fire or failure of utilities are exempt from quarterly monitoring per 30 TAC Chapter 115 and 40 CFR Part 60 Subpart VV, provided that each valve is equipped with a rupture disc upstream. A pressure gauge shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity, but no later than the next process shutdown.

18. Total production throughput of polyisobutylene (PIB) shall be limited to the production rates provided in Confidential Section 5.0 of the January 2007 Permit Number 19806 amendment application. Annual throughput records shall be maintained at the plant site.

19. Sampling ports and platform(s) shall be incorporated into the design of EPNs EB-1B-2501, EB-1B-505, and EPN EB-1B-506 according to the specifications set forth in the attachment entitled "Chapter 2, Stack Sampling Facilities." Alternate sampling facility designs may be submitted for approval by the Texas Commission on Environmental Quality (TCEQ) Regional Director. **(05/11)**

20. Upon request by the TCEQ Executive Director, the holder of this permit shall perform stack sampling and other testing as required to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere.

AQUEOUS AMMONIA HANDLING (NH_3)

21. Aqueous ammonia storage tanks shall be located within a physical barrier to traffic. Tank containment shall be employed with a minimum of 110 percent of tank volume.

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Vapors resulting from the filling operations of the aqueous ammonia storage tank(s) shall be collected and vapor returned back to the transport vessel. **(05/11)**

22. The relief valve system shall be designed and operated to ensure that there are no working loss emissions to the atmosphere resulting from filling operations, and that there are no breathing losses during normal non-filling (standing) operations. The fill level of the aqueous ammonia storage tank shall not exceed a level that is in line with good engineering practices, and shall include a high level alarm and a high-high level alarm. In addition, sealless pumps shall be used in all piping handling aqueous ammonia. **(05/11)**

23. Audio, visual and olfactory (AVO) checks for ammonia leaks shall be made once per day within the operating area. **(05/11)**

    A. No later than one hour following detection of a leak, plant personnel shall take the following actions:

        (1) Locate and isolate the leak; and

        (2) Use a leak collection or containment system to control the leak until repair or replacement can be made.

    B. A component in no instance may be allowed to have a leak for more than 15 calendar days after the leak is found.

<u>ROUTINE MAINTENANCE, STARTUP, AND SHUTDOWN (MSS)</u>

24. The maintenance startup and shutdown (MSS) emissions associated with EPNs EB-1-2501, EB-1B-505, EB-1B-506 and DH2CAT-MSS activities are reflected in the MAERT. The MSS emissions associated with all other sources are included in the site wide MSS emissions contained in the MAERT for Permit No. 46307. **(05/11)**

25. MSS emissions will be minimized by the following: **(05/11)**

    A. Facility and air pollution control equipment will be operated in a manner consistent with good practices for minimizing emissions.

    B. The duration of operation in MSS mode will be minimized and the applicable emissions monitoring systems will be kept in operation.

    C. MSS activities are authorized provided that the NO_x, CO and VOC emission rates in pounds per hour (lb/hr) do not exceed those specified in the MAERT for MSS operations and comply with the annual limits specified in the MAERT.

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26. Startup is defined as the period that begins when fuel is supplied to the Air Heater (FIN 1B-2502) and ends when the SCR catalyst bed temperature for EPN EB-1B-505 and EB-1B-506 has reached a minimum of 450° F and ammonia injection has commenced. Startup events shall not exceed 36 hours each. **(05/11)**

27. During startup events, the Heat Recovery Boilers (FINs 1B-505 and 1B-506), Regen Gas Generator Turbine (FIN 1G-2520), and Turbine (FIN 2502T) shall not be operated until the SCR catalyst bed for EPN EB-1B-505 has achieved the minimum operating temperature of 450° F and ammonia injection has commenced. **(05/11)**

28. Unplanned or emergency shutdowns are required to comply with the requirements of 30 TAC § 101.201. **(05/11)**

CONTINUOUS DETERMINATION OF COMPLIANCE

29. The holder of this permit shall install, calibrate, and maintain a continuous emission monitoring system (CEMS) to measure and record the in-stack concentration of nitrogen oxides (NO_x) and carbon monoxide (CO) from the Heat Recovery Boiler Stacks (EPNs EB-1B-505 and EB-1B-506). **(05/11)**

    A. The CEMS shall meet the design and performance specifications, pass the field tests, and meet the installation requirements and the data analysis and reporting requirements specified in the applicable Performance Specifications No. 1 through 6, 40 CFR Part 60, Appendix B. If there are no applicable performance specifications in 40 CFR Part 60, Appendix B, contact the TCEQ Office of Permitting and Registration, Air Permits Division for requirements to be met.

    B. The system shall be zeroed and spanned daily; and corrective action shall be taken when the 24-hour span drift exceeds two times the amounts specified in 40 CFR Part 60, Appendix B, or as specified by the TCEQ if not specified in Appendix B. Zero and span is not required on weekends and plant holidays if instrument technicians are not normally scheduled on those days, unless the monitor is required by a subpart of NSPS or NESHAP, in which case zero and span shall be done daily without exception.

    Each monitor shall be quality assured at least quarterly in accordance with 40 CFR Part 60, Appendix F, Procedure 1, Section 5.1.2. For non-NSPS sources, an equivalent method approved by the TCEQ may be used.

    C. The monitoring data shall be reduced to hourly average concentrations at least once every day using a minimum of four equally-spaced data points from each one-hour

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period. The individual average concentrations shall be reduced to units of the permit allowable emission rate in pounds per hour at least once every week.

D. All monitoring data and quality-assurance data shall be maintained by the source for a period of five years and shall be made available to the TCEQ Executive Director or his designated representative upon request. The data from the CEMS may, at the discretion of the TCEQ, be used to determine compliance with the conditions of this permit.

E. All cylinder gas audit exceedances of ±15 percent accuracy and any CEMS downtime shall be reported to the appropriate TCEQ Regional Director, and necessary corrective action shall be taken. Supplemental stack concentration measurements may be required at the discretion of the appropriate TCEQ Regional Director.

F. For NSPS sources subject to Appendix F, the appropriate TCEQ Regional Office shall be notified at least 30 days prior to each annual relative accuracy testing audit in order to provide them the opportunity to observe the testing.

30. The permit holder shall install, calibrate, and maintain a predictive emission monitoring system (PEMS) to measure and record the in-stack concentration of NO_x and O_2 from Boiler 9.

A. A PEMS may be used for demonstrating continuous compliance if it can be proven to have the same or better accuracy, precision, reliability, accessibility, and timeliness as that provided by a hardware CEMS. All PEMS shall be subject to the approval of the TCEQ Executive Director. Owners or operators must petition the TCEQ Executive Director for approval to use PEMS. The petition must include results of tests conducted beforehand to demonstrate equivalent accuracy and precision of PEMS to that of hardware CEMS. Demonstrating equivalency of PEMS to CEMS shall be met by instantaneously comparing data collected by PEMS with that collected by a certified hardware CEMS or an EPA reference method. For a PEMS replacing a CEMS, both systems shall remain in place for at least an operating quarter collecting valid information before the CEMS is removed.

B. For any unit at which the PEMS is installed, PEMS initial certification by the TCEQ shall occur while the unit is firing its primary fuel. The owner or operator shall:

(1) Conduct relative accuracy testing for NO_x and O_2, or carbon dioxide (CO_2) per 40 CFR Part 60, Appendix B, Performance Specifications 2, 3, and 4, respectively, at low, medium, and high levels of the most significant operating parameter affecting NO_x emissions.

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(2) Conduct statistical test analysis at low, medium, and high levels of the most significant operating parameter affecting NO_x emissions. A minimum of 30 successive paired data points which are either 15-minute averages, 20-minute averages, or hourly averages must be collected at each tested level before a reliable statistical test can be performed.

Data collection must be continuous at all times except when calibration of the reference method must be conducted for the purpose of collecting data for RATA.

The following three tests must be conducted to demonstrate precision:

a. A T-test for bias per Appendix A, 40 CFR Part 75, § 7.6. The test shall be conducted using all paired data points collected at all three tested levels.

b. An F-test per 40 CFR § 75.41(c)(1). The F-test must be conducted separately at the three tested levels.

c. A correlation analysis per 40 CFR § 75.41(c)(2). Calculation of the correlation coefficient (Equation 27) shall be performed using all paired data points collected at all three tested levels.

(3) For NO_x and for the purpose of conducting an F-test, if the standard deviation (SD) of the reference method is less than either 3 percent of the span or 5 ppm, use a reference method SD of the greater of 5 ppm or 3 percent of span.

(4) For diluent CO_2 or O_2 and for the purpose of conducting an F-test, if the SD of the reference method is less than 3 percent of span, use a reference method SD of 3 percent of span.

(5) For NO_x at any one tested level, if the mean value of the reference method is less than either 10 ppm or 5 percent of the standard, all statistical tests are waived for that emission parameter at that specific tested level.

(6) For either O_2 or CO_2 and at any one tested level, if the mean value of the reference method is less than 3 percent of span, all the statistical tests are waived for that diluent parameter at that specific tested level.

C. The monitoring data shall be reduced to hourly average concentrations at least once everyday, using a minimum of four equally-spaced data points from each one-hour period. The individual average concentrations shall be reduced to units of pounds per hour and pounds per million BTU at least once every week as follows:

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The measured hourly average NO_x concentration from the PEMS shall be multiplied by the custom F factor based on fuel density and excess O_2 to determine the hourly emission rate of NO_x in pounds per million Btu. The hourly average emission rate in pounds per hour is determined by multiplying the pounds per million Btu times the boiler firing rate based on fuel gas flow and average fuel heat content.

D. All monitoring data and quality-assurance data shall be maintained by the permit holder.

E. Any PEMS downtime shall be reported to the appropriate TCEQ Regional Director within three days of any downtime, and necessary corrective action shall be taken. Quality-assured (or valid) data must be generated when the Boiler 9 is operating except during the performance of a daily zero and span check. Loss of valid data due to periods of monitor break down, out-of-control operation (producing inaccurate data), repair, maintenance, or calibration may be exempted provided it does not exceed 5 percent of the time (in minutes) that the Boiler 9 operated over the previous rolling 12-month period. Owners or operators shall demonstrate that all missing data can be accounted for in accordance with the applicable missing data procedures of 40 CFR Part 75, Subpart D. Supplemental stack concentration measurements may be required at the discretion of the appropriate TCEQ Regional Director.

F. The appropriate TCEQ Regional Office shall be notified at least 15 days prior to each annual RATA in order to provide them the opportunity to observe the testing.

G. The owner or operator shall perform daily sensor validation. The owner or operator shall develop and implement plans that will ensure proper functioning of the monitoring systems, ensure proper accuracy and calibration of all operational parameters that affect emissions and serve as input to the predictive monitoring system, and ensure continuous operation within the certified operating range.

H. In accordance with the procedure of § 2.3.1, Appendix B of 40 CFR Part 60, a RATA must be performed every six months for each unit while firing its primary fuel. A RATA may be performed annually if the relative accuracy of the previous audit is 7.5 percent or less.

I. Any RATA exceeding 20 percent or statistical test exceeding the applicable standard shall be reported to the appropriate TCEQ Regional Director, and necessary corrective action shall be taken.

J. When an alternative fuel is fired in a unit, PEMS must be re-certified in accordance with the certification procedures outlined for initial certification under Section B.

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Owners or operators may justify to the satisfaction of the TCEQ Executive Director that slight changes in fuel composition do not constitute an alternative fuel. No additional recertification procedures are required if the unit meets the current monitoring requirements when switching back to the normal fuel from an alternate fuel.

K. The system is required to provide valid emission predictions for at least 95 percent of the time that the unit being monitored is operated. The following rules for tuning without recertification shall be followed:

(1) The model did not change fundamentally.

(2) The model continues to operate within the initially certified operating ranges.

Otherwise, the system must be recertified. Any tuning must be documented, and the records must be made available during any future inspection.

L. All owners or operators shall develop a quality-assurance plan or manual that insures continuous and reliable performance of the PEMS. As part of the plan, owners or operators shall recommend a frequency for calibrating each sensor whose readout serves as an input to the model. All sensors, at a minimum, shall be calibrated as often as recommended by the manufacturer.

M. The holder of this permit shall maintain monthly records of the emissions from Boilers No. 9 (EPN EP-H9). These records shall consist of average steam made for the month in units of pounds per hour, average firing rate for the month in units of MMBtu/hr, total tons of emissions for the month based on the average firing rate for the month, and total tons of emissions for the year-to-date. Records shall be maintained at the plant site for a period of two years and shall be made available to TCEQ personnel or any authorized local air pollution control agency upon request.

31. The NH_3 concentration in each Exhaust Stack (EPNs EB-1B-505 and EB-1B-506) shall be tested or calculated according to one of the methods listed below and shall be tested or calculated according to frequency listed below. Testing for NH_3 slip is only required on days when the SCR unit is in operation. **(05/11)**

A. The holder of this permit may install, calibrate, maintain, and operate a CEMS to measure and record the concentrations of NH_3. The NH_3 concentrations shall be corrected and reported in accordance with Special Condition Nos. 9 and 10.

B. As an approved alternative, the NH_3 slip may be measured using a sorbent or stain tube device specific for NH_3 measurement in the 5 to 15 parts per million (ppm)

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range. The frequency of sorbent or stain tube testing shall be daily for the first 60 days of operation, after which, the frequency may be reduced to weekly testing if operating procedures have been developed to prevent excess amounts of NH_3 from being introduced in the SCR unit and when operation of the SCR unit has been proven successful with regard to controlling NH_3 slip. Daily sorbent or stain tube testing shall resume when the catalyst is within 30 days of its useful life expectancy. These results shall be recorded and used to determine compliance with Special Condition Nos. 9 and 10.

If the sorbent or stain tube testing indicates an ammonia slip concentration which exceeds 7 ppm at any time, the permit holder shall begin NH_3 testing by either the Phenol-Nitroprusside Method, the Indophenol Method, or EPA Conditional Test Method (CTM) 27 on a quarterly basis in addition to the weekly sorbent or stain tube testing. The quarterly testing shall continue until such time as the SCR unit catalyst is replaced; or if the quarterly testing indicates NH_3 slip is 5 ppm or less, the Phenol-Nitroprusside/Indophenol/CTM 27 tests may be suspended until sorbent or stain tube testing again indicate 7 ppm NH_3 slip or greater. These results shall be recorded and used to determine compliance with Special Condition Nos. 9 and 10.

C. As an approved alternative, the permit holder may install and operate a second NO_x CEMS probe located upstream of the SCR, which may be used in association with the SCR efficiency and NH_3 injection rate to estimate NH_3 slip. This condition shall not be construed to set a minimum NO_x reduction efficiency on the SCR unit. These results shall be recorded and used to determine compliance with Special Condition Nos. 9 and 10.

D. As an approved alternative, the permit holder may install and operate a dual stream system of NO_x CEMS at the exit of the SCR. One of the exhaust streams would be routed, in an unconverted state, to one NO_x CEMS, and the other exhaust stream would be routed through a NH_3 converter to convert NH_3 to NO_x and then to a second NO_x CEMS. The NH_3 slip concentration shall be calculated from the delta between the two NO_x CEMS readings (converted and unconverted). These results shall be recorded and used to determine compliance with Special Condition Nos. 9 and 10.

E. Any other method used for measuring NH_3 slip shall require prior approval from the TCEQ Houston Regional Office. **(9/09)**

32. Storage tanks are subject to the following requirements. The control requirements specified in paragraphs A - D of this condition shall not apply (1) where the VOC has an aggregate partial pressure of less than 0.50 psia at the maximum feed temperature or 95F, whichever is greater, or (2) to storage tanks smaller than 25,000 gallons.

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A. An internal floating deck or "roof" or equivalent control shall be installed in all tanks. The floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the internal floating roof: (1) a liquid-mounted seal, (2) two continuous seals mounted one above the other, or (3) a mechanical shoe seal.

B. An open-top tank containing a floating roof (external floating roof tank) which uses double seal or secondary seal technology shall be an approved control alternative to an internal floating roof tank provided the primary seal consists of either a mechanical shoe seal or a liquid-mounted seal and the secondary seal is rim-mounted. A weathershield is not approvable as a secondary seal unless specifically reviewed and determined to be vapor-tight.

C. For any tank equipped with a floating roof, the permit holder shall perform the visual inspections and seal gap measurements as specified in 40 CFR § 60.113b Testing and Procedures (as amended at 54 FR 32973, Aug. 11, 1989) to verify fitting and seal integrity. Records shall be maintained of the dates seals were inspected and seal gap measurements made, results of inspections and measurements made (including raw data), and actions taken to correct any deficiencies noted.

D. The floating roof design shall incorporate sufficient flotation to conform to the requirements of API Code 650 dated November 1, 1998, except that an internal floating cover need not be designed to meet rainfall support requirements and the materials of construction may be steel or other materials.

E. Uninsulated tank exterior surfaces exposed to the sun shall be white or aluminum. Storage tanks must be equipped with permanent submerged fill pipes.

F. The permit holder shall maintain an emissions record which includes calculated emissions of VOC from all storage tanks during the previous calendar month and the past consecutive 12-month period. The record shall include tank identification number, control method used, tank capacity in gallons, name of the material stored, VOC molecular weight, VOC monthly average temperature in degrees Fahrenheit, VOC vapor pressure at the monthly average material temperature in psia, VOC throughput for the previous month and year-to-date. Records of VOC monthly average temperature are not required to be kept for unheated tanks which receive liquids that are at or below ambient temperatures.

Emissions for tanks shall be calculated using: the TCEQ publication titled "Technical Guidance Package for Chemical Sources - Storage Tanks."

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33. Polyisobutylene (PIB-1 and PIB-2) Unit Piping, Valves, Connectors, Pumps, Agitators, and Compressors - 28VHP **(07/07)**

Except as may be provided for in the special conditions of this permit, the following requirements apply to the above-referenced equipment.

A. These conditions shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure of less than 0.044 pound per square inch, absolute (psia) at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon request.

The exempted components may be identified by one or more of the following methods:

(1) piping and instrumentation diagram (PID); or

(2) a written or electronic database.

B. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable ANSI, API, ASME, or equivalent codes.

C. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

D. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by 30 TAC Chapter 115, shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph A above. If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe-to-monitor times. A difficult-to-monitor component for which quarterly monitoring is specified may instead be monitored annually.

E. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of

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the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve to seal the line so that no leakage occurs. Except during sampling, both valves shall be closed. If the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 24 hours. If the repair or replacement is not completed within 24 hours, the line or valve must have a cap, blind flange, plug, or second valve installed.

F. Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown.

A check of the reading of the pressure-sensing device to verify disc integrity shall be performed weekly and recorded in the unit log.

The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR Part 60, Appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs are being monitored, the response factor shall be calculated for the average composition of the process fluid. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured.

Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.

G. Except as may be provided for in the special conditions of this permit, all pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent

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emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.

H. Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days. Records of the first attempt to repair shall be maintained. (See exemption in Special Condition No. 34.) **(11/09)**

I. Every reasonable effort shall be made to repair a leaking component, as specified in this paragraph, within 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC § 115.782 (c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC § 115.782 (c)(1)(B)(i)(I), the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

J. Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument

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monitoring shall indicate dates and times, test methods, and instrument readings. Records of physical inspections shall be noted in the operator's log or equivalent.

K. Alternative monitoring frequency schedules of 30 TAC Sections 115.352 - 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F through G of this condition.

L. Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable NSPS, or an applicable NESHAPS and does not constitute approval of alternative standards for these regulations

34. In addition to the weekly physical inspection required by Item E of Special Condition No. 33, all accessible connectors in gas/vapor and light liquid service shall be monitored quarterly with an approved gas analyzer in accordance with Items F through J of Special Condition No. 33. (28CNTQ)

A. Connectors may be monitored on a semiannual basis if the percent of connectors leaking for two consecutive quarterly monitoring periods is less than 0.5 percent.

Connectors may be monitored on an annual basis if the percent of connectors leaking for two consecutive semiannual monitoring periods is less than 0.5 percent.

If the percent of connectors leaking for any semiannual or annual monitoring period is 0.5 percent or greater, the facility shall revert to quarterly monitoring until the facility again qualifies for the alternative monitoring schedules previously outlined in this paragraph.

B. The percent of connectors leaking used in paragraph A shall be determined using the following formula:

$$(Cl + Cs) \times 100/Ct = Cp$$

Where:

Cl = the number of connectors found leaking by the end of the monitoring period, either by Method 21 or sight, sound, and smell.

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Cs	=	the number of connectors for which repair has been delayed and are listed on the facility shutdown log.
Ct	=	the total number of connectors in the facility subject to the monitoring requirements, as of the last day of the monitoring period, not including nonaccessible and unsafe-to-monitor connectors.
Cp	=	the percentage of leaking connectors for the monitoring period.

35. DH2 Piping, Valves, Connectors, Pumps, and Compressors in contact with VOC - 28VHP. **(05/11)**

Except as may be provided for in the special conditions of this permit, the following requirements apply to the above-referenced equipment:

A. These conditions shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure equal to or less than 0.044 pound per square inch, absolute (psia) at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made available upon request.

The exempted components may be identified by one or more of the following methods:

(1) piping and instrumentation diagram (PID); or

(2) a written or electronic database.

B. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable ANSI, API, ASME, or equivalent codes.

C. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

D. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Non-accessible valves, as defined by 30 TAC Chapter 115, shall be identified in a list to be made available upon request. The non-

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accessible valves may be identified by one or more of the methods described in subparagraph A above.

E. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve. Except during sampling, both valves shall be closed. If the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 24 hours. If the repair or replacement is not completed within 24 hours, the line or valve must have a cap, blind flange, plug, or second valve installed.

F. Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded-bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown. A check of the reading of the pressure-sensing device to verify disc integrity shall be performed weekly and recorded in the unit log.

An approved gas analyzer shall conform to requirements listed in Method 21 of 40 CFR Part 60, Appendix A. In addition, the response factor of the specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. The gas analyzer shall be calibrated with methane or another calibration gas as long as the response factor for the VOCs being measured is less than 10.

Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.

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G. Except as may be provided for in the special conditions of this permit, all pump, compressor and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.

H. Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 10,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days. Records of the first attempt to repair shall be maintained. (See exemption in Special Condition No. 36.) **(11/09)**

I. Every reasonable effort shall be made to repair a leaking component, as specified in this paragraph, within 15 days after the leak is found. If the repair of a component would require a unit shutdown, that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC § 115.782 (c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list.

When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown, the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting

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shutdown. This notification shall be made within 15 days of making this determination.

J. Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. Records of physical inspections shall be noted in the operator's log or equivalent.

K. Fugitive emission monitoring required by 30 TAC Chapter 115 may be used in lieu of Items F through I of this condition.

L. Compliance with the requirements of this condition does not assure compliance with requirements of an applicable NSPS or an applicable NESHAPS and does not constitute approval of alternative standards for these regulations.

36. The leak definition level for identifying leaking or damaged valves, connectors, pumps, compressors, and agitator seals found to be emitting VOCs in Special Condition Nos. 33H and 35H shall be 250 ppmv instead of the applicable 500 ppmv, 2,000 ppmv, or 10,000 ppmv. **(11/09)**

PRODUCT LOADING

37. The total hourly loading transfer rate of PIB at all loading stations shall not exceed the total hourly transfer value provided in Confidential Table A-4, footnote (f) of the January 2007 Permit Number 19806 amendment application.

38. The permit holder shall maintain and update monthly emissions record which includes calculated emissions of VOC from all loading operations over the previous rolling 12-month period. The record shall include the loading spot, control method used, quantity loaded in gallons, name of the liquid loaded, vapor molecular weight, liquid temperature in degrees Fahrenheit, liquid vapor pressure at the liquid temperature in psia, liquid throughput for the previous month and rolling 12 months to date. Records of VOC temperature are not required to be kept for liquids loaded from unheated tanks which receive liquids that are at or below ambient temperatures. Emissions shall be calculated using the TCEQ publication titled "Technical Guidance Package for Chemical Sources - Loading Operations."

39. All product loading lines and connectors shall be visually inspected for any defects prior to hookup. Product loading lines and connectors that are visibly damaged shall be removed from service operations shall cease immediately upon detection of any liquid leaking from the lines or connections.

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40. Total combined uncontrolled loading of PIB for Loading Spots EPNs E-PIBTT, E-PIBTC, E-PIB2RC1, E-PIB2RC2, E-PIB2TT1, and E-PIB2TT2 shall be limited to no more than 2.55 MM gallons/year.

    A. Except for as provided in Special Condition No. 18A of this subpart, all PIB loading operations shall be conducted in a manner that captures and routes 95 percent of the loading emissions to the plant vent recovery system.

    B. All tank trucks used for loading operations as described in Special Condition No. 18B of this subpart shall pass vapor-tight testing every 12 months using the methods described in 40 CFR Part 60, Subpart XX.

41. Emergency and upset emissions from the PIB Production Unit that contain non-neutralized boron trifluoride-alcohol complex shall be routed to a caustic scrubber and then a flare. Emergency and/or upset emissions from the PIB Production Unit are not authorized as a function of this permit and are subject to 30 TAC § 101.201.

RECORDKEEPING

42. Records shall be maintained for Special Condition Nos. 19, 28, 29, 31, 32, 33, 35, and 38 of this permit and kept at the plant site. These records shall be made available to representatives of the TCEQ or any local pollution control program having jurisdiction upon request. These records shall be kept for five years after the data is obtained.

43. The following records shall be kept at the plant for the life of the permit. All records required in this permit shall be made available at the request of personnel from the TCEQ, EPA, or any air pollution control agency with jurisdiction. **(05/11)**

    A. A copy of this permit.

    B. Permit application dated October 2010 and subsequent representations submitted to the TCEQ.

    C. Stack sampling results or other air emissions testing (other than CEMS data) that may be conducted on units authorized under this permit after the date of issuance of this permit.

44. The following information shall be maintained by the holder of this permit in a form suitable for inspection for a period of five years after collection and shall be made immediately available upon request to representatives of the TCEQ, EPA, or any local air pollution control program having jurisdiction: **(05/11)**

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A. Annual throughput records in accordance with Special Condition No. 18. **(05/11)**

B. Records of sulfur content of natural gas and plant gas as required by Special Condition No. 8A and fuel usage as required by Special Condition No. 8B.

C. The NO_x, CO, and diluent gases, O_2 or CO_2, CEMS emissions data to demonstrate compliance with the emission rates listed in the maximum allowable emission rates table (MAERT) and the concentration limits in Special Conditions No. 9 and 10.

D. Raw data files of all CEMS and PEMS data including calibration checks and adjustments and maintenance performed on these systems.

E. Records to identify the times emission data have been excluded from the calculation of average concentration for purposes of demonstrating compliance with the emission limitations in Special Condition No. 9 and 10.

F. Results of CO concentration evaluation pursuant to Special Condition No. 11.

G. Field records of visible emissions observations as specified in Special Condition No. 14.

H. Records of 30-day and 12-month rolling average sulfur concentrations in DH2 feedstock as specified in Special condition No. 15.

I. Records demonstrating compliance with AVO checks and maintenance as required by Special Condition No. 23.

J. Records of NH_3 emissions sampling and calculations pursuant to Special Condition No. 31.

ASSOCIATED PERMIT AMENDMENTS

45. Prior to operation of the DH2 unit, TCEQ Permit No. 46307 shall be amended to include particulate matter emissions associated with the cooling tower (EPN: CT-3) as a result of the DH2 restart and planned production of ETBE in the existing MTBE manufacturing unit. **(05/11)**

46. Prior to operation of the DH2 unit, TCEQ Permit No. 22052 shall be amended to update emissions associated with the marine loading operations and tanks as a result of the DH2 restart and planned production of ETBE in the existing MTBE manufacturing unit. **(05/11)**

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit Number 19806

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities, sources, and related activities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
EB-1B-505	Dehydro No. 2 Heat Recovery Boiler Dehydro No. 2 Air Heater Dehydro No. 2 Regen Gas Generator **(Normal Operations)**	NO_x	7.23	--
		CO	1.57	--
		VOC	2.01	--
		$PM/PM_{10}/PM_{2.5}$	3.37	--
		SO_2	29.33	--
		NH_3	8.99	--
EB-1B-505 (8)	Dehydro No. 2 Heat Recovery Boiler Dehydro No. 2 Air Heater Dehydro No. 2 Regen Gas Generator **(MSS Operations)**	NO_x	8.80	--
		CO	1.57	--
		VOC	1.22	--
		$PM/PM_{10}/PM_{2.5}$	1.68	--
		SO_2	29.19	--
EB-1B-505	Dehydro No. 2 Heat Recovery Boiler Dehydro No. 2 Air Heater Dehydro No. 2 Regen Gas Generator **(Annual Limits)**	NO_x	--	32.97
		CO	--	6.88
		VOC	--	8.81
		$PM/PM_{10}/PM_{2.5}$	--	14.76
		SO_2	--	38.60
		NH_3	--	39.37

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
EB-1B-506	Dehydro No. 2 Heat Recovery Boiler Dehydro No. 2 Turbine **(Normal Operations)**	NO_x	4.66	--
		CO	20.48	--
		VOC	1.16	--
		$PM/PM_{10}/PM_{2.5}$	2.15	--
		SO_2	0.18	--
		NH_3	13.00	--
EB-1B-506 (8)	Dehydro No. 2 Heat Recovery Boiler Dehydro No. 2 Turbine **(MSS Operations)**	NO_x	46.60	--
		CO	20.48	--
		VOC	1.16	--
		$PM/PM_{10}/PM_{2.5}$	2.15	--
		SO_2	0.18	--
EB-1B-506	Dehydro No. 2 Heat Recovery Boiler Dehydro No. 2 Turbine **(Annual Limits)**	NO_x	--	27.40
		CO	--	87.71
		VOC	--	5.07
		$PM/PM_{10}/PM_{2.5}$	--	9.44
		SO_2	--	0.79
		NH_3	--	56.96
EB-1B-2501	Dehydro No. 2 Unit Feed Heater	NO_x	2.60	11.39
		CO	1.68	7.36
		VOC	0.35	1.54
		$PM/PM_{10}/PM_{2.5}$	0.48	2.12
		SO_2	0.04	0.17

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
F-20	Dehydro 2 Unit Fugitives (5)	VOC	0.52	2.29
		NH_3	0.93	4.08
T-6F-1778	Tank 6F-2778	VOC	0.38	0.03
T-31	Tank 31	VOC	4.24	0.63
T-36	DIB Storage Tank 36	VOC	0.64	0.17
T-37	DIB Storage Tank 37	VOC	0.64	0.17
T-73	MTBE/ETBE Storage Tank 73	VOC	8.79	1.42
T-80	MeOH/EtOH Storage Tank 80	VOC	1.70	0.37
T-74	MTBE/ETBE Storage Tank 74	VOC	8.79	1.42
T-87	MTBE/ETBE/ MeOH/EtOH Storage Tank 87	VOC	3.87	0.60
DH2CAT-MSS	DH2 Catalyst Change Out Fugitives	$PM/PM_{10}/PM_{2.5}$	0.39	0.04
EP-H9	Boiler No. 9	NO_x	247.06	658.08
		CO	74.12	95.72
		VOC	4.85	21.26
		PM	6.71	29.37
		SO_2	0.53	2.32
T-117	PIB-1 Process Tank 117	VOC	2.28	(6)
T-118	PIB-1 Process Tank 118	VOC	2.28	(6)

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
T-119	PIB-1 Process Tank 119	VOC	2.28	(6)
T-IP-1	PIB-2 Process Tank 1	VOC	1.44	(6)
T-IP-2	PIB-2 Process Tank 2	VOC	1.44	(6)
T-IP-3	PIB-2 Process Tank 3	VOC	1.44	(6)
T-PIB-1	PIB-2 Storage Tank 1	VOC	1.62	(6)
T-PIB-2	PIB-2 Storage Tank 2	VOC	1.62	(6)
T-PIB-3	PIB-2 Storage Tank 3	VOC	1.62	(6)
T-PIB-4	PIB-2 Storage Tank 4	VOC	1.62	(6)
T-PIB-5	PIB-2 Storage Tank 5	VOC	1.62	(6)
T-PIB-6	PIB-2 Storage Tank 6	VOC	1.62	(6)
TNK-GRP	Tank Emissions Cap	VOC	--	7.0
E-PIBTT	PIB-1 Product Loading B Tank Trucks	VOC	(7)	(7)
E-PIBTC	PIB-1 Product Loading B Rail Cars	VOC	(7)	(7)
E-PIB2RC1	PIB-2 Product Loading Rail Cars - Station 1	VOC	(7)	(7)
E-PIB2RC2	PIB-2 Product Loading Rail Cars - Station 2	VOC	(7)	(7)

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
E-PIB2TT1	PIB-2 Product Loading Tank Truck - Station 1	VOC	(7)	(7)
E-PIB2TT2	PIB-2 Product Loading Tank Truck - Station 2	VOC	(7)	(7)
LOAD-GRP	Loading Emissions Cap	VOC	18.26	0.33
F-PIBPROC	PIB-1 Process Fugitives (5)	VOC	0.13	0.57
F-PIBSTOR	PIB-1 Tank Farm Fugitives (5)	VOC	0.10	0.45
F-PIB2PROC	PIB-2 Process Fugitives (5)	VOC	0.15	0.66
F-PIB2STOR	PIB-2 Tank Farm Fugitives (5)	VOC	0.31	1.35
T-P1WW1	PIB-1 Wastewater Tank 1	VOC	0.01	0.01
T-P1WW2	PIB-1 Wastewater Tank 2	VOC	0.01	0.01
T-P2WW1	PIB-2 Wastewater Tank 1	VOC	0.01	0.01
T-P2WW2	PIB-2 Wastewater Tank 2	VOC	0.01	0.01

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.
(2) Specific point source name. For fugitive sources, use area name or fugitive source name.
(3) VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1
NO_x - total oxides of nitrogen
SO_2 - sulfur dioxide
PM - total particulate matter, suspended in the atmosphere, including PM_{10} and $PM_{2.5}$, as represented
PM_{10} - total particulate matter equal to or less than 10 microns in diameter, including $PM_{2.5}$, as represented
$PM_{2.5}$ - particulate matter equal to or less than 2.5 microns in diameter
CO - carbon monoxide
NH_3 - ammonia
(4) Compliance with annual emission limits (tons per year) is based on a 12 month rolling period.
(5) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate. Emission rate is an estimate and is enforceable through compliance with the applicable special condition(s) and permit application representations.
(6) The total annual emission rates for PIB process and storage tanks are limited to the annual cap indicated under EPN TNK-GRP.
(7) The total PIB product loading emission rates are limited to the hourly and annual caps indicated under EPN LOAD-GRP which may be loaded through either tank trucks or tank cars or both.
(8) MSS lb/hr limits apply only during each clock hour that includes one or more minutes of MSS activities. During all other clock hours, the normal lb/hr limits apply.

Date: _____

DRAFT

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EVENTOS

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(30 de abril a 1 de mayo y 7 y 8 de mayo, 2011)

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Avisos Legales

Comisión de Calidad Ambiental del Estado de Texas

AVISO DE SOLICITUD Y DECISIÓN PRELIMINAR PARA UN PERMISO DE CALIDAD DE AIRE

PERMISO DE CALIDAD DE AIRE NO. 19806

SOLICITUD Y DECISIÓN PRELIMINAR. TPC Group LLC, 8600 Park Place Blvd., Houston, Tejas 77017-2513 ha solicitado de la Comisión para la Calidad Ambiental de Tejas (TCEQ o Texas Commission on Environmental Quality) el Permiso de Calidad de Aire Número 19806 para autorizar la construcción de una Unidad Dehydro 2 en 8600 Park Place Boulevard, Houston, Condado de Harris, Tejas 77017. La instalación propuesta va a emitir los siguientes contaminantes atmosféricos: material compuesto por partículas inclusive material compuesto por partículas con diámetros de 10 micras o menos y 2.5 micras o menos, monóxido de carbón, óxidos de nitrógeno, compuesto orgánico, ammonia y bióxido de azufre.

El director ejecutivo de la TCEQ ha concluido la revisión técnica de la solicitud y ha preparado un permiso preliminar, el cual si es aprobado, establecerá las condiciones debajo de las cuales el sitio deberá operar. El director ejecutivo ha hecho la decisión preliminar de otorgar este permiso. La solicitud del permiso, la decisión preliminar del director ejecutivo, y el permiso preliminar estarán disponibles para ser revisados y copiados en la Oficina de la TCEQ y en Melcher Neighborhood Library, 7200 Keller Houston, TX 77012 Houston, Condado de Harris, Tejas. Los archivos del cumplimiento de la leyes de la facilidad, si existen, están disponibles para la revisión del público en la Oficina Regional de TCEQ en Houston, 5425 Polk St Ste H, Houston, Tejas.

COMENTARIOS PÚBLICOS/JUNTA PÚBLICA. Usted puede presentar comentarios públicos o solicitar una junta pública sobre esta solicitud. El propósito de la junta pública es el proveer la oportunidad de someter comentarios o hacer preguntas sobre esta solicitud. La TCEQ tendrá una junta pública si el director ejecutivo determina que hay suficiente interés de parte del público en esta solicitud o si es solicitada por un legislador local. Una junta pública no es una audiencia en controversia.

Comentarios por escrito o peticiones para juntas públicas sobre esta solicitud deberán recibirse por escrito

www.ifest.org

Celebración del Cinco de Mayo:

(mayo, 2011)

La celebración del Cinco de Mayo en Houston se lleva a cabo con un festival en el Teatro al Aire Libre Miller del Parque Hermann y un desfile por el centro de la ciudad con mariachis, grupos de baile folclórico y comida típica. (713) 695-5980 www.lulac8.org

Festival de las Fresas en Pasadena:

(20-22 de mayo, 2011)

Música en vivo, arte y manualidades, un concurso de belleza, concurso de bandas musicales escolares, la famosa carne estilo barbacoa y el pastel de fresa más grande del mundo forman parte de este festival.(281) 991-9500 www.strawberryfest.org

Art Car Parade Desfile de Autos Artísticamente Decorados:

(22 de mayo, 2011)

Más de 250.000 espectadores bordean las calles del centro para disfrutar de este desfile donde se presentan las más sorprendentes obras del arte popular de Houston... sobre ruedas. La Fruit Mobile, camioneta Ford station wagon del 1967, inició esta locura en 1986. Este desfile, realmente merecedor de ser visto, es organizado por la Orange Show Foundation. (713) 926-6368. www.orangeshow.org

78711-3087, o por el Internet al www.tceq.state.tx.us/about/comments.html, **dentro de 30 días después de la publicación de este aviso.**

Después del plazo final para someter comentarios públicos subsecuentes a cualquier Aviso de la Solicitud y de la Decisión Preliminar que se requiera, el director ejecutivo considerará los comentarios y preparará una respuesta a todos los comentarios públicos relevantes y materiales, o de otro modo significativo. **La respuesta a los comentarios, junto con la decisión del director ejecutivo sobre la solicitud, serán entonces enviada por correo a todos aquellos que hayan sometido comentarios públicos o que hayan peticionado para estar en la lista de correo sobre esta solicitud. Si alguna solicitud para audiencia pública no es retirada, la correspondencia tendrá instrucciones sobre cómo solicitar una audiencia en controversia o como solicitar que la decisión del director ejecutivo sea reconsiderada.**

OPORTUNIDAD PARA UNA AUDIENCIA EN CONTROVERSIA. Una audiencia en controversia es un proceso legal semejante a un a un juicio civil en una corte de distrito estatal. **Una persona que pueda ser afectada por las emisiones de contaminantes atmosféricos de la instalación tiene derecho a peticionar una audiencia en controversia. Para solicitar una audiencia en controversia, usted deberá proporcionar lo siguiente: (1) su nombre (o, para un grupo o asociación, un representante oficial), dirección postal, número de teléfono durante el día, y número de fax, si hay; (2) el nombre del solicitante y el número de permiso; (3) la oración en inglés "I/we request a contested case hearing;" (4) una descripción específica de cómo le perjudicaría la solicitud y las emisiones atmosféricas de una manera que no es común con los miembros del público en general; (5) la localización y distancia de su propiedad en relación a la instalación; y (6) una descripción de cómo usted usa la propiedad que pudiera ser afectada por la instalación.**

Una audiencia en controversia sólo se otorgará basada en asuntos en controversia que sean relevantes y materiales a la decisión de los Comisionados sobre la solicitud. Además, la Comisión sólo concederá una audiencia en controversia en esos asuntos que fueron presentados durante el período de los comentarios públicos y que no se retiraron. Asuntos como el valor de la propiedad, ruido, seguridad de tráfico, y zonas municipales están fuera de lo que la Comisión tiene la jurisdicción de considerar en este proceso.

ACCIÓN DEL DIRECTOR EJECUTIVO. Una solicitud para audiencia a sido recibida por la TCEQ dentro del plazo de tiempo requerido. A menos de que se presente una petición para una audiencia en controversia o una petición para que reconsidere su decisión, el director ejecutivo aprobará la solicitud para este permiso. Si se reciben peticiones para una audiencia en controversia o para que se reconsidere su decisión, el director ejecutivo no aprobará la solicitud para este permiso y remitirá la solicitud y las peticiones a los Comisionados de la TCEQ para su consideración en una junta Comisionados.

LISTA PARA ENVÍO DE CORREO. Usted puede solicitar ser incluido en una lista de correo para recibir información adicional con respecto a esta solicitud. Para ser incluido en una lista de correo, envíe su petición a la oficina del Office of Chief Clerk a la dirección que se encuentra a continuación en el parrafo titulado "Información."

INFORMACIÓN. Para más información sobre la solicitud para este permiso o sobre el proceso de permisos, llame a la Oficina de Asistencia Pública (Office of Public Assistance), sin cargo a el 1 800 687 4040. Información general concerniente a la TCEQ puede encontrarse vía internet en http://www.tceq.state.tx.us/.

Más información puede ser obtenida de TPC Group LLC, en la dirección ubicada en el primer párrafo o llamando a la Señora Geri Shoop, Ingeniero Ambiental-HNO al (713)475-7422.

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 11, 2011

MR CHARLES KIRK JOHNSON
PLANT MANAGER
TPC GROUP LLC
8600 PARK PLACE BLVD
HOUSTON TX 77017-2513

RECEIVED - GPOL
AIR PLANNING SEC.
11 MAY -5 PM 3: 34

Re: Permit Amendment Application
Permit Number: 19806
Dehydro 2 Unit
Houston, Harris County
Regulated Entity Number: RN100219526
Customer Reference Number: CN603624289

Dear Mr. Johnson:

The executive director has made a preliminary decision on the above-referenced application. In accordance with Title 30 Texas Administrative Code § 39.419(b), you are now required to publish Notice of Application and Preliminary Decision. You must provide a copy of this preliminary decision letter with the draft permit at the public place referenced in the public notice.

If you have any questions, please call Ms. Kristi Mills-Jurach at (512) 239-1261, or write to the Texas Commission on Environmental Quality, Office of Permitting and Registration, Air Permits Division, MC-163, P.O. Box 13087, Austin, Texas 78711-3087.

Sincerely,

DRAFT

Steven D. Hagood, P.E., Manager
Combustion / Coatings New Source Review Permits Section
Air Permits Division

SH/KM/

Enclosure

Re: Permit Number 19806

cc: Larry Darcey, Vice President, Sage Environmental Consulting, Houston
Bureau Chief of Air Quality Control, Health and Human Services Department, City of Houston, Houston
Director, Environmental Public Health Division, Harris County Public Health and Environmental Services, Pasadena
Air Section Manager, Region 12 - Houston

Project Number: 160152

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1340 FEDERAL RD. / 713-450-0945
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2: IRVINGTON AVE.
BOTANICA SAN ANTONIO
1: 7241 HILLCROFT / 281-888-0299
2: 2222 SPENCER # 303
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YERBERIA SAN MARTIN CABALLERO
1: 1819 BINGLE / 713-463-7788
2: 3403 LITTLE YORK / 281-442-1200
YERBERIA DEL NINO FIDENCIO
6545 CANAL / 713-921-3197
YERBERIA Y CENTRO NATURISTA
9771 LONG POINT / 713-365-0926
BOTANICA SAN MIGUEL ARCANGEL
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2: 983 FEDERAL RD. / 713-450-0762
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GRATIS SET DE 5 Piezas, cuando haces tu vestido con nosotros. Diseño de todo tipo de vestidos.

A TODAS LAS PERSONAS Y PARTES INTERESADAS:

TPC Group LLC, se ha registrado con la Comisión para la Calidad Ambiental de Tejas (TCEQ o Texas Commission on Environmental Quality) para la enmienda del Permiso de Calidad de Aire Número 19806 con acción de permiso para una Fuente Mayor de Contaminantes Atmosféricos Peligrosos [FCAA §112(g) (Acta Federal de Aire Limpio)], para autorizar la construcción de una Unidad Dehydro 2 en 8600 Park Place Boulevard, Houston, Condado de Harris, Tejas 77017. Información adicional sobre esta solicitud puede encontrarse en la sección de avisos públicos de esta publicación.

ABOGADO DE BANCARROTA Mark Solomon le ayudara, marque hoy mismo y salve su casa o carro 713-403-2092 o 832-893-7208.

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INCOMETAX PARA TODOS los Estados .Taxes de Negocios, empresas, personales, de pareja y de familia. Autorizado por el IRS. 100% Confiable. Le ayudamos con Reembolsos rapidos. 713-776-3150.

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PEINADOS! PEINADOS! PEINA-

PARE LAS LLAMADAS de colección , salve su casa hábleme hoy mismo, yo le ayudare 713-403-2092 o 832-893-7208.

NOSOTROS LE OFRECEMOS la instalación y reparación de puertas y motores de garages, residencial y comercial. 713-927-4494.

TE GUSTARIA CONTROLAR tu talla y peso? Que no requiera de mucho tiempo y dinero? Yo tengo la solución. Llama a la sra. Garza 713-585-6586.

ESTA TEMPORADA DE income tax H.S. Garcia and Associates le ayuda a recibir el maximo reembolso. W-2, 1099 Misc y W-7. 8304 Fulton St. 713-691-4520 y 713-691-4128.

NECESITAS CAMBIAR LA carpeta de tu casa? Ahora es tiempo aprovecha los especiales del mes. Carpeta Nueva 1 Cuarto Regular con Instalacion y esponja incluida solo $160.00 usada $110.00 no esperes mas llama ya! 713-213-7179 713-812-0173.

INCOMETAX ELECTRONICO, EN Descuento $ 5.00. Tambien Incometax Regular. Ven a Marlene Multiservices. Autorizado por el IRS. Profesionales amables. Llama-nos para sacar tu cita. 713-776-3150.

PROBLEMAS CON SU motor de la puerta de su garage? No busque más! Robelo's Garage Doors le ofrece presupuesto gratis, residen-

RECIBA EL MÁXIMO reembolso de su income tax W-2, 1099 Misc y W-7. solo en H.S. Garcia and Associates. 8304 Fulton St. 713-691-4520 y 713-691-4128.

PARA TU MASCOTA Arreglos de uñas, peinados, y mucho más. 713-741-3474. 5808 Schroeder Rd.

CERRAJERIA FAST ACCES te ofrece sus servicios de programación de llaves , de computadora, de control remoto, para carros . Precios accesibles y servicio a domicilio. 832-723-8964.

¿OLVIDASTES TUS LLAVES adentro de tu auto? No hay problema, nosotros te ayudamos. Apertura de carros, programación de llaves, residencial y comercial, precios economicos, servicio a domicilio. 832-723-8964.

SABIA USTED QUE el agua Alcalina mejora su salud y dolencias, porque oxigena su organismo. Obtenga un procesador de agua Alcalina y disfrute en su hogar de agua pura, fresca y natural a centavos el galon. Llamenos 713-227-7951.*

¿Quieres Bajar de Peso?
Consigue Mejores Resultados con las Pastillas Chinas 100%
* Meizitang *Dream Body

Workforce Commission.

Over the past three years, the period cited in the Journal, Texas lost 61,600 jobs, according to Workforce Commission data from March 2008 to March 2011.

Of course, our numbers are still better than those in many other states, including California. Texas' jobless rate is 8.1 percent, compared with California's 12 percent.

'Fact' from California

But even in the Internet age, facts matter. A Google search for references to the erroneous Texas job number turned up more than 6,000 hits.

It didn't take long to determine where it came from: California Assemblyman Dan Logue, R-Linda. Most of the news articles and blog posts used his flawed 165,000 number.

His spokeswoman, Lucy Ma, took credit — or perhaps blame — for the number. (I couldn't tell which.) She said she still felt comfortable using it. It came from the U.S. Bureau of Labor Statistics, so it had to be correct, she said.

It's possible to use a correct number in the wrong context, I argued.

She tried to change the subject.

"Numbers are only part of the story," Ma said, before taking me on a side road of talking points about Silicon Valley jobs leaving the Golden State and the wisdom of Texas' business-friendly climate.

"After all is said and done, although the margin may not be as wide as our numbers indicate, California is farther ahead than Texas."

Why didn't Perry check?

Fine, but about the numbers ...

"These numbers are right," Ma said firmly. "It depends what light you're viewing them under."

Why, yes it does.

Ma insisted several "experts" assured her the numbers were used correctly. Her main expert: a study author at the Texas Public Policy Foundation, the Austin-based conservative think tank that some months ago suggested Texas secede from the Medicaid program.

Now, a California

It's a myth to keep acting as though Texas has been untouched by one of the deepest recessions in American history. Or that we're not facing a state budget shortfall in the tens of billions of dollars.

Every time the governor or some other politician downplays the effect on Texas, it minimizes the struggles of the 984,411 Texans, who, by latest count, are still out of work.

against the amendment, that it violated the Texas Constitution, which prohibits him from making commitments about future budgets or funding levels. I think both sides could have worked together to craft a constitutionally-sound compromise. But in hindsight, I should have included Perry's point in the column.

lisa.falkenberg@chron.com

TO ALL INTERESTED PERSONS AND PARTIES:

TPC Group LLC, has applied to the Texas Commission on Environmental Quality (TCEQ) for an amendment to Air Quality Permit Number 19806, which would authorize construction of a Dehydro 2 Unit at 8600 Park Place Blvd., Houston, Harris County, Texas 77017. Additional information concerning this application is contained in the public notice section of this newspaper.

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When you were young, your fath
many things. With every question y
fered a valuable lesson. Many years
away, you still had questions. So y
resting place, grateful that he left y
to reflect.

It was during one of these vis
understood the importance of this p
that, even though you had decided t
your loved ones would still need a p
bet you. And you realized that in
your father was teaching you one
no less valuable than all the others.

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loved ones to visit.

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Earthman Resthaven Funera

(WHOSE ADDRESS AND WHEREABOUTS ARE UNKNOWN)

YOU ARE HEREBY COMMANDED to be and appear before the 55th Judicial District Court of Harris County, Texas in the Courthouse in the city of Houston, Texas at or before 10:00 o'clock A.M. Tuesday, the 31st MAY 2011 being the Tuesday next after the expiration date of forty-two days after this citation is issued, and you are hereby commanded and required then and there to appear and file written answer to the Original Petition, filed in said Court on the 21st March 2011, in a suit numbered 2011-17118 the docket of said court, wherein FLAGSTAR BANK F.S.B. is the Plaintiff and The Unknown Heirs at Law of Terry L Usselman and The Unknown Devisees Terry L Usselman are the Defendants, the nature of plaintiff's demand and the said petition alleging: FORECLOSURE

SUMMARY:

You are hereby notified that a suit has been brought to rescind the vendor's lien by Flagstar Bank F.S.B., its successors and assigns by and through its attorney of record, Jeffrey B Hardaway of Barret Daffin Frappier Turner & Engel, LLP, 1900 St. James Place, Houston, Texas 77056, against Defendants The Unknown Heirs at Law of Terry L Usselman, and The Unknown Devisees of Terry L Usselman, and any other person claiming any right, title, interest or 10513 Ney Street, Houston, Texas 77034, and legally described to wit:

LOT FOURTEEN (14), IN BLOCK TWENTY-ONE (21) OF GULFWAY TERRACE, AND ADDITION IN HARRIS COUNTY, TEXAS ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 43, PAGE 57 OF THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

Notice hereof shall be given by publishing this Citation once a week for four consecutive weeks previous to the day of MAY 27th 2011, in some newspaper published in the County of Harris, if there be a newspaper published therein, but if not, then the nearest county where a newspaper is published, and this citation shall be returned on the 27th OF MAY 2011 which is forty two days after the date it is issued, and the first publication shall be at least twenty-eight days before said return day.

HEREIN FAIL NOT, but have before said court on said return day this publication with your return thereon, showing how you have executed same.

Witness: Chris Daniel,
District Clerk,
Harris County Texas.

GIVEN UNDER MY HAND AND SEAL OF SAID COURT at Houston, Texas this 15th APRIL 2011.

(Seal)**CHRIS DANIEL**
District Clerk
Harris County, Texas
201 Caroline
Houston, Texas 77002
P.O. Box 4651,
Houston, Texas 77210
By: /s/
K. PERKINS,
Deputy District Clerk
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The Houston Chronicle
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about this permit application or the permitting process, please contact the Texas Commission on Environmental Quality, Office of Public Assistance, MC-108, P.O. Box 13087, Austin, Texas 78711-3087 or toll free at 1-800-687-4040. General information about the TCEQ can be found at www.tceq.texas.gov. Si desea informacion en Espanol, puede llamar al 1-800-687-4040. Further information may also be obtained for Enterprise Products Operating, LLC, by calling Mr. Jon Fields at (713) 381-8268.
Notice Issuance Date: April 7, 2011

NOTICE OF APPLICATION AND PRELIMINARY DECISION FOR AN AIR QUALITY PERMIT
PERMIT NUMBER: 19806

APPLICATION AND PRELIMINARY DECISION. TPC Group LLC, 8600 Park Place Blvd., Houston, Texas 77017-2513, has applied to the Texas Commission on Environmental Quality (TCEQ) for an amendment to Air Quality Permit Number 19806, which would authorize construction of a Dehydro 2 Unit at 8600 Park Place Blvd., Houston, Harris County, Texas 77017. This application was submitted to the TCEQ on September 17, 2010. The amendment will authorize an increase in emissions of the following air contaminants: particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less, carbon monoxide, nitrogen oxides, organic compounds, ammonia and sulfur dioxide.
The executive director has completed the technical review of the application and prepared a draft permit which, if approved, would establish the conditions under which the facility must operate. The executive director has made a preliminary decision to issue the permit because it meets all rules and regulations. The permit application, executive director's preliminary decision, and draft permit will be available for viewing and copying at the TCEQ central office, the TCEQ Houston regional office, and at the Melcher Neighborhood Library located at 7200 Keller Street, Houston, Harris County, Texas, beginning the first day of publication of this notice. The facility's compliance file, if any exists, is available for public review at the TCEQ Houston Regional Office, 5425 Polk St., Ste. H, Houston, Texas.
PUBLIC COMMENT/PUBLIC MEETING. You may submit public comments or request a public meeting about this application. The purpose of a public meeting is to provide the opportunity to submit comment or to ask questions about the application. The TCEQ will hold a public meeting if the executive director determines that there is a significant degree of public interest in the application or if requested by a local legislator. A public meeting is not a contested case hearing.
You may submit additional written public comment either electronically at www.tceq.texas.gov/about/comments.html or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087, within 30 days of the date of newspaper publication of this notice.
RESPONSE TO COMMENTS AND EXECUTIVE DIRECTOR ACTION. After the deadline for public comments, the executive director will consider the comments and prepare a response to all relevant and material or significant public comments. Because no timely hearing requests have been received, after preparing the response to comments, the executive director may then issue final approval of the application. **The response to comments, along with the executive director's decision on the application will be mailed to everyone who submitted public comments or is on a mailing list for this application, and will be posted electronically to the Commissioners' Integrated Database (CID).**
ELECTRONICALLY AVAILABLE INFORMATION. When they become available, the executive director's response to comments and the final decision on this application will be accessible through the Commission's Web site at www.tceq.texas.gov/goto/cid. Once you have access to the CID using the above link, enter the permit number for this application which is provided at the top of this notice.
MAILING LIST. You may ask to be placed on a mailing list to obtain additional information on this application by sending a request to the Office of the Chief Clerk at the address below.
AGENCY CONTACTS AND INFORMATION. All public comments and requests must be submitted either electronically at www.tceq.texas.gov/about/comments.html, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. If you choose to communicate with the TCEQ electronically, please be aware that your email address, like your physical mailing address, will become part of the agency's public record. For more information about this permit application or the permitting process, please call the Office of Public Assistance, Toll Free, at 1-800-687-4040. Si desea informacion en Espanol, puede llamar al 1-800-687-4040. General information regarding the TCEQ can be found at www.tceq.texas.gov.
Further information may also be obtained from TPC Group LLC at the address stated above or by calling Geri Shoop, Staff Environmental Engineer at (713) 475-7422.
Notice Issuance Date: April 26, 2011

MUSEUMS: Ships, trains could

CONTINUED FROM PAGE D1

forces did for us," he said. "The museum doesn't glorify war, but if we don't know our past, it tends to repeat itself."

The other possible museum moves, the Metro rail line under construction along Harrisburg Boulevard, the management district's sidewalk improvements on major streets, and the district's vision for a trolley connecting the museums encouraged him to relocate to the East End, said Hernandez, who grew up on Canal Street.

Having several museums so close to each other would help make the area more of an entertainment district as well, said David Cook, a real estate broker with Cushman & Wakefield in Houston.

"It would be tremendous. It would be another magnet to bring people into this area," he said, noting that much interest is already being spurred by the development of the Dynamo stadium nearby.

Maritime museum

The Houston Maritime Museum is looking at about an acre of land on North York near Buffalo Bayou, said Anne Olson, president of the Buffalo Bayou Partnership, which owns the land.

The land, directly across from Tony Marron Park, would be near an area of the bayou that will be designated for use by the Texas Dragon Boat Association and Rice University crew team.

"If the maritime museum were to go there, it would be great synergy," Olson said.

The museum, home to ship models, navigational instruments and various industry artifacts, would like to move to a bigger space where it can hold events for students that complement academic programs in the area, said John
executive dire
museum.

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WORKING: Searches by employ

CONTINUED FROM PAGE D1

information by employees or disparaging comments about the company in public forums.

He declined to disclose how many companies have signed up to conduct the searches, which cost $20 to $50 each.

Soliciting OxyContin

Drucker said it's not uncommon to find applicants posting sexually explicit material or drug solicitations — especially seeking to buy or sell the powerful painkiller OxyContin, which has become a popular street drug.

The searches also have found postings threatening violence as well as images of gun-toting applicants, he said. In one picture, a job applicant was pointing a handgun, and others in the photo were brandishing an assault weapon and a Samurai sword. They were all drinking beer.

But should employers be looking at these images? What if they reveal information about an applicant's race, religion, marital status or other detail that could launch a civil rights claim if they swayed hiring decisions?

"I think it's really important to find out as much as you can about the CEO and other critical positions," said David Barron, an employment
yer who represents
agement with Epstein
Becker Green Wickliff & Hall
in Houston. But for lower-level retail or office jobs? It may not be worth the risk of facing a civil rights claim, Barron said.

"You will probably run across things you wouldn't normally know," he said. Or aren't allowed to consider — like whether the applicant is pregnant. The problem is compounded if the employer just checks up on applicants of a certain race or gender.

Social media sites

Barron said he has been receiving more questions from clients a
applicants on
sites. Many a
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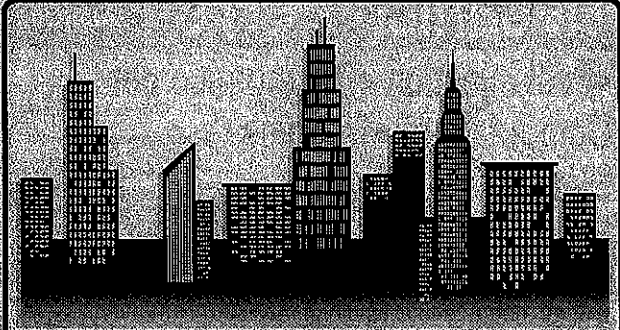

SERVICIO A LA COMUNIDAD EN HOUSTON

EVENTOS

Festival Internacional de Houston celebra La Ruta de la Seda en 2011:

(30 de abril a 1 de mayo y 7 y 8 de mayo, 2011)

Más de un millón de personas asisten a esta gran fiesta multicultural. El festival es dedicado cada año a un país o región del mundo con puestos de comida típica, ventas de obras de arte, artesanías, interesantes exposiciones y gran cantidad de artistas. (713) 654-0808.

Avisos Legales

Comisión de Calidad Ambiental del Estado de Texas

AVISO DE SOLICITUD Y DECISIÓN PRELIMINAR PARA UN PERMISO DE CALIDAD DE AIRE

PERMISO DE CALIDAD DE AIRE NO. 19806

SOLICITUD Y DECISIÓN PRELIMINAR. TPC Group LLC, 8600 Park Place Blvd., Houston, Tejas 77017-2513 ha solicitado de la Comisión para la Calidad Ambiental de Tejas (TCEQ o Texas Commission on Environmental Quality) el Permiso de Calidad de Aire Número 19806 para autorizar la construcción de una Unidad Dehydro 2 en 8600 Park Place Boulevard, Houston, Condado de Harris, Tejas 77017. La instalación propuesta va a emitir los siguientes contaminantes atmosféricos: material compuesto por partículas inclusive material compuesto por partículas con diámetros de 10 micras o menos y 2.5 micras o menos, monóxido de carbón, óxidos de nitrógeno, compuesto orgánico, ammonia y bióxido de azufre.

El director ejecutivo de la TCEQ ha concluido la revisión técnica de la solicitud y ha preparado un permiso preliminar, el cual si es aprobado, establecerá las condiciones debajo de las cuales el sitio deberá operar. El director ejecutivo ha hecho la decisión preliminar de otorgar este permiso. La solicitud del permiso, la decisión preliminar del director ejecutivo, y el permiso preliminar estarán disponibles para ser revisados y copiados en la Oficina de la TCEQ y en Melcher Neighborhood Library, 7200 Keller Houston, TX 77012 Houston, Condado de Harris, Tejas. Los archivos del cumplimiento de la leyes de la facilidad, si existen, están disponibles para la revisión del público en la Oficina Regional de TCEQ en Houston, 5425 Polk St Ste H, Houston, Tejas.

COMENTARIOS PÚBLICOS/JUNTA PÚBLICA. Usted puede presentar comentarios públicos o solicitar una junta pública sobre esta solicitud. El propósito de la junta pública es el proveer la oportunidad de someter comentarios o hacer preguntas sobre esta solicitud. La TCEQ tendrá una junta pública si el director ejecutivo determina que hay suficiente interés de parte del público en esta solicitud o si es solicitada por un legislador local. Una junta pública no es una audiencia en controversia.

Comentarios por escrito o peticiones para juntas públicas sobre esta solicitud deberán recibirse por escrito en la Oficina del Secretario Principal (Office of the Chief Clerk), MC 105, TCEQ, P.O. Box 13087, Austin, Texas

Print Form

TX 134
V.3

AIR, PESTICIDES, AND TOXICS
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New File ☐ OR Infiling ☒

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(☐) AR - Acid Rain
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(☐) GE - General
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(☐) RA - Regulatory Applicability
(☐) Other _____

TSCA:

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(☐) AS or AW - Asbestos or Asbestos Worker Protection
(☐) CB - Confidential
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(☐) FO - Non Site Specific
(☐) IM - **Section 5 & 8
(☐) LB - **Lead
(☐) PC - **PCB

** Extension of file type (if needed): (☐) ES - Enforcement Sensitive
(☐) DO - Docket Number

EPCRA / SARA (☐) ***FIFRA*** (☐)

EPA Registry I.D.

Current FRS Number: 110000461134
(Found in EnviroFacts)

Facility Name & Physical Address: TPC Group LLC
8600 Park Place Blvd.
Houston, Tx. 77017 2513

Remarks:

Requestor's Name & Phone Number:

Les Koval X6733

TPC Group
Houston Operations

TEL 713.477.9211
FAX 713.475.6008

8600 Park Place Boulevard, Houston, Texas 77017
www.tpcgrp.com

August 11, 2011

CERTIFIED MAIL NO.:
7007 1490 0000 4468 5537
RETURN RECEIPT REQUESTED

Air Permit Initial Review Team (APIRT)
Texas Commission on Environmental Quality (TCEQ)
Mail Code 161, P.O. Box 13087
Austin, Texas 78711-3087

RECEIVED
11 AUG 17 PM 4: 29
AIR PERMITS SECTION
6PD-R

Subject: New Source Review (NSR) Permit Application and
Permit Alteration Request for NSR Permit No. 46307
TPC Group LLC
Houston, Harris County, Texas
Customer Reference Number: CN603624289
Regulated Entity Number: RN100219526

To Whom It May Concern:

This New Source Review (NSR) permit application is being submitted by TPC Group LLC (TPC) for their Houston Plant located in Harris County, TX. This plant currently has units that produce various light olefin products including butadiene, butenes, and isobutlyenes, as well as MTBE. This application is being submitted to request a new NSR permit to authorize all Maintenance Startup and Shutdown (MSS) related emissions at the facility. Some MSS activities are currently authorized by NSR Permit No. 46307. However, TPC prefers to have all MSS activities authorized in a single stand-alone permit. Therefore, concurrent with this application, TPC is requesting a Permit Alteration for Permit No. 46307 to omit the MSS activities from this permit.

TPC is submitting the attached New Source Review (NSR) permit application in accordance with 30 Texas Administrative Code (TAC), Chapter 116. The amendment contains updated emission calculations that reflect current process knowledge and the latest emission calculation factors.

A copy of the permit amendment application fee check of $900.00 for the amendment fee is included in this submittal. The actual registration fee check will be sent under a separate cover to the TCEQ Revenue Section.

TPC Group LLC would like to thank you in advance for your review and approval of this permit amendment. If you have any questions, please do not hesitate to call me at (713) 475-7422.

Sincerely,

Geri Ann Shoop

Geri Shoop
Staff Environmental Engineer

Attachments:

MSS Permit Application

cc:

TCEQ, Region 12
5425 Polk Avenue, Suite H
Houston, TX 77023-1486
CERTIFIED MAIL NO. 7007 1490 0000 4468 5544

City of Houston
Bureau Chief of Air Quality Control
Health and Human Services
7411 Park Place Blvd, Room 108
Houston, Texas 77087-4441
CERTIFIED MAIL NO. 7007 1490 0000 4468 5551

Harris County
Environmental Public Health Division
101 South Richey Street, Suite G
Pasadena, Texas 77506-1023
CERTIFIED MAIL NO. 7007 1490 0000 4468 5568

Environmental Protection Agency
Air Permit Division
1445 Ross Avenue
Dallas, TX 75202-2733
CERTIFIED MAIL NO. 7007 1490 0000 4468 5582

New Source Review Permit Request for New MSS Permit

Permit Number: To Be Determined

TPC Group

TPC Group, L.L.C.
Houston Plant
8600 Park Place Blvd.
Houston, Texas 77017

CN: 603624289
RN: 100219526

TITAN Engineering, Inc.
Environmental Consulting and Management

August 2011

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B – Calculations

1. INTRODUCTION

The TPC Group, L.L.C.'s (TPC) Houston Plant (TPC or Plant) is located in Houston, Harris County, Texas at 8600 Park Place Blvd. TPC is applying to the Texas Commission on Environmental Quality (TCEQ) to for an original New Source Review (NSR) Permit with an original permit number. This request is t to have one permit for the sitewide Maintenance, Startup, and Shutdown (MSS) activities. In doing this, we are requesting that all of the MSS activities and Special Conditions relating to MSS activities currently listed in Permit No. 46307 be transferred into this new NSR Permit via permit alteration. We are also requesting that the MSS activities and facilities currently listed in Permit No. 46307 and being transferred into this new permit be removed from Permit No. 46307 via permit alteration as indicated in this permit application. Finally, we requesting that the MSS activities and facilities being transferred to the new permit via permit alteration be amended as indicated in this permit application.

In accordance with 30 Texas Administrative Code (TAC) §101.222(h)(1)(D), TPC is submitting this application to the TCEQ to create a NSR Permit to transfer the MSS activities that occur at the Plant and the emissions associated with these activities. In addition, TPC is amending these emissions to better represent plant operations. Included in this application are the calculation methodologies as needed, Best Available Control Technology (BACT) analysis as needed, regulatory applicability, and required TCEQ forms.

This permitting activity does not constitute a new major source or major modification of criteria air pollutants, as those terms are defined in 40 Code of Federal Regulations (CFR) §52.21, and, therefore, does not trigger Prevention of Significant Deterioration (PSD) permitting requirements. Also, the permitting activity does not trigger a new major source or major modification of oxides of nitrogen (NO_X) or volatile organic compounds (VOC) in an ozone nonattainment area. Therefore, the permitting activity does not trigger Nonattainment New Source Review (NNSR) permitting requirements. Therefore, this NSR permit amendment application requests that the TCEQ issue a state air permit amendment to authorize the Facility's MSS activities in accordance with 30 TAC Chapter 116.

1.1 Permit History

This Plant submitted the initial MSS NSR Permit application on January 2, 2008. The MSS activities were originally authorized in the existing NSR Permit No. 46307. An amended NSR Permit No. 46307 with the MSS activities was issued by the TCEQ on May 16, 2011. Upon review and implementation, it was determined that the activities listed in this permit could occur more frequently than originally represented. It was also discovered that, in some cases, better data was now available to estimate emissions than was available when the estimates were agreed upon during the last quarter of 2010. Based on these reasons, this permit application is being submitted. Further, it was determined that for management reasons that these MSS activities should be in one NSR Permit, separate from the normal operations. This separation facilitates future normal operation modifications which do not require MSS modifications to proceed separately from other permit modifications. Hence, we are submitting this

1.2 Permit Alterations to the Maximum Allowable Emissions Rate Table (MAERT)

We are requesting that here, via permit alteration, that following Emission Point Numbers (EPNs) be transferred from the Maximum Allowable Emission Rate Table (MAERT) of the existing NSR Permit No. 46307 to the MAERT of this new NSR Permit with an original number:

- EPN: Plant-MSS-1, External Floating Roof Tank MSS Emissions;
- EPN: Plant-MSS-2, Fixed Roof Tanks - MSS Emissions;
- EPN: Plant-MSS-3, Frac Tanks - MSS Emissions;
- EPN: Plant-MSS-4, Heat Exchangers - MSS Emissions;
- EPN: Plant-MSS-5, Internal Floating Roof Tanks - MSS Emissions;
- EPN: Plant-MSS-6, Spheres - MSS Emissions;
- EPN: Plant-MSS-7, Towers - MSS Emissions;
- EPN: Plant-MSS-8, Vacuum Trucks - MSS Emissions;
- EPN: Plant-MSS-9, Attachment B MSS Activities;
- EPN: Plant-MSS-10, Attachment A MSS Activities;
- EPN: Plant-MSS-11, Temporary Control Device - MSS Emissions; and
- EPN: Plant-MSS, Plantwide Short-term Emission Rate Allowables for Individual Chemicals.

1.3 Permit Alterations to the Special Conditions

We are also requesting, via permit alteration, that all of the Planned Maintenance, Startup, and Shutdown (MSS) Special Conditions and associated Attachments be transferred from the existing NSR Permit No. 46307 to this new NSR Permit. Specifically, we are requesting that Special Condition 40 through Special Condition 52 and Attachment A through Attachment D of the recently issued (July 2011) NSR Permit No. 46307 be transferred to this new NSR Permit with an original number.

1.4 Application Content

This air permit application has been prepared based upon information provided by TPC and TCEQ guidance. The remainder of this document is structured as follows:

- Section 2 presents a process / project description and site location of the Plant;
- Section 3 presents a discussion of the Plant air emissions and BACT;
- Section 4 identifies the state and federal regulations that apply to the Plant for Permit requirements demonstration; and
- Section 5 presents a list of references used in the preparation of this air permit application document.

This document also contains the following appendices:

- Appendix A contains the applicable TCEQ permit application forms; and
- Appendix B contains the calculations required for this application.

1.5 Permit Fee

For this permit application, TPC is submitting a fee of $900 (NINE HUNDRED DOLLARS AND NO CENTS). The fee calculation was based on the cost of the amendment and the amount calculated in Table 30. Because these are all existing facilities or activities being transferred into this new permit, no capital costs are associated with this permitting action. A signed Table 30 is presented in Appendix A of this document.

1.6 Figures

The figures required for this permit application and an explanation of these figures are described below.

1.6.1 Area Map

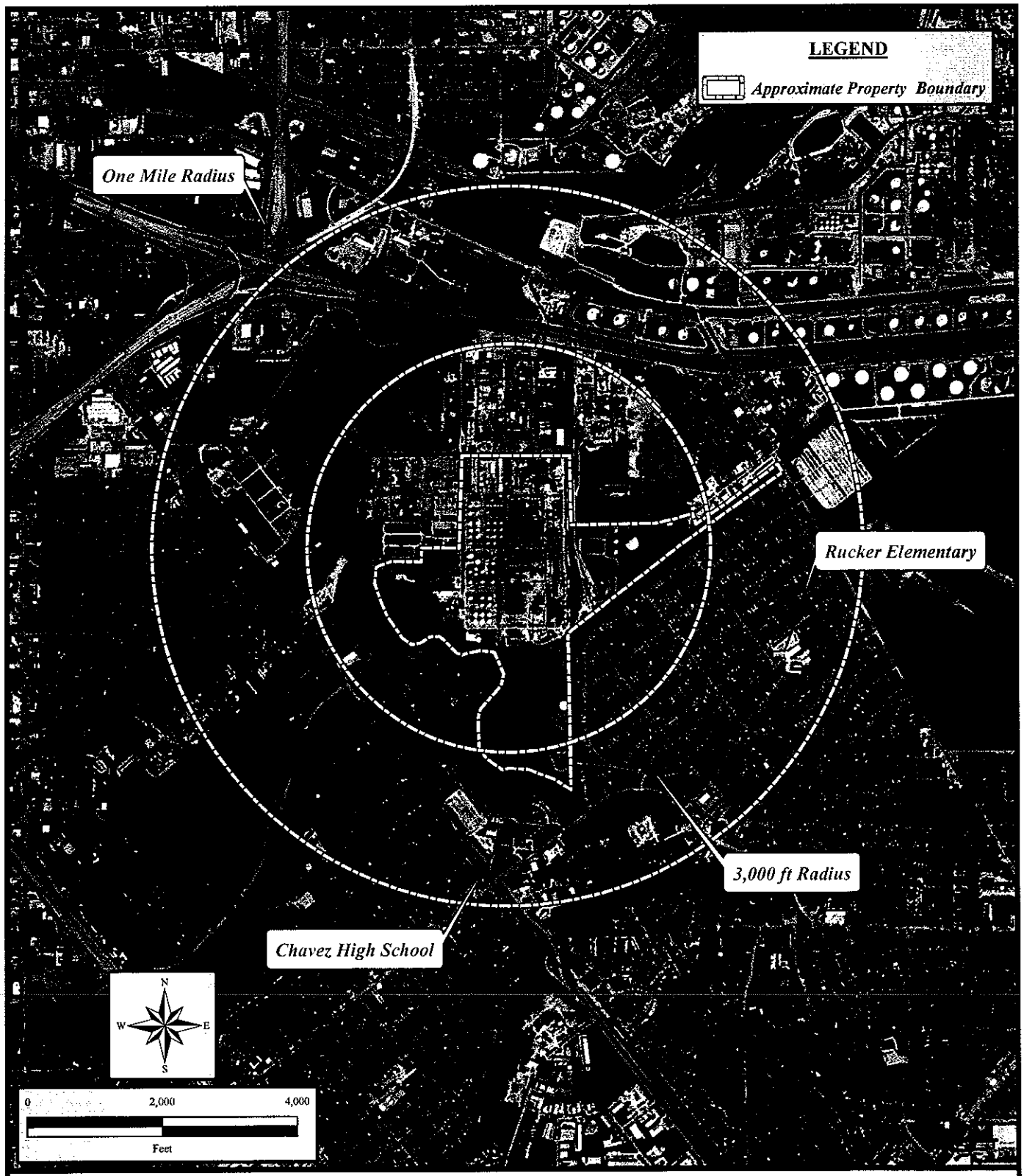
An area map showing the location of the property is provided on the following pages.

1.6.2 Plot Plan

A plot plan of the property boundaries and facilities in the plant are provided on the following pages.

1.6.3 Process Flow Diagram

A process flow diagram is not included in this submittal because the operations in this submittal do not function to manufacture or produce materials.

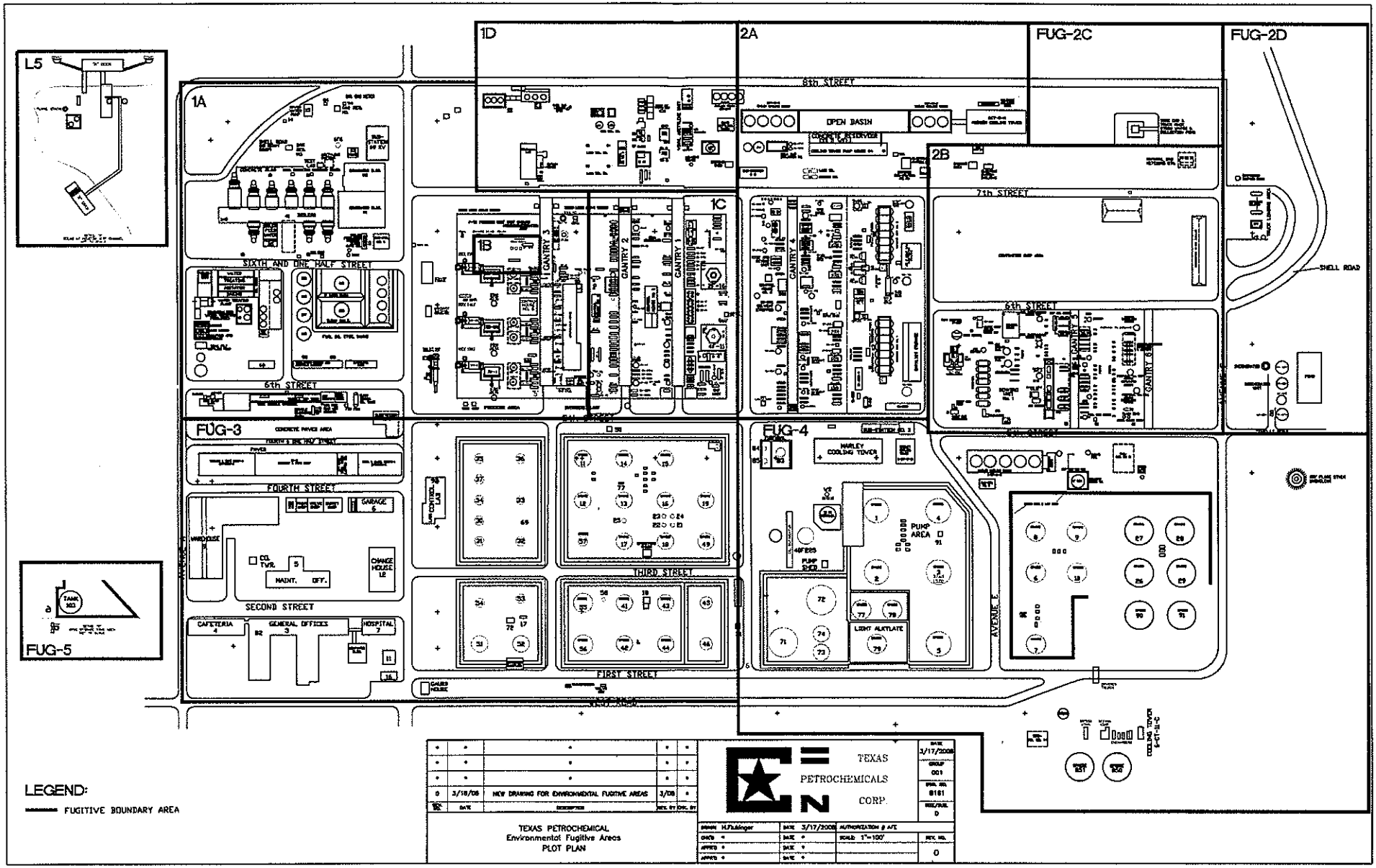


TITAN Engineering, Inc.
Environmental Consulting and Management
2801 Network Boulevard, Suite 200
Frisco, Texas 75034
Phone: (469) 365-1100 • Fax: (469) 365-1199
www.titanengineering.com

TPC Group

FIGURE 1-1 AREA MAP

TPC Group LLC
8600 Park Place Blvd
Houston, Texas 77017
August 2011
from USGS Quadrangles Pasadena & Park Place, Texas
Ground Condition Depicted October 2007
Digital Data Courtesy of ESRI Online Datasets



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1A
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1D
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FUG-2C
FUG-2D
FUG-3
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FUG-5
8th STREET
7th STREET
6th STREET
SIXTH AND ONE HALF STREET
FOURTH STREET
SECOND STREET
THIRD STREET
FIRST STREET
AVENUE E
SHELL ROAD
OPEN BASIN
CONCRETE RESERVOIR
GANTRY 1
GANTRY 2
GANTRY 3
GANTRY 4
GANTRY 5
GANTRY 6
MARLEY COOLING TOWER
PUMP AREA
LIGHT ALKYLATE
CONTROL LAB
GARAGE 6
CHANGE HOUSE 12
MAINT. OFF.
CAFETERIA 4
GENERAL OFFICES 3
HOSPITAL 7
TANK 103
LEGEND:
FUGITIVE BOUNDARY AREA
0 3/18/08 NEW DRAWING FOR ENVIRONMENTAL FUGITIVE AREAS 3/08
TEXAS PETROCHEMICAL
Environmental Fugitive Areas
PLOT PLAN
TEXAS PETROCHEMICALS CORP.
3/17/2008
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H.Fluhinger
3/17/2008
AUTHORIZATION # AFE
SCALE: 1"=100'
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0018161
3/18/2008

2. PROCESS / PROJECT DESCRIPTION AND SITE LOCATION

This section provides an overview of the Plant operations. The Plant is a petrochemical production facility located in Houston, Harris County, Texas. The following is the process description of the Plant.

TPC operates a petrochemical production facility in Houston, Harris County, Texas. The plant currently manufactures various light olefin products including butadiene, butenes, and isobutlyenes, as well as methyl tert-butyl ether (MTBE). The operation of this type of facility has various maintenance, startup, and shutdown (MSS) activities.

This air permit application requests that the TCEQ issue TPC a new NSR Permit with an original NSR Permit Number for its MSS activities. First, TPC requests the TCEQ to transfer all of the MSS activities that are currently in NSR Permit No. 46307, and as listed in Section 1, into this new NSR Permit. Further, TPC requests that TCEQ amend the emission rates of these activities as listed in this permit application.

The reason for these actions is because it was determined that the MSS activities listed in NSR Permit No. 46307 could occur more frequently than originally represented. It was also discovered that, in some cases, better data was now available to estimate emissions than was available when the estimates were originally submitted. Based on these reasons, this permit application is being submitted.

For these reasons, we are submitting this permit application and requesting a new NSR Permit for the MSS activities at the site.

3. AIR EMISSIONS CALCULATIONS AND BACT

This Section describes the air emissions associated with this permit application. The detailed calculations and calculation methodologies are presented in Appendix B of this permit application.

This Section also presents proposed Best Available Control Technologies (BACT) for controlling air emissions from the equipment at the Plant. The detailed calculations with the air emission estimates are presented in Appendix B of this permit application.

3.1 Air Emissions Calculations

This section describes the air emissions calculations associated with this permit application. A summary of the air emissions are presented in Table B-1 in this Appendix B and Table 1(a) in Appendix A. The detailed calculations are presented in the Appendix B of this permit application.

3.1.1 Air Emissions Calculations for MSS

The MSS emissions presented in this permit application use the same methodology that was used in the original submittal for NSR Permit No. 46307 for the MSS emissions. The changes in emissions are due to increased frequency of MSS activities and more complete data. The detailed calculations are presented in the Appendix B of this permit application.

3.2 Best Available Control Technology (BACT)

The Texas Clean Air Act (TCAA) and 30 TAC 116.111(a)(2)(C) require facilities to utilize Best Available Control Technology (BACT), with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facilities. TPC believes that the techniques and methods of operation described below constitute BACT for the Plant operations described in this permit application.

3.2.1 BACT Approach

BACT requirements are intended to ensure that a proposed Plant will incorporate air pollution control systems reflecting the latest demonstrated practical techniques for a particular emission unit, and do not result in the exceedance of a National Ambient Air Quality Standard (NAAQS), PSD Increment, or other standards imposed at the state level. The BACT evaluation requires the documentation of performance levels achievable for each air pollution control technology applicable to this facility. The TCEQ uses a "Tiered" approach when evaluating available air pollution control technologies. This approach to the BACT process involves three Tiers to determine BACT. All three Tiers are discussed in detail below; however, the Tier I approach for BACT will be used in this permit application.

Tier I

The first Tier (Tier I) of this approach is basically the claim that the control technology being used is BACT. The claim of BACT is based on controls that have been accepted as BACT by the TCEQ, EPA, or other state regulatory agencies in recent permits for the same process or industry. This approach has the assumption that no new technical developments have been made that would justify additional controls. The TCEQ publishes BACT guidance for some common industries and sources. Due to this, only a Tier I analysis will be demonstrated in this air permit application.

Tier II

The second Tier (Tier II) of the approach is the consideration of control technologies which have been accepted as BACT in recent permits for the same exhaust stream in a different process or industry. This is known as technology transfer. As in Tier I, Tier II approval is based on the TCEQ, EPA, or other state regulatory agencies having accepted the control technology as BACT in recent permits along with the assumption that no new technical developments have been made that would justify additional controls. Detailed documentation of technical feasibility or economic reasonability is not needed for this tier of analysis.

Tier III

The third Tier (Tier III) is a detailed analysis of technical and economic documentation of all control options available for the process under review. Considerations for controls included the demonstration of the control technology being successful in similar applications and economic reasonability based on initial and operational costs demonstrated in dollars per pound of pollutant removed. This Tier is not often used as BACT for most process or industries have been established, as in Tier I, or the BACT control technology can be transferred, as in Tier II.

3.2.2 BACT for Particulate Matter Emissions

The following physical and operational controls implemented at the site constitute BACT for particulate matter (PM) emissions from the inherently low emitting activities. Specifically, these PM emissions are from changing catalyst and the filling of roll-off dumpsters.

- Good housekeeping measures and procedures during the activities to minimize PM emissions during the changing of catalyst and filling of roll-off dumpsters.

3.2.3 BACT for Volatile Organic Compounds

The plant has several sources of volatile organic compounds (VOC's) for proposed facilities included in this permit application. The TCEQ had listed several proposed controls that would meet BACT for MSS activities. A table in Appendix B displays these proposed controls for BACT and how TPC plans to meet BACT.

4. REGULATORY APPLICABILITY

The following sections demonstrate that the Plant, as represented in this permit application, will meet 30 TAC §116.111 for the permit. Furthermore, the following sections also demonstrate that the Plant will be operated in accordance with the intent of the Texas Clean Air Act, including protection of the health and physical property of the people.

4.1 Permit Review – 30 TAC §§116.111 and 116.116

The following sections demonstrate that the Plant has met and is meeting the federal and state air quality rules and regulations and the requirements to amend and renew an air permit as listed in 30 TAC §§116.111 and 116.116 for the permit renewal.

The following sections demonstrate that the Plant has met and is meeting the state air quality rules and regulations.

4.1.1 30 TAC 101 - General Air Quality Rules (effective 5/15/11)

The Plant will be operated in accordance with the General Rules relating to circumvention, nuisance, traffic hazard, notification requirements for major upset, notification requirements for maintenance, sampling, sampling ports, emissions inventory requirements, sampling procedures and terminology, compliance with Environmental Protection Agency Standards, the National Primary and Secondary Air Quality Standards, inspection fees, emissions fees, and all other applicable General Rules.

4.1.2 30 TAC 111 - Control of Air Pollution from Visible Emissions and Particulate Matter (effective 7/19/06)

The potential applicability of this chapter to the Plant is explained in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§111.111-113	Visible Emissions	Yes	The Plant will not exceed 30% opacity for any six-minute period from any building, enclosed facility, or other structure under this application.
§§111.121-129	Solid Waste Incineration	No	The Plant will not conduct solid waste incineration activities under this application.

Section Number	Reference	Applicability	Compliance Explanation
§§111.131-139	Abrasive Blasting of Water Storage Tanks Performed by Portable Operations	No	Abrasive blasting of water storage tanks will not be conducted as part of this permit application.
§§111.141-149	Materials Handling, Construction, Roads, Streets, Alleys and Parking Lots	Yes	The Plant is located in Harris County, which is within the geographic area of applicability.
§111.151	Allowable Emission Limits on Nonagricultural Processes	Yes	The Plant's particulate emissions associated with this application will be less than the allowable emission limits specified in §111.151.
§111.153	Emission Limits for Steam Generators	No	The Plant is not proposing to operate a steam generator, as defined in this section, as part of this application.
§§111.171-175	Emission Limits on Agricultural Processes	No	The Plant will not conduct agricultural processes as part of this application.
§§111.181-183	Exemptions for Portable or Transient Operations	No	The Plant is not a portable or transient operation.
§§111.201-221	Outdoor Burning	Yes	Any outdoor burning that may be conducted at the Plant will be done in accordance with these requirements.

4.1.3 30 TAC 112 - Control of Air Pollution from Sulfur Compounds (effective 7/12/01)

30 TAC 112 governs various sulfur compound emissions including sulfur dioxide, hydrogen sulfide, sulfuric acid, and total reduced sulfur compounds from Kraft Pulp Mills. The potential applicability of this chapter to sources in this application is explained in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§112.3-4	SO_2 Net Ground Level Concentrations	Yes	SO_2 emissions are expected from the activities described in this permit.
§§112.5-7	Allowable SO_2 Emission Rates	No	There are no sulfuric acid or sulfur recovery plants in this permit application.
§112.8	Allowable SO_2 Emission Rates	No	There are no solid fossil fuel-fired steam generators in this permit application.
§112.9	Allowable SO_2 Emission Rates	No	There will be no liquid fuel-fired steam generators, furnaces, or heaters in this permit application.
§112.14	Allowable SO_2 Emission Rates	No	The Plant will not include any nonferrous smelters.
§§112.15-18	Temporary Fuel Shortage Plan	No	The Plant does not anticipate a shortage of low sulfur fuel.
§§112.19-21	Area Control Plan	No	The Plant does not anticipate needing relief from the requirements of §112.3.
§§112.31-34	Allowable Emissions of H_2S	No	The Plant in this application will not produce H_2S emissions, the Plant will comply with this rule.
§§112.41-47	Allowable Emissions of H_2SO_4	No	The Plant is not anticipated to emit H_2SO_4, and the Plant will comply with this rule.
§§112.51-59	Emission Limits for Total Reduced Sulfur Compounds	No	The Plant will not include a Kraft Pulp Mill.

4.1.4 30 TAC 113 - Hazardous Air Pollutant (HAP) Standards (effective 5/14/09)

30 TAC 113 addresses the control of air pollution from HAPs and other designated facilities, defined within this chapter to be certain air emissions from municipal solid waste landfills (MSWLFs), medical waste incinerators, and certain other processes/emissions regulated under 40 CFR Parts 61 and 63. The Plant will not include a MSWLF or medical waste incinerator, nor is the Plant anticipated to produce radon emissions. Consequently, Subchapters B and D are not applicable.

30 TAC 113 Subchapter C implements 40 CFR Part 63 by regulating HAP emissions released from source categories listed in this rule. The Plant is a major source of HAP's. Thus, several MACT rules

apply to the plant. A detailed discussion of the applicable MACT rules and how the Plant complies with these rules is in the federal rules subsection of this section.

4.1.5 30 TAC 114 - Control of Air Pollution from Motor Vehicles (effective 12/13/10)

The Plant production operations will include a motor vehicle fleet. Therefore, this chapter does apply. TPC will comply with these rules.

4.1.6 30 TAC 115 - Control of Air Pollution from Volatile Organic Compounds (VOC) (effective 2/17/11)

30 TAC Chapter 115 regulates VOC emissions according to source type and Plant location (county). The Plant is located in Harris County, which is included in the "Houston/Galveston Nonattainment Area" under this rule. Therefore, the potential applicability of the 30 TAC 115 sections is addressed in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§115.112-119	Storage of VOC	Yes	The Plant does have VOC storage vessels associated with this application and will comply with this rule.
§§115.120-129	Vent Gas Control	No	The Plant will not have process vents as part of this application.
§§115.131-139	Water Separation	No	The Plant will not have any volatile organic compound water separators as part of this application.
§§115.140-149	Industrial Wastewater	No	The Plant will not handle industrial wastewater as defined in this section as part of this application.
§§115.152-159	Municipal Solid Waste Landfills	No	The Plant does not have a Municipal Solid Waste Landfill.
§§115.160-169	Batch Processes	No	The Plant is not considered to be a Batch Process.
§§115.211-259	VOC Transfer Operations	Yes	The Plant may conduct transfer operations as defined in this section as part of this application.

Section Number	Reference	Applicability	Compliance Explanation
§§115.311-359	Petroleum Refining, Natural Gas Processing, and Petrochemical Processes	Yes	The Plant may conduct any of the referenced processes as part of this application.
§§115.412-419	Degreasing Processes	No	No degreasing process operations as defined in this section will be conducted as part of this application.
§§115.420-429	Surface Coating Processes	Yes	The Plant will conduct surface coating process operations as defined in this section as part of this application.
§§115.430-449	Printing Processes	No	Facilities in this application will not conduct printing operations as defined in these sections.
§§115.510-559	Miscellaneous Industrial Sources	No	Facilities in this application will not conduct any of the miscellaneous industrial activities defined in this section.
§§115.600-619	Consumer-Related Sources and Products	No	Facilities in this application will not produce consumer products.
§§115.720-729	HRVOC - Vent Gas Control	Yes	This rule applies to facilities or activities covered in this application.
§§115.760-769	HRVOC – Cooling Tower Heat Exchange Systems	No	Facilities in this application do not meet the requirements of this rule.
§§115.780-789	HRVOC – Fugitive Emissions	Yes	This rule applies to facilities or activities covered in this application.
§§115.901-916	Alternates Means of Control	No	Facilities in this application are not requesting alternate means of control.
§§115.920-923	Early Reductions	No	Facilities in this application are not requesting early reductions.
§§115.930-940	Compliance and Control Plan Requirements	No	This rule applies to facilities or activities covered in this application.

4.1.7 30 TAC 117 - Control of Air Pollution from Nitrogen Compounds (effective 5/5/11)

30 TAC 117 governs NO_X emissions from the following types of facilities: Major Sources in an applicable Ozone Non-Attainment Area, acid manufacturers, and gas-fired combustion unit manufacturers, distributors, retailers, and installers. 30 TAC 117 also governs NO_X emissions from Minor Sources located in the Houston/Galveston ozone Non-Attainment Area and sources located in specified counties in Central and East Texas. The Plant will be located in Harris County which is part of the Houston/Galveston Ozone Non-Attainment Area. Therefore, the potential applicability of 30 TAC 117 sections is addressed in the following table. Brief explanations of compliance are provided for all applicable rules.

Section Number	Reference	Applicability	Compliance Explanation
§§117.100-156	Combustion Control Beaumont–Port Arthur	No	The Plant will not be within the geographic area of applicability.
§§117.200-256	Combustion Control Dallas-Fort Worth	No	The Plant will not be within the geographic area of applicability.
§§117.300-356	Combustion Control Houston-Galveston-Brazoria	Yes	The Plant will comply with this rule.
§§117.400-456	Combustion Control Dallas/Fort Worth 8-HR	No	The Plant will not be within the geographic area of applicability.
§§117.1000-1056	Combustion Control at Major Utility Electric Generation Sources Beaumont-Port Arthur	No	The Plant will not be within the geographic area of applicability.
§§117.1100-1156	Combustion Control at Major Utility Electric Generation Sources Dallas-Fort Worth	No	The Plant will not be within the geographic area of applicability.

Section Number	Reference	Applicability	Compliance Explanation
§§117.1200-1256	Combustion Control at Major Utility Electric Generation Sources Houston-Galveston-Brazoria	No	The Plant will be within the geographic area of applicability, but is not owned or operated by an electric cooperative, municipality, river authority, public utility, or a Public Utility Commission of Texas regulated utility.
§§117.1300-1356	Combustion Control at Major Utility Electric Generation Sources Dallas-Fort Worth 8-HR	No	The Plant will not be within the geographic area of applicability.
§§117.2000-2145	Combustion Control at Minor Sources	No	The Plant is a major source, and not a minor source. Therefore, this section of 30 TAC 117 does not apply.
§§117.3000-3345	Multi-Region Combustion Control	No	The Plant will be located in Harris County which is part of the Houston/Galveston area which is not within the geographic area of applicability.
§§117.4000-4210	Acid Manufacturing	No	The Plant is not an acid manufacturer. Therefore, this section of 30 TAC 117 does not apply.
§§117.8000-8140	General Monitoring and Testing Requirements	Yes	The Plant will perform monitoring and testing as defined in these sections as a part of this application and will comply with these rules.
§§117.9000-9810	Compliance Schedule and Compliance Flexibility	Yes	The Plant will follow the compliance schedule and compliance flexibility, if used, as defined in these sections as a part of this application.

4.1.8 30 TAC 118 - Control of Air Pollution Episodes (effective 5/14/04)

The Plant will operate in compliance with the TCEQ General Rules and the Air Pollution Episodic Requirements of 30 TAC 118.

4.1.9 30 TAC 122 - Federal Operating Permits (effective 8/3/06), Acid Rain, CAIR

30 TAC 122 addresses the Texas implementation of the federal operating permits program promulgated under Title V of the Clean Air Act. Based on its potential to emit, as reflected by this application, the Plant will be classified as a Major Source. Consequently, the Plant will submit a revision notification application, if required, for a Title V operating permit in accordance with this rule.

4.1.10 Impact on Nearby Schools

As shown on the Figure 1-2 Area Map, there is a school located within 3,000 feet of the Plant.

4.2 Measurement of Emissions - §116.111(a)(2)(B)

At the request of the Executive Director of the TCEQ, TPC will provide provisions for the measurement of significant emissions, including the installation of sampling ports, platforms, etc.

4.3 Best Available Control Technology (BACT) - §116.111(a)(2)(C)

Refer to Section 3.0 for a BACT analysis.

4.4 New Source Performance Standards (NSPS) - §116.111(a)(2)(D)

NSPS (40 CFR Part 60) outlines specific requirements for certain types of new or modified sources. The following paragraph describes the NSPS that with potential applicability to the Plant.

4.4.1 NSPS Kb

NSPS Kb (40 CFR Part 60, Subpart Kb - Standards of Performance for Volatile Organic Storage Vessels (Including Petroleum Liquid Storage Vessels) For Which Construction, Reconstruction, or Modification After July 23, 1984) outlines specific requirements for tanks storing volatile organic compounds (VOL's) built after July 23, 1984 with a storage capacity greater than 10,000 gallons. There are tanks in this permit application that store VOL's, have a storage capacity greater than 10,000 gallons, and were built after July 23, 1984. Therefore, this rule does apply and the Plant will comply with this rule for applicable tanks.

4.5 National Emission Standards for Hazardous Air Pollutants -§116.111(a)(2)(E)

National Emission Standards for Hazardous Air Pollutants (NESHAPs) have been established in 40 CFR Part 61 for various materials, including radon, beryllium, mercury, vinyl chloride, radionuclides, benzene, asbestos, and inorganic arsenic emissions from various types of sources. However, these standards are not applicable because the Plant will not be a source that emits one of these materials listed in these rules.

4.6 NESHAPs for Source Categories - §116.111 (a)(2)(F)

Additional NESHAPs (also known as MACT standards) have been established in 40 CFR Part 63 for various source categories and/or industries. Though the facilities in this air permit application will not constitute a major source of HAPs, the site is major source of HAPs. Therefore, the facilities in this air permit application will be subject to, and will comply with, MACT standards applicable to major HAP sources.

The site is a major source of HAPs, and therefore may have applicable MACT standards for major HAP sources. However, a few MACT standards apply to non-major "area sources" that meet the criteria of the rule, but are not major sources of HAPs. Because the site is a major source of HAPs, these rules will generally apply. The following paragraph describes the MACT that with potential applicability to the Plant.

4.6.1 MACT F, G, and H (a.k.a. The HON)

MACT F (40 CFR Part 63, Subpart F – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry (SOCMI)) outlines specific requirements for manufacturers that use a reactant or produce as a product, by-product, or co-product certain chemicals listed in this rule. The Plant is a manufacturer that uses a listed chemical as reactant or produce as a product, by-product, or co-product. Therefore, this rule does apply and the Plant will comply with this rule.

MACT G (40 CFR Part 63, Subpart G – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry (SOCMI) for Process Vents, Storage Vessels, Transfer Operations, and Wastewater) outlines specific requirements for manufacturers that use a reactant or produce as a product, by-product, or co-product certain chemicals listed in this rule and that utilizes one or all of the listed pieces of equipment to manufacture the product. The Plant is a manufacturer that uses a listed chemical as reactant or produce as a product, by-product, or co-product and uses equipment listed in this rule to manufacture these products. Therefore, this rule does apply and the Plant will comply with this rule.

MACT G (40 CFR Part 63, Subpart H – National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks) outlines specific requirements for manufacturers that use a reactant or produce as a product, by-product, or co-product certain chemicals listed in this rule and that utilizes equipment that may have equipment leaks, also known as fugitive emissions, to manufacture the product. The Plant is a manufacturer that uses a listed chemical as reactant or produce as a product, by-product, or co-product and uses equipment listed in this rule to manufacture these products. Therefore, this rule does apply and the Plant will comply with this rule.

4.6.2 MACT FFFF (a.k.a. The MON)

MACT FFFF (40 CFR Part 63, Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing) outlines specific requirements for

miscellaneous organic chemical manufacturing process units (MCPU) that use certain chemicals listed in this rule. The Plant is a MCPU that uses a listed chemical. Therefore, this rule does apply and the Plant will comply with this rule.

4.7 Performance Demonstration - §116.111 (a)(2)(G)

The Plant will be operated as represented in this application and will achieve the specified performance levels. Upon TCEQ request, additional information can be submitted to further demonstrate that operational levels and emission limitations are being upheld.

4.8 Nonattainment Review - §116.111(a)(2)(H)

The Plant will be located in Harris County which is in the Houston/Galveston area for ozone nonattainment. The nonattainment review provisions specified in §116.150 are not applicable to the Plant because only hourly emissions are being increased. Due to this, nonattainment review will not be triggered.

4.9 Permit Alteration - §116.116(c)

This permit application includes a request for permit alteration. Permit alterations are allowed for various changes in an air permit including changes in special conditions that do not change the control or character of emissions or result in an increase in emissions. As indicated in Section 1 of this air permit application, TPC is requesting that EPN's and Special Conditions associated with MSS activities be including in this new NSR permit and removed from NSR Permit No. 46307. Therefore, this rule applies to the Plant and the Plant will comply with this rule.

5. REFERENCES

The following references have been used in the preparation of this air permit application document. Where appropriate, certain materials have been included in Appendix C.

- State of Texas. Texas Administrative Code. Title 30, Chapter 101. *General Air Quality Rules.* January 1, 2009.
- State of Texas. Texas Administrative Code. Title 30, Chapter 111. *Control of Air Pollution from Visible Emissions and Particulate Matter.* July 19, 2006.
- State of Texas. Texas Administrative Code. Title 30, Chapter 112. *Control of Air Pollution from Sulfur Compounds.* July 12, 2001.
- State of Texas. Texas Administrative Code. Title 30, Chapter 113. *Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants.* May 14, 2009.
- State of Texas. Texas Administrative Code. Title 30, Chapter 114. *Control of Air Pollution from Motor Vehicles.* December 13, 2010.
- State of Texas. Texas Administrative Code. Title 30, Chapter 115. *Control of Air Pollution from Volatile Organic Compounds (VOCs).* February 17, 2011.
- State of Texas. Texas Administrative Code. Title 30, Chapter 116. *Control of Air Pollution by Permits for New Construction or Modification.* March 17, 2011.
- State of Texas. Texas Administrative Code. Title 30, Chapter 117. *Control of Air Pollution from Nitrogen Compounds.* May 15, 2011.
- United States. Code of Federal Regulations. Title 40, Part 60. *New Source Performance Standards.* July 2010.
- United States. Code of Federal Regulations. Title 40, Part 61. *National Emission Standards for Hazardous Air Pollutants.* July 2010.
- United States. Code of Federal Regulations. Title 40, Part 63. *National Emission Standards for Hazardous Air Pollutants for Source Categories.* July 2010.

APPENDIX A

TCEQ FORMS AND TABLES

TCEQ Form **Page**

PI-1 – General Application for Air Permit A-1
Table 1(a) – Emission Point Summary A-11
Table 30 Permit Fees A-13

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Update: The TCEQ **requires** that a Core Data Form be submitted on all incoming applications unless a Regulated Entity and Customer Reference Number have been issued by the TCEQ and no core data information has changed. For more information regarding the Core Data Form, call (512) 239-5175 or go to the TCEQ Web site at www.tceq.state.tx.us/permitting/central_registry/guidance.html.

I. APPLICANT INFORMATION		
A. Company or Other Legal Name: **TPC Group, L.L.C.**		
Texas Secretary of State Charter/Registration Number (*if applicable*):		
B. Company Official Contact Name (☒ Mr. ☐ Mrs. ☐ Ms. ☐ Dr.): **Charles Kirk Johnson**		
Title: **Plant Manager**		
Mailing Address: **8600 Park Place Blvd.**		
City: **Houston**	State: **Texas**	ZIP Code: **77017**
Telephone No: **713-740-4238**	Fax No.: **713-475-6008**	E-mail Address: **kirk.johnson@tpcgrp.com**
C. Technical Contact Name (☐ Mr. ☐ Mrs. ☒ Ms. ☐ Dr.): **Geri Shoop**		
Title: **Staff Environmental Engineer**		
Company Name: **TPC Group LLC.**		
Mailing Address: **8600 Park Place Blvd.**		
City: **Houston**	State: **Texas**	ZIP Code: **77017**
Telephone No.: **713-475-7422**	Fax No.: **713-475-7463**	E-mail Address: **geri.shoop@tpcgrp.com**
D. Facility Location Information:		
Street Address: **8600 Park Place Blvd.**		
If no street address, provide clear driving directions to the site in writing:		
City: **Houston**	County: **Harris**	ZIP Code: **77017**
E. TCEQ Account Identification Number (leave blank if new site or facility): **HG-0562-P**		
F. Is a TCEQ Core Data Form (TCEQ Form No. 10400) attached?		☐ YES ☒ NO
G. TCEQ Customer Reference Number *(leave blank if unknown)*: **CN603624289**		
H. TCEQ Regulated Entity Number *(leave blank if unknown)*: **RN100219526**		
II. IMPORTANT GENERAL INFORMATION		
A. Is confidential information submitted with this application?		☐ YES ☒ NO
If "YES," is each "confidential" page marked "**CONFIDENTIAL**" in large red letters?		☐ YES ☐ NO

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II. IMPORTANT GENERAL INFORMATION *(continued)*		
B. Is this application in response to a TCEQ investigation or enforcement action?		☐ YES ☒ NO
If "YES", attach a copy of any correspondence from the TCEQ		
C. Number of New Jobs: **0**		
D. Names of the State Senator and district number for this facility site: **Senator Mario Gallegos – District 6**		
Names of State Representative and district number for this facility site: **Representative Carol Alvarado – District 145**		
E. For Concrete Batch Plants, and PSD, or Nonattainment Permits that require public notice, name of the County Judge for this facility site:		
Mailing Address:		
City:	State:	ZIP Code:
F. For Concrete Batch Plants, is the facility located in a municipality or an extraterritorial jurisdiction of a municipality?		☐ YES ☐ NO
If "YES," list the name(s) of the Presiding Officer(s) for this facility site: **N/A**		
Mailing Address		
City:	State:	ZIP Code:
III. FACILITY AND SOURCE INFORMATION		
A. Site Name: **Houston Plant**		
B. Area Name/Type of Facility: **Houston Plant**		☒ Permanent ☐ Portable
C. Principal Company Product or Business: **1,3 Butadiene, MTBE, Isobutylene, and other C4 products**		
Principal Standard Industrial Classification Code: **2869**		
D. Projected Start of Construction Date: **N/A**	Projected Start of Operation Date: **N/A**	
IV. TYPE OF PERMIT ACTION REQUESTED		
A. Permit Number *(if existing)*:		
B. Is this an initial permit application?		☒ YES ☐ NO

If "YES," check the type of permit requested *(check all that apply)*:

☒ State Permit
☐ Flexible Permit
☐ Multiple Plant Permit
☐ Nonattainment Federal Permit
☐ Prevention of Significant Deterioration Federal Permit
☐ Hazardous Air Pollutants Permit Federal Clean Air Act § 112(g)

Other: Transferring MSS Activities authorized in NSR Permit 46307 to New Permit and amending the emission rates for the MSS Activities.

IV. TYPE OF PERMIT ACTION REQUESTED *(continued)*		
C. Is this a permit amendment?		☒ YES ☐ NO
If "YES," check the type of permit requested *(check all that apply):* ☒ State Permit Amendment ☐ Flexible Permit Amendment ☐ Multiple Plant Permit Amendment ☐ Nonattainment Major Modification ☐ Prevention of Significant Deterioration Major Modification ☐ Hazardous Air Pollutants Permit Federal Clean Air Act § 112(g) Modification Other: Transferring MSS Activities authorized in NSR Permit 46307 to New Permit and amending the emission rates to the MSS Activities.		
D. Is a permit renewal application being submitted in conjunction with this amendment in accordance with Senate Bill 1673? [THSC 382.055(a)(2)](80th Legislative)		☐ YES ☒ NO
E. Is this application for a change of location of previously permitted facilities?		☐ YES ☒ NO
If "YES," answer IVE. 1. - IVE. 4.		
1. Current location of facility:		
Street Address *(If no street address, provide clear driving directions to the site in writing.)*:		
City:	County:	ZIP Code:
2. Proposed location of facility:		
Street Address *(If no street address, provide clear driving directions to the site in writing.)*:		
City:	County:	ZIP Code:
3. Will the proposed facility, site, and plot plan meet all current technical requirements of the permit special conditions?		☐ YES ☐ NO
If "NO," attach detailed information.		
4. Is the site where the facility is moving considered major?		☐ YES ☐ NO
F. Is this a relocation?		☐ YES ☒ NO
G. Are there any standard permits, exemptions or permits by rule to be consolidated into this permit?		☒ YES ☐ NO

IV. TYPE OF PERMIT ACTION REQUESTED *(continued)*	
H. Are you permitting a facility or group of facilities that have planned maintenance, startup and shutdown emissions that cannot be authorized by a permit by rule or standard permit or that are authorized by a permit by rule or standard permit and are being rolled into this permit?	☒ YES ☐ NO
If "YES," attach information on any changes to emissions under this application as specified in Sections IX, and X.	
If "YES," answer IVH. 1 -IVH. 3.	
1. Are the activities to be included in this permit covered by any previously existing MSS authorizations?	☒ YES ☐ NO
If "YES," provide a listing of all other authorizations (permit by rule or standard permit and the associated registration number if any).	
NSR 46307	
2. Have the emissions been previously submitted as part of an emissions inventory?	☐ YES ☒ NO
3. List which years the MSS activities were included in emissions inventory submittals:	
I. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability)	
Is this facility located at a site required to obtain a federal operating permit under 30 TAC Chapter 122?	☒ YES ☐ NO ☐ To be Determined
1. Identify the requirements of 30 TAC Chapter 122 that will be triggered if this PI-1 application is approved. ☐ FOP Significant Revision ☐ FOP Minor ☐ Application for an FOP Revision ☐ Operational Flexibility/Off-Permit Notification ☐ Streamlined Revision for GOP ☒ To be determined ☐ None	
2. Identify the type(s) of FOP(s) issued and/or FOP application(s) submitted/pending for the site (check all that apply)	
☐ GOP Issued ☐ GOP application/revision application: submitted or under APD review ☒ SOP Issued ☐ SOP application/revision application:	
V. PERMIT FEE INFORMATION	
A. Fee paid for this application:	**$900.00**
1. Is a copy of the check or money order attached to the original submittal of this application?	☒ YES ☐ NO ☐ N/A
2. Is a Table 30 entitled, "Certification of estimated Capital Cost and Fee Verification," attached?	☒ YES ☐ NO ☐ N/A

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VI. PUBLIC NOTICE APPLICABILITY	
A. Is this a new permit application or a change of location application?	☒ YES ☐ NO
B. Is this an application for a major modification of a PSD, NA or 30 TAC § 112(g) permit?	☐ YES ☒ NO
C. Is this a state permit amendment application?	☒ YES ☐ NO
If "YES," answer VIC. 1. - VIC. 3.	
1. Is there any change in character of emissions in this application?	☒ YES ☐ NO
Is there a new air contaminant in this application?	☐ YES ☒ NO
2. Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetables fibers (agricultural facilities)?	☐ YES ☒ NO
3. List the total annual emission increases associated with the application (*list all that apply*):	
Volatile Organic Compounds (VOC):	17.11 tpy
Sulfur Dioxide (SO_2):	0.02 tpy
Carbon Monoxide (CO):	3.34 tpy
Hazardous Air Pollutants (HAPs): (Estimate Only and not a limit)	17.11 tpy
Nitrogen Oxides (NO_x):	1.54 tpy
Particulate Matter (PM):	2.82 tpy
PM_{10}:	2.82 tpy
$PM_{2.5}$:	2.82 tpy
Lead (Pb):	0.00 tpy
Other air contaminants not listed above:	0.00 tpy

VII. PUBLIC NOTICE INFORMATION ***(complete if applicable)***		
A. Responsible Person:		
Name (☒ Mr. ☐ Mrs. ☐ Ms. ☐ Dr.): **Charles Kirk Johnson**		
Title: **Plant Manager**		
Mailing Address: **8600 Park Place Blvd.**		
City: **Houston**	State: Texas	ZIP Code: **77017**
Telephone No: **713-740-4238**	Fax No.: **713-475-6008**	E-mail Address: **kirk.johnson@tpcgrp.com**

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendments

VII. PUBLIC NOTICE INFORMATION ***(complete if applicable)***		
B. Technical Contact:		
Company Name : **TPC Group L.L.C.**		
Name (☐ Mr. ☐Mrs. ☒Ms. ☐Dr.): **Geri Shoop**		
Title: **Staff Environmental Engineer**		
Mailing Address: **8600 Park Place Blvd.**		
City: **Houston**	State: **Texas**	ZIP Code: 77017
Telephone No.: 713-475-7422	Fax No.: **713-475-7463**	E-mail Address: geri.shoop@tpcgrp.com
C. Application in Public Place:		
Name of Public Place: **Park Place Regional Library**		
Physical Address: **8145 Park Place Boulevard**		
City: Houston	County: Harris	
The public place has granted authorization to place the application for public viewing and copying?		☒ YES ☐ NO
The public place has internet access available for the public?		☒ YES ☐ NO ☐ N/A
Complete VII.D. 1. - VII.D. 3., as applicable.		
D.1. Name of the Mayor for this facility site: **Annise Parker**		
Mailing Address: **P.O. Box 1562**		
City: **Houston**	State: **Texas**	ZIP Code: **77251**
D.2. Name of the Federal Land Manager for this facility site:		
Mailing Address:		
City:	State:	ZIP Code:
D.3. Name of the Indian Governing Body for this facility site:		
Mailing Address:		
City:	State:	ZIP Code:

VII. PUBLIC NOTICE INFORMATION *(complete if applicable)*	
E. Is a bilingual program **required** by the Texas Education Code in the School District?	☒ YES ☐ NO
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?	☒ YES ☐ NO
If "YES," which language is **required** by the bilingual program?	Spanish

VIII. SMALL BUSINESS CLASSIFICATION *(required)*	
A. Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?	☐ YES ☒ NO
B. Is the site a major source under 30 TAC Chapter 122, Federal Operating Permit Program?	☒ YES ☐ NO
C. Are the site emissions of any individual air contaminant greater than 50 tpy?	☒ YES ☐ NO
D. Are the site emissions of all air contaminants combined greater than 75 tpy?	☒ YES ☐ NO

IX. TECHNICAL INFORMATION				
A. Is a current area map attached?				☒ YES ☐ NO
Are any schools located within 3,000 feet of this facility?				☒ YES ☐ NO
B. Is a plot plan of the plant property attached?				☒ YES ☐ NO
C. Is a process flow diagram and a process description attached?				☒ YES ☐ NO
D. Maximum Operating Schedule:	Hours:24	Day(s):7	Week(s):52	Year(s):
Seasonal Operation?				☐ YES ☒ NO
If "YES," please describe.				
E. Are worst-case emissions data and calculations attached?				☒ YES ☐ NO
1. Is a Table 1(a) entitled, "Emission Point Summary Table," attached?				☒ YES ☐ NO
2. Is a Table 2 entitled, "Material Balance Table," attached? (available upon request)				☐ YES ☒ NO
3. Are equipment, process, or control device tables attached? (available upon request)				☐ YES ☒ NO
F. Are actual emissions for the last two years (determination federal applicability) attached?				☐ YES ☒ NO

X. STATE REGULATORY REQUIREMENTS *Applicants must be in compliance with all applicable state regulations to obtain a permit or amendment.*	
A. The emissions from the proposed facility will comply with all rules and regulations of the TCEQ and details are attached?	☒ YES ☐ NO
B. The proposed facility will be able to measure emissions of significant air contaminants and details are attached?	☒ YES ☐ NO
C. A demonstration of Best Available Control Technology (BACT) is attached?	☒ YES ☐ NO
D. The proposed facilities will achieve the performance in the permit application and compliance demonstration or record keeping information is attached?	☒ YES ☐ NO
E. Is atmospheric dispersion modeling attached?	☐ YES ☒ NO
F. Does this application involve any air contaminants for which a "disaster review" is required?	☐ YES ☒ NO
If "YES," details must be attached.	
Note: For a list of air contaminants for which a "disaster review" will be required, refer to the NSRPD Disaster Review Guidance Document at www.tceq.state.tx.us/permitting/air/rules/federal/63/63hmpg.html.	
G. Is this facility or group of facilities located at a site within an Air Pollutant Watch List (APWL) area?	☐ YES ☒ NO
If "YES," answer X.G. 1. - X.G. 3.	
1. List the APWL Site Number:	
2. Does the site emit a pollutant of concern for the APWL area in which the site is located?	☐ YES ☐ NO
3. If "YES," list the pollutant(s) of concern emitted by this site:	
H. Is this facility or group of facilities located at a site within the Houston/Galveston nonattainment area? (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, or Waller Counties)	☒ YES ☐ NO
If "YES," answer X.H. 1. - X.H. 4.	
1. Does the facility or group of facilities located at this site have an uncontrolled design capacity to emit 10 tpy or more of NO_X?	☒ YES ☐ NO
2. Is this site subject to 30 TAC Chapter 101, Subchapter H, Division 3 (Mass Emissions Cap and Trade)?	☒ YES ☐ NO
3. Does this action make the site subject to 30 TAC Chapter 101, Subchapter H, Division 3 (Mass Emissions Cap and Trade)?	☐ YES ☒ NO
4. Does this action require the site to obtain additional emission allowances?	☐ YES ☒ NO

XI. FEDERAL REGULATORY REQUIREMENTS **Applicants must be in compliance with all applicable federal regulations to obtain a permit or amendment.** ***If any of the following questions are answered "YES, the application must contain detailed attachments addressing applicability, identify federal regulation Subparts, show how requirements are met, and include compliance information.***	
A. Does a Title 40 Code of Federal Regulations Part 60, (40 CFR Part 60) New Source Performance Standard (NSPS) apply to a facility in this application?	☒ YES ☐ NO
B. Does 40 CFR Part 61, National Emissions Standard for Hazardous Air Pollutants (NESHAP) apply to a facility in this application?	☐ YES ☒ NO
C. Does a 40 CFR Part 63, Maximum Achievable Control Technology (MACT) standard apply to a facility in this application?	☒ YES ☐ NO
D. Does nonattainment permitting requirements apply to this application?	☐ YES ☒ NO
E. Does prevention of significant deterioration permitting requirements apply to this application?	☐ YES ☒ NO
F. Does Hazardous Air Pollutant Major Source [FAA § 112(g)] requirements apply to this application?	☐ YES ☒ NO
XII. COPIES OF THIS APPLICATION	
A. Has the required fee been sent separately with a copy of this Form PI-1 to the TCEQ Revenue Section? *(MC 214, P.O. Box 13088, Austin, Texas 78711).*	☒ YES ☐ NO ☐ NA
B. Are the Core Data Form, Form PI-1, and all attachments being sent to the TCEQ in Austin?	☒ YES ☐ NO
OPTIONAL: Has an extra copy of the Core Data Form, Form PI-1 and all attachments been sent to the TCEQ in Austin?	☐ YES ☒ NO
If "YES," please mark this application as "COPY."	
C. Is a copy of the Core Data Form, the Form PI-1, and all attachments being sent to the appropriate TCEQ regional office?	☒ YES ☐ NO
D. Is a copy of the Core Data Form, the Form PI-1, and all attachments being sent to each appropriate local air pollution control program(s)?	☒ YES ☐ NO
List all local air pollution control program(s): **Harris County Environmental Public Health Division and City of Houston Air Quality Control Bureau.**	
E. Is a copy of the Core Data Form, Form PI-1, and all attachments (without confidential information) being sent to the EPA Region 6 office in Dallas, Texas? (federal applications only)	☐ YES ☒ NO
F. This facility is located within 100 kilometers of the Rio Grande River and a copy of the application was sent to the International Boundary and Water Commission (IBWC):	☐ YES ☒ NO
G. This facility is located within 100 kilometers of a federally-designated Class I area and a copy of the application was sent to the appropriate Federal Land Manager:	☐ YES ☒ NO

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XIII. PROFESSIONAL ENGINEER (P.E.) SEAL	
Is the estimated capital cost of the project greater than $2 million dollars?	No
If "YES," the application must be submitted under the seal of a Texas licensed Professional Engineer (P.E.).	

XIV. DELINQUENT FEES AND PENALTIES

Notice: This form will not be processed until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the "Delinquent Fee and Penalty Protocol." For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: www.tceq.state.tx.us/agency/delin/index.html.

XV. SIGNATURE

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations of the Texas Commission on Environmental Quality or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. I further state that I have read and understand TWC §§ 7.177-7.183, which defines CRIMINAL OFFENSES for certain violations, including intentionally or knowingly making or causing to be made false material statements or representations in this application, and TWC § 7.187, pertaining to CRIMINAL PENALTIES.

NAME: Charles Kirk Johnson

SIGNATURE: _____
Original Signature Required

DATE: 8/11/11

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	RN100219526	Date:	Aug-2011
Company Name:	TPC Group LLC				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS										
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant		4. UTM Coordinates of Emission Point			5. Building Height (ft)	6. Height Above Ground (ft)	Source					
											7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees [b] (C)
Proposed Operations																
Plant-MSS-1	Plant-MSS-1	External Floating Roof Tanks - MSS Emissions	VOC	45.02	2.41	15	282,002	3,287,868								
Plant-MSS-2	Plant-MSS-2	Fixed Roof Tanks - MSS Emissions	VOC	25.40	0.08	15	282,002	3,287,868								
Plant-MSS-3	Plant-MSS-3	Frac Tanks - MSS Emissions	VOC	3.43	0.04	15	282,002	3,287,868								
Plant-MSS-4	Plant-MSS-4	Heat Exchangers - MSS Emissions	VOC	1.46	0.02	15	282,002	3,287,868								
Plant-MSS-5	Plant-MSS-5	Internal Floating Roof Tanks - MSS Emissions	VOC	519.20	5.54	15	282,002	3,287,868								
Plant-MSS-6	Plant-MSS-6	Spheres- MSS Emissions	VOC	74.98	0.39	15	282,002	3,287,868								
Plant-MSS-7	Plant-MSS-7	Towers- MSS Emissions	VOC	31.41	0.07	15	282,002	3,287,868								
Plant-MSS-8	Plant-MSS-8	Vacuum Trucks- MSS Emissions	VOC	14.90	3.73	15	282,002	3,287,868								
Plant-MSS-9	Plant-MSS-9	Attachment B MSS Activities	VOC	70.58	0.52	15	282,002	3,287,868								
			PM	0.37	<0.01											
Plant-MSS-10	Plant-MSS-10	Attachment A Activities	VOC	12.90	0.60	15	282,002	3,287,868								
			PM	<0.01	<0.01											
Plant-MSS-11	Plant-MSS-11	Temporary Control Device- MSS Emissions	NO_X	3.28	4.50	15	282,002	3,287,868								
			CO	6.43	4.50											
			SO_2	0.08	0.03											
			VOC	62.49	0.03											
			PM	0.08	0.03											
Plant-MSS-12	Plant-MSS-12	Bullets	VOC	23.33	0.03	15	282,002	3,287,868								
Plant-MSS-13	Plant-MSS-13	Poly Tank - MSS Emissions	VOC	11.45	0.06	15	282,002	3,287,868								
Plant-MSS-14	Plant-MSS-14	Controlled Fixed Roof Tank - MSS Emissions	VOC	0.66	<0.01	15	282,002	3,287,868								
Plant-MSS-15	Plant-MSS-15	Painting MSS Emission	VOC	73.02	6.28	15	282,002	3,287,868								
			PM	2.23	0.07											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	RN100219526	Date:	Aug-2011
Company Name:	TPC Group LLC				

			1,3 Butadiene													
			Aqueous Ammonia (1%)	32.79												
			Aqueous Ammonia (30%)	9.96												
			Butane	8.75												
			Butene	76.22												
			Diisobutylene (DIB)	34.83												
			Dimethyl Formamide (DMF)	50.62												
			Ethyl Tert-Butyl Ether (ETBE)	19.43												
			Ethanol	315.02												
			Ethylene Glycol	81.40												
			Furfural	9.45												
			Gasoline	40.61												
		Plantwide MSS	Isobutane	12.96												
		Emissions	Isobutylene	37.90												
Plant-MSS	Plant-MSS	lb/hr maximums for	Lean Oil	88.27		15	282,002	3,287,868								
		individual chemcials	Lube Oil	113.41												
			Methanol	1.88												
			Methyl Tert-Butyl Ether (MTBE)	94.08												
			Pentane	559.68												
			Polyisobutylene (PIB)	3.04												
			Polyisobutylene (HOF)	29.31												
			Propylene Glycol	29.32												
			Quench Oil	15.63												
			R-22	31.91												
			Triethanolamine (TEA)	8.12												
			Vinyl Acetylene	19.52												
			Polygas	47.89												
			PIB-Solv	4.96												

NOTE: Only hourly increases (and NOT annual increases) are being requested with this permit application, thus no annual emissions are presented.

Texas Commission on Environmental Quality
Table 30
Estimated Capital Cost and Fee Verification

Include estimated cost of the equipment and services that would normally be capitalized according to standard and generally accepted corporate financing and accounting procedures. Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality, Air Permits Division Web site at **www.tceq.state.tx.us/nav/permits/air_permits.html**.

I. DIRECT COSTS [30 TAC § 116.141(c)(1)]	Estimated Capital Cost
A. A process and control equipment not previously owned by the applicant and not currently authorized under this chapter	$
B. Auxiliary equipment, including exhaust hoods, ducting, fans, pumps, piping, conveyors, stacks, storage tanks, waste disposal facilities, and air pollution control equipment specifically needed to meet permit and regulation requirements	$
C. Freight charges	$
D. Site preparation, including demolition, construction of fences, outdoor lighting, road and parking areas	$
E. Installation, including foundations, erection of supporting structures, enclosures or weather protection, insulation and painting, utilities and connections, process integration, and process control equipment	$
F. Auxiliary buildings, including materials storage, employee facilities, and changes to existing structures	$
G. Ambient air monitoring network	$
II. INDIRECT COSTS [30 TAC § 116.141(c)(2)]	**Estimated Capital Cost**
A. Final engineering design and supervision, and administrative overhead	$
B. Construction expense, including construction liaison, securing local building permits, insurance, temporary construction facilities, and construction clean-up	$
C. Contractor's fee and overhead	$
TOTAL ESTIMATED CAPITAL COST	$ 0

I certify that the total estimated capital cost of the project as defined in 30 TAC § 116.141 is equal to or less than the above figure. I further state that I have read and understand Texas Water Code § 7.179, which defines CRIMINAL OFFENSES for certain violations, including intentionally or knowingly making, or causing to be made, false material statements or representations.

Company Name: TPC Group L.L.C.

Company Representative Name (please print): Charles Kirk Johnson Title: Plant Manager

Company Representative Signature: CK Johnson

Estimated Capital Cost	Permit Application Fee	PSD/Nonattainment Application Fee
Less than $300,000	$900 (minimum fee)	$3,000 (minimum fee)
$300,000 to $25,000,000	0.30% of capital cost	
$300,000 to $7,500,000		1.0% of capital cost
Greater than $25,000,000	$75,000 (maximum fee)	
Greater than $7,500,000		$75,000 (maximum fee)

PERMIT APPLICATION FEE (from table above) = $ 900 Date:

Check Date: 05-AUG-2011 No. **65560**

Vendor No.: 911 Vendor Name: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INVOICE NO.	INVOICE DATE	DESCRIPTION	DISCOUNT AMOUNT	NET AMOUNT
MMS PERMIT APPLICATION FEE 2011	25-JUL-2011		0.00	900.00
			0.00	**900.00**

PLEASE DETACH AND RETAIN THIS STATEMENT AS YOUR RECORD OF PAYMENT. *Thank You*

WARNING - THIS CHECK IS PROTECTED BY SPECIAL SECURITY GUARD PROGRAM™ FEATURES

TPC Group

5151 San Felipe, Suite 800
Houston, Texas 77056
(713) 627-7474

Bank of America
Chicago, Illinois 60603

70-2328 / 719 IL

DATE	CHECK NO.	AMOUNT
05-Aug-2011	65560	$900.00

PAY Nine Hundred Dollars And Zero Cents*****

VOID AFTER 90 DAYS

TO THE ORDER OF
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. Box 13089
HOUSTON-AIR EMISSION
Autin, TX 78711

Robert R Whitlow Jr.
AUTHORIZED SIGNATURE(S)

SECURE FEATURES INCLUDE INVISIBLE FIBERS, MICROPRINTING, VOID FEATURE, PANTOGRAPH, ENDORSEMENT BACKER, BROWN STAIN CHEMICAL REACTANT

⑈065560⑈ ⑆071923284⑆ 5590095252⑈

APPENDIX B

EMISSION CALCULATIONS

TCEQ FORMS AND TABLES

Emission Calculations and TCEQ Forms and Tables **Page**

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Table B-2 Bullet Maintenance Emissions Summary B-2
Table B-3 Controlled Fixed Roof Tank Maintenance Emissions Summary B-4
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TABLE B-1

TOTAL PROPOSED MAINTENANCE, STARTUP, AND SHUTDOWN EMISSIONS

TPC GROUP LLC
HOUSTON PLANT

Description	VOC		PM	
	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Bullet	23.33	0.03		
Controlled Fixed Roof Tanks	0.66	<0.01		
External Floating Roof Tanks	45.02	2.41		
Fixed Roof Tanks	25.40	0.08		
Frac Tanks	3.43	0.04		
Heat Exchangers	1.46	0.02		
Internal Floating Roof Tanks	519.20	5.54		
Piping and Fugitive Components	0.94	0.47		
Poly Tanks	11.45	0.06		
Pumps	0.19	<0.01		
Spheres	74.98	0.39		
Towers	31.41	0.07		
Vacuum Trucks	14.90	3.73		
Painting	73.02	6.28	2.23	0.07
Catalyst Changes	69.46	0.04	0.37	<0.01
Low Emitting Activities	12.90	0.60	<0.01	<0.01
Temporary Control Device				
External Floating Roof Tanks	2.70	0.12		
Internal Floating Roof Tanks	2.47	0.11		
Spheres	12.99	0.42		
Towers	1.96	0.03		
Total	**20.13**	**0.69**		
Total	**907.74**	**20.45**	**2.61**	**0.07**

Table B-2 (a)
Bullet Maintenance Emissions Summary

Basis:

1. Two bullets will be opened at a time based on available maintenance personnel and schedule.
2. Six bullets will be opened per year.
3. Emissions are based on the vapor space calculation for the largest bullet. However, any bullet containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Bullet	Description	Estimated Unit Volume (ft^3)	Pressure (psia)	Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppmv)	Saturated Vapor (lbs)
25	Isobutylene	8,421.90	14.7	95	56.11	10,000	**11.66**

MSS Emissions

lbs/event	11.66
hours/event	1
simultaneous events	2
lbs/hr	**23.33**
total events	6
tons/year	**0.035**

Total MSS Emissions from sphere openings

lbs/hr	**23.33**
tons/year	**0.03**

Table B-2 (b)
Bullet Vapor Space Emissions for VOC Evacuated from Process Units During Turnarounds

Bullet	Description	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppmv)	Saturated Vapor (lbs)
111	Lean Oil	1,886.50	14.7	95	130.0	2,500	1.51
112	Quench Oil	1,886.50	14.7	95	130.0	2,500	1.51
47	Gasoline (RVP-10)	2,807.30	14.7	95	66.0	2,500	1.14
48	Gasoline (RVP-10)	2,807.30	14.7	95	66.0	2,500	1.14
21	Isobutylene	8,421.90	14.7	95	56.1	2,500	2.92
22	Isobutylene	8,421.90	14.7	95	56.1	2,500	2.92
23	Isobutylene	8,421.90	14.7	95	56.1	2,500	2.92
24	Isobutylene	8,421.90	14.7	95	56.1	2,500	2.92
25	Isobutylene	8,421.90	14.7	95	56.1	2,500	2.92

Table B-3
Controlled Fixed Roof Tank Maintenance Emissions Summary

Basis:

1. Two of the controlled fixed roof tanks may be opened at a time.
2. Up to six controlled fixed roof tanks will be opened per year.

Tank ID	18F-2667
Material Stored	Off-Spec Waste Water
P - Pressure (psia)	14.7000
M_V - Vapor Molecular Weight	130.00
D - Tank Diameter (ft)	12.0
H_S - Tank Shell Height (ft)	35.0
H_L - Tank Liquid Height (ft)	31.5
Roof Type (Cone/Dome/Horizontal)	Cone
H_{RO} - Roof Outage (ft)	0.1
H_{VO} - Vapor Space Outage (ft)	3.6
Tank Capacity (gal)	30,000
T_{max} - Maximum Daily Temp (°F)	95.00
V_V - Vapor Space Volume (ft3)	409.98

Concentration of Vapor Space (ppmv)	2500.00
Saturated Vapor Released to Atmosphere (lbs)	0.33

MSS Emissions

lbs/event	0.33
hours/event	1.00
simultaneous events	2
lbs/hr	0.66
total events	6
tons/year	<0.01

Total MSS Emissions from fixed roof tank openings

lbs/hr	0.66
tons/year	<0.01

Table B-4 (a)
External Floating Roof Tank Maintenance Emissions Summary

Basis:

1. One external floating roof tank can be opened at a time.
2. Three external floating roof tanks may be opened per year. Up to five change of service will occur each year.
3. Hourly emissions are based on the vapor space calculation for Tank 103.
4. Annual emissions are based on opening each tank once and two change of service (COS) on tanks 114 & 115 and one change of service on tank 103.
5. Any combination of external floating roof tanks may be opened as long as the hourly and annual emissions do not exceed those represented below.
6. For External Floating Roof Tanks landings, cleanings, and refloating will all be controlled.
7. Emissions are based on MTBE and ETBE being stored in external floating roof tanks.
8. The external floating roof tanks all have geodesic domes.

Controlled MSS Emissions from external floating roof tank openings routed to a thermal oxidizer

lbs/hr	2.70
tons/year	0.12

Uncontrolled MSS Emissions from external floating roof tank openings

lbs/hr	45.02
tons/year	2.41

Table B-4 (b)
External Floating Roof MSS Emissions

		MTBE - Cleaning			MTBE - Change of Service			ETBE - Cleaning			ETBE - Change of Service		
Tank ID	**Notes/Equations Used**	**103**	**114**	**115**	**103**	**114**	**115**	**103**	**114**	**115**	**103**	**114**	**115**
Type of Tank	EFR with geodesic dome	EFR	EFR	EFR	EFR	EFR	EFR	EFR	EFR	EFR	EFR	EFR	EFR
D - Tank Diameter (ft)		200	75	75	200	75	75	200	75	75	200	75	75
Leg Height (ft)		4.5	4	4	4.5	4	4	4.5	4	4	4.5	4	4
H_{LX} - Heel Height (ft)		0	0	0	0	0	0	0	0	0	0	0	0
Meteorological Data		Houston	Houston	Houston	Houston	Houston	Houston	Houston	Houston	Houston	Houston	Houston	Houston
P_A -Avg. Atm Pressure (psia)		14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Material Stored		MTBE	MTBE	MTBE	MTBE	MTBE	MTBE	ETBE	ETBE	ETBE	ETBE	ETBE	ETBE
Daily Max Stock Temp (°F)		95	95	95	95	95	95	95	95	95	95	95	95
VP at Daily Max Liq Temp (psia)		7.23	7.23	7.23	7.23	7.23	7.23	3.57	3.57	3.57	3.57	3.57	3.57
Liquid Density (lb/gal)		6.18	6.18	6.18	6.18	6.18	6.18	6.14	6.14	6.14	6.14	6.14	6.14
M_V - Vapor Molecular Weight (lb/lbmol)		88.15	88.15	88.15	88.15	88.15	88.15	102.18	102.18	102.18	102.18	102.18	102.18
M - Liquid Molecular Weight (lb/lbmol)		88.15	88.15	88.15	88.15	88.15	88.15	102.18	102.18	102.18	102.18	102.18	102.18
R - Ideal Gas Constant (psia-ft³/lbmol°R)		10.73	10.73	10.73	10.73	10.73	10.73	10.73	10.73	10.73	10.73	10.73	10.73
V_V - Vapor Space Volume (ft³)	$V_V = \pi(D/2)^2 x (H_L - H_{LX})$	141,372	17,671	17,671	141,372	17,671	17,671	141,372	17,671	17,671	141,372	17,671	17,671
Emptying the Tank													
No emissions above routine are expected.	This is until the roof is landed once the roof is landed emissions are routed to a temporary control device	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CONTROLLED EMISSIONS	Emissions routed to a temporary control device												
Roof Landing Emissions (Idle Emissions)													
n_d - Number of Days Tank Stands Idle		5	5	5	1	1	1	5	5	5	1	1	1
K_E - Vapor Expansion Factor		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
K_S - Vapor Saturation Factor	full heel = .6 - TCEQ Guidance	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
L_{SL} - Roof Landing Losses (lbs/event)	Equation 2-16 from 7.1.3.2.2 Roof landings of Ch 7, AP-42	1815.88	226.98	226.98	363.18	45.40	45.40	1039.02	129.88	129.88	207.80	25.98	25.98
Total L_{RL} = rim seal loss during roof landing, lbs		1,815.88	226.98	226.98	363.18	45.40	45.40	1,039.02	129.88	129.88	207.80	25.98	25.98
L_{SL} - Roof Landing Losses (lbs/hr)		15.13	1.89	1.89	15.13	1.89	1.89	8.66	1.08	1.08	8.66	1.08	1.08
Capture Efficiency		75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
Roof Landing Losses Emissions to Atmosphere (lb/event)		453.97	56.75	56.75	90.79	11.35	11.35	259.76	32.47	32.47	51.95	6.49	6.49
Roof Landing Emissions to Atmosphere (lb/hr)		3.78	0.47	0.47	3.78	0.47	0.47	2.16	0.27	0.27	2.16	0.27	0.27
Control Efficiency		99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
Controlled Roof Landing Emissions (lb/event)		13.62	1.70	1.70	2.72	0.34	0.34	7.79	0.97	0.97	1.56	0.19	0.19
Controlled Roof Landing Emissions (lb/hr)		0.11	0.01	0.01	0.11	0.01	0.01	0.06	0.01	0.01	0.06	0.01	0.01

Table B-4 (b)
External Floating Roof MSS Emissions

		MTBE - Cleaning			MTBE - Change of Service			ETBE - Cleaning			ETBE - Change of Service		
Cleaning Emissions	use ideal gas law with VP at 95 F or actual temp if higher and vapor molecular weight of compound in the tank												
Cleaning Material Depth (ft) (assumed)	assume cleaning material depth is 4 ft, enough to refloat the roof when water and microbial-based surfactant is added	4	4	4				4	4	4			
Volume Displaced During Cleaning (ft³)	use vapor space volume	125,664	17,671	17,671				125,664	17,671	17,671			
Saturation Factor	assume full heel = 0.6	0.6	0.6	0.6				0.6	0.6	0.6			
Cleaning Losses (lbs/event)	n = PV/RT * saturation factor	8,061	1,134	1,134				4,612	649	649			
Time to flush tank (hours)	water is added to tank using 1-2 hoses at 250 - 300 GPM total used 300 gpm for calculations	52.22	7.34	7.34				52.22	7.34	7.34			
Cleaning Losses (lb/hr)		154.36	154.36	154.36				88.32	88.32	88.32			
Control Efficiency		99%	99%	99%				99%	99%	99%			
Controlled Cleaning Losses (lbs/event)		80.61	11.34	11.34				46.12	6.49	6.49			
Controlled Cleaning Losses (lbs/hr)		1.54	1.54	1.54				0.88	0.88	0.88			
Refloating Emissions													
Filling Saturation Factor	Use drain-dry factor for clean tank 0.15 Use staturated factor for Change of Service 0.6	0.15	0.15	0.15	0.6	0.6	0.6	0.15	0.15	0.15	0.6	0.6	0.6
Refloating Losses (lbs/event)	Equation 2-26 of 7.1.3.2.2 Roof landings of Chapter 7, AP-42	2,267	283	283	9,068	1,134	1,134	1,297	162	162	5,189	649	649
Maximum Filling Rate (GPM)	use 500 bbl/hr fill rate which converts to 350 gpm	350	350	350	350	350	350	350	350	350	350	350	350
Refilling Time (hours)		50.36	6.29	6.29	50.36	6.29	6.29	50.36	6.29	6.29	50.36	6.29	6.29
Hourly Refloating Emissions (lb/hr)		45.02	45.02	45.02	180.09	180.09	180.09	25.76	25.76	25.76	103.04	103.04	103.04
Capture Efficiency		75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
Emissions to Atmosphere (lb/event)		566.78	70.85	70.85	2267.11	283.39	283.39	324.30	40.54	40.54	1297.21	162.15	162.15
Emissions to Atmosphere (lb/hr)		11.26	11.26	11.26	45.02	45.02	45.02	6.44	6.44	6.44	25.76	25.76	25.76
Control Efficiency		99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
Controlled Refloating Emissions (lb/event)		17.00	2.13	2.13	68.01	8.50	8.50	9.73	1.22	1.22	38.92	4.86	4.86
Controlled Refloating Emissions (lb/hr)		0.68	0.68	0.68	2.70	2.70	2.70	0.39	0.39	0.39	1.55	1.55	1.55
External Floating Roof Tank Emissions Summary													
Events per year		1.00	1.00	1.00	1.00	4.00	4.00	3.00	3.00	3.00	1.00	4.00	4.00
Controlled Maximum Hourly Losses (lb/hr)		1.54	1.54	1.54	2.70	2.70	2.70	0.88	0.88	0.88	1.55	1.55	1.55
Controlled Losses (lb/event)		111.23	15.16	15.16	70.74	8.84	8.84	63.64	8.68	8.68	40.47	5.06	5.06
Controlled Losses (ton/year)		0.056	0.008	0.008	0.035	0.018	0.018	0.095	0.013	0.013	0.020	0.010	0.010
Uncontrolled Maximum Hourly Losses (lb/hr)		11.26	11.26	11.26	45.02	45.02	45.02	6.44	6.44	6.44	25.76	25.76	25.76
Uncontrolled Losses (lb/event)		1,020.75	127.59	127.59	2,357.91	294.74	294.74	584.06	73.01	73.01	1,349.16	168.65	168.65
Uncontrolled Losses (ton/year)		0.51	0.06	0.06	1.18	0.59	0.59	0.88	0.11	0.11	0.67	0.34	0.34

Table B-5 (a)
Fixed Roof Tank Maintenance Emissions Summary

Basis:

1. Only one fixed roof tank will be opened at a time.
2. Six fixed roof tanks will be opened per year.
3. Emissions are based on tank with the highest emissions, which is the vapor space calculation for tank. However, any fixed roof tank containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

MSS Emissions

lbs/event	25.40
hours/event	1.00
simultaneous events	1
lbs/hr	**25.40**
total events	6
tons/year	**0.076**

Total MSS Emissions from fixed roof tank openings

lbs/hr	25.40
tons/year	0.08

Table B-5 (b)
FIXED ROOF TANK MSS EMISSIONS

Tank ID	31F-2030	T-82	6F-1778	GAS-2	T-IP-1	T-IP-1	T-P1WW1	T-P1WW1
Material Stored	Diesel	Dimethyl Formamide (DMF)	Lean Oil	Gasoline (RVP-10)	Polyisobutylene (PIB)	Polyisobutylene (HOF)	Aqueous Ammonia (1%)	Aqueous Ammonia (30%)
P - Pressure (psia)	14.7000	14.7000	14.7000	14.7000	14.7000	14.7000	14.7000	14.7000
M_V - Vapor Molecular Weight	230.0000	73.0900	130.0000	66.0000	93.3000	93.3000	18.0000	35.0500
D - Tank Diameter (ft)	30.0	30.0	30.0	30.0	30.0	30.0	16.0	16.0
H_S - Tank Shell Height (ft)	25.0	25.0	25.0	25.0	25.0	25.0	22.5	22.5
H_L - Tank Liquid Height (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roof Type (Cone/Dome/Horizontal)	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone
H_{RO} - Roof Outage (ft)	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
H_{VO} - Vapor Space Outage (ft)	25.3	25.3	25.3	25.3	25.3	25.3	22.7	22.7
T_{max} - Maximum Daily Temp (°F)	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00
V_V - Vapor Space Volume (ft3)	17892.42	17892.42	17892.42	17892.42	17892.42	17892.42	4557.41	4557.41

Concentration of Vapor Space (ppmv)	2500.00	2500.00	2500.00	2500.00	2500.00	2500.00	2500.00	2500.00
Saturated Vapor Released to Atmosphere (lbs)	**25.40**	**8.07**	**14.35**	**7.29**	**10.30**	**10.30**	**0.51**	**0.99**

Tank ID	31F-2030	T-82	6F-1778	GAS-2	T-IP-1	T-IP-1	T-P1WW1	T-P1WW1
Material Stored	Diesel	Dimethyl Formamide (DMF)	Lean Oil	Gasoline (RVP-10)	Polyisobutylene (PIB)	Polyisobutylene (HOF)	Aqueous Ammonia (1%)	Aqueous Ammonia (30%)
lbs/hr	25.40	8.07	14.35	7.29	10.30	10.30	0.51	0.99

MSS Emissions

lbs/event	25.40
hours/event	1.00
simultaneous events	1
lbs/hr	**25.40**
total events	6
tons/year	**0.08**

Total MSS Emissions from fixed roof tank openings

lbs/hr	25.40
tons/year	0.08

Table B-5 (c)
Fixed Roof Tank Emissions from Clingage

Tank ID	T-155	T-81		6F-1778
Material Stored	Triethanolamine (TEA)	Furfural	Lube Oil	Quench Oil
Vapor Pressure (psia)	0.0004	0.06	0.01	0.10
D - Tank Diameter (ft)	20	20	8	20
H_S - Tank Shell Height (ft)	27	27	20	27
A - Interior Surface Area (ft^2)	1,307	1,307	277	1,307
Clingage Factor (ft)	3.33E-05	3.33E-05	3.33E-05	3.33E-05
V - Clingage Volume (ft^3)	0.04	0.04	0.01	0.04
ρ - Density (lb/gal)	5.10	9.68	7.59	7.10
ρ - Density (lb/ft^3)	38.15	72.45	56.77	53.11
Clingage Mass (lb)	1.66	3.16	0.52	2.31
Clingage Mass after water wash (lb)	0.17	0.32	0.05	0.23

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)

1) Assume clingage forms a layer of material 0.0004 inches (0.0000333 ft) thick.
2) Multiply the thickness by the vessel surface area to get volume of liquid.
3) Multiply the volume of the liquid density to get mass of clingage.
4) If VOC vapor perssure of the materials is ≤ 0.1, use clingage emissions; vapor space emissions can be neglected.

Calculation Formulas:	**Reference:**
$A\ (ft^2) = 2\pi\ (D/2)^2 + 2\ \pi\ (D/2)\ H_s$	
$V\ (ft^2) = A \times$ Clingage Factor	TCEQ MSS Update for Process Vessels, page 86
Clingage Mass (lb) = V x ρ	TCEQ MSS Update for Process Vessels, page 86

Table B-6 (a)
Frac Tanks Maintenance Emissions Summary

Basis:

1. Six frac tanks will be filled at a time.
2. Up to three hundred fifty Frac Tanks may be used per year.
3. Emissions are based on the vapor space calculation for the material with the highest emissions. However, the frac tank may contain material as long as emissions are less than or equal to the emissions represented below.

MSS Emissions

lbs/hr	0.57
simultaneous events	6.00
lbs/hr	3.43
tons/year	0.04

Total MSS Emissions from Frac Tanks	
lbs/hr	3.43
tons/year	0.04

Table B-6 (b)
FRAC TANK MSS EMISSIONS

Variable	Description	Units	Value
LT	total loss = Ls + Lw	lb/yr	
Lh	Maximum houlry working loss = 0.001 Mv Pv Q/42 Kp	lb/hr	
Ls	standing loss = 365 Vv Wv Ke Ks	lb/yr	
Lw	working loss = 0.001 Mv Pv Q/42 Kn Kp	lb/yr	
I	Solar insolation factor	Btu/ft2-day	1351
P_A	Atmospheric Pressure	psia	14.7
T	Annual Average Temperature	°F	68.25
T_{AX}	Daily Maximum Ambient Temperature	°F	95
T_{AN}	Daily Minimum Ambient Temperature	°F	57.4
DTa	Daily average ambient temperature range	°F	26.75
Kp	Product factor		1

Material Stored	AP-42 Section 7.1 Equation					
		Lean Oil	Dimethyl Formamide (DMF) 10%	Methanol 10%	MTBE 10%	Diisobutylene (DIB) (C 8s) 10%
Average Vapor Pressure (psia)		1.77	0.49	0.61	0.60	0.51
Maximum Vapor Pressure (psia)		2.94	0.58	0.73	0.71	0.61
Mv - Vapor Molecular Weight		130	18.2287	21.2247	30.5862	21.6325
D - Tank Diameter (ft)		6.8	6.8	6.8	6.8	6.8
Hs - Tank Shell Height (ft)		15.2	15.2	15.2	15.2	15.2
Tank Capacity (gal)		16,400	16,400	16,400	16,400	16,400
Roof Type(Cone/Dome/ Horizontal)		dome	dome	dome	dome	dome
Tank Color		white	white	white	white	white
a - Paint Solar Absorb Factor		0.17	0.17	0.17	0.17	0.17
ΔTv - Daily Vapor Temp. Range (°F)	(1-8)	22.07	22.07	22.07	22.07	22.07
Hvo - Vapor Space Outage (ft)	(1-15)	8.07	8.07	8.07	8.07	8.07
Vv - Vapor Space Volume (ft3)		292.92	292.92	292.92	292.92	292.92
Wv - Vapor Density (lb/ft3)		0.04	0.00	0.00	0.00	0.00
Ke - Vapor Space Expan. Factor	(1-5)	0.04	0.04	0.04	0.04	0.04
Ks -Vented Vapor Sat. Factor	(1-20)	0.57	0.83	0.79	0.80	0.82
Frac Tanks per year		350	350	350	350	350
Q - Annual thruput (gal)		5,740,000	5,740,000	5,740,000	5,740,000	5,740,000
Q - Maximum Hourly Pump Rate (gph)		6300.00	6300.00	6300.00	6300.00	6300.00
Kn - Turnover Factor		0.252381	0.25238095	0.252381	0.252381	0.252380952
Ls - Standing Loss (lb/yr)	(1-4)	98.15	5.52	7.70	10.88	6.80
Lw - -Working Loss (lb/yr)	(1-29)	7,936.62	307.27	447.23	628.56	381.28
LT - Total Loss (ton/yr)	(1-1)	4.02	0.16	0.23	0.32	0.19
Lw -Working Loss (lb/hr)	(1-29)	57.23	1.60	2.32	3.24	1.98

Controlled Emissions

Control Efficiency[2] (%)		90.00	90.00	90.00	90.00	90.00
Ls - Standing Loss (lb/yr)		0.98	0.06	0.08	0.11	0.07
Lw - -Working Loss (lb/yr)		79.37	3.07	4.47	6.29	3.81
LT - Total Loss (ton/yr)		0.04	0.00	0.00	0.00	0.00
Lw -Working Loss (lb/hr)		0.57	0.02	0.02	0.03	0.02

Notes:

1) Equations from AP-42 Section 7.1 (dated 11/06)

2) The vent from the frac tank is controlled with a dual carbon canister which each have an efficiency of 90%.

Table B-7 (a)
Heat Exchanger Maintenance Emissions Summary

Basis:

1. Twelve heat exchangers may be opened simultaneously.
2. Three hundred heat exchangers will be opened per year.
3. Emissions are based on the worst case scenario, which uses the combination of heat exchanger and possible material with the highest emissions, which is the clingage calculation. However, any heat exchanger containing any material may be used as long as the emissions are less than or equal to the emissions represented below.
4. A water wash is performed prior to opening the heat exchanger. The volume of water used will remove 99% of the material.

Heat Exchanger Emissions from Clingage

Heat Exchanger	Material Stored	Heat Exchanger Tube Surface Area (ft^2)	Clingage Factor (ft)	Clingage Volume (ft^3)	Density (lb/gal)	Density (lb/ft^3)	Clingage Mass (lb)	Clingage Mass After Water Wash (lb)
1E-2586	Furfural	5036.00	3.33E-05	1.68E-01	9.6848	72.45	12.16	0.12

MSS Emissions

lbs/event	0.12
hours/event	1.00
simultaneous events	12.00
lbs/hr	**1.46**
total events	375
tons/year	**0.02**

Total MSS Emissions from heat exchanger openings

lbs/hr		lbs/hr	1.46
tons/year		tons/year	0.02

Table B-7 (b)
Heat Exchanger Vapor Space Emissions for VOC Evacuated from Process Units During Turnarounds

Largest Heat Exchanger with varied constituents

Heat Exchanger	Description	V Estimated Unit Volume (ft^3)	Pressure (psia)	Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppmv)	Saturated Vapor Released (lbs)
1E-2586	Lean Oil	64.94	14.7	95	130	500	**0.010**
1E-2586	Dimethyl Formamide (DMF)	64.94	14.7	95	73.09	500	**0.006**
1E-2586	Methanol	64.94	14.7	95	32.04	500	**0.003**
1E-2586	MTBE	64.94	14.7	95	88.15	500	**0.007**
1E-2586	Diisobutylene (DIB) (C 8s)	64.94	14.7	95	112.2	500	**0.009**
1E-2586	Polyisobutylene (PIB)	64.94	14.7	95	93.3	500	**0.007**
1E-2586	Polyisobutylene (HOF)	64.94	14.7	95	93.3	500	**0.007**
1E-2586	Gasoline (RVP-10)	64.94	14.7	95	66	500	**0.005**
1E-2586	1,3 Butadiene	64.94	14.7	95	54.1	500	**0.004**
1E-2586	Butene	64.94	14.7	95	56.11	500	**0.004**
1E-2586	Isobutylene	64.94	14.7	95	56.11	500	**0.004**
1E-2586	Butane	64.94	14.7	95	58.123	500	**0.005**
1E-2586	Isobutane	64.94	14.7	95	58.12	500	**0.005**
1E-2586	ETBE	64.94	14.7	95	102.18	500	**0.008**
1E-2586	Ethanol	64.94	14.7	95	46.07	500	**0.004**
1E-2586	Polygas	64.94	14.7	95	150.3	500	**0.012**
1E-2586	Vinyl Acetylene	64.94	14.7	95	52.07	500	**0.004**
1E-2586	Aqueous Ammonia (1%)	64.94	14.7	95	18	500	**0.001**
1E-2586	Pentane	64.94	14.7	95	72.15	500	**0.006**

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) Use Ideal Gas Law to calculate emissions.
2) Use vessel pressure for vapor pressure.
3) If VOC vapor pressure of the materials is ≥ 0.1 use vapor space emissions; clingage emissions can be neglectec
4) Assume maximum temperature of the vapor space to be 95 ° F.

Calculation Formulas:

$V\ (ft^3) = \pi\ (D/2)^2\ L$ x number of tubes

Saturated Vapor Released (lbs) = PV/RT

Reference:

MSS Update for Process Vessels, page 87.

Table B-7 (c)
Heat Exchanger Emissions from Clingage

Heat Exchanger	Material Stored	A Heat Exchanger Tube Surface Area (ft²)	Clingage Factor (ft)	V Clingage Volume (ft³)	ρ Density (lb/gal)	ρ Density (lb/ft³)	Clingage Mass (lb)	Clingage Mass After Water Wash (lb)
1E-2586	Triethanolamine (TEA)	5036.00	3.33E-05	1.68E-01	5.1	38.15	**6.40**	**0.06**
1E-2586	Furfural	5036.00	3.33E-05	1.68E-01	9.6848	72.45	**12.16**	**0.12**
1E-2586	Quench Oil	5036.00	3.33E-05	1.68E-01	7.1	53.11	**8.92**	**0.09**
1E-2586	Propylene Glycol	5036.00	3.33E-05	1.68E-01	8.646	64.68	**10.86**	**0.11**
1E-2586	Ethylene Glycol	5036.00	3.33E-05	1.68E-01	9.29	69.49	**11.67**	**0.12**

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) Assume clingage forms a layer of material 0.0004 inches (0.0000333 ft) thick.
2) Multiply the thickness by the vessel surface area to get volume of liquid.
3) Multiply the volume of the liquid density to get mass of clingage.
4) If VOC vapor perssure of the materials is ≤ 0.1, use clingage emissions; vapor space emissions can be neglected.
5) The surface area of the largest furfural heat exchangers was used.

Calculation Formulas:	**Reference:**
A (ft²) =[2π (D/2)² + 2 π (D/2) L] x number of tubes	
V (ft²) = A x Clingage Factor	TCEQ MSS Update for Process Vessels, page 86
Clingage Mass (lb) = V x ρ	TCEQ MSS Update for Process Vessels, page 86

Table B-8 (a)
Internal Floating Roof Tank Maintenance Emissions Summary

Basis:

1. Two IFR's may be opened at the same time. However, no more than 1 MTBE or ETBE tank will be able to be opened at one time.
2. Up to twenty five internal floating roof tanks may be opened per year. Fifteen openings will include cleanings and ten will be for change of service only.
3. Emissions are based on the largest internal floating roof tank (Tank 71/72) with the highest emissions. Any combination of internal floating roof tanks may be used as long as the hourly and annual emissions do not exceed the emissions represented below.
4. Emissions are based on DIB, Ethanol, Methanol, Lean Oil, Quench Oil, Furfural, Polygas, MTBE and ETBE being stored in internal floating roof tanks.

Uncontrolled MSS Emissions from internal floating roof tank openings

lbs/hr	519.20
tons/year	6.64

Controlled MSS Emissions from internal floating roof tank openings routed to a thermal oxidizer

lbs/hr	2.47
tons/year	0.11

Table B-8 (b)
Internal Floating Roof MSS Emissions

		Cleaning	COS	Cleaning	COS	Cleaning	COS	Cleaning	COS
Tank ID	**Notes/Equations Used**	**71**	**71**	**71**	**71**	**71**	**71**	**71**	**71**
Type of Tank		IFR	IFR	IFR	IFR	IFR	IFR	IFR	IFR
D - Tank Diameter (ft)		73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3
H_L - Leg Height (ft)		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
H_{LX} - Heel Height (ft)		0	0	0	0	0	0	0	0
Meteorological Data		Houston	Houston	Houston	Houston	Houston	Houston	Houston	Houston
Material Stored		MTBE	MTBE	ETBE	ETBE	Ethanol	Ethanol	Methanol	Methanol
Daily Max Stock Temp (°F)		95	95	95	95	95	95	95	95
VP at Daily Max Liq Temp (psia)		7.23	7.23	3.57	3.57	2.00	2.00	4.00	4.00
Liquid Density (lb/gal)		6.18	6.18	6.14	6.14	6.61	6.61	6.63	6.63
M_V - Vapor Molecular Weight (lb/lbmol)		88.15	88.15	102.18	102.18	46.07	46.07	32.04	32.04
M - Liquid Molecular Weight (lb/lbmol)		88.15	88.15	102.18	102.18	46.07	46.07	32.04	32.04
R - Ideal Gas Constant (psia-ft^3/lbmol°R)		10.73	10.73	10.73	10.73	10.73	10.73	10.73	10.73
V_V - Vapor Space Volume (ft^3)	$V_V = \pi(D/2)^2 x (H_L-H_{LX})$	18,989.36	18,989.36	18,989.36	18,989.36	18,989.36	18,989.36	18,989.36	18,989.36
Emptying the Tank									
No emissions above routine are expected.		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CONTROLLED EMISSIONS									
Idle Emissions									
n_d - Number of Days Tank Stands Idle		5	1	5	1	5	1	5	1
DT_A (°R)		20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3
K_E - Vapor Expansion Factor		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
K_S - Vapor Saturation Factor	full heel = .6 - TCEQ Guidance	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
L_{SL} - Roof Landing Losses (lbs/event)	Equation 2-16 from 7.1.3.2.2 Roof landings of Ch 7, AP-42	230.73	46.15	132.02	26.40	33.37	6.67	46.44	9.29
Total L_{RL} = rim seal loss during roof landing, lbs		230.73	46.15	132.02	26.40	33.37	6.67	46.44	9.29
L_{SL} - Roof Landing Losses (lbs/hr)		1.92	1.92	1.10	1.10	0.28	0.28	0.39	0.39
Capture Efficiency		75%		75%		75%		75%	
Roof Landing Losses Emissions to Atmosphere (lbs/event)		0.48		0.28		0.07		0.10	
Roof Landing Losses Emissions to Atmosphere (lb/hr)		0.004		0.002		0.001		0.001	
Control Efficiency		99%		99%		99%		99%	
Controlled L_{SL} - Roof Landing Losses (lbs/event)		1.73		0.99		0.25		0.35	
Controlled L_{SL} - Roof Landing Losses (lbs/hr)		0.014		0.008		0.002		0.003	
Cleaning Emissions	use ideal gas law with VP at 95 F or actual temp if higher and vapor molecular weight of compound in the tank								
Cleaning Material Depth (ft) (assumed)	assume cleaning material depth is 4 ft, enough to refloat the roof when water and microbial-based surfactant is added	4		4		4		4	
Volume Displaced During Cleaning (ft3)	use vapor space volume	16,879		16,879		16,879		16,879	
Saturation Factor	full heel = .6 - TCEQ Guidance	0.6		0.6		0.6		0.6	
Cleaning Losses (lbs/event)	n = PV/RT * saturation factor	1,083		620		157		218	
Time to flush tank (hours)	water is added to tank using 1-2 hoses at 250 - 300 GPM total used 300 gpm for calculations	7.01		7.01		7.01		7.01	
Cleaning Losses (lbs/hr)		154.36		88.32		22.32		31.07	
Control Efficiency		99.00%		99.00%		99.00%		99.00%	
Controlled Cleaning Losses (lbs/event)		10.83		6.20		1.57		2.18	
Controlled Cleaning Losses (lbs/hour)		1.54		0.88		0.22		0.31	
Refloating Emissions	Equation 2-26 of 7.1.3.2.2 Roof landings of Chapter 7, AP-42								
Filling Saturation Factor	Use drain-dry factor for clean tank 0.15 Use saturated heel for change of service 0.6	0.15	0.6	0.15	0.6	0.15	0.6	0.15	0.6
Refloating Losses (lbs/event)	Equation 2-26 of 7.1.3.2.2 Roof landings of Chapter 7, AP-42	304.52	1218.09	174.24	696.98	44.04	176.16	61.29	245.15
Maximum Filling Rate (GPH)	1200 bbl/hr	50,400	50,400	50,400	50,400	50,400	50,400	50,400	50,400
Refilling Time (hours)		2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82
Hourly Refloating Emissions (lb/hr)		108.05	432.21	61.83	247.31	15.63	62.51	21.75	86.99
Capture Efficiency		75%		75%		75%		75%	
Emissions to Atmosphere (lb/event)		76.13		43.56		11.01		15.32	
Emissions to Atmosphere (lb/hr)		27.01		15.46		3.91		5.44	
Control Efficiency		99%		99%		99%		99%	
Controlled Refloating Emissions (lb/event)		2.28		1.31		0.33		0.46	
Controlled Refloating Emissions (lb/hr)		0.81		0.46		0.12		0.16	

Table B-8 (b)
Internal Floating Roof MSS Emissions

Internal Floating Roof Tank Emissions Summary									
Events per year		15.00	5.00	2.00	5.00	13.00	10.00	13.00	10.00
Controlled Maximum Hourly Losses (lb/hr)		1.54		0.88		0.22		0.31	
Controlled Losses (lb/event)		14.84		8.49		2.15		2.99	
Controlled Losses (ton/year)		0.111		0.008		0.014		0.019	
Uncontrolled Maximum Hourly Losses (lb/hr)		27.01	432.21	15.46	247.31	3.91	62.51	5.44	86.99
Uncontrolled Losses (lb/event)		76.61	1,264.24	43.84	723.38	11.08	182.83	15.42	254.44
Uncontrolled Losses (ton/year)		0.57	3.16	0.04	1.81	0.07	0.91	0.10	1.27
		3.74		1.85		0.99		1.37	
		5.54							

Uncontrolled MSS Emissions from internal floating roof tank openings

lbs/hr	519.20
tons/year	5.54

Controlled MSS Emissions from internal floating roof tank openings routed to a thermal oxidizer

lbs/hr	2.47
tons/year	0.11

Cleaning	Cleaning	COS	Cleaning	Cleaning	COS	Cleaning	COS
71	71	71	71	71	71	71	71
IFR	IFR	IFR	IFR	IFR	IFR	IFR	IFR
73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3
4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
0	0	0	0	0	0	0	0
Houston	Houston	Houston	Houston	Houston	Houston	Houston	Houston
Lean Oil	Polygas	Polygas	Diisobutylene (DIB) (C 8s)	Quench Oil	Quench Oil	Furfural	Furfural
95	95	95	95	95	95	95	95
2.94	0.28	0.28	1.34	0.10	0.10	0.06	0.06
7.26	5.00	5.00	5.97	7.10	7.10	9.68	9.68
130.00	150.30	150.30	112.20	130.00	130.00	96.09	96.09
188.00	150.30	150.30	112.20	188.00	188.00	96.09	96.09
10.73	10.73	10.73	10.73	10.73	10.73	10.73	10.73
18,989.36	18,989.36	18,989.36	18,989.36	18,989.36	18,989.36	18,989.36	18,989.36
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	5	1	5	5	1	5	1
20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
138.11	15.23	3.05	54.42	4.82	0.96	2.20	0.44
138.11	15.23	3.05	54.42	4.82	0.96	2.20	0.44
1.15	0.13	0.13	0.45	0.04	0.04	0.02	0.02
75%	75%		75%	75%		75%	
0.29	0.03		0.11	0.01		0.005	
0.002	0.0003		0.001	0.0001		0.00004	
99%	99%		99%	99%		99%	
1.04	0.11		0.41	0.04		0.02	
0.009	0.001		0.003	0.000		0.000	
4	4		4	4		4	
16,879	16,879		16,879	16,879		16,879	
0.6	0.6		0.6	0.6		0.6	
648	71		255	23		10	
7.01	7.01		7.01	7.01		7.01	
92.40	10.19		36.41	3.23		1.47	
99.00%	99.00%		99.00%	99.00%		99.00%	
6.48	0.71		2.55	0.23		0.10	
0.92	0.10		0.36	0.03		0.01	
0.15	0.15	0.6	0.15	0.15	0.6	0.15	0.6
182.28	20.10	80.42	71.83	6.37	25.46	2.90	11.62
50,400	50,400	50,400	50,400	50,400	50,400	50,400	50,400
2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82
64.68	7.13	28.54	25.49	2.26	9.04	1.03	4.12
75%	75%		75%	75%		75%	
45.57	5.03		17.96	1.59		0.73	
16.17	1.78		6.37	0.56		0.26	
99%	99%		99%	99%		99%	
1.37	0.15		0.54	0.05		0.02	
0.49	0.05		0.19	0.02		0.01	

13.00	13.00	10.00	13.00	13.00	10.00	13.00	10.00
0.92	0.10		0.36	0.03		0.01	
8.88	0.98		3.50	0.31		0.14	
0.058	0.006		0.023	0.002		0.001	
16.17	1.78	28.54	6.37	0.56	9.04	0.26	4.12
45.86	5.06	83.47	18.07	1.60	26.43	0.73	12.06
0.30	0.03	0.42	0.12	0.01	0.13	0.00	0.06
0.30	0.45		0.12	0.14		0.07	

Table B-9 (a)
Piping and Fugitive Component Maintenance Emissions Summary

Basis:

1. Pipe is 6 inches in diameter and 20 feet long.
2. Emissions are based on the vapor space calculation with the pipe containing the material with the highest emissions. However, any size pipe containing any material may be used as long as the emissions are less than or equal to
3. Six events may occur at the same time and up to 6000 events per year.

Constituent	V Estimated Unit Volume (ft³)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Polygas	3.93	14.7	95	150.30	10,000	0.1563

MSS Emissions

lbs/event	0.1563
hours/event	1
simultaneous events	6
lbs/hr	0.9380
total events	6000
tons/year	0.4690

Total MSS Emissions from Piping and Fugitive Components

lbs/hr	0.94
tons/year	0.47

Table B-9 (b)
Piping and Fugitive Component Maintenance Emissions Vapor Space Calculation

Basis:

1. Pipe is 6 inches in diameter and 20 feet long (volume = 3.93 ft^3).

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Lean Oil	3.93	14.7	95	130.00	10,000	0.0126
Dimethyl Formamide (DMF)	3.93	14.7	95	73.09	10,000	0.0071
Methanol	3.93	14.7	95	32.04	10,000	0.0031
MTBE	3.93	14.7	95	88.15	10,000	0.0085
Diisobutylene (DIB) (C 8s)	3.93	14.7	95	112.20	10,000	0.0109
Polyisobutylene (PIB)	3.93	14.7	95	93.30	10,000	0.0090
Polyisobutylene (HOF)	3.93	14.7	95	93.30	10,000	0.0090
Gasoline (RVP-10)	3.93	14.7	95	66.00	10,000	0.0064
1,3 Butadiene	3.93	14.7	95	54.10	10,000	0.0052
Butene	3.93	14.7	95	56.11	10,000	0.0054
Isobutylene	3.93	14.7	95	56.11	10,000	0.0054
Butane	3.93	14.7	95	58.12	10,000	0.0056
Isobutane	3.93	14.7	95	58.12	10,000	0.0056
ETBE	3.93	14.7	95	102.18	10,000	0.0099
Ethanol	3.93	14.7	95	46.07	10,000	0.0045
Polygas	3.93	14.7	95	150.30	10,000	0.0146
Vinyl Acetylene	3.93	14.7	95	52.07	10,000	0.0050
Aqueous Ammonia (1%)	3.93	14.7	95	18.00	10,000	0.0017
Aqueous Ammonia (30%)	3.93	14.7	95	35.05	10,000	0.0034
Pentane	3.93	14.7	95	72.15	10,000	0.0070

Notes:

According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)

1) Use Ideal Gas Law to calculate emissions.
2) Use pipe pressure (open to atmosphere) for vapor pressure.
3) If VOC vapor pressure of the materials is ≥ 0.1, use vapor space emissions; clingage emissions can be neglected.

Calculation Formulas:

V (ft3) = $\pi(D/2)^2L$

Saturated Vapor Released (lbs) = PV/RT

Reference:

MSS Update for Process Vessels, page 87.

Table B-9 (c)
Piping and Fugitive Component Emissions from Clingage

Assumptions:
1. Pipe is 6 inches in diameter and 20 feet long (surface area = 31.81 ft2).

Material Stored	A Pipe Surface Area (ft^2)	Clingage Factor (ft)	V Clingage Volume (ft^3)	ρ Density (lb/gal)	ρ Density (lb/ft^3)	Clingage Mass (lb)
Triethanolamine (TEA)	31.81	0.000033	0.0011	5.1000	38.1508	0.0405
Furfural	31.81	0.000033	0.0011	9.6848	72.4476	0.0768
Quench Oil	31.81	0.000033	0.0011	7.1000	53.1119	0.0563
Lube Oil	31.81	0.000033	0.0011	7.5894	56.7729	0.0602
PIB-solv	31.81	0.000033	0.0011	7.1130	53.2092	0.0564
Propylene Glycol	31.81	0.000033	0.0011	8.6460	64.6768	0.0686
Ethylene Glycol	31.81	0.000033	0.0011	9.2900	69.4943	0.0737

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) Assume clingage forms a layer of material 0.0004 inches (0.0000333 ft) thick.
2) Multiply the thickness by the vessel surface area to get volume of liquid.
3) Multiply the volume of the liquid density to get mass of clingage.
4) If VOC vapor perssure of the materials is ≤ 0.1, use clingage emissions; vapor space emissions can be neglected.

Calculation Formulas:	**Reference:**
$A\ (ft^2) = \pi\ (D/2)^2 + 2\ \pi\ (D/2)L$	
$V\ (ft^2) = A \times$ Clingage Factor	TCEQ MSS Update for Process Vessels, page 86
Clingage Mass (lb) = $V \times \rho$	TCEQ MSS Update for Process Vessels, page 86

Table B-10 (a)
Poly/Temporary Tank Maintenance Emissions Summary

Basis:

1. Up to 20 poly tanks will be used per year.
2. Two poly tanks will be filled at a time.
3. Emissions are based on tank with the highest emissions, which is the vapor space calculation for Tank, T-81. However, any fixed roof tank containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

MSS Emissions

lbs/event	5.72325
hours/event	1
simultaneous events	2
lbs/hr	11.4465
total events	20
tons/year	0.0572325

Total MSS Emissions from fixed roof tank openings

lbs/hr	11.45
tons/year	0.06

Table B-10 (b)
POLY/TEMPORARY TANK MSS EMISSIONS

Variable	Description	Units	Value
LT	total loss = Ls + Lw	lb/yr	
Lh	Maximum houlry working loss = 0.001 Mv Pv Q/42 Kp	lb/hr	
Ls	standing loss = 365 Vv Wv Ke Ks	lb/yr	
Lw	working loss = 0.001 Mv Pv Q/42 Kn Kp	lb/yr	
I	Solar insolation factor	Btu/ft2-day	1351
P_A	Atmospheric Pressure	psia	14.7
T	Annual Average Temperature	°F	68.25
T_{AX}	Daily Maximum Ambient Temperature	°F	95
T_{AN}	Daily Minimum Ambient Temperature	°F	57.4
DTa	Daily average ambient temperature range	°F	26.75
Kp	Product factor		1

AP42 Table 7.1-6

Spreadsheet Table Name = Paint

1	2	3
Alum_Spec	0.39	0.49
Alum_Diff	0.6	0.68
Gray_Lt	0.54	0.63
Gray_Med	0.68	0.74
Red	0.89	0.91
White	0.17	0.34

Material Stored	AP-42 Section 7.1 Equation							Dimethyl Formamide (DMF)	Diisobutylene (DIB) (C 8s)	Polyisobutylene (PIB)	Furfural	Triethanolamine (TEA)	
		Lean Oil	Dimethyl Formamide (DMF) 10%	Methanol 10%	MTBE 10%	Diisobutylene (DIB) (C 8s) 10%	Polyisobutylene (PIB) 10%	Dimethyl Formamide (DMF)	Diisobutylene (DIB) (C 8s)	Polyisobutylene (PIB)	Furfural	Triethanolamine (TEA)	Polyisobutylene (HOF) 10%
Average Vapor Pressure (psia)		1.77	0.49	0.61	0.60	0.51	0.50	0.06	0.68	0.12	0.02	0.00	0.50
Maximum Vapor Pressure (psia)		2.94	0.58	0.73	0.71	0.61	0.59	0.14	1.34	0.12	0.06	0.00	0.60
Mv - Vapor Molecular Weight		130	18.2287	21.2247	30.5862	21.6325	18.1057	73.09	112.2	93.3	96.09	149.19	18.4972
D - Tank Diameter (ft)		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Hs - Tank Shell Height (ft)		10	10	10	10	10	10	10	10	10	10	10	10
Tank Capacity (gal)		4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Roof Type(Cone/Dome/ Horizontal)		dome	dome	dome	dome	dome	dome	dome	dome	dome	dome	dome	dome
Tank Color		white	white	white	white	white	white	white	white	white	white	white	white
a - Paint Solar Absorb Factor		0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ΔTv - Daily Vapor Temp. Range (°F)	(1-8)	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07
Hvo - Vapor Space Outage (ft)	(1-15)	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31
Vv - Vapor Space Volume (ft3)		84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42
Wv - Vapor Density (lb/ft3)		0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Ke - Vapor Space Expan. Factor	(1-5)	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Ks -Vented Vapor Sat. Factor	(1-20)	0.67	0.88	0.85	0.86	0.87	0.88	0.98	0.84	0.97	0.99	1.00	0.88
Q - Annual thruput (gal)		80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
Q - Maximum Hourly Pump Rate (gph)		6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00
Kn - Turnover Factor		1	1	1	1	1	1	1	1	1	1	1	1
Ls - Standing Loss (lb/yr)	(1-4)	33.17	1.69	2.39	3.37	2.09	1.71	0.92	13.83	2.40	0.45	0.01	1.75
Lw - -Working Loss (lb/yr)	(1-29)	438.29	16.97	24.70	34.71	21.06	17.17	8.29	145.33	21.86	4.04	0.05	17.60
LT - Total Loss (ton/yr)	(1-1)	0.24	0.01	0.01	0.02	0.01	0.01	0.00	0.08	0.01	0.00	0.00	0.01
Lw -Working Loss (lb/hr)	(1-29)	57.23	1.60	2.32	3.24	1.98	1.61	1.59	22.55	1.72	0.91	0.01	1.65

Controlled Emissions

Control Efficiency[2] (%)		90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
Ls - Standing Loss (lb/yr)		3.32	0.17	0.24	0.34	0.21	0.17	0.09	1.38	0.24	0.05	0.00	0.17
Lw - -Working Loss (lb/yr)		43.83	1.70	2.47	3.47	2.11	1.72	0.83	14.53	2.19	0.40	0.00	1.76
LT - Total Loss (ton/yr)		0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Lw -Working Loss (lb/hr)		5.72	0.16	0.23	0.32	0.20	0.16	0.16	2.26	0.17	0.09	0.00	0.17

1,3 Butadiene 1%	Butene 1%	Isobutylene 1%	Butane 1%	Isobutane1 %	ETBE 10%	Ethanol 10%	Polygas 10%	Aqueous Ammonia (1%)	Furfural 10%	Propylene Glycol 10%	Polygas 10%	Ethylene Glycol 10%
0.63	0.63	0.63	0.61	0.61	0.53	0.53	0.50	1.30	0.48	0.49	0.50	0.71
0.74	0.75	0.75	0.72	0.72	0.64	0.63	0.59	1.50	0.57	0.58	0.59	0.83
25.7145	25.7326	25.7326	25.206	25.206	24.8912	20.529	19.74	18	18.2159	18.007	18.8965	54.7758
4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
10	10	10	10	10	10	10	10	10	10	10	10	10
4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
dome	dome	dome	dome	dome	dome	dome	dome	dome	dome	dome	dome	dome
white	white	white	white	white	white	white	white	white	white	white	white	white
0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07	22.07
5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31
84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42	84.42
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.85	0.85	0.85	0.85	0.85	0.87	0.87	0.88	0.73	0.88	0.88	0.88	0.83
80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00	6300.00
1	1	1	1	1	1	1	1	1	1	1	1	1
2.99	2.99	2.99	2.82	2.82	2.49	2.03	1.86	3.70	1.66	1.67	1.78	7.02
31.08	31.10	31.10	29.17	29.17	25.31	20.59	18.68	44.57	16.62	16.71	17.88	74.31
0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.04
2.87	2.88	2.88	2.71	2.71	2.37	1.94	1.76	4.05	1.56	1.57	1.68	6.85

90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
0.30	0.30	0.30	0.28	0.28	0.25	0.20	0.19	0.37	0.17	0.17	0.18	0.70
3.11	3.11	3.11	2.92	2.92	2.53	2.06	1.87	4.46	1.66	1.67	1.79	7.43
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.29	0.29	0.29	0.27	0.27	0.24	0.19	0.18	0.41	0.16	0.16	0.17	0.69

Table B-11 (a)
Pump Maintenance Emissions Summary

Basis:

1. Six pumps can be opened simultaneously based on available maintenance personnel.
2. Up to six hundred pumps may be opened per year (based on work orders per year and a contingency factor).
3. Emissions are based on the clingage calculation for the largest pump containing the material with the highest emissions. However, any pump containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Pump Size	Vapor Pressure (psia)	Casing and Impeller Surface Area (ft^2)	Clingage Factor (ft)	Clingage Volume (ft^3)	Density (lb/gal)	Density (lb/ft^3)	Clingage Mass (lb)
Large	0.06	12.85	3.33E-05	0.0004	9.68	72.45	0.03

MSS Emissions

lbs/event	0.03
hours/event	1
simultaneous events	6
lbs/hr	**0.19**
total events	600
tons/year	**0.009**

Total MSS Emissions from pump openings

lbs/hr	**<0.19**
tons/year	**<0.01**

Table B-11 (b)
Pump Vapor Space Emissions for VOC Evacuated from Process Units During Turnarounds

Pump Category	Material	V Volume of Casing (ft³)	Pressure (psia)	Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppmV)	Saturated Vapor (lbs)
Large	Lean Oil	0.98	15	95	130	500	0.00016
Large	Dimethyl Formamide (DMF)	0.98	15	95	73	500	0.00009
Large	Methanol	0.98	15	95	32	500	0.00004
Large	MTBE	0.98	15	95	88	500	0.00011
Large	Diisobutylene (DIB) (C 8s)	0.98	15	95	112	500	0.00014
Large	Polyisobutylene (PIB)	0.98	15	95	93	500	0.00011
Large	Polyisobutylene (HOF)	0.98	15	95	93	500	0.00011
Large	Gasoline (RVP-10)	0.98	15	95	66	500	0.00008
Large	1,3 Butadiene	0.98	15	95	54	500	0.00007
Large	Butene	0.98	15	95	56	500	0.00007
Large	Isobutylene	0.98	15	95	56	500	0.00007
Large	Butane	0.98	15	95	58	500	0.00007
Large	Isobutane	0.98	15	95	58	500	0.00007
Large	ETBE	0.98	15	95	102	500	0.00012
Large	Ethanol	0.98	15	95	46	500	0.00006
Large	Polygas	0.98	15	95	150	500	0.00018
Large	Vinyl Acetylene	0.98	15	95	52	500	0.00006
Large	Aqueous Ammonia (1%)	0.98	15	95	18	500	0.00002
Large	Aqueous Ammonia (30%)	0.98	15	95	35	500	0.00004
Large	Pentane	0.98	15	95	72	500	0.00009

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) To calculation emissions from the vapor space use the Ideal Gas Law.
2) Pressure used is the vessel pressure.
3) If VOC vapor pressure of the materials is ≥ 0.1 use vapor space emissions; clingage emissions can be
4) Assumed maximum temperature of the vapor space to be 95 ° F

Calculation Formulas:
V (ft3) = $\pi(D/2)^2T$
Saturated Vapor Released (lbs) = PV/RT

Reference:
MSS Update for Process Vessels, page 87.

Table B-11 (c)
Pump Emissions from Clingage

Pump Size	Material Stored	A Casing and Impeller Surface Area (ft^2)	Clingage Factor (ft)	V Clingage Volume (ft^3)	ρ Density (lb/gal)	ρ Density (lb/ft^3)	Clingage Mass (lb)
Large	Triethanolamine (TEA)	12.85	3.33E-05	4.28E-04	5.1	38.15	0.0163
Large	Furfural	12.85	3.33E-05	4.28E-04	9.6848	72.45	0.0310
Large	Lube Oil	12.85	3.33E-05	4.28E-04	7.5894	56.77	0.0243
Large	PIB-solv	12.85	3.33E-05	4.28E-04	7.113	53.21	0.0228
Large	Quench Oil	12.85	3.33E-05	4.28E-04	7.1	53.11	0.0227
Large	Propylene Glycol	12.85	3.33E-05	4.28E-04	8.646	64.68	0.0277
Large	Ethylene Glycol	12.85	3.33E-05	4.28E-04	9.29	69.49	0.0298

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) Assume clingage forms a layer of material 0.0004 inches (0.0000333 ft) thick.
2) Multiply the thickness by the vessel surface area to get volume of liquid.
3) Multiply the volume of the liquid density to get mass of clingage.
4) If VOC vapor pressure of the materials is ≤ 0.1 use clingage emissions; vapor space emissions can be neglected.

Calculation Formulas:	**Reference:**
$A\ (ft^2) = \pi\ (D/2)^2 + 2\ \pi\ (D/2)\ T$	
$V\ (ft^2) = A \times$ Clingage Factor	TCEQ MSS Update for Process Vessels, page 86
Clingage Mass (lb) = V x ρ	TCEQ MSS Update for Process Vessels, page 86

Table B-12 (a)
Sphere Maintenance Emissions Summary

Basis:

1. Only 1 sphere will be opened at a time based on available maintenance personnel and schedule.
2. Six spheres will be opened per year.
3. For two openings, sphere 850 with a vapor space concentration of 2,000 ppmv is used.
4. For four openings, sphere 26 with a vapor space concentration of 2,500 ppmv is used.
5. Emissions are based on the vapor space calculation for the two largest spheres. However, any sphere containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Sphere	Description	Estimated Unit Volume (ft^3)	Pressure (psia)	Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppmv)	Saturated Vapor (lbs)
850	1,3 Butadiene	260,729.90	14.7	95	54.1	2,000	**74.98**

MSS Emissions

lbs/event	74.98
hours/event	1
simultaneous events	1
lbs/hr	**74.98**
total events	2
tons/year	**0.07**

Sphere	Description	Estimated Unit Volume (ft^3)	Pressure (psia)	Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppmv)	Saturated Vapor (lbs)
9	Butane	84,218.97	14.7	95	58.123	2,500	**30.21**

MSS Emissions

lbs/event	30.21
hours/event	1
simultaneous events	1
lbs/hr	**30.21**
total events	4
tons/year	**0.06**

Total MSS Emissions from sphere openings		1,3 BD	Butane	Total
lbs/hr	lbs/hr	74.98	30.21	74.98
tons/year	tons/year	0.15	0.24	0.39

Table B-12 (b)
Sphere Vapor Space Emissions for VOC Evacuated from Process Units During Turnarounds

Sphere	Description	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppmv)	Saturated Vapor (lbs)
53	1,3 Butadiene	14,036.49	14.7	95	54.1	2,000	3.75
57	Furfural	14,036.49	14.7	95	96.1	2,500	8.32
54	Polyisobutylene (HOF)	14,036.49	14.7	95	93.3	2,500	8.08
14	1,3 Butadiene	33,687.59	14.7	95	54.1	2,000	9.00
15	1,3 Butadiene	33,687.59	14.7	95	54.1	2,000	9.00
17	1,3 Butadiene	33,687.59	14.7	95	54.1	2,000	9.00
18	1,3 Butadiene	33,687.59	14.7	95	54.1	2,000	9.00
42	1,3 Butadiene	33,687.59	14.7	95	54.1	2,000	9.00
43	1,3 Butadiene	33,687.59	14.7	95	54.1	2,000	9.00
44	1,3 Butadiene	33,687.59	14.7	95	54.1	2,000	9.00
51	1,3 Butadiene	33,687.59	14.7	95	54.1	2,000	9.00
52	1,3 Butadiene	33,687.59	14.7	95	54.1	2,000	9.00
11	Butane	33,687.59	14.7	95	58.1	2,500	12.08
12	Butane	33,687.59	14.7	95	58.1	2,500	12.08
19	Butene	33,687.59	14.7	95	56.1	2,500	11.66
16	Furfural	33,687.59	14.7	95	96.1	2,500	19.98
13	Isobutane	33,687.59	14.7	95	58.1	2,500	12.08
41	Isobutylene	33,687.59	14.7	95	56.1	2,500	11.66
49	Pentane	33,687.59	14.7	95	72.2	2,500	15.00
1	Butane	67,375.18	14.7	95	58.1	2,500	24.17
4	Butane	67,375.18	14.7	95	58.1	2,500	24.17
5	Butane	67,375.18	14.7	95	58.1	2,500	24.17
2	Isobutane	67,375.18	14.7	95	58.1	2,500	24.17
3	Isobutane	67,375.18	14.7	95	58.1	2,500	24.17
10	1,3 Butadiene	84,218.97	14.7	95	54.1	2,000	22.49
9	Butane	84,218.97	14.7	95	58.1	2,500	30.21
6	Butene	84,218.97	14.7	95	56.1	2,500	29.16
7	Butene	84,218.97	14.7	95	56.1	2,500	29.16
8	Butene	84,218.97	14.7	95	56.1	2,500	29.16
56	Isobutylene	84,218.97	14.7	95	56.1	2,500	29.16
55	Vinyl Acetylene	84,218.97	14.7	95	52.1	2,500	27.06
26	1,3 Butadiene	140,364.95	14.7	95	54.1	2,000	37.49
27	1,3 Butadiene	140,364.95	14.7	95	54.1	2,000	37.49
28	1,3 Butadiene	140,364.95	14.7	95	54.1	2,000	37.49
29	1,3 Butadiene	140,364.95	14.7	95	54.1	2,000	37.49
90	1,3 Butadiene	140,364.95	14.7	95	54.1	2,000	37.49
91	1,3 Butadiene	140,364.95	14.7	95	54.1	2,000	37.49
850	1,3 Butadiene	280,729.90	14.7	95	54.1	2,000	74.98
851	1,3 Butadiene	280,729.90	14.7	95	54.1	2,000	74.98

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) Use Ideal Gas Law to calculate emissions.
2) Use vessel pressure for vapor pressure.
3) If VOC vapor pressure of the materials is ≥ 0.1, use vapor space emissions; clingage emissions can be neglected.
4) Assume daily maximum temperature to be 95 ° F.

Calculation Formulas:
Saturated Vapor Released (lbs) = PV/RT

Reference:
MSS Update for Process Vessels, page 87.

Table B-12 (a)
Tower Systems Maintenance Emissions Summary

Basis:

1. Fourteen tower systems may be opened per year. A tower system consists of towers, accumulators, heat exchangers, and assoicated piping.
2. Up to three tower systems may be opened at a time based on available maintenance personnel.
3. Emissions are based on the worst case scenario, which uses the largest tower system and possible material that yields the highest emissions. However, any tower system containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Process Units	Chemical	Estimated Unit Volume (ft^3)	Pressure (psia)	Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppmv)	Saturated Vapor (lbs)
1D-120	Lean Oil	130522.83	14.7	95	130.00	250	10.471

MSS Emissions

lbs/event	10.47
hours/event	1
simultaneous events	3
lbs/hr	31.41
total events	14
tons/year	0.07

Total MSS Emissions from tower openings

lbs/hr	31.41
tons/year	0.07

Table B-13 (b)
Tower Vapor Space Emissions for VOC Evacuated from Process Units During Turnarounds

Largest Tower with varied constituents

Tower System	Chemical	Estimated Unit Volume (ft^3)	Pressure (psia)	Temp (°F)	Vapor Molecular Wt. (lb/lb-mol)	Concentration of Vapor (ppmv)	Saturated Vapor (lbs)
1D-120	Lean Oil	130522.83	14.7	95	130.00	250	10.471
1D-120	Dimethyl Formamide (DMF)	130522.83	14.7	95	73.09	250	5.887
1D-120	Methanol	130522.83	14.7	95	32.04	250	2.581
1D-120	MTBE	130522.83	14.7	95	88.15	250	7.100
1D-120	Diisobutylene (DIB) (C 8s)	130522.83	14.7	95	112.20	250	9.037
1D-120	1,3 Butadiene	130522.83	14.7	95	54.10	250	4.358
1D-120	Butene	130522.83	14.7	95	56.11	250	4.520
1D-120	Isobutylene	130522.83	14.7	95	56.11	250	4.520
1D-120	Butane	130522.83	14.7	95	58.12	250	4.682
1D-120	Isobutane	130522.83	14.7	95	58.12	250	4.681
1D-120	ETBE	130522.83	14.7	95	102.18	250	8.230
1D-120	Ethanol	130522.83	14.7	95	46.07	250	3.711
1D-120	Vinyl Acetylene	130522.83	14.7	95	52.07	250	4.194
1D-120	Aqueous Ammonia (1%)	130522.83	14.7	95	18.00	250	1.450

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) Use Ideal Gas Law to calculate emissions.
2) Use vessel pressure for vapor pressure.
3) If VOC vapor pressure of the materials is ≥ 0.1, use vapor space emissions; clingage emissions can be neglected.
4) Assume daily maximum temperature to be 95 ° F.

Calculation Formulas:
Tower Volume (ft^3) = $\pi (D/2)^2 h + 4/3\pi (D/2)^3$
Accumulator Volume (ft^3) = $\pi (D/2)^2 L$
Piping Volume assumed to be 15% of tower and accumulator volume.
Saturated Vapor Released (lbs) = PV/RT

Reference:

MSS Update for Process Vessels, page 87.

Table B-13 (c)
Tower System Emissions from Clingage

Tower System	Material Stored	A Tower System Surface Area (ft^2)	Clingage Factor (ft)	V Clingage Volume (ft^3)	ρ Density (lb/gal)	ρ Density (lb/ft^3)	Clingage Mass (lb)	Clingage Mass After Water Wash (lb)
1D-120	Triethanolamine (TEA)	33394.06	3.33E-05	1.11E+00	5.1	38.15	**42.47**	**0.42**
1D-120	Furfural	33394.06	3.33E-05	1.11E+00	9.6848	72.45	**80.64**	**0.81**
1D-120	Quench Oil	33394.06	3.33E-05	1.11E+00	7.1	53.11	**59.12**	**0.59**
1D-120	Propylene Glycol	33394.06	3.33E-05	1.11E+00	8.646	64.68	**71.99**	**0.72**
1D-120	Ethylene Glycol	33394.06	3.33E-05	1.11E+00	9.29	69.49	**77.36**	**0.77**

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) Assume clingage forms layer of material 0.0004 inches (0.0000333 ft) thick.
2) Multiply the thickness by the vessel surface area to get volume of liquid.
3) Multiply the volume of the liquid density to get mass of clingage.
4) If VOC vapor perssure of the material is ≤ 0.1; use clingage emissions; vapor space emissions can be neglected.

Calculation Formulas: **Reference:**

$A_V\ (ft^2) = \pi\ (D/2)^2 + 2\ \pi\ (D/2)L$

$A_T\ (ft^2) = \pi\ (D/2)^2 + 2\ \pi\ (D/2)L$

$A_{TOTAL}\ (ft^2) = \pi\ (D/2)^2 + 2\ \pi\ (D/2)L$

$V\ (ft^2) = A \times$ Clingage Factor — TCEQ MSS Update for Process Vessels, page 86

Clingage Mass (lb) = $V \times \rho$ — TCEQ MSS Update for Process Vessels, page 86

Table B-14 (a)
Temporary Thermal Oxidizer Emissions Summary

Basis:
1. Temporary control device will be used for cleaning towers, spheres, and tanks
2. The temporary control device will be a thermal oxidizer

Description	Pollutant	Combustion Emission Rates		Waste Gas Emission Rates		Total Emission Rates	
		Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)
Temporary Thermal Oxidizer	CO	0.38	0.14	6.06	4.36	6.43	4.50
	NO_X	0.65	0.24	2.62	1.89	3.28	2.13
	PM	0.04	0.01	0.23	0.16	0.26	0.18
	SO_2	0.08	0.03	–	–	0.08	0.03
	VOC	0.04	0.01	62.45	0.69	62.49	0.70

Total MSS Emissions from Temporary Control Device

	VOC Emissions
lbs/hr	62.49
tons/year	0.70

Notes:
1) Hourly emissions include one temporary control devices being operated simultaneously.

Table B-14 (b)
Temporary Control Device Waste Gas Emissions (non-VOC)

Description	Capacity [e] (MMBtu/hr)	Annual Operating Hours (hr/yr)	Number of Temporary Control Devices Operating Simultaneously	Pollutant	Emission Factors [a]	Units	Emission Rates Two Control Device Hourly [a,d] (lb/hr)	Annual [b] (T/yr)
Temporary Thermal Oxidizer Waste Gas	16.50	1,440	2	CO	--	--	6.06	4.36
				NO_X	--	--	2.62	1.89
				PM	0.007	lb/ MMBtu	0.23	0.16
				SO_2	--	--	--	--

[a] Emission Factors for PM are based upon AP-42 Table 1.5-1 (dated 07/08). An example calculations for hourly PM emissions for one temporary thermal oxidizer follows:

PM (lb/hr) = (Capacity, MMBtu/hr)*(Emission Factor, lb/MMBtu)
PM (lb/hr) = (16.50 MMBtu/hr)*(0.0069 lb/MMBtu)
= 0.11 lb/hr PM

[b] An example calculation for annual PM emissions for the temporary thermal oxidizer follows:

PM (T/yr) = (Hourly Emissions, lb/hr)*(Annual Operating Hours, hr/yr)*(1 T/2,000 lb)
PM (T/yr) = (0.23 lb/hr)*(1440 hr/yr)*(1 T/2,000 lb)
= 0.16 T/yr CO

[c] SO_2 emissions are not anticipated from the waste gas.

[c] NO_X and CO emissions are based on test data from February 2010 turnaround at 110% of actual.

[e] The temporary incinerator capacity is based on data from February 2010 turnaround at 110% of actual.

Table B-14 (c)
Temporary Control Device Combustion Emissions

Description	Fuel Flow Rate (gallons/hr)	Lower Heating Value (Btu/scf)	Annual Operating Hours (hr/yr)	Number of Temporary Thermal Oxidizers Operating Simultaneously	Pollutant	Emission Factors [a]	Units	Hourly [a,d] (lb/hr)	Annual [b] (T/yr)
Temporary Thermal Oxidizer	25.15	2284	1,440	2	CO	7.50	lb/ 10^3 gal	0.38	0.136
					NO_x	13.00	lb/ 10^3 gal	0.65	0.235
					PM	0.70	lb/ 10^3 gal	0.04	0.013
					SO_2	1.50	lb/ 10^3 gal	0.08	0.027
					VOC	0.80	lb/ 10^3 gal	0.04	0.014

[a] Emission Factors for CO, NOX, PM, and VOC are based upon AP-42 Table 1.5-1 (dated 07/08). An example calculations for hourly CO emissions for four temporary thermal oxidizers being operated simultaneously follows:

CO (lb/hr) = (Fuel Flow Rate, gallons/hr)*(Number of Temporary Thermal Oxidizers Operating Simultaneously)*(CO Emission Factor, lb/1000 gal)

CO (lb/hr) = (25.15 gal/hr)*(7.50 lb/ 1000 gal)*2

= 0.38 lb/hr CO

[b] An example calculation for annual CO emissions for the temporary thermal oxidizer follows:

CO (T/yr) = (Fuel Flow Rate, gallons/hr)*(CO Emission Factor, lb/1000 gal)*(Annual Operating Hours, hr/yr)*(1 T/2,000 lb)

CO (T/yr) = (25.15 gal/hr)*(1440 hr/yr)*(7.50 lb/1000 gal)*(1 T/2,000 lb)

= 0.14 T/yr CO

[c] The combustion emissions are conservatively based on propane as the fuel used for the temporary control device, natural gas may

[d] The fuel flow rate was based on data from the February 2010 turnaround at 110% of actual.

[e] The annual operating hours my vary, however the tons per year values represented above will not be exceeded.

Table B-14 (d)
Tower and Sphere Saturated Vapor Space Emissions Routed to a Control Device

Sphere Vapor Space Emissions Routed to a Control Device

Sphere	Description	V Estimated Unit Volume (ft³)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Saturated Vapor (lbs)	Concentration (PPM)	Control Efficiency	Controlled Emissions
850	1,3 Butadiene	280,729.90	14.7	95	2,000	1,385,936.37	8,000.00	99.00%	110.87
9	Butane	84,218.97	14.7	95	10,000	2,078,904.56	7,500.00	99.00%	155.92

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) Use Ideal Gas Law to calculate emissions.
2) Use vessel pressure for vapor pressure.
3) If VOC vapor pressure of the materials is ≥ 0.1, use vapor space emissions; clingage emissions can be neglected.
4) Assume daily maximum temperature to be 95 ° F.
5) After transfering the material out of the sphere, further clearing the sphere with nitrogen leaving the concentration at 10,000 ppm and reducing it to 2,000 ppm for BD and 2,500 ppm for all other matierals by venting to the control device.

Calculation Formulas:
Saturated Vapor Released (lbs) = PV/RT

Reference:
MSS Update for Process Vessels, page 87.

Tower System Vapor Space Emissions Routed to a Control Device

Tower	Description	V Estimated Unit Volume (ft³)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Saturated Vapor (lbs)	Concentration (PPM)	Control Efficiency	Controlled Emissions
1D-120	Lean Oil	130522.83	14.7	95	250	80,547.33	9,750.00	99.00%	7.85

Notes:
According to TCEQ Guidance Provided at 2009 Air Permitting Seminar (MSS Update, Part 1)
1) Use Ideal Gas Law to calculate emissions.
2) Use vessel pressure for vapor pressure.

3) If VOC vapor pressure of the materials is ≥ 0.1, use vapor space emissions; clingage emissions can be neglected.
4) Assume daily maximum temperature to be 95 ° F.
5) Concentration is based on 10,000 ppm being reduced to 250 ppm using the temporary control device.

Calculation Formulas:	Reference:
Tower Volume (ft^3) = $\pi (D/2)^2 h + 4/3\pi (D/2)^3$	
Accumulator Volume (ft^3) = $\pi (D/2)^2 L$	MSS Update for Process Vessels, page 87.
Piping Volume assumed to be 15% of tower and accumulator volume.	
Saturated Vapor Released (lbs) = PV/RT	MSS Update for Process Vessels, page 87.

Basis:

1. Fourteen tower systems may be opened per year but only seven will be vented to a temporary control device.
2. Three tower system and one sphere may be vented to the temporary control device simultaneously.
3. Emissions are based on the worst case scenaios. However any tower/sphere combination may be used as long as the emissions are less than or equal to the emissions represented below.
4. Six spheres will be opened per year.
5. For openings from 1,3 Butadiene a vapor space concentration of 2,000 ppmv is used.
6. For all other sphere openings a concentration of 2,500 ppmv is used.
7. For tower openings a concentration of 250 ppmv is used.

Tower Emissions Sent to Control Device

lbs/event	7.85
hours/event	12
simultaneous events	3
lbs/hr	1.96
total events	7
tons/year	0.03

Sphere Emissions Sent to Control Device

	Sphere 850	Sphere 26	Total
lbs/event	110.87	155.92	155.92
hours/event	12	12	12
simultaneous events	1	1	1
lbs/hr	9.24	12.99	12.99
total events	2	4	6
tons/year	0.11	0.31	0.42

Controlled MSS Emissions from Tower and Sphere venting to a temporary incinerator

	Tower	Sphere
lbs/hr	1.96	12.99
tons/year	0.027	0.42

Table B-15
Vacuum Truck Maintenance Emissions Summary

Basis:
1. Emissions based on 500 vacuum trucks per year.
2. Up to three vacuum trucks may be filled simultaneously.
3. Emissions are based on the vapor space calculation for the material with the highest emissions. However, the vacuum truck may contain any material as long as the emissions are less than or equal to the emissions represented below.

Material Stored	Saturation Factor	True Vapor Pressure[2]	Molecular Weight	Temperature		Capacity	Hourly Throughput	Loading Loss	Control Device #1 Control Eff[3]	Hourly Emissions
		(psia)	(lb/mole)	(F)	(R)	(Mgal)	(Mgal/hr)	(lb/Mgal)	(%)	(lb/hr)
Lean Oil	1.45	2.94	130	95	555	4.00	4.00	12.42	90%	4.97
Triethanolamine (TEA)	1.45	0.0004	149.19	95	555	4.00	4.00	0.00	90%	0.00
Furfural - 20%	1.45	0.57	21.49	95	555	4.00	4.00	0.40	90%	0.16
Dimethyl Formamide (DMF) - 10%	1.45	0.58	19.47	95	555	4.00	4.00	0.37	90%	0.15
Methanol - 20%	1.45	0.73	18.82	95	555	4.00	4.00	0.45	90%	0.18
MTBE - 10%	1.45	0.71	19.56	95	555	4.00	4.00	0.45	90%	0.18
Diisobutylene (DIB) (C 8s) - 10%	1.45	0.61	19.65	95	555	4.00	4.00	0.39	90%	0.16
Polyisobutylene (PIB) - 10%	1.45	0.59	19.89	95	555	4.00	4.00	0.38	90%	0.15
Polyisobutylene (HOF) - 10%	1.45	0.60	19.85	95	555	4.00	4.00	0.38	90%	0.15
1,3 Butadiene - 1%	1.45	0.74	18.12	95	555	4.00	4.00	0.44	90%	0.18
Butene - 1%	1.45	0.75	18.12	95	555	4.00	4.00	0.44	90%	0.18
Isobutylene - 1%	1.45	0.75	18.12	95	555	4.00	4.00	0.44	90%	0.18
Butane - 1%	1.45	0.72	18.13	95	555	4.00	4.00	0.42	90%	0.17
Isobutane - 1%	1.45	0.72	18.13	95	555	4.00	4.00	0.42	90%	0.17
ETBE - 10%	1.45	0.64	19.62	95	555	4.00	4.00	0.41	90%	0.16
Ethanol - 10%	1.45	0.63	19.17	95	555	4.00	4.00	0.39	90%	0.16
Quench Oil	1.45	0.10	130	95	555	4.00	4.00	0.43	90%	0.17
Propylene Glycol - 10%	1.45	0.58	19.49	95	555	4.00	4.00	0.37	90%	0.15
Polygas - 10%	1.45	0.59	19.74	95	555	4.00	4.00	0.38	90%	0.15
Aqueous Ammonia (1%)	1.45	1.50	18	95	555	4.00	4.00	0.88	90%	0.35
PIB-Solv	1.45	0.01	175	95	555	4.00	4.00	0.04	90%	0.02
Ethylene Glycol - 10%	1.45	0.83	19.71	95	555	4.00	4.00	0.54	90%	0.21

1. Calculation method and factors per AP-42, Section 5.2, dated June 2008.
2. True vapor pressure, molecular weight, and temperature per TANKS 4.09d calculations.
3. The vent from the vacuum truck is equipped with two carbon canisters or a liquid scrubber followed by a carbon canister, each with a 90% efficiency.

Sample Calculations:

Loading Loss = 12.46 * (Saturation Factor) * (True Vapor Pressure, psia) * (MW, lb/lb-mol) / (Temp., R) * (1 - Control Eff., wt%)*(1 - Control Eff., wt%)

MSS Emissions

lbs/hr	4.97
simultaneous events	3.00
lbs/hr	14.90
trucks/year	500.00
tons/year	3.73

Total MSS Emissions from Vacuum Trucks	
lbs/hr	14.90
tons/year	3.73

TABLE B-16-1
TOTAL PROPOSED INHERENTLY LOW EMITTING ACTIVITIES
TPC GROUP LLC
HOUSTON PLANT

Description	VOC		PM, PM10 & PM2.5	
	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Instrumentation/Analyzer Maintenance	< 0.01	0.01		
Meter Proving	0.05	< 0.01		
Filter Changes	3.15	0.09		
Sampling Emissions	0.11	0.34		
Low Vapor Pressure Materials	< 0.01	< 0.01		
Wash Water	0.64	0.15		
Rolloffs			0.01	< 0.01
Compressors	8.95	< 0.01		
Total Inherently Low Emitting Emissions	**12.90**	**0.60**	**< 0.01**	**< 0.01**
Attachment B Actitivies				
Catalyst Changes	69.46	0.04	0.37	< 0.01

Note: Emissions listed at <0.01 were rounded up to <0.01 lbs/hr or tons/year.

Table B-16-2 (a)
Inherently Low Emitting Activities
Instrumentation/Analyzer Maintenance - Clingage

Basis:

1. Tweleve instruments may be opened simultaneously.
2. A maximum of 8400 instruments/analyzers will receive maintenance per year.
3. Estimated area cleared is 1 inch in diameter and 5 feet long.
4. Emissions are based on the clingage calculation with the instrument/analyzer containing the material with the highest emissions. However, any instrument/analyzer containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Material Stored	A Surface Area (ft^2)	Clingage Factor (ft)	V Clingage Volume (ft^3)	ρ Density (lb/gal)	ρ Density (lb/ft^3)	Clingage Mass (lb)
Triethanolamine (TEA)	1.3090	3.33E-05	4.36E-05	5.1000	38.1508	0.0017
Furfural	1.3090	3.33E-05	4.36E-05	9.6848	72.4476	0.0032
Quench Oil	1.3090	3.33E-05	4.36E-05	7.1000	53.1119	0.0023
PIB-solv	1.3090	3.33E-05	4.36E-05	7.1130	53.2092	0.0023
Propylene Glycol	1.3090	3.33E-05	4.36E-05	8.6460	64.6768	0.0028
Ethylene Glycol	1.3090	3.33E-05	4.36E-05	9.2900	69.4943	0.0030

MSS Emissions

lbs/event	0.0032
hours/event	1
simultaneous events	12
lbs/hr	0.0031611245
total events	8400
tons/year	0.0133

Total MSS Emissions from Instrumentation and Analyzer Maintenance

lbs/hr	0.003	< 0.01
tons/year	0.013	0.013

Table B-16-2 (b)
Inherently Low Emitting Activities
Instrumentation/Analyzer Maintenance - Vapor Space

Basis:

1. Tweleve instruments may be opened simultaneously.
2. A maximum of 8400 instruments/analyzers will receive maintenance per year.
3. Esitmated unit volume is 1 inch in diameter and 5 feet long (volume = 0.03 ft3).
4. Emissions are based on the vapor space calculation with the instrument/analyzer containing the material with the highest emissions. However, any instrument/analyzer containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Material Stored	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Lean Oil	0.03	14.7	95	130.00	10,000	0.00009
Dimethyl Formamide (DMF)	0.03	14.7	95	73.09	10,000	0.00005
Methanol	0.03	14.7	95	32.04	10,000	0.00002
MTBE	0.03	14.7	95	88.15	10,000	0.00006
Diisobutylene (DIB) (C 8s)	0.03	14.7	95	112.20	10,000	0.00008
Polyisobutylene (PIB)	0.03	14.7	95	93.30	10,000	0.00006
Polyisobutylene (HOF)	0.03	14.7	95	93.30	10,000	0.00006
Gasoline (RVP-10)	0.03	14.7	95	66.00	10,000	0.00004
1,3 Butadiene	0.03	14.7	95	54.10	2,000	0.00001
Butene	0.03	14.7	95	56.11	10,000	0.00004
Isobutylene	0.03	14.7	95	56.11	10,000	0.00004
Butane	0.03	14.7	95	58.12	10,000	0.00004
Isobutane	0.03	14.7	95	58.12	10,000	0.00004
ETBE	0.03	14.7	95	102.18	10,000	0.00007
Ethanol	0.03	14.7	95	46.07	10,000	0.00003
Polygas	0.03	14.7	95	150.30	10,000	0.00010
Vinyl Acetylene	0.03	14.7	95	52.07	10,000	0.00004
Aqueous Ammonia	0.03	14.7	95	35.05	10,000	0.00002
Pentane	0.03	14.7	95	72.15	10,000	0.00005

MSS Emissions

lbs/event	0.0001
hours/event	1
simultaneous events	12
lbs/hr	0.0012
total events	8400
tons/year	0.00042

Total MSS Emissions from Instrumentation and Analyzer Maintenance

lbs/hr	0.0012	< 0.01
tons/year	0.0004	< 0.01

Table B-16-3 (a)
Inherently Low Emitting Activities
Meter Proving - Clingage

Basis:

1. Up to two meters will be calibrated/tested at a time.
2. A maximum of 300 meters will be calibrated/tested per year.
3. Estimated unit volume is 3 inches in diameter and 12 feet long.
4. Emissions are based on the clingage calculation with the meter containing the material with the highest emissions. However, any meter containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Material Stored	A Surface Area (ft^2)	Clingage Factor (ft)	V Clingage Volume (ft^3)	ρ Density (lb/gal)	ρ Density (lb/ft^3)	Clingage Mass (lb)
Triethanolamine (TEA)	9.42	3.33E-05	3.14E-04	5.1000	38.1508	0.0120
Furfural	9.42	3.33E-05	3.14E-04	9.6848	72.4476	0.0228
Quench Oil	9.42	3.33E-05	3.14E-04	7.1000	53.1119	0.0167
PIB-solv	9.42	3.33E-05	3.14E-04	7.1130	53.2092	0.0167
Propylene Glycol	9.42	3.33E-05	3.14E-04	8.6460	64.6768	0.0203
Ethylene Glycol	9.42	3.33E-05	3.14E-04	9.2900	69.4943	0.0218

MSS Emissions

lbs/event	0.02
hours/event	1
simultaneous events	2
lbs/hr	0.05
total events	300
tons/year	0.003

Total MSS Emissions from Meter Proving

lbs/hr	**0.05**	**0.05**
tons/year	**0.003**	**< 0.01**

Table B-16-3 (b)
Inherently Low Emitting Activities
Meter Proving - Vapor Space

Basis:

1. Up to two meters will be calibrated/tested at a time.
2. A maximum of 150 meters will be calibrated/tested per year.
3. Esitmated unit volume is 3 inches in diameter and 12 feet long.
4. Emissions are based on the vapor space calculation with the meter containing the material with the highest emissions. However, any meter containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Material Stored	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Lean Oil	0.59	14.7	95	130.00	10,000	0.0019
Dimethyl Formamide (DMF)	0.59	14.7	95	73.09	10,000	0.0011
Methanol	0.59	14.7	95	32.04	10,000	0.0005
MTBE	0.59	14.7	95	88.15	10,000	0.0013
Diisobutylene (DIB) (C 8s)	0.59	14.7	95	112.20	10,000	0.0016
Polyisobutylene (PIB)	0.59	14.7	95	93.30	10,000	0.0014
Polyisobutylene (HOF)	0.59	14.7	95	93.30	10,000	0.0014
Gasoline (RVP-10)	0.59	14.7	95	66.00	10,000	0.0010
1,3 Butadiene	0.59	14.7	95	54.10	2,000	0.0002
Butene	0.59	14.7	95	56.11	10,000	0.0008
Isobutylene	0.59	14.7	95	56.11	10,000	0.0008
Butane	0.59	14.7	95	58.12	10,000	0.0008
Isobutane	0.59	14.7	95	58.12	10,000	0.0008
ETBE	0.59	14.7	95	102.18	10,000	0.0015
Ethanol	0.59	14.7	95	46.07	10,000	0.0007
Polygas	0.59	14.7	95	150.30	10,000	0.0022
Vinyl Acetylene	0.59	14.7	95	52.07	10,000	0.0008
Aqueous Ammonia	0.59	14.7	95	35.05	10,000	0.0005
Pentane	0.59	14.7	95	72.15	10,000	0.0010

MSS Emissions

lbs/event	0.002
hours/event	1
simultaneous events	2
lbs/hr	0.004
total events	150
tons/year	0.000

Total MSS Emissions from Meter Proving

lbs/hr	**0.004**	**< 0.01**
tons/year	**0.000**	**< 0.01**

Note: Emissions were rounded up to <0.01 lb/hr and <0.01 tons/year. Calculated emissions are lower.

Table B-16-4 (a)
Inherently Low Emitting Activities
Filter Changes - Clingage

Basis:

1. Up to 20 filter housings may be opened simultaneously.
2. A maximum of 1,100 filter housings will be changed out each year.
3. Average sized filters are 2.5 ft in diamter by 4 ft high.
   A large filter is 3 ft in diamter by 6 ft in height.
4. Emissions are based on the clingage calculation with the filter containing the material with the highest emissions. However, any filter containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Material Stored	A Surface Area (ft^2)	Clingage Factor (ft)	V Clingage Volume (ft^3)	ρ Density (lb/gal)	ρ Density (lb/ft^3)	Clingage Mass (lb)
Triethanolamine (TEA)	56.5500	3.33E-05	1.89E-03	5.1000	38.1508	0.0719
Furfural	56.5500	3.33E-05	1.89E-03	9.6848	72.4476	0.1366
Quench Oil	56.5500	3.33E-05	1.89E-03	7.1000	53.1119	0.1001
PIB-solv	56.5500	3.33E-05	1.89E-03	7.1130	53.2092	0.1003
Propylene Glycol	56.5500	3.33E-05	1.89E-03	8.6460	64.6768	0.1219
Ethylene Glycol	56.5500	3.33E-05	1.89E-03	9.2900	69.4943	0.1310

MSS Emissions

lbs/event	0.1366
hours/event	1
simultaneous events	20
lbs/hr	2.7313
total events	1100
tons/year	0.0751

Total MSS Emissions from Filter Changes

lbs/hr	**2.731**	**2.73**
tons/year	**0.075**	**0.08**

Table B-16-4 (b)
Inherently Low Emitting Activities
Filter Changes - Vapor Space

Basis:

1. Up to 20 filter housings may be opened simultaneously.
2. A maximum of 1,100 filter housings will be changed out each year.
3. Average sized filters are 2.5 ft in diamter by 4 ft high.
   A large filter is 3 ft in diamter by 6 ft in height.
4. Emissions are based on the vapor space calculation with the filter containing the material with the highest emissions. However, any filter containing any material may be used as long as the emissions are less than or equal to the emissions represented below.

Material Stored	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Lean Oil	42.41	14.7	95	130.00	10,000	0.1361
Dimethyl Formamide (DMF)	42.41	14.7	95	73.09	10,000	0.0765
Methanol	42.41	14.7	95	32.04	10,000	0.0335
MTBE	42.41	14.7	95	88.15	10,000	0.0923
Diisobutylene (DIB) (C 8s)	42.41	14.7	95	112.20	10,000	0.1175
Polyisobutylene (PIB)	42.41	14.7	95	93.30	10,000	0.0977
Polyisobutylene (HOF)	42.41	14.7	95	93.30	10,000	0.0977
Gasoline (RVP-10)	42.41	14.7	95	66.00	10,000	0.0691
1,3 Butadiene	42.41	14.7	95	54.10	2,000	0.0113
Butene	42.41	14.7	95	56.11	10,000	0.0587
Isobutylene	42.41	14.7	95	56.11	10,000	0.0587
Butane	42.41	14.7	95	58.12	10,000	0.0608
Isobutane	42.41	14.7	95	58.12	10,000	0.0608
ETBE	42.41	14.7	95	102.18	10,000	0.1070
Ethanol	42.41	14.7	95	46.07	10,000	0.0482
Polygas	42.41	14.7	95	150.30	10,000	0.1573
Vinyl Acetylene	42.41	14.7	95	52.07	10,000	0.0545
Aqueous Ammonia	42.41	14.7	95	35.05	10,000	0.0367
Pentane	42.41	14.7	95	72.15	10,000	0.0755

MSS Emissions

lbs/event	0.16
hours/event	1
simultaneous events	20
lbs/hr	3.15
total events	1100
tons/year	0.087

Total MSS Emissions from Filter Changes

lbs/hr	3.15	3.15
tons/year	0.087	0.09

Table B-16-5 (a)
Inherently Low Emitting Activities
Catalyst Changeout - VOC Emissions

DH2 Reactors

1. Seven catalyst change outs may occur at a time
2. DH2 reactor catalyst will be changed out 7 times per year.
3. Emissions for the largest volume catalyst are based on isobutylene, MTBE, and isobutane the materials present for this size.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Isobutylene	4035.00	14.7	95	56.11	10,000	5.59
Isobutane	4035.00	14.7	95	58.12	10,000	5.79
MTBE	4035.00	14.7	95	88.15	10,000	8.78

MSS Emissions	
lbs/event	8.78
hours/event	1
simultaneous events	7
lbs/hr	61.46
total events	7
tons/year	0.0307

Ultra Beds

1. Two catalyst change outs may occur at a time
2. Ultra bed catalyst will be changed out 2 times per year.
3. Emissions for the largest volume catalyst are based on isobutylene the material present for this size.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Isobutylene	2250.00	14.7	95	56.11	10,000	3.12

MSS Emissions	
lbs/event	3.12
hours/event	1
simultaneous events	2
lbs/hr	6.23
total events	2
tons/year	0.0031

MTBE, DIB and BHY Reactors

1. Two catalyst change outs may occur at a time
2. There will be up to 8 changeouts per year.
3. Emissions for the largest volume catalyst are based on MTBE, Diisobutylene, and 2 wt% BD the materials present for this size.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
MTBE	275.00	14.7	95	88.15	10,000	0.60
Diisobutylene (DIB) (c 8s)	275.00	14.7	95	112.20	10,000	0.0152
1,3 Butadiene	275.00	14.7	95	54.10	2,000	0.0015

MSS Emissions	
lbs/event	0.60
hours/event	1
simultaneous events	2
lbs/hr	1.20
total events	8
tons/year	0.0024

ISOM Reactors

1. Two catalyst change outs may occur at a time
2. There will be up to 3 changeouts per year.
3. Emissions for the largest volume catalyst are based on butene and 0.4 wt% BD the materials present for this size.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Butene	125.00	14.7	95	56.11	10,000	0.17
1,3 Butadiene	125.00	14.7	95	54.10	2,000	0.00013

MSS Emissions	
lbs/event	0.17
hours/event	1
simultaneous events	2
lbs/hr	0.35
total events	3
tons/year	0.00026

PIB Alumina Beds

1. Two catalyst change outs may occur at a time
2. There will be up to 12 changeouts per year.
3. Emissions for the largest volume catalyst are based on isobutylene the materials present for this size.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Isobutylene	55.00	14.7	95	56.11	10,000	0.076

MSS Emissions

lbs/event	0.076
hours/event	1
simultaneous events	2
lbs/hr	0.15
total events	12
tons/year	0.000457

Misc. (DIB, HPIB, B-1 Dryer, etc..)

1. Two catalyst change outs may occur at a time
2. There will be up to 75 changeouts per year.
3. Emissions for the largest volume catalyst are based on isobutylene and butene the materials present for this size.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Isobutylene	25.00	14.7	95	56.11	10,000	0.035
Butene	25.00	14.7	95	56.11	10,000	0.035

MSS Emissions	
lbs/event	0.035
hours/event	1
simultaneous events	2
lbs/hr	0.07
total events	75
tons/year	0.0013

Total MSS Emissions from Catalyst Changeouts

lbs/hr	**69.46**	**69.46**
tons/year	**0.038**	**0.04**

Table B-16-5 (b)
Inherently Low Emitting Activities
Catalyst Changeout - PM emissions

Basis:

1. Up to seven catalyst changes may occur at one time.
2. PM emissions are estimated using AP-42 Section 13.2.4

E (lb/ton) = k*0.0032((U/5)^1.3/(M/2)^1.4)

E = PM10 emission rate in lb/ton	
k = multiplier to adjust to PM10	0.74
U = average wind speed (m/s)	7.8
M = moisture content of the material (%)	**15**

DH2 Reactors

1. Seven catalyst change outs may occur at a time
2. DH2 reactor catalyst will be changed out 7 times per year.

Constituent	V Estimated Unit Volume (ft^3)	Density of Catalyst (lb/ft3)	Mass of Catalyst (lbs)	Mass of Catalyst (tons)	PM10 Emission Rate (lb/ton)	PM10 Emission Rate in (lbs/event)
PM10	4035.00	87.4	352618.7	176.3	0.0003	0.0443

MSS PM Emissions	
lbs/event	0.04
hours/event	1
simultaneous events	7
lbs/hr	0.31
total events	7
tons/year	0.0002

Ultra Beds

1. Two catalyst change outs may occur at a time
2. Ultra bed catalyst will be changed out 2 times per year.

Constituent	V Estimated Unit Volume (ft^3)	Density of Catalyst (lb/ft3)	Mass of Catalyst (lbs)	Mass of Catalyst (tons)	PM10 Emission Rate (lb/ton)	PM10 Emission Rate in (lbs/event)
PM10	2250.00	87.4	196627.5	98.3	0.0003	0.0247

MSS PM Emissions	
lbs/event	0.02
hours/event	1
simultaneous events	2
lbs/hr	0.05
total events	2
tons/year	0.00002

MTBE, DIB and BHY Reactors

1. Two catalyst change outs may occur at a time
2. There will be up to 8 changeouts per year.

Constituent	V Estimated Unit Volume (ft^3)	Density of Catalyst (lb/ft3)	Mass of Catalyst (lbs)	Mass of Catalyst (tons)	PM10 Emission Rate (lb/ton)	PM10 Emission Rate in (lbs/event)
PM10	225.00	87.4	19662.8	9.8	0.0003	0.0025

MSS PM Emissions	
lbs/event	0.002
hours/event	1
simultaneous events	2
lbs/hr	0.005
total events	8
tons/year	0.00001

ISOM Reactors

1. Two catalyst change outs may occur at a time
2. There will be up to 3 changeouts per year.

Constituent	V Estimated Unit Volume (ft^3)	Density of Catalyst (lb/ft3)	Mass of Catalyst (lbs)	Mass of Catalyst (tons)	PM10 Emission Rate (lb/ton)	PM10 Emission Rate in (lbs/event)
PM10	125.00	87.4	10923.8	5.5	0.0003	0.0014

MSS PM Emissions	
lbs/event	0.001
hours/event	1
simultaneous events	2
lbs/hr	0.00
total events	3
tons/year	0.000002

PIB Alumina Beds

1. Two catalyst change outs may occur at a time
2. There will be up to 12 changeouts per year.

Constituent	V Estimated Unit Volume (ft^3)	Density of Catalyst (lb/ft3)	Mass of Catalyst (lbs)	Mass of Catalyst (tons)	PM10 Emission Rate (lb/ton)	PM10 Emission Rate in (lbs/event)
PM10	55.00	87.4	4806.5	2.4	0.0003	0.0006

MSS PM Emissions	
lbs/event	0.001
hours/event	1
simultaneous events	2
lbs/hr	0.001
total events	12
tons/year	0.000004

Misc. (DIB, HPIB, B-1 Dryer, etc.)

1. Two catalyst change outs may occur at a time
2. There will be up to 75 changeouts per year.

Constituent	V Estimated Unit Volume (ft^3)	Density of Catalyst (lb/ft3)	Mass of Catalyst (lbs)	Mass of Catalyst (tons)	PM10 Emission Rate (lb/ton)	PM10 Emission Rate in (lbs/event)
PM10	55.00	87.4	4806.5	2.4	0.0003	0.0006

MSS PM Emissions	
lbs/event	0.001
hours/event	1
simultaneous events	2
lbs/hr	0.001
total events	75
tons/year	0.00002

Total MSS Emissions from Catalyst Changeouts

lbs/hr	0.37	0.37
tons/year	0.0002	< 0.01

Table B-16-6
Inherently Low Emitting Activities
Sampling Emissions

Basis:

1. Approximately 7500 samples (hydrocarbon) are collected per month.
2. Emissions are losses from sample filling.
3. Assume samples are collected in largest sample cylinder which is 1 L (0.0353 ft3).
4. Assume sample filling losses are equivalent to 50% of one sample cylinder being displaced to the atmosphere

Material Stored	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt. (lb/lb-mol)	Sample Filling Losses
Lean Oil	0.04	14.7	95	130.00	0.0057
Dimethyl Formamide (DMF)	0.04	14.7	95	73.09	0.0032
Methanol	0.04	14.7	95	32.04	0.0014
MTBE	0.04	14.7	95	88.15	0.0038
Diisobutylene (DIB) (C 8s)	0.04	14.7	95	112.20	0.0049
Polyisobutylene (PIB)	0.04	14.7	95	93.30	0.0041
Polyisobutylene (HOF)	0.04	14.7	95	93.30	0.0041
Gasoline (RVP-10)	0.04	14.7	95	66.00	0.0029
1,3 Butadiene	0.04	14.7	95	54.10	0.0024
Butene	0.04	14.7	95	56.11	0.0024
Isobutylene	0.04	14.7	95	56.11	0.0024
Butane	0.04	14.7	95	58.12	0.0025
Isobutane	0.04	14.7	95	58.12	0.0025
ETBE	0.04	14.7	95	102.18	0.0045
Ethanol	0.04	14.7	95	46.07	0.0020
Polygas	0.04	14.7	95	150.30	0.0065
Vinyl Acetylene	0.04	14.7	95	52.07	0.0023
Aqueous Ammonia	0.04	14.7	95	35.05	0.0015
Pentane	0.04	14.7	95	72.15	0.0031
Triethanolamine (TEA)	0.04	14.7	95	149.19	0.0065
Furfural	0.04	14.7	95	96.09	0.0042
Quench Oil	0.04	14.7	95	130.00	0.0057
PIB-solv	0.04	14.7	95	175.00	0.0076
Propylene Glycol	0.04	14.7	95	76.11	0.0033
Ethylene Glycol	0.04	14.7	95	62.07	0.0027

MSS Emissions

lbs/event	0.0076
hours/event	1
simultaneous events	15
lbs/hr	0.1144
total events	90000
tons/year	0.34310

Total MSS Emissions from Instrumentation and Analyzer Maintenance

lbs/hr	0.1144
tons/year	0.3431

Table B-16-7
Inherently Low Emitting Activities
Low Vapor Pressure Materials

Basis:

1. Emissions from low vapor pressure materials will be generated when conducting maintenance on meters, pumps, piping and fugitive components, and heat exchangers.
2. Emissions will be determined by assuming twice the volume of water is generated by flushing out the equipment except for meters. Meter proving will generate approximately 75 gallons of wash water each time.
3. Assume all TOC is VOC, TOC content is 999 ppm, mixture is 99.9% water.

Equipment	Volume of Equipment (ft3)	Simultaneous Events	Events/Year	Liquid Generated (gallons/event)	Liquid Generated (gallons/hr)	Liquid Generated (gallons/yr)	Emissions (lb/event)	Emissions (lb/hr)	Emissions (tons/year)
Pumps	0.98	6	600	7.33	43.99	4399.42	0.00012	0.00074	0.00004
Piping and Fugitive Components	0.49	6	6000	3.67	22.00	21997.12	0.00012	0.00074	0.00037
Heat Exchangers	64.94	6	300	485.88	2915.29	145764.60	0.00012	0.00074	0.00002
Meter Proving	N/A	2	150	150.00	300.00	22500.00	0.00012	0.00025	0.00001
							TOTAL	< 0.01	< 0.01

Table B-16-8
Inherently Low Emitting Activities
Rolloff Box Filling - PM emissions

Basis:
1. Rolloff boxes may be used for up to 450,000 lbs of waste per year.
2. PM emissions are estimated using AP-42 Section 13.2.4

E (lb/ton) = k*0.0032((U/5)^1.3/(M/2)^1.4)
E = PM10 emission rate in lb/ton

k = multiplier to adjust to PM10	0.74
U = average wind speed (m/s)	7.8
M = moisture content of the material (%)	10

Rolloff Boxes

1. Up to 4 rolloff boxes may be filled at the same time.

Constituent	Mass of Waste Material (lbs)	Mass of Waste Material (tons)	PM10 Emission Rate (lb/ton)	PM10 Emission Rate in (lbs/event)
PM10	40000.00	20.00	0.0004	0.0089

MSS PM Emissions	
lbs/hr	0.01
hours/event	1
simultaneous events	4
lbs/hr	0.04
total events	50
tons/year	0.0002

Total MSS Emissions from Rolloff Boxes

lbs/hr	**0.01**	**0.01**
tons/year	**0.0002**	**< 0.01**

Table B-16-9
Inherently Low Emitting Activities
Compressor Maintenance Emissions Vapor Space Calculation

DH2 Compressors (Product Compressors)

1. DH2 has 3 compressors which will be serviced at the same time.
2. DH2 compressors will be opened once every year.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Isobutylene	490.00	14.7	95	56.11	10,000	0.6787
Isobutane	490.00	14.7	95	58.12	10,000	0.7030

MSS Emissions	
lbs/event	0.70
hours/event	1
simultaneous events	3
lbs/hr	2.11
total events	3
tons/year	0.0011

DMF Compressors (Coolant Compressors)

1. DMF has 2 compressors which will be serviced at the same time.
2. DMF compressors will be opened once every year.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
R-22	188.00	14.7	95	86.45	10,000	0.4012

MSS Emissions	
lbs/event	0.40
hours/event	1
simultaneous events	2
lbs/hr	0.80
total events	2
tons/year	0.0004

PIB I Compressors (Coolant Compressors)

1. PIB 1 has 3 compressor units which have 4 compressors each.
2. One PIB I compressor unit will be opened each year. (4 individual compressors)

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
R-22	35.77	14.7	95	86.45	10,000	0.0763

MSS Emissions	
lbs/event	0.08
hours/event	1
simultaneous events	1
lbs/hr	3.00
total events	1
tons/year	0.00004

PIB II Compressors

1. PIB II has 1 unit with 2 compressors which each hold 15,000 lbs of R-22.
2. The PIB II unit will be changed out 1 time each year.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
R-22	198.70	14.7	95	86.45	10,000	0.4240

MSS Emissions	
lbs/event	0.42
hours/event	1
simultaneous events	2
lbs/hr	3.00
total events	2
tons/year	0.0004

850-851 Sphere Compressors (Coolant Compressors)

1. There are two compressors.
2. The compressors will be changed out 2 times per year, one at a time.

Constituent	V Estimated Unit Volume (ft^3)	P Pressure (psia)	T Temp (°F)	Vapor Molecular Wt (lb/lb-mol)	Concentration of Vapor (ppm)	Saturated Vapor (lbs)
Isobutane	13.37	14.7	95	58.12	10,000	0.0192

MSS Emissions	
lbs/event	0.02
hours/event	1
simultaneous events	2
lbs/hr	0.04
total events	2
tons/year	0.00002

Total MSS Emissions from Catalyst Changeouts

lbs/hr	8.95	8.95
tons/year	0.002	< 0.01

Table B-16-10
Inherently Low Emitting Activities
Wash Water

Basis:

1. Emissions from low vapor pressure materials will be generated when draining wash water from tanks and towers.
2. Emissions from low vapor pressure materials will be estimated using one turnover of a fixed roof tank with a volume of 11.4 million gallons. It is assumed that this tank will tank a minimum of 12 hours to drain.
3. Assume all TOC is VOC, TOC content is 999 ppm, mixture is 99.9% water.
4. Emissions were calculated using Tanks 4.09 with a water/voc mixture.
5. Assume 27 tanks and 14 towers are drained per year, for a total of 41 events.
6. Only one tank or tower will be drained at a time.

Equipment	Volume of Equipment (gallons)	Simultaneous Events	Events/Year	Liquid Generated (gallons)
Poly Tanks	4000	1	20	20,000.00
Fixed Roof Tanks	210000	1	6	315,000.00
IFR's	350,000	2	21	1,837,500.00
EFR's	11256000 and 1587600	1	5	12,843,600.00
Frac Tanks	16400	6	350	1,435,000.00
Towers	1088560	14	1	272,140.00
Vacuum Trucks	4000	1	500	500,000.00
Sphere	1050000	1	6	1,575,000.00
Bullet	63000	2	6	94,500.00
		Total Events/Year	915	
			Total Wash Water	18,892,740

MSS Emissions

lbs/event	0.3199
hours/event	1
simultaneous events	2
lbs/hr	0.6399
total events	915
tons/year	0.1464

Total MSS Emissions from draining low vapor pressure materials.

lbs/hr	**0.64**
tons/year	**0.15**

Table B-17 (a)
SURFACE COATING EMISSIONS

Basis:
TPC Group LLC performs surface coating at the their Houston Plant on immovable fixed structures and in a laydown yard. Annual emissions are based on the annual usage rate and average content of the coatings and thinners used at the site. Maximum hourly emissions are based on the maxium hourly usage rate and maximum content. Emission calculation formulas and emission factors are defined in *TCEQ Technical Guidance Document for Surface Coating Operations* dated April 2001. The emission factor for each compound is based on the compounds from coatings and thinners used at the site. The overspray factor is from TCEQ's *Air Permit Technical Guidance for Coating Sources: Surface Coating Operations*, Table 1, for airless spray guns painting flat surfaces. The PM factor is based on TCEQ guidance using the "RESCAR Study" for PM distribution using airless spray guns. The PM_{10} factor is also based on TCEQ guidance using the "RESCAR Study" for PM distribution using airless spray guns.

Data for Calculations:

Annual Coating Usage Rate =	3,377	gal/yr
Maximum Hourly Coating Usage Rate =	20	gal/hr
Annual Thinner/Solvent Usage Rate =	552	gal/yr
Maximum Hourly Thinner/Solvent Usage Rate =	6	gal/hr
Max. Coating Overspray =	30.0%	(airless spray gun)
RESCAR PM Factor=	1.44%	(for airless spray guns)
RESCAR PM_{10} Factor=	0.13%	(for airless spray guns)

Compound	Speciation	Maximum Content (lb/gal)	Average Content (lb/gal)	Maximum Emission Rates (lb/hr)	(tpy)
VOC (Coatings)		3.50	3.44	70.00	5.81
	1,2,4-Trimethylbenzene	0.60	0.44	11.96	0.74
	1,3,5-Trimethylbenzene	0.36	0.25	7.20	0.43
	1-Butanol	0.90	0.39	17.93	0.66
	1-Methoxy-2-Propanol Acetate	0.61	0.61	12.18	1.03
	2-Butoxyethanol	0.27	0.24	5.46	0.40
	Cyclohexanone	0.19	0.19	3.74	0.32
	Ethylbenzene	0.35	0.20	7.03	0.33
	Light Aromatic Hydrocarbons	0.45	0.28	8.97	0.48
	Medium Aromatic Hydrocarbons	0.24	0.24	4.87	0.41
	Methyl Ethyl Ketone	0.85	0.54	17.00	0.90
	Methyl Isobutyl Ketone	1.34	1.34	26.83	2.26
	Methyl n-Amyl Ketone	2.48	1.46	49.60	2.46
	Mineral Spirits	2.45	1.27	48.92	2.14
	Naphthalene	0.02	0.02	0.49	0.04
	n-Butyl Acetate	0.97	0.97	19.50	1.65
	Phenol	0.17	0.17	3.45	0.29
	Phenylmethanol	3.27	2.38	65.40	4.02
	Polycyclic Aromatic Compounds	0.11	0.11	2.18	0.18
	Xylene	1.96	1.22	39.27	2.06
VOC (Thinners)		8.04	6.90	3.02	0.48
	1-Methoxy-2-Propanol Acetate	8.04	5.04	3.02	0.35
	2-Butoxyethyl Acetate	0.07	0.07	0.02	0.00
	2-Propanol	0.67	0.67	0.25	0.05
	Ethylbenzene	0.63	0.44	0.24	0.03
	Light Aliphatic Hydrocarbon Solvent	1.66	1.66	0.62	0.11
	Methanol	0.27	0.27	0.10	0.02
	Methyl Isobutyl Ketone	3.32	2.50	1.24	0.17
	Methyl n-Amyl Ketone	1.67	1.67	0.63	0.12
	Toluene	2.20	1.63	0.82	0.11
	Xylene	3.66	2.52	1.37	0.17
VOC (Total)				73.02	6.28
Acetone (Exempt Solvents)		1.39	1.39	0.52	0.10
PM		25.77	9.64	2.23	0.07
	Quartz	7.81	2.47	0.67	0.02
	Refined Coal Tar Pitch	3.80	3.73	0.33	0.03
	Talc	3.45	1.55	0.30	0.01
	Titanium Dioxide	4.26	2.28	0.37	0.02
	Zinc	22.95	22.95	1.98	0.17
PM_{10}		25.77	9.64	0.20	0.01

Coatings

Hourly Potential to Emit VOC

VOC Emissions (lb/hr) = (Maximum Usage Rate, gal/hr) * (Max. VOC Content, lb/gal)
VOC Emissions (lb/hr) = (20 gal/hr) * (3.50 lb/gal)

Annual Potential to Emit VOC

VOC Emissions (T/yr) = (Annual Usage Rate, gal/yr) * (Avg. VOC Content, lb/gal) / (2,000 lb/T)
VOC Emissions (T/yr) = (3377 gal/yr) * (3.44 lb/gal) / (2,000 lb/T)

Thinners

Hourly Potential to Emit VOC

VOC Emissions (lb/hr) = (Maximum Paint Thinner Poured into Vat, gal) / (Evaporation Time, hrs.) * (Max. VOC Content, lb/gal) * (25%)
VOC Emissions (lb/hr) = (6 gal) / (4.0 hr) * (8.04 lb VOC / gal) *(0.25)

Annual Potential to Emit VOC

VOC Emissions (T/yr) = (Maximum Annual Usage Rate, gal/yr) * (Avg. VOC Content, lb/gal) / (2,000 lb/T) * (25%)
VOC Emissions (T/yr) = (552 gal/yr) * (6.90 lb VOC / gal)/ (2,000 lb/T) * (0.25)

Particulate Matter

Hourly Potential to Emit PM

PM Emissions (lb/hr) = (Maximum Hourly Usage Rate, gal/hr) * (Max. Solids Content, lb/gal) * (Overspray, %) * (RESCAR Factor, %)
PM Emissions (lb/hr) = (20 gal/hr) * (25.77 lb/gal) * (30 %) * (1.44 %)

Annual Potential to Emit PM

PM Emissions (T/yr) = (Maximum Annual Usage Rate, gal/yr) * (Avg. Solids Content, lb/gal) * (Overspray, %) * (RESCAR Factor, %) / (2,000 lb/T)
PM Emissions (T/yr) = (3377 gal/yr) * (9.64 lb/gal) * (30%) * (1.44 %) / (2,000 lb/T)

Table B-17 (b)
COATINGS

Product Name	Code	Product Number	Density (lb/gal)	PM Content (lb/gal)	PM Content (%)	VOC Content (lb/gal)	VOC Content (%)	Components	VOC	CAS Number	SARA 313 Chemical	Percent by Weight (%)	Weight Percent Sum (%)	VOC Weight Percent (%)	Normalized Weight Percent	Speciated Content (lb/gal)
TAR GUARD™ Coal Tar Epoxy (Part A), Black		B69B60	11.13	8.94	80.3	2.19	19.7	Polycyclic Aromatic Compounds	Yes	Proprietary	Yes	3	97	23	0.9	0.10
								Ethylbenzene	Yes	100-41-4	Yes	3			2.8	0.31
								Xylene	Yes	1330-20-7	Yes	17			15.9	1.77
								Trace/Non-Hazardous PM							4.3	0.48
								Tri(dimethylaminomethyl)phenol	No	90-72-2	No	1			1.0	0.11
								Refined Coal Tar Pitch	No	65996-93-2	No	33			33.0	3.67
								Polyamide	No	68410-23-1	No	11			11.0	1.22
								Talc	No	14807-96-6	No	31			31.0	3.45
TAR GUARD™ Coal Tar Epoxy (Part A), Red		B69R60	11.50	9.10	79.1	2.40	20.9	Polycyclic Aromatic Compounds	Yes	Proprietary	Yes	3	77	22	0.9	0.11
								Ethylbenzene	Yes	100-41-4	Yes	3			2.6	0.33
								Xylene	Yes	1330-20-7	Yes	18			17.1	1.96
								Trace/Non-Hazardous PM							24.1	2.78
								Tri(dimethylaminomethyl)phenol	No	90-72-2	No	1			1.0	0.12
								Refined Coal Tar Pitch	No	65996-93-2	No	33			33.0	3.80
								Polyamide	No	68410-23-1	No	11			11.0	1.27
								Talc	No	14807-96-6	No	10			10.0	1.15
TAR GUARD™ Coal Tar Epoxy (Part B), Hardener		B69V60	9.70	9.70	100.0	0.00	0.0	Epoxy Polymer	No	25068-38-6	No	100	100	0	100	9.70
ZINC CLAD® IV Primer (Part U), Flat/Gray-Green		B69A8	28.33	25.77	91.0	2.56	9.0	Ethylbenzene	Yes	100-41-4	Yes	1	95	8	1.1	0.32
								Xylene	Yes	1330-20-7	Yes	6			6.8	1.92
								Methyl n-Amyl Ketone	Yes	110-43-0	No	1			1.1	0.32
								Trace/Non-Hazardous PM							4.0	1.12
								Epoxy Polymer	No	67924-34-9	No	4			4.0	1.13
								Zinc	No	7440-66-6	Yes (N982)	81			81.0	22.95
								Quartz	No	14808-60-7	No	2			2.0	0.57
ZINC CLAD® IV Primer (Part V), Hardener		B69V8	11.10	8.88	80.0	2.22	20.0	Ethylbenzene	Yes	100-41-4	Yes	3	91	20	3.0	0.33
								Xylene	Yes	1330-20-7	Yes	17			17.0	1.89
								Trace/Non-Hazardous PM							9.0	1.00
								Tri(dimethylaminomethyl)phenol	No	90-72-2	No	5			5.0	0.56
								Polyamide	No	68410-23-1	No	29			29.0	3.22
								Quartz	No	14808-60-7	No	37			37.0	4.11
Industrial Enamel HS, Pure White		B54WZ401	9.71	7.04	72.5	2.67	27.5	Mineral Spirits	Yes	64742-88-7	No	24	50.2	26.2	25.2	2.45
								Ethylbenzene	Yes	100-41-4	Yes	0.2			0.2	0.02
								2-Butoxyethanol	Yes	111-76-2	Yes (N230)	2			2.1	0.20
								Trace/Non-Hazardous PM							48.5	4.71
								Quartz	No	14808-60-7	No	8			8.0	0.78
								Titanium Dioxide	No	13463-67-7	No	16			16.0	1.55
HS Polyurethane Gloss (Part S), Ultradeep Base	B65T304	B65T304	9.46	7.03	74.3	2.43	25.7	Mineral Spirits	Yes	64742-88-7	No	1	42	26	1.0	0.09
								Methyl n-Amyl Ketone	Yes	110-43-0	No	23			22.7	2.15
								Cyclohexanone	Yes	108-94-1	No	2			2.0	0.19
								Trace/Non-Hazardous PM							58.1	5.52
								Quartz	No	14808-60-7	No	16			16.0	1.51
HS Polyurethane Activator (Part T)	B60V30	B60V30	8.44	5.96	70.6	2.48	29.4	Methyl n-Amyl Ketone	Yes	110-43-0	No	29	100.7	29	29.4	2.48
								Hexamethylene Diisocyanate (max.)	No	822-06-0	Yes (N120)	0.7			0.7	0.06
								Hexamethylene Diisocyanate Polymer	No	28182-81-2	No	71			69.9	5.90
PHENICON® HS Epoxy (Part A), White	600102198	920-W-A11	14.8	12.59	85.1	2.21	14.9	Ethylbenzene	Yes	100-41-4	Yes	2	99.1	15	2.0	0.29
								Xylene	Yes	1330-20-7	Yes	11			11.0	1.62
								1-Butanol	Yes	71-36-3	Yes	1			1.0	0.15
								Methyl Ethyl Ketone	Yes	78-93-3	No	1			1.0	0.15
								Trace/Non-Hazardous PM							1.0	0.14
								Epoxy Polymer	No	Proprietary	No	6			6.0	0.85
								Epoxy Polymer	No	25068-38-6	No	20			20.0	2.96
								Quartz	No	14808-60-7	No	0.1			0.1	0.01
								Talc	No	14807-96-6	No	20			20.0	2.96
								Barium Sulfate	No	7727-43-7	Yes (N040)	27			27.0	4.00
								Titanium Dioxide	No	13463-67-7	No	11			11.0	1.63
PHENICON® High Solids Epoxy (Part B), Catalyst	600102032	700-C-685	8.53	5.26	61.7	3.27	38.3	Phenylmethanol	Yes	100-51-6	No	38	99	38	38.3	3.27
								Trace/Non-Hazardous PM							0.7	0.06
								Tetraethylene Pentamine	No	112-57-2	No	3			3.0	0.26
								1,2-Cyclohexanediamine	No	694-83-7	No	15			15.0	1.28
								Polyamine	No	Proprietary	No	23			23.0	1.96
								Polyamidoamine	No	Proprietary	No	20			20.0	1.71
HS Epoxy (Part B), Low Temp Hardener	640171609	700-C-825	8.73	4.76	54.5	3.97	45.5	Ethylbenzene	Yes	100-41-4	Yes	1	97	46	1.0	0.09
								Xylene	Yes	1330-20-7	Yes	7			6.9	0.60
								Phenylmethanol	Yes	100-51-6	No	36			35.6	3.11
								Phenol	Yes	108-95-2	Yes	2			2.0	0.17
								Trace/Non-Hazardous PM							3.5	0.31
								1,3-Benzenedimethanamine	No	1477-55-0	No	3			3.0	0.26
								Methylenedicyclohexylamine	No	1761-71-3	No	4			4.0	0.35
								Amino Polymer	No	Proprietary	No	32			32.0	2.78
								Polyamine	No	Proprietary	No	12			12.0	1.05

Components	VOC	Speciated Content (lb/gal)
1,2-Cyclohexanediamine	No	1.2795
1,2-Cyclohexanediamine	No	1.35
1,3-Benzenedimethanamine	No	0.2619
Amino Polymer	No	2.7936
Barium Sulfate	No	3.996
Barium Sulfate	No	3.8799
Epoxy Polymer	No	9.7
Epoxy Polymer	No	1.1332
Epoxy Polymer	No	0.888
Epoxy Polymer	No	2.96
Epoxy Polymer	No	1.8844
Epoxy Polymer	No	1.8844
Epoxy Polymer	No	5.6875
Epoxy Polymer	No	4.3929
Epoxy Polymer	No	3.9104
Hexamethylene Diisocyanate (max.)	No	0.05908
Hexamethylene Diisocyanate (max.)	No	0.0933
Hexamethylene Diisocyanate Polymer	No	5.90092
Hexamethylene Diisocyanate Polymer	No	9.2367
Methylenedicyclohexylamine	No	0.3492
Modified Aliphatic Amine	No	4.5
Polyamide	No	1.2243
Polyamide	No	1.765
Polyamide	No	3.219
Polyamide	No	3.3409
Polyamide	No	2.3807
Polyamidoamine	No	1.706
Polyamine	No	1.9619
Polyamine	No	1.0476
Polyamine	No	1.7244
Quartz	No	0.5066
Quartz	No	4.107
Quartz	No	0.7768
Quartz	No	1.5136
Quartz	No	0.0148
Quartz	No	7.8068
Quartz	No	1.437
Quartz	No	4.277
Quartz	No	1.701
Refined Coal Tar Pitch	No	3.6729
Refined Coal Tar Pitch	No	3.795
Talc	No	3.4503
Talc	No	1.15
Talc	No	2.96
Talc	No	1.0971
Talc	No	0.2874
Talc	No	0.3666
Tetraethylene Pentamine	No	0.2559
Titanium Dioxide	No	1.5536
Titanium Dioxide	No	1.626
Titanium Dioxide	No	3.7789
Titanium Dioxide	No	4.2602
Titanium Dioxide	No	0.6508
Titanium Dioxide	No	1.7244
Titanium Dioxide	No	2.3814
Tri(dimethylaminomethyl)phenol	No	0.1113
Tri(dimethylaminomethyl)phenol	No	0.115
Tri(dimethylaminomethyl)phenol	No	0.555
Tri(dimethylaminomethyl)phenol	No	0.2874
Zinc	No	22.9473
1,2,4-Trimethylbenzene	Yes	0.45
1,2,4-Trimethylbenzene	Yes	0.597602
1,2,4-Trimethylbenzene	Yes	0.292982
1,2,4-Trimethylbenzene (from EDS)	Yes	0.409565
1,3,5-Trimethylbenzene	Yes	0.36
1,3,5-Trimethylbenzene	Yes	0.149451
1-Butanol	Yes	0.147133
1-Butanol	Yes	0.136522
1-Butanol	Yes	0.896703
1-Methoxy-2-Propanol Acetate	Yes	0.609244

VOC	Average (lb/gal)	Max (lb/gal)
1,2,4-Trimethylbenzene	0.44	0.60
1,3,5-Trimethylbenzene	0.25	0.36
1-Butanol	0.39	0.90
1-Methoxy-2-Propanol Acetate	0.61	0.61
2-Butoxyethanol	0.24	0.27
Cyclohexanone	0.19	0.19
Ethylbenzene	0.20	0.35
Light Aromatic Hydrocarbons	0.28	0.45
Medium Aromatic Hydrocarbons	0.24	0.24
Methyl Ethyl Ketone	0.54	0.85
Methyl Isobutyl Ketone	1.34	1.34
Methyl n-Amyl Ketone	1.46	2.48
Mineral Spirits	1.27	2.45
Naphthalene	0.02	0.02
n-Butyl Acetate	0.97	0.97
Phenol	0.17	0.17
Phenylmethanol	2.38	3.27
Polycyclic Aromatic Compounds	0.11	0.11
Xylene	1.22	1.96

Non VOC	Average (lb/gal)	Max (lb/gal)
1,2-Cyclohexanediamine	1.31	1.35
1,3-Benzenedimethanamine	0.26	0.26
Amino Polymer	2.79	2.79
Barium Sulfate	3.94	4.00
Epoxy Polymer	3.60	9.70
Hexamethylene Diisocyanate (max.)	0.08	0.09
Hexamethylene Diisocyanate Polymer	7.57	9.24
Methylenedicyclohexylamine	0.35	0.35
Modified Aliphatic Amine	4.50	4.50
Polyamide	1.89	3.22
Polyamidoamine	1.71	1.71
Polyamine	1.58	1.96
Tetraethylene Pentamine	0.26	0.26
Tri(dimethylaminomethyl)phenol	0.27	0.56

PM	Average (lb/gal)	Max (lb/gal)
Quartz	2.47	7.81
Refined Coal Tar Pitch	3.73	3.80
Talc	1.55	3.45
Titanium Dioxide	2.28	4.26
Zinc	22.95	22.95

Product Name	Code	Product Number	Density (lb/gal)	PM Content (lb/gal)	PM Content (%)	VOC Content (lb/gal)	VOC Content (%)	Components	VOC	CAS Number	SARA 313 Chemical	Percent by Weight (%)	Weight Percent Sum (%)	VOC Weight Percent (%)	Normalized Weight Percent	Speciated Content (lb/gal)
MACROPOXY® 646 Fast Cure Epoxy Coating (Part A), Mill White	B58W610	B58W610	12.19	10.08	82.7	2.11	17.3	Ethylbenzene	Yes	100-41-4	Yes	3	69	18	2.9	0.35
								Xylene	Yes	1330-20-7	Yes	15			14.4	1.76
								Trace/Non-Hazardous PM							31.7	3.86
								Polyamide	No	68410-23-1	No	11			11.0	1.34
								Talc	No	14807-96-6	No	9			9.0	1.10
								Titanium Dioxide	No	13463-67-7	No	31			31.0	3.78
MACROPOXY® 646 Fast Cure Epoxy Coating (Part B), Hardener	B58V600	B58V600	13.46	11.81	87.7	1.65	12.3	Ethylbenzene	Yes	100-41-4	Yes	0.3	98.3	12.3	0.3	0.04
								Xylene	Yes	1330-20-7	Yes	2			2.0	0.27
								Methyl Isobutyl Ketone	Yes	108-10-1	Yes	10			10.0	1.34
								Trace/Non-Hazardous PM							1.7	0.23
								Epoxy Polymer	No	25036-25-3	No	14			14.0	1.88
								Epoxy Polymer	No	25068-38-6	No	14			14.0	1.88
								Quartz	No	14808-60-7	No	58			58.0	7.81
TILE-CLAD HS Epoxy (Part A), Extra White	B62WZ111	B62WZ111	12.53	9.39	74.9	3.14	25.1	Ethylbenzene	Yes	100-41-4	Yes	2	76	23	2.2	0.27
								Xylene	Yes	1330-20-7	Yes	13			14.2	1.77
								Light Aromatic Hydrocarbons	Yes	64742-95-6	No	2			2.2	0.27
								1-Butanol	Yes	71-36-3	Yes	1			1.1	0.14
								2-Butoxyethanol	Yes	111-76-2	Yes (N230)	2			2.2	0.27
								1,2,4-Trimethylbenzene (from EDS)	Yes	95-63-6	Yes	3			3.3	0.41
								Trace/Non-Hazardous PM							21.9	2.75
								Polyamide	No	68410-23-1	No	19			19.0	2.38
								Titanium Dioxide	No	13463-67-7	No	34			34.0	4.26
TILE-CLAD® HS Enamel (Part B), Hardener	B60VZ70	B60VZ70	8.75	5.69	65.0	3.06	35.0	Ethylbenzene	Yes	100-41-4	Yes	3	99	34	3.1	0.27
								Xylene	Yes	1330-20-7	Yes	19			19.5	1.71
								Light Aromatic Hydrocarbons	Yes	64742-95-6	No	3			3.1	0.27
								1,3,5-Trimethylbenzene	Yes	108-67-8	No	4			4.1	0.36
								1,2,4-Trimethylbenzene	Yes	95-63-6	Yes	5			5.1	0.45
								Trace/Non-Hazardous PM							0.03	0.003
								Epoxy Polymer	No	Proprietary	No	65			65.0	5.69
EPO-PHEN Hi-Temp Coating (Part A), Haze Gray	B62A55	B62A55	16.27	14.23	87.5	2.04	12.5	Ethylbenzene	Yes	100-41-4	Yes	1	43	12	1.0	0.17
								Xylene	Yes	1330-20-7	Yes	6			6.3	1.02
								Methyl Ethyl Ketone	Yes	78-93-3	No	5			5.2	0.85
								Trace/Non-Hazardous PM							56.5	9.19
								Epoxy Polymer	No	Proprietary	No	27			27.0	4.39
								Titanium Dioxide	No	13463-67-7	No	4			4.0	0.65
EPO-PHEN Hi-Temp Coating (Part B), Hardener	B62V55	B62V55	9.00	6.30	70.0	2.70	30.0	Phenylmethanol	Yes	100-51-6	No	30	95	30	30.0	2.70
								Trace/Non-Hazardous PM							5.0	0.45
								Modified Aliphatic Amine	No	Proprietary	No	50			50.0	4.50
								1,2-Cyclohexanediamine	No	694-83-7	No	15			15.0	1.35

Average PM Content = 9.56
Maximum PM Content = 25.77

Components	VOC	Speciated Content (lb/gal)
2-Butoxyethanol	Yes	0.203817
2-Butoxyethanol	Yes	0.273043
Cyclohexanone	Yes	0.186923
Ethylbenzene	Yes	0.312857
Ethylbenzene	Yes	0.327273
Ethylbenzene	Yes	0.32
Ethylbenzene	Yes	0.333
Ethylbenzene	Yes	0.020382
Ethylbenzene	Yes	0.294667
Ethylbenzene	Yes	0.086304
Ethylbenzene	Yes	0.351667
Ethylbenzene	Yes	0.040244
Ethylbenzene	Yes	0.273043
Ethylbenzene	Yes	0.27
Ethylbenzene	Yes	0.17
Ethylbenzene	Yes	0.02989
Ethylbenzene	Yes	0.058596
Ethylbenzene	Yes	0.073109
Light Aromatic Hydrocarbons	Yes	0.273043
Light Aromatic Hydrocarbons	Yes	0.27
Light Aromatic Hydrocarbons	Yes	0.448352
Light Aromatic Hydrocarbons	Yes	0.146491
Medium Aromatic Hydrocarbons	Yes	0.243697
Methyl Ethyl Ketone	Yes	0.147333
Methyl Ethyl Ketone	Yes	0.85
Methyl Ethyl Ketone	Yes	0.609244
Methyl Isobutyl Ketone	Yes	1.341463
Methyl n-Amyl Ketone	Yes	0.32
Methyl n-Amyl Ketone	Yes	2.149615
Methyl n-Amyl Ketone	Yes	2.48
Methyl n-Amyl Ketone	Yes	0.878947
Mineral Spirits	Yes	2.445802
Mineral Spirits	Yes	0.093462
Naphthalene	Yes	0.02437
n-Butyl Acetate	Yes	0.97479
Phenol	Yes	0.172609
Phenylmethanol	Yes	3.27
Phenylmethanol	Yes	3.106957
Phenylmethanol	Yes	2.7
Phenylmethanol	Yes	0.448352
Polycyclic Aromatic Compounds	Yes	0.10
Polycyclic Aromatic Compounds	Yes	0.109051
Xylene	Yes	1.772857
Xylene	Yes	1.963636
Xylene	Yes	1.92
Xylene	Yes	1.887
Xylene	Yes	1.620667
Xylene	Yes	0.60413
Xylene	Yes	1.958333
Xylene	Yes	0.268793
Xylene	Yes	1.774783
Xylene	Yes	1.71
Xylene	Yes	1.02
Xylene	Yes	0.149453
Xylene	Yes	0.292982
Xylene	Yes	0.365546
Trace/Non-Hazardous PM		0.4812
Trace/Non-Hazardous PM		2.775
Trace/Non-Hazardous PM		1.1229
Trace/Non-Hazardous PM		0.999
Trace/Non-Hazardous PM		4.7096
Trace/Non-Hazardous PM		5.5164
Trace/Non-Hazardous PM		0.1432
Trace/Non-Hazardous PM		0.0567
Trace/Non-Hazardous PM		0.3077
Trace/Non-Hazardous PM		3.8631
Trace/Non-Hazardous PM		0.2344
Trace/Non-Hazardous PM		2.7493
Trace/Non-Hazardous PM		0.0025
Trace/Non-Hazardous PM		9.1863
Trace/Non-Hazardous PM		0.45
Trace/Non-Hazardous PM		2.3095
Trace/Non-Hazardous PM		3.996
Trace/Non-Hazardous PM		4.3576

Table B-17 (c)
THINNERS

Product Name	Code	Product Number	Density (lb/gal)	PM Content (lb/gal)	PM Content (%)	VOC Content (lb/gal)	VOC Content (%)	Components	VOC	CAS Number	SARA 313 Chemical	Percent by Weight (%)	Weight Percent Sum (%)	VOC Weight Percent (%)	Normalized Weight Percent	Speciated Content (lb/gal)
R7K119 Lacquer Thinner	1544709	K119-SW	6.64	1.39	20.9	5.25	79.1	Light Aliphatic Hydrocarbon Solvent	Yes	64742-89-8	No	25	99.9	78.9	25.1	1.66
								Toluene	Yes	108-88-3	Yes	33			33.1	2.20
								Ethylbenzene	Yes	100-41-4	Yes	0.9			0.9	0.06
								Xylene	Yes	1330-20-7	Yes	5			5.0	0.33
								Methanol	Yes	67-56-1	Yes	4			4.0	0.27
								2-Propanol	Yes	67-63-0	No	10			10.0	0.67
								Acetone	No	67-64-1	No	21			20.9	1.39
								2-Butoxyethyl Acetate	Yes	112-07-2	Yes (N230)	1			1.0	0.07
POLANE® Reducer-69	5302641	530-2138	7.04	0.01	0.1	7.03	99.9	Toluene	Yes	108-88-3	Yes	15	100	100	15.0	1.06
								Ethylbenzene	Yes	100-41-4	Yes	9			9.0	0.63
								Xylene	Yes	1330-20-7	Yes	52			52.0	3.66
								Methyl Isobutyl Ketone	Yes	108-10-1	Yes	24			24.0	1.69
Reducer No. 132	R7K132	R7K132	8.04	0	0.0	8.04	100.0	1-Methoxy-2-Propanol Acetate	Yes	108-65-6	No	100	100	100	100.0	8.04
Reducer No. 15	R7K15	R7K15	6.91	0.01	0.1	6.9	99.9	Ethylbenzene	Yes	100-41-4	Yes	8	100	100	8.0	0.55
								Xylene	Yes	1330-20-7	Yes	44			44.0	3.04
								Methyl Isobutyl Ketone	Yes	108-10-1	Yes	48			48.0	3.32
Reducer No. 58	R7K58	530-8713	7.28	0	0.0	7.28	100.0	Ethylbenzene	Yes	100-41-4	Yes	7	100	100	7.0	0.51
								Xylene	Yes	1330-20-7	Yes	42			42.0	3.06
								Methyl n-Amyl Ketone	Yes	110-43-0	No	23			23.0	1.67
								1-Methoxy-2-Propanol Acetate	Yes	108-65-6	No	28			28.0	2.04

Components	VOC	Average (lb/gal)	Max (lb/gal)
1-Methoxy-2-Propanol Acetate	Yes	5.04	8.04
2-Butoxyethyl Acetate	Yes	0.07	0.07
2-Propanol	Yes	0.67	0.67
Acetone	No	1.39	1.39
Ethylbenzene	Yes	0.44	0.63
Light Aliphatic Hydrocarbon Solvent	Yes	1.66	1.66
Methanol	Yes	0.27	0.27
Methyl Isobutyl Ketone	Yes	2.50	3.32
Methyl n-Amyl Ketone	Yes	1.67	1.67
Toluene	Yes	1.63	2.20
Xylene	Yes	2.52	3.66

Table B-18
TPC MSS Activiities Best Available Control Technology (BACT)

Source Type	Pollutant	Best Available Control Technology (BACT) for MSS Activities Proposed by TCEQ		TPC's BACT
		Minimum Acceptable Control	Control Efficiency or Details	
Fixed Roof Tank (Draining)	VOC	Send liquid to a covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia.		Liquid is transferred to a covered vessel. If necessary, water and microbial-based surfactant are added to break down remaining hydrocarbon. When the wash water is ≤1,000 ppm, it is routed to the biological treatment pond. Then, the tank is opened. Note: The breathing vents on these tanks vent to the atmosphere under normal operations. Therefore, no additional control is applied for maintenance activities.

Table B-18
TPC MSS Activiities Best Available Control Technology (BACT)

Source Type	Pollutant	Best Available Control Technology (BACT) for MSS Activities Proposed by TCEQ		TPC's BACT
		Minimum Acceptable Control	Control Efficiency or Details	
Floating Roof Landing	VOC	May land roof without control, subject to effects review, if meet a category detailed to the right. Control all other landings as detailed below.	Bulk gasoline terminals: two landings per tank per year when required for Reid Vapor Pressure changes.	N/A
			For change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Liquid is transferred to a covered vessel. If necessary, water and microbial-based surfactant are added to break down remaining hydrocarbon. When the wash water is ≤1,000 ppm, it is routed to the biological treatment pond. Then, the tank is opened. Note: The breathing vents on these tanks vent to the atmosphere under normal operations. Therefore, no additional control is applied for maintenance activities.
	All	Drain to covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the acid vapor pressure is less than 0.02 psia.	Route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof.	N/A

Table B-18
TPC MSS Activiities Best Available Control Technology (BACT)

Source Type	Pollutant	Best Available Control Technology (BACT) for MSS Activities Proposed by TCEQ		TPC's BACT
		Minimum Acceptable Control	Control Efficiency or Details	
Vacuum Trucks		No BACT listed.		Control the vacuum truck vents through a carbon canister. Sampling is conducted once per shift to ensure that the VOC concentration from the carbon canister's vent is less than 500 ppm. If emissions are greater than or equal to 500 ppm, the carbon canister will be replaced.
Frac Tanks	Exterior surfaces	Color shall be white or aluminum (effective May 1, 2013)		Use commercially available frac tanks.
	VOC (VP of liquid stored is > 0.50 psia at 95 deg. F.	Submerged fill pipes and emissions vented to a control device.		Use commercially available frac tanks and vent emissions to a control device such as a carbon canister.
Valve Maintenance	VOC <0.5 psia	Send to a closed drain system. Drain any remaining liquid to a pan, then pump to a vacuum truck or put in a closed container.		Recover as much material as practical. Absorbent material is used to catch any residual liquid and is placed into a closed container.
	VOC >0.5 psia	Send material to the flare knockout drum to separate into vapors, light liquids, and heavy liquids. Route the vapors back through the process to be recovered before going to the flare using the recovery compressors, where available. Route vapors to flare. Route liquids to slop drums or strippers. Drain any remaining liquid to a pan, then pump to a vacuum truck or put in a closed container.	Alternative 1: Send the material to the refinery slop drums to be recovered. Verify that there are no emissions from sending the material back to the process to be recovered. If there is any remaining liquid in the system, drain it to a pan, then pump to a vacuum truck or put in a closed container. Alternative 2: Steam material to the enclosed sewer. Collect hydrocarbons in the unit sump, to be pumped to the slop tanks and recycled. If any fluid remains, steam or drain it to a pan then pump the material to a vacuum truck or put in a closed container.	

Table B-18
TPC MSS Activiities Best Available Control Technology (BACT)

Source Type	Pollutant	Best Available Control Technology (BACT) for MSS Activities Proposed by TCEQ		TPC's BACT
		Minimum Acceptable Control	Control Efficiency or Details	
Compressor Maintenance	VOC	Send material to the flare knockout drum to separate into vapors, light liquids, and heavy liquids. Route the vapors back through the process to be recovered before going to the flare using the recovery compressors, where available. Route vapors to flare. Route liquids to slop drums or strippers. Drain any remaining liquid to a pan, then pump to a vacuum truck or put in a closed container.	Alternative: Steam material to the enclosed sewer. Collect hydrocarbons in the unit sump, to be pumped to the slop tanks and recycled. If any fluid remains, steam or drain it to a pan then pump the material to a vacuum truck or put in a closed container.	The compressor is drained to another vessel within the process and purged to the vent gas recovery system. Absorbent material is used to catch any residual liquid and is placed into a closed container.
Pump Maintenance	VOC <0.5 psia	Send to a closed drain system. Drain any remaining liquid to a pan, then pump to a vacuum truck or put in a closed container	Alternative: Drain to an absorbent pad or pan and properly dispose of it.	The material is drained to another vessel within the process. Absorbent material is used to catch any residual liquid and is placed into a closed container.
	VOC >0.5 psia	Send material to the flare knockout drum to separate into vapors, light liquids, and heavy liquids. Vapors are routed to flare. Liquids go to slop drums or strippers. Drain any remaining liquid it to a pan then pump to a vacuum truck or put in a closed container.	Alternative 1: Send the material to the refinery slop drums to be recovered. If there is any remaining liquid in the system, drain it to a pan then pump to a vacuum truck or put in a closed container. Alternative 2: Drain to a recovery tank that is vented to the flare. Drain any remaining liquid to a pan then pump to a vacuum truck or put in a closed container. Alternative 3: Steam material to the enclosed sewer. Collect hydrocarbons in the unit sump, to be pumped to the slop tanks and recycled. If any liquids remain, steam or drain to a pan, then pump to vacuum truck or put in closed container	The pump is drained to another vessel within the process and purged to the vent gas recovery system. Absorbent material is used to catch any residual liquid and is placed into a closed container.

Table B-18
TPC MSS Activiities Best Available Control Technology (BACT)

Source Type	Pollutant	Best Available Control Technology (BACT) for MSS Activities Proposed by TCEQ		TPC's BACT
		Minimum Acceptable Control	Control Efficiency or Details	
Pipe Maintenance	VOC <0.5 psia	Send to a closed drain system. Drain any remaining liquid to a pan, then pump the material to a vacuum truck or put in a closed container.		The line is drained to another vessel within the process. Absorbent material is used to catch any residual liquid and is placed into a closed container.
	VOC >0.5 psia	Send material to the flare knockout drum to separate into vapors, light liquids, and heavy liquids. Route the vapors back through the process to be recovered before going to the flare using the recovery compressors, where available. Route vapors to flare. Route liquids to slop drums or strippers. Drain any remaining liquid to a pan, then pump to a vacuum truck or put in a closed container.	Alternative 1: Drain material to a recovery tank that is vented to the flare. Drain any remaining liquid to a pan, then pump the material to a vacuum truck or put in a closed container. Alternative 2: Send the material to the refinery slop drums to be recovered. Drain any remaining liquid to a pan, then pump the material to a vacuum truck or put in a closed container.	The line is drained to another vessel within the process and purged to the vent gas recovery system. Absorbent material is used to catch any residual liquid and is placed into a closed container.
	Fuel Gas	Purge fuel gas, natural gas, and LNG to the furnace and/or waste heat boiler.		Purge fuel gas to vent recovery system.
Distillation Column	VOC	Route fluids to other parts of the process as much as possible. If necessary, route to knockout-drum for phase separation. Drain liquids to covered vessels if possible.	If VOC partial pressure > 0.5 psi, route any vents to control device or controlled recovery system. Control loading emissions if vapor pressure > 0.5 psia. If physical configuration of the equipment prevents draining to a covered vessel, can drain to open pan but cover liquid or transfer liquid to covered vessel within 1 hr. of being drained. If liquid had a VP ≥0.5 psia, degas vessel to control until VOC concentration <10,000 ppmv.	Material in the tower is transferred to another vessel within the process. The tower is then purged to the vent gas recovery system. If necessary, water washes of the tower are performed. Sampling is conducted to ensure that the vessel contains ≤10% LEL of the stored material prior to opening.

T134 v.2

Print Form

AIR, PESTICIDES, AND TOXICS
6TH FLOOR RECORDS CENTER
INFILING / NEW FILE FORM

New File ☐ OR Infiling ☒

Choose from the file types below:

AIR FACILITY:

(☐) AR - Acid Rain

(☐) CB - Confidential Business

(☐) CO - Compliance
(☐) EN - **Enforcement
(☐) GE - General
(☒) PE - Permit
(☐) RA - Regulatory Applicability
(☐) Other _____

TSCA:

(☐) AH - Asbestos Hazard Emergency Response Act
(☐) AS or AW - Asbestos or Asbestos Worker Protection
(☐) CB - Confidential
(☐) FI - Site Specific
(☐) FO - Non Site Specific
(☐) IM - **Section 5 & 8
(☐) LB - **Lead
(☐) PC - **PCB

** Extension of file type (if needed): (☐) ES - Enforcement Sensitive
(☐) DO - Docket Number

EPCRA / SARA (☐) ***FIFRA*** (☐)

EPA Registry I.D.

Current FRS Number: 110000461134
(Found in EnviroFacts)

Facility Name & Physical Address: TPC Group LLC
8600 Park Place Blvd.
Houston, Tx. 77017

Remarks: Texas Petrochemicals, LLC

Requestor's Name & Phone Number:

Les Koval X6733

Program Management Files:

A current listing of these file types and their numeric codes are located in a blue binder on the top shelf of the "APT" file cabinet in the 9th Floor Records Center.

AIRS - Aerometric Information Retrieval System
ATO - Air Toxics
EMR - Emergency Response
ENF - Enforcement -
ENF 5-5-1 requires Month and Fiscal Year accompany file code.
ENF 5-6-5 requires Fiscal Year accompany file code.
EXR - External Relations
GEO - Geographical Summary Data
GRA - Grants Administration
The majority of this section requires the Fiscal Year accompany file code.
Project Officer Grants require the Grant number and Fiscal Year accompany file code.
LAB - Laboratory Support
LBP - Lead Based Paint
LBP 12-3 requires the facility name in which document refers to be either highlighted or circled on the top page.
LEL - Legal and Legislative
MON – Monitoring NES - National Emission Standards
NSP - New Source Performance
NSR - New Source Review
OPP - Operating Permits Program
PEA - Permits Administration Program
PES - Pesticides
PLA - Planning
PUA - Public Affairs
RAD - Radiation
RCR - Resource Conservation and Recovery Act - Regulatory Development
RDE - Research and Development
REG - Registration
SIP - State Implementation Plan
SUP - Superfund
TITL - Title III
TSC - Toxic Substance Control
TSC 1-1-4 requires the facility name in which document refers to be either highlighted or circled on the top page.
TSU - Technical Support
VRP - Voluntary Reduction Program

TPC Group
Houston Operations

TEL 713.477.9211
FAX 713.475.6008

8600 Park Place Boulevard, Houston, Texas 77017
www.tpcgrp.com

November 29, 2010

CERTIFIED MAIL NO.
7005 3110 0003 2210 1813
RETURN RECEIPT REQUESTED

RECEIVED - 6TDL
AIR PLANNING SEC.
10 DEC -3 PM 2:49

Air Permits Initial Review Team
MC 161
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Subject: **TPC Group LLC**
Houston, Harris County, Texas
Customer Reference No.: CN603624289
Regulated Entity No.: RN100219526
Minor Revision for FOP O-01598

Dear TCEQ:

Please find enclosed an application for a minor revision to the federal operating permit (FOP) for the TPC Group LLC's (TPC's) Houston Plant located in Houston, Harris County, Texas. This minor revision is being requested to update the applicability for Tank T-73. Tank 73 is an internal floating roof tank with a dual seal system in which the existing primary vapor mounted seal will be replaced with a mechanical shoe seal. The secondary seal which is rim mounted, will not be changed. The specific changes affecting this FOP are described in detail on the attached TCEQ Form OP-2, Application for Permit Revision/Renewal. In addition to the OP-2 Form, the following forms are included in this submittal: OP-SUMR, OP-UA3, and OP-REQ2.

Form OP-REQ3 is not included as we understand that TCEQ generates specific regulatory requirements to be incorporated into the FOP based on specific information provided in the revision applications OP-UA Form.

TPC believes that the requested changes qualify for a Minor Permit Revision to the Houston Plant's FOP pursuant to 30 TAC § 122.215. This revision application includes updates to applicability representations which do not result in emission increases.

TPC would like to thank you in advance for your review and concurrence with this minor revision to the SOP. If you have any questions regarding the information presented in this letter and attachments, please contact Mr. Kelly Nidini, EHS&S Manager at (713) 470-3101.

Sincerely,

CK Johnson

Charles Kirk Johnson
Plant Manager

cc: EPA Region 6, 1445 Ross Ave. Suite 1200, Dallas, Texas 75202

Mr. Manuel Bautista, Air Section Manager, TCEQ Region 12, 5425 Polk Ave., Ste. H; Houston, Texas 77023-1452

Mr. Michael Schaffer, Director; Environmental Public Health Division, Harris County Public Health and Environmental Services; 107 N. Munger St., Pasadena, Texas 77506-1322

Mr. Arturo Blanco, Bureau Chief of Air Quality Control, Health and Human Services Dept., City of Houston, 7411 Park Place Blvd., Rm. 108, Houston, Texas, 77087-4441

Form OP-CRO1
Certification by Responsible Official
Federal Operating Permit Program

All initial permit application, revision, renewal, and reopening submittals requiring certification must be addressed using this form. Updates to site operating permit (SOP) and temporary operating permit (TOP) applications, other than public notice verification materials, must be certified prior to authorization of public notice or start of public announcement. Updates to general operating permit (GOP) applications must be certified prior to receiving an authorization to operate under a GOP.

I. IDENTIFYING INFORMATION

A. RN: RN100219526	B. CN: CN603624289	C. Account No.: HG-0562-P
D. Permit No.: O1598	E. Project No.: TBA	
F. Area Name: Houston Plant		
G. Company Name: TPC Group LLC		

II. CERTIFICATION TYPE *(Please mark the appropriate box)*

A. ☑ Responsible Official: B. ☐ Duly Authorized Representative:

III. SUBMITTAL TYPE *(Place an "X" in the appropriate box) (Only one response can be accepted per form)*

☐ SOP/TOP Initial Permit Application ☐ Update to Permit Application

☐ GOP Initial Permit Application ☑ Permit Revision, Renewal, or Reopening

☐ Other:_____

IV. CERTIFICATION OF TRUTH

This certification does not extend to information which is designated by the TCEQ as information for reference only.

I, Charles Kirk Johnson, certify that I am the RO for this application
(Certifier Name printed or typed) *(RO or DAR)*

and that, based on information and belief formed after reasonable inquiry, the statements and information dated during the time period in Section IV.A below, or on the specific date(s) in Section IV.B below, are true, accurate, and complete:

Note: Enter EITHER a Time Period OR Specific Date(s) for each certification. This section must be completed. The certification is not valid without documentation date(s).

A. Time Period: From _____ to _____
*Start Date** *End Date**

OR

B. Specific Dates: 11/29/2010
*Date 1** *Date 2** *Date 3** *Date 4** *Date 5** *Date 6** *Date 7** *Date 8**

**The Time Period option may only be used when the "Submittal Type" is 'Update to Permit Application' and there are multiple uncertified submittals; or a submittal package has multiple dates recorded in the documentation. Do not use the Time Period option if the "Submittal Type" is 'Other.'*

Signature: CK Johnson Signature Date: November 29, 2010

Title: Plant Manager

Texas Commission on Environmental Quality
Federal Operating Permit Program
Application for Permit Revision/Renewal
Form OP-2
Table 1

Date: 11/29/2010	**Permit No.: O1598**	**Account No.: HG-0562-P**	**Regulated Entity No.: RN100219526**
Area Name: Houston Plant	**Company Name: TPC Group LLC**	**Customer Reference No.: CN603624289**	

For Submissions to EPA *(SOP renewal, minor revision, and significant revision applications only)*	
Has a copy of this application been submitted (or is being submitted) to EPA? *(Refer to the form instructions for additional information.)*	☒ YES ☐ NO

I. APPLICATION TYPE

Indicate the type of application:
- ☐ Renewal
- ☐ Significant Revision
- ☐ Administrative Revision
- ☒ Streamlined Revision (*Must include provisional terms and conditions as explained in the instructions.*)
- ☐ Revision Requesting Prior Approval
- ☐ Response to Reopening

II. QUALIFICATION STATEMENT

For SOP Revisions Only	The referenced changes qualify for the marked revision type.	☒ YES ☐ NO
For GOP Revisions Only	The permitted area continues to qualify for a GOP.	☐ YES ☐ NO

III. MAJOR SOURCE POLLUTANTS *(Complete this section if the permit revision is due to a change at the site.)*

Indicate all pollutants for which the site is a major source based on the site's potential to emit after the change is operated:

Pollutant	**VOC**	**NO_x**	**SO_2**	**PM_{10}**	**CO**	**Pb**	**HAPs**	**Other**
Major at the Site *(YES/NO)*:	YES	YES	NO	YES	YES	NO	YES	

IV. FEE INFORMATION

Has the applicant paid emissions fees for the most recent agency fiscal year (September 1 - August 31)?	☒ YES ☐ NO ☐ N/A

V. DELINQUENT FEES AND PENALTIES

Notice: This form will not be processed until all delinquent fees and/or penalties owed the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and penalty protocol.

Texas Commission on Environmental Quality
Federal Operating Permit Program
Application for Permit Revision/Renewal
Form OP-2
Table 2

Date: 11/29/2010	Permit No.: O1598	Account No.: HG-0562-P	Regulated Entity No.: RN100219526
Area Name: Houston Plant	Company Name: TPC Group LLC	Customer Reference No.: CN603624289	

I. DESCRIPTION OF REVISION

Revision No.	Revision Code	Unit/Group Process			NSR Authorization	Description of Changes and Provisional Terms and Conditions
		New Unit	ID No.	Applicable Form		
1	MS-C	NO	T-73	OP-SUMR	086/05/04/1994, 106.261/12/24/1998, 106.472/09/04/2000, 106.478/09/04/2000	Remove from GRP-TANK4.
2	MS-C	NO	T-74	OP-SUMR	086/05/04/1994, 106.261/12/24/1998, 106.478/09/04/2000	Remove from GRP-TANK4.
3	MS-C	NO	GRP-TANK4	OP-SUMR	086/05/04/1994, 106.261/12/24/1998, 106.472/09/04/2000, 106.478/09/04/2000	Remove GRP-TANK4.
4	MS-C	NO	T-73	OP-UA3	086/05/04/1994, 106.261/12/24/1998, 106.472/09/04/2000, 106.478/09/04/2000	Add 30 TAC Chapter 115, Storage of VOC Applicability.
5	MS-C	NO	T-73	OP-UA3	086/05/04/1994, 106.261/12/24/1998, 106.472/09/04/2000, 106.478/09/04/2000	Add 40 CFR 63, Subpart G Applicability. The T-73 tank seal will be changed from vapor mounted to mechanical shoe.

Texas Commission on Environmental Quality
Federal Operating Permit Program
Application for Permit Revision/Renewal
Form OP-2
Table 2

Date: 11/29/2010	Permit No.: O1598	Account No.: HG-0562-P	Regulated Entity No.: RN100219526
Area Name: Houston Plant	Company Name: TPC Group LLC		Customer Reference No.: CN603624289

I. DESCRIPTION OF REVISION

Revision No.	Revision Code	Unit/Group Process			NSR Authorization	Description of Changes and Provisional Terms and Conditions
		New Unit	ID No.	Applicable Form		
6	MS-C	NO	T-73	OP-UA3	086/05/04/1994, 106.261/12/24/1998, 106.472/09/04/2000, 106.478/09/04/2000	Add 40 CFR Part 60, Subpart Kb Negative Applicability.
7	MS-C	NO	T-74	OP-UA3	086/05/04/1994, 106.261/12/24/1998, 106.478/09/04/2000	Add 30 TAC Chapter 115, Storage of VOC Applicability.
8	MS-C	NO	T-74	OP-UA3	086/05/04/1994, 106.261/12/24/1998, 106.478/09/04/2000	Add 40 CFR 63, Subpart G Applicability.
9	MS-C	NO	T-74	OP-UA3	086/05/04/1994, 106.261/12/24/1998, 106.472/09/04/2000, 106.478/09/04/2000	Add 40 CFR Part 60, Subpart Kb Negative Applicability.

Texas Commission on Environmental Quality
Federal Operating Permit Program
Application for Permit Revision/Renewal
Form OP-2
Table 3

Date: 11/29/2010	**Permit No.: O1598**	**Account No.: HG-0562-P**	**Regulated Entity No.: RN100219526**
Area Name: Houston Plant	**Company Name: TPC Group LLC**		**Customer Reference No.: CN603624289**

I. SIGNIFICANT REVISION *(Complete this section if you are submitting a significant revision application or a* ***renewal application*** *that includes a significant revision.)*

A.	Is the site subject to bilingual requirements pursuant to 30 TAC § 122.322?	☐ YES ☐ NO
B.	Indicate the alternate language(s) in which public notice is required:	
C.	Will there be a change in air pollutant emissions as a result of the significant revision?	☐ YES ☐ NO
D.	Indicate the air pollutant(s) that will be changing and include a brief description of the change in pollutant emissions for each pollutant:	

Pollutant	Description of the Change in Pollutant Emissions

Texas Commission on Environmental Quality
Federal Operating Permit Program
Individual Unit Summary for Revisions
Form OP-SUMR
Table 1

Date: 11/29/2010	**Regulated Entity No.:** RN100219526	**Permit No.:** O1598
Company Name: TPC Group LLC	**Area Name:** Houston Plant	

Unit/Process						Preconstruction Authorizations	
AI	Revision No.	ID No.	Applicable Form	Name/ Description	CAM	30 TAC Chapter 116/ 30 TAC Chapter 106	Title I
D	1	T-73	OP-UA3	Storage Tank 73		See OP-2	
D	2	T-74	OP-UA3	Storage Tank 74		See OP-2	
A	4	T-73	OP-UA3	Storage Tank 73		See OP-2	
A	7	T-74	OP-UA3	Storage Tank 74		See OP-2	

Texas Commission on Environmental Quality
Federal Operating Permit Program
Individual Unit Summary for Revisions
Form OP-SUMR
Table 2

Date: 11/29/2010	**Regulated Entity No.:** RN100219526	**Permit No.:** O1598
Company Name: TPC Group LLC	**Area Name:** Houston Plant	

Revision No.	ID No.	Applicable Form	Group AI	Group ID No.	Plant AI	Plant ID No.
1	T-73	OP-UA3	D	GRP-TANK4		
2	T-74	OP-UA3	D	GRP-TANK4		
4	T-73	OP-UA3	A			
7	T-74	OP-UA3	A			

Storage Tank/Vessel Attributes
Form OP-UA3 (Page 4)
Federal Operating Permit Program

Table 4a: Title 30 Texas Administrative Code Chapter 115 (30 TAC Chapter 115)
Subchapter B: Storage of Volatile Organic Compounds (VOCs)

Date: 11/29/2010	Permit No.: O1598	Regulated Entity No.: RN100219526
Area Name: Houston Plant		Customer Reference No.: CN603624289

Unit ID No.	SOP/GOP Index No.	Alternate Control Requirement	ACR ID No.	Product Stored	Storage Capacity	Throughput	Potential to Emit	Uncontrolled Emissions
T-73		No		VOC1	A40K+			
T-74		No		VOC1	A40K+			

Storage Tank/Vessel Attributes
Form OP-UA3 (Page 5)
Federal Operating Permit Program

Table 4b: Title 30 Texas Administrative Code Chapter 115 (30 TAC Chapter 115) Subchapter B: Storage of Volatile Organic Compounds (VOCs)

Date: 11/29/2010	Permit No.: O1598	Regulated Entity No.: RN100219526
Area Name: Houston Plant		Customer Reference No.: CN603624289

Unit ID No.	SOP/GOP Index No.	Construction Date	Tank Description	True Vapor Pressure	Primary Seal	Secondary Seal	Control Device Type	Control Device ID No.
T-73			IFR1	1.5+A	MSHOE			
T-74			IFR1	1.5+A	VAPOR			

Storage Tank/Vessel Attributes
Form OP-UA3 (Page 13)
Federal Operating Permit Program

Table 9a: Title 40 Code of Federal Regulations Part 63 (40 CFR Part 63)
Subpart G: National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Storage Vessels

Date: 11/29/2010	Permit No.: O1598	Regulated Entity No.: RN100219526
Area Name: Houston Plant		Customer Reference No.: CN603624289

Unit ID No.	SOP Index No.	MACT Subpart F/G Applicability	NESHAP Subpart Y Applicability	NSPS Subpart Kb Applicability	Maximum TVP	Emission Control Type	AMOC ID No.
T-73		YES	NO		11.11-	IFR	
T-74		YES	NO		11.11-	IFR	

Storage Tank/Vessel Attributes
Form OP-UA3 (Page 14)
Federal Operating Permit Program

Table 9b: Title 40 Code of Federal Regulations Part 63 (40 CFR Part 63)
Subpart G: National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Storage Vessels

Date: 11/29/2010	Permit No.: O1598	Regulated Entity No.: RN100219526
Area Name: Houston Plant		Customer Reference No.: CN603624289

Unit ID No.	SOP Index No.	Seal Type	Closed Vent System	Hard Piping	Bypass Lines	Control Device Type	Control Device ID No.	Control Device Design	Design Evaluation Submitted
T-73									
T-74									

Texas Commission on Environmental Quality
Form OP-REQ2
Negative Applicable Requirement Determinations
Federal Operating Permit Program

Date: 11/29/2010	Regulated Entity No.: RN100219526	Permit No.: O1598
Company Name: TPC Group LLC	Area Name: Houston Plant	

Unit AI	Revision No.	Unit/Group/Process		Potentially Applicable Regulatory Name	Negative Applicability Citation	Negative Applicability Reason
		ID No.	Applicable Form			
A	6	T-73	OP-UA3	NSPS Kb	60.110b(a)	Construction, reconstruction, or modification of this tank was commenced before 07/23/1984
A	9	T-74	OP-UA3	NSPS Kb	60.110b(a)	Construction, reconstruction, or modification of this tank was commenced before 07/23/1984
			OP-			
			OP-			
			OP-			
			OP-			
			OP-			
			OP-			
			OP-			
			OP-			