SAGE
ENVIRONMENTAL CONSULTING

Plains Marketing, L.P.

New Source Review Permit Application

Corpus Christi Dock and Storage Terminal

Corpus Christi, Texas

July 2015 Supplement

STATE OF TEXAS
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SECTION 1
INTRODUCTION

1.0 Summary of Changes from September 2014 Application

This July 2015 submittal substantially revises the air permit application for the proposed Corpus Christi Dock and Storage Terminal ("The Facility") to reflect commitments that Plains Marketing, L.P. ("Plains") has made to resolve community concerns and to incorporate information on design and operation of The Facility that was not available at the time of the September 2014 submittal. In addition, the July 2015 submittal addresses each of the TCEQ's June 5, 2015 requests for additional information as applied to Plains' updated plans for The Facility. This overview highlights the principal enhancements and refinements to The Facility that are more particularly described in this section by section summary of changes. As a result of the updated representations found in the July 2015 application supplement, Plains is able to substantially reduce and more thoroughly characterize allowable emissions from The Facility. The principal changes include the following:

- The use of Internal Floating Roof ("IFR") design for the twelve (12) product storage tanks to reflect technical commitments made by Plains to resolve community concerns and reduce emissions.
- The availability of additional Vapor Combustor Unit ("VCU") design and emissions data, including manufacturer guarantee of 99.9% destruction efficiency for VOCs routed to VCUs.
- The reduction in allowable emissions of regulated air contaminants such that federal Prevention of Significant Deterioration ("PSD") review is no longer required for The Facility.
- The recognition that Plains may also transfer crude oil and condensate from The Facility via pipeline. While the maximum annual marine loading throughput remains at 73 million barrels per year ("MMbbl/yr"), the maximum throughput has been increased to 100 MMbbl/yr to allow for pipeline and tank-to-tank transfers at The Facility.
- The addition of a second loading arm at the marine dock to allow the increased short-term marine vessel loading rate to be increased to 40,000 barrels per hour (bph).
- The refinement of various emission estimates based on the detailed design of The Facility that is now available including Piping & Instrument Diagrams ("P&IDs").
- The more representative characterization of the Reid Vapor Pressures ("RVP") of the crude oil and condensate over the anticipated range of anticipated ambient temperatures.
- The updated evaluation of anticipated maintenance, startup and shutdown ("MSS") activities and associated emissions.

A more detailed list of changes is presented in new Appendix H.

1.1 Purpose

Plains Marketing, L.P. (Plains) is requesting authorization to construct a petroleum storage and transfer facility to be located along the Corpus Christi Ship Channel, Nueces County, Texas. Once constructed, the facility will have the capability to handle up to 100 million barrels (MMbbl) of crude oil and/or condensate annually, and to load up to 73 MMbbl of crude oil and/or condensate on to ships and ocean-going barges annually. Plains is submitting this revised version of the permit application as a supplement to its September 2014 permit application, which was submitted to the Texas Commission on Environmental Quality (TCEQ) in accordance with Title 30 of the Texas Administrative Code (30 TAC) Chapter 116, related to the control of air pollution by permits for new construction, as specified in 30 TAC § 116.111. The revised version of the permit application identifies changes and additional controls to the proposed facilities that exceed Best Available Control Technology ("BACT") requirements and will reduce allowable emissions such that the project will no longer be subject to federal Prevention of Significant Deterioration ("PSD") Review.

The proposed Corpus Christi Dock and Storage Terminal, henceforth referred to as "The Facility", will include the following equipment:

- Six (6) 234,000 bbl (working capacity), 302,000 bbl (shell capacity) Internal Floating Roof (IFR) product storage tanks;
- Six (6) 309,000 bbl (working capacity), 377,000 bbl (shell capacity) IFR product storage tanks;
- Two (2) slop oil tanks (400 bbls each);
- One (1) dock stormwater/wastewater sump tank (approximately 1,100 gallons);
- One (1) ocean-going barge and ship loading operation;
- One (1) marine vapor combustor system;
- Two (2) emergency generator engines;
- Associated fugitive components; and
- Associated Maintenance, Startup, and Shutdown (MSS) activities.

The Facility will be located in Nueces County, Texas, which is classified as an attainment or unclassifiable area for all criteria pollutants. The Facility is considered a minor source and it therefore not subject to the PSD or Title V Federal Operating Permit ("FOP") programs. Summary Table 1-1 shows that emissions of all regulated pollutants are below the major source thresholds. Detailed emission calculation methodologies for the emissions noted below are discussed in Sections 3 and 4 of this application.

Table 1-1 Overall Emissions Summary

Pollutant	Annual Emissions Tons/Year	PSD Major Stationary Source or Title V Major Source Threshold Tons/Year	PSD Significant Emission Rate Tons/Year	PSD Review Required?
Nitrogen Oxides (NOx)	52.3	100	40	NO
Carbon Monoxide (CO)	80.4	100	100	NO
Volatile Organic Compounds (VOC)	87.7	100	40	NO
Particulates ($PM/PM_{10}/PM_{2.5}$)*	6.3	100	25/15/10	NO
Sulfur Dioxide (SO_2)	3.4	100	40	NO
Hydrogen Sulfide (H_2S)	0.1	N/A	10	NO
Carbon Dioxide Equivalents (CO_2e)	66,180	N/A	N/A**	NO
Total HAPs	2.2	25	N/A	NO
Highest Single HAP (n-Hexane)	0.4	10	N/A	NO

* Conservatively assumes all $PM_{2.5} = PM_{10} = PM$

** Following the Supreme Court's decision in *UARG v. EPA*, EPA has indicated that PSD review for greenhouse gas emissions (GHGs) can only be required if at least one other regulated pollutant exceeds the major source threshold.

1.2 Federal Permitting Applicability

The TCEQ's SIP-approved PSD regulations define a "major stationary source" as a source that has the potential to meet or exceed the major source threshold of 100 tons per year (TPY) for any federally regulated New Source Review (NSR) pollutant if the source is one of the 28 categories of named sources. The Facility, as a petroleum storage and transfer unit with a total storage capacity exceeding 300,000 barrels, is one of the named sources. Emissions resulting from the operation of The Facility are not subject to PSD review because none of the regulated pollutants exceed the major source emission threshold. TCEQ administrative form Table 1F is included in Appendix B to show federal NSR applicability.

1.3 Application Contents

Key components of this application are organized as follows:

- An area map is provided at the end of Section 2;
- A plot plan is provided at the end of Section 2;
- A process description and process flow diagrams are included in Section 2;
- Emission calculation methodology is included in Section 3;
- Best Available Control Technology (BACT) is addressed in Section 4;

- Regulatory applicability and compliance strategies are addressed in Section 5;
- Appendix A contains completed TCEQ administrative forms, including the PI-1 application form, Table 1(a), Material Balance Table 2, the Core Data Form, and Table 30 “Fee Verification” Form;
- Appendix B contains completed TCEQ Federal NSR Applicability Form Table 1F;
- Appendix C contains completed TCEQ technical application forms, including the Table 4, Table 7, and Table 29 forms required for the proposed equipment;
- Appendix D contains emission rate calculations for the proposed facility;
- Appendix E contains documents supporting the emission calculation basis and inputs; and
- Appendix F contains TCEQ Current BACT Guidelines.
- Appendix G contains the October 9th, 2014 TCEQ response submittal including additional BACT analyses.

SECTION 2
PROCESS DESCRIPTION

2.1 Process Description

The Facility is a petroleum bulk storage terminal, providing temporary storage of crude oil and condensate. Liquids will be received into the Facility via pipeline or marine vessel. Liquids received by pipeline may be stored in the twelve crude/condensate storage tanks for delivery out of the Facility by pipeline or marine vessel or loaded directly on to marine vessels at the dock, bypassing tank storage. Liquids received by marine vessel may be placed into tank storage for delivery out of the Facility by pipeline or marine vessel or delivered out of the Facility by pipeline directly, bypassing tank storage.

Up to 73 million bbl/yr will be loaded onto marine vessels (ships and/or ocean-going barges). Note, this application does not request authorization for the loading of inland or shallow-draft barges. The twelve crude/condensate storage tanks will be authorized for a cumulative throughput of 100 million barrels per year. The difference (27 million bbl/yr) is to allow for volumes that may be received and delivered by pipeline (i.e., not involving marine vessels), as well as tank-to-tank transfers for operational purposes.

The maximum hourly loading rate into the crude/condensate storage tanks from the pipelines is 50,000 barrels per hour (bbl/hr). The maximum hourly withdrawal rate from the storage tanks to a combination of pipelines and marine vessel will not exceed 50,000 bbl/hr.

Barge and ship loading of crude oil/condensate will be controlled via a vapor combustor system with a minimum VOC Destruction/Removal Efficiency (DRE) of 99.9%. The physical marine dock structure will be designed with two loading arms to be able to accommodate both ocean-going barges and ships at a maximum loading rate of up to 40,000 bbl/hr.

The Facility will include the following equipment:

- Six (6) 234,000 bbl (working capacity), 302,000 bbl (shell capacity) IFR crude oil or condensate product storage tanks (EPNs 27600, 27610, 27620, 27630, 27640, and 27650);
- Six (6) 309,000 bbl (working capacity), 377,000 bbl (shell capacity) IFR crude oil or condensate product storage tanks (EPNs 35000, 35010, 35020, 35030, 35040, and 35050);
- Two (2) slop oil tanks, 400 bbls each (EPNs 27800 and 27810);
- One (1) dock stormwater/wastewater sump tank, approximately 1,100 gallons (EPN 27820), equipped with a carbon adsorption system (CAS);
- One (1) ocean-going barge and ship loading operation (EPNs L-1 and L-2);

- One (1) marine vapor combustor system (EPNs V-1 and V-2);
- Two emergency generator engines (EPNs EMERGEN1 and EMERGEN2);
- Associated fugitive components (EPN FUG-1); and
- Associated Maintenance, Startup, and Shutdown (MSS) activities (EPN MSS).

Planned Maintenance, Startup, and Shutdown (MSS) emissions will result from the following activities:

- Initial filling of the storage tanks;
- Change of service of the storage tanks;
- Periodic cleaning and maintenance of the storage tanks;
- Vacuum truck operations (for removing the heel from storage tanks for maintenance); and
- Small equipment maintenance, including sample pots and strainers, pipeline section maintenance, pigging activities, and pump maintenance.

A description of each planned MSS activity and estimated maximum frequencies and durations are provided in the emission calculation methodology section (Section 3) and in the emission calculation tables in Appendix D. IFR storage tank degassing and refilling activities will be controlled by the vapor combustor system. The vacuum trucks will be controlled by a CAS.

An area map, plot plan, and process flow diagram are provided at the end of this section.

Figure 2-1 Area Map

Figure 2-1 Area Map

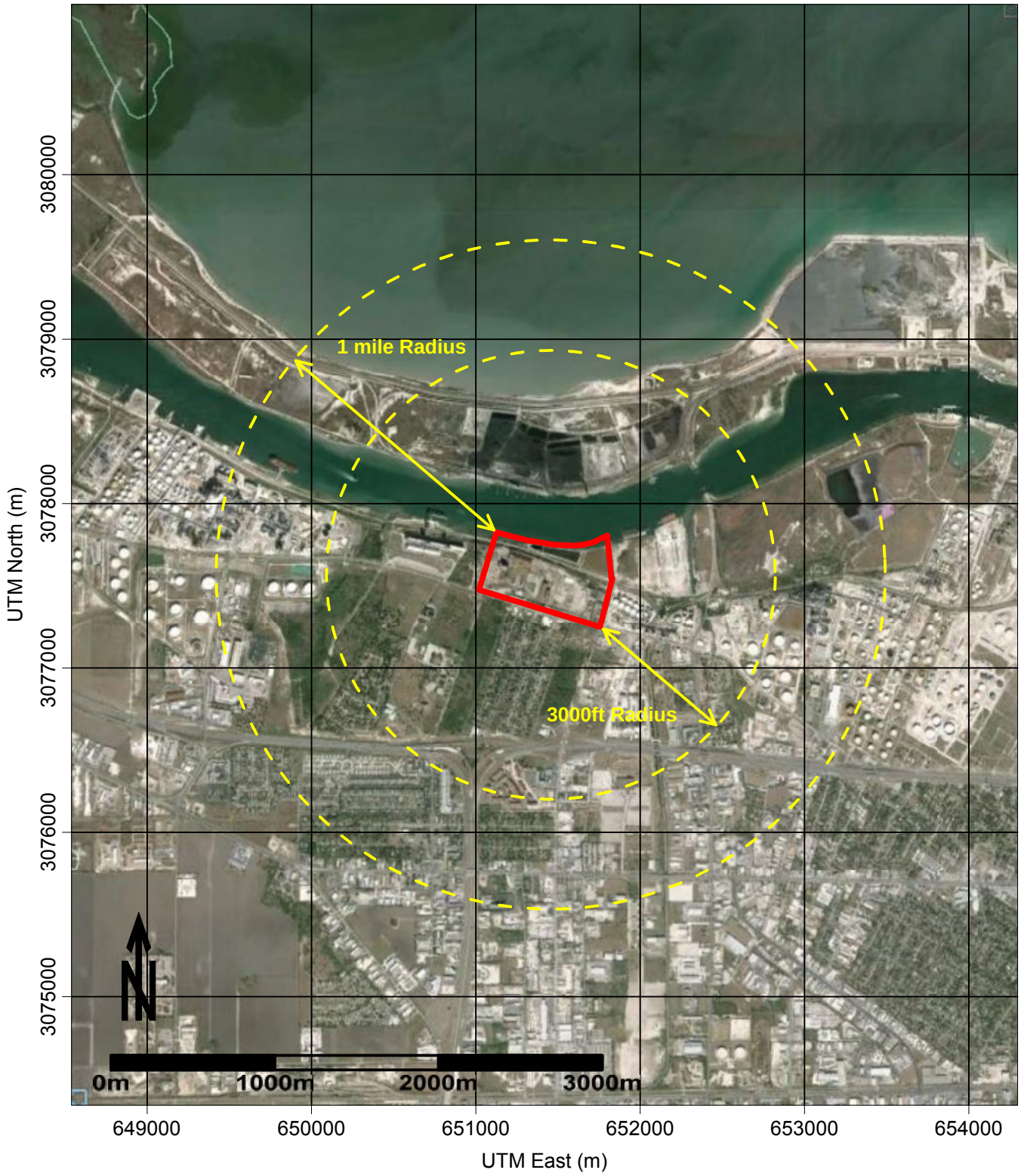
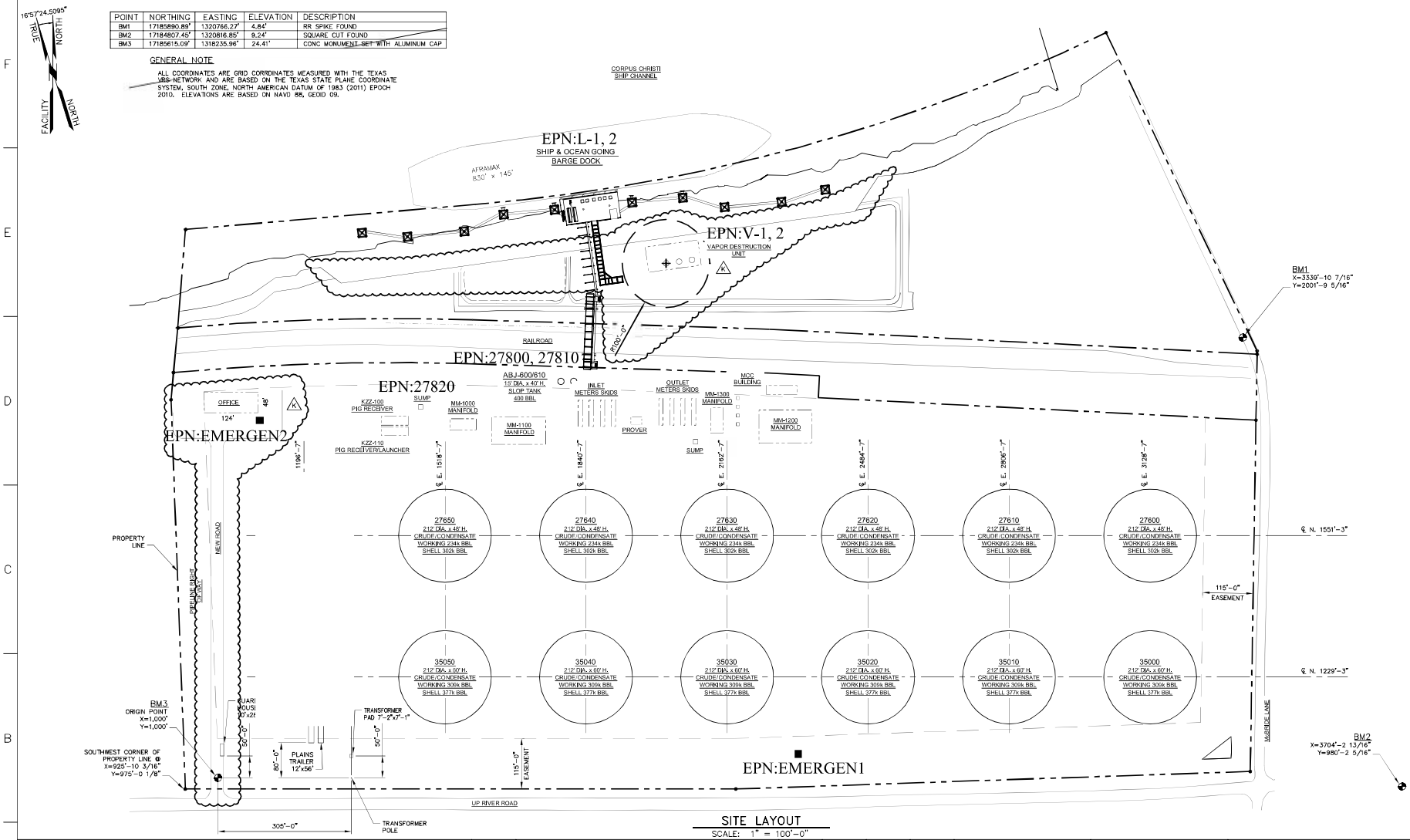


Figure 2-2 Plot Plan

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
BM1	17185890.89'	1320766.27'	4.84'	RR SPIKE FOUND
BM2	17184807.45'	1320816.85'	9.24'	SQUARE CUT FOUND
BM3	17185615.09'	1318235.96'	24.41'	CONC MONUMENT SET WITH ALUMINUM CAP

GENERAL NOTE

ALL COORDINATES ARE GRID CORRDINATES MEASURED WITH THE TEXAS JBS NETWORK AND ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NORTH AMERICAN DATUM OF 1983 (2011) EPOCH 2010. ELEVATIONS ARE BASED ON NAVD 88, GEOID 09.



SITE LAYOUT

SCALE: 1" = 100'-0"

REV.	REVISION	DATE	DRAFT	CHECKED	APP'D.
K	REVISED LOCATION OF VDU UNIT AND BDLG SIZE	01/19/15	LPD		
J	ADDED LOCATION OF EQUIPMENT	08/20/14	LPD		
H	ORIGIN POINT RELOCATED PER SURVEY & ADDED TRAILERS	06/25/14	LPD		
G	ADDED SLOP TANKS	6/3/14	LTC		
F	REVISED TANK NUMBERS	5/21/14	LTC		
E	REVISED ELECTRICAL SUBSTATION AREA	5/14/14	LTC		
D	REVISED AS NOTED	05/09/14	LPD		
C	REVISED T-27530, T-27630 & SHIP DOCK LOCATION	05/01/14	LPD		
B	RE-ISSUED FOR APPROVAL	04/16/14	LPD		
A	ISSUED FOR APPROVAL	04/16/14	LPD		

PELICAN Energy Consultants, LLC

PLAINS MARKETING, L.P.

TITLE: CORPUS CHRISTI CRUDE OIL STORAGE FACILITY
CORPUS CHRISTI, TEXAS

SITE LAYOUT

DRAWING APPROVAL

DRAWN BY:	LPD	04/16/14	CHECKED BY:	
DESIGN ENGINEER:	PJL	04/16/14	CLIENT APPROVAL:	

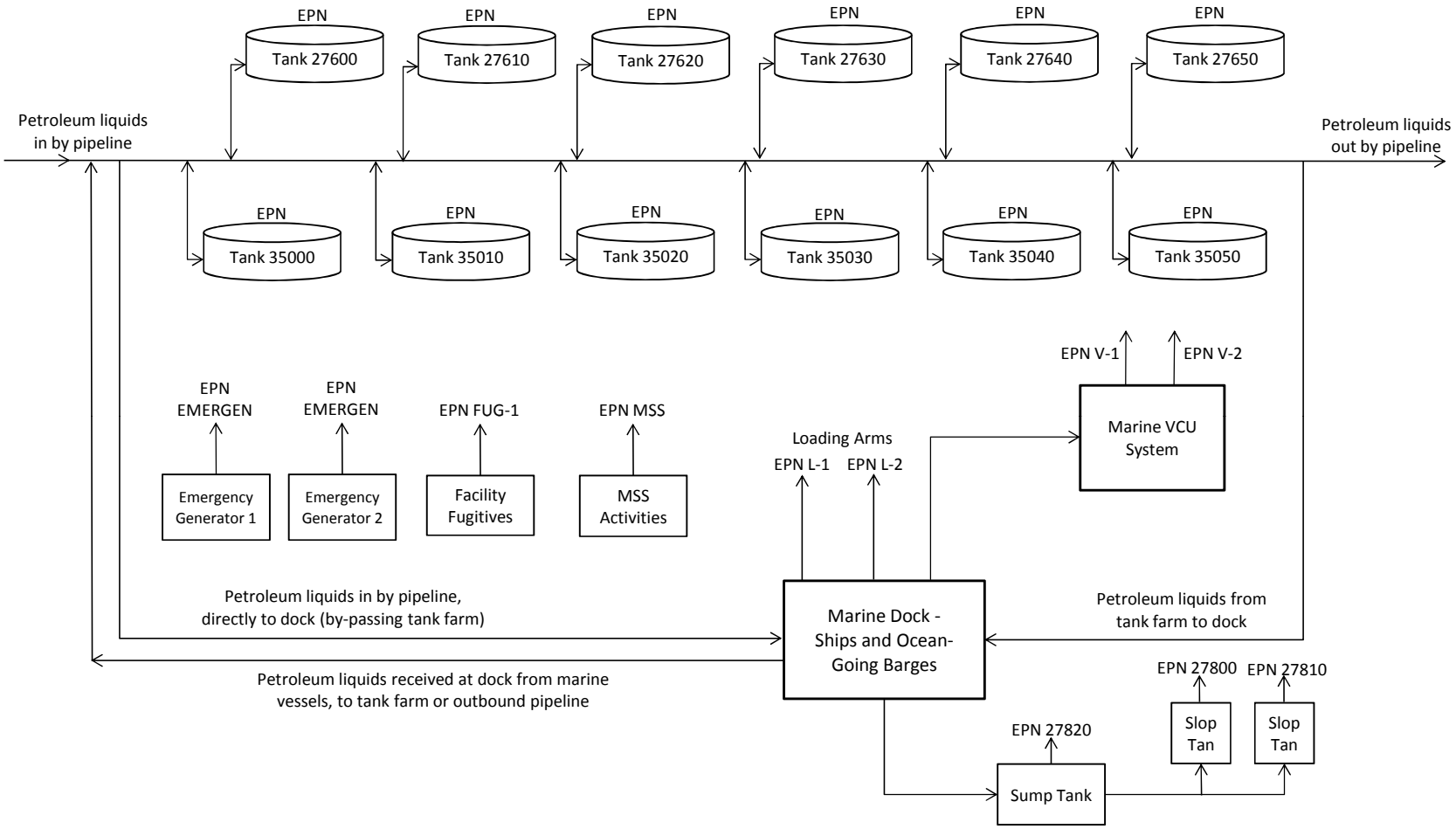
CLIENT: PLAINS MARKETING, L.P.

JOB NO. 140114 DWG. NO. 31000

PLOT TIME: January 20, 2015 1:15 PM BY: LARRY DAIGLE FILE PATH: F:\DRAFTING\CLIENT PROJECTS\PLAINS ALL AMERICAN\CORPUS CHRISTI\140114 CORPUS STORAGE FACILITY\DRAWINGS\30000 MECHANICAL\31000\31000-140114.DWG

Figure 2-3 Process Flow Diagram

Figure 2-3
Plains Marketing, LP - Corpus Christi Dock and Storage Terminal
Facility Process Flow Diagram



SECTION 3
EMISSION CALCULATION METHODOLOGY

The methodology for calculating the emissions proposed in this application are explained in this section. A summary of the emissions and detailed calculations can be found in Appendix D. Supporting documentation related to the emission calculations is provided in Appendix E.

3.1 Fugitive Equipment Leaks

The following is a summary of the key assumptions used:

- Plains has estimated the number of fugitive components based on the types of equipment to be constructed at The Facility, and a component count for each equipment type was determined from the P&ID diagrams for the facility. The components consist primarily of valves, flanges, pumps, and connectors.
- Plains has used the TCEQ guidance document "Emission Factors for Equipment Leak Fugitive Components," Addendum to RG-360A, January 2008. Table 4 of this guidance document, referencing Petroleum Marketing Terminal factors, was used to obtain the emission factors for the various components, except for pipe disconnects.
- When the loading arms used for ocean-going barge and ship loading are disconnected from service, it is assumed that a layer of liquid will remain on the interior surface of the pipe, often referred to as "clingage." This liquid results in the saturation of the remaining vapor space inside the pipe, which is then released to the atmosphere. Plains has used an equation that assumes the entire clingage volume is released to the atmosphere. The equation uses a clingage layer of 0.006 bbls/1,000 ft^2 and the surface area of the inside of the piping (calculated from facility P&IDs) to estimate emissions per disconnect event. The clingage layer is referenced from Table 7.1-10 in Chapter 7 of the EPA's Compilation of Air Pollutant Emission Factors, otherwise referred to as AP-42. Since there will be two loading arms potentially operating simultaneously, the maximum number of pipe disconnects per hour is 2. The maximum annual number of pipe disconnects is estimated at 1081 per year, based on the maximum annual facility throughput (73,000,000 bbls), the smallest ship size (135,000 bbls), and the 2 loading connections per ship.
- Storage tank mixer seals are treated the same as pump seals and counted in the pump seals category.
- The liquid and gas streams are conservatively assumed to be 100% volatile organic compounds (VOCs).

3.2 Storage Tanks

The following is a summary of the key assumptions used:

- All twelve of the product storage tanks at The Facility will be equipped with internal floating roofs with double rim seals and 13 fixed-roof support columns. The two slop oil tanks will be vertical fixed roof tanks without internal floating roofs. The stormwater/wastewater sump tank will be a horizontal fixed roof tank without internal floating roofs.
- The maximum pumping rate for each of the product storage tanks is 50,000 barrels per hour. This was used along with a maximum temperature assumption of 95 °F to calculate maximum hourly emissions.
- A proposed annual site throughput of 100,000,000 barrels per year was used to calculate maximum annual working losses from the product storage tanks.
- An annual throughput of 600 barrels per year (based on 1.5 turnovers per year) and hourly maximum throughput of 29 barrels per hour (based on a maximum pump rate of 20 gpm) were assumed to calculate annual and max hourly emissions for each of the two slop oil tanks.
- The crude oil/condensate being stored is conservatively assumed to have an RVP of 9.5 psi, which is the maximum expected RVP for this facility.
- Except for the number of fixed-roof support columns in each tank, floating roof fitting counts are assumed to be the default values specified by Table 7.1-12 in Chapter 7 of the EPA's Compilation of Air Pollutant Emission Factors, otherwise referred to as AP-42, and adjusted to be compliant with NSPS Kb standards. The tanks will be designed with 13 fixed-roof support columns rather than the AP-42 default value of 22. This results in significant emission reductions from each tank.
- The assumptions above were used as inputs for the EPA's TANKS 4.09 program, which was used to calculate the emissions for each tank (except the wastewater/ stormwater sump tank which was calculated using the ideal gas law).
- A carbon adsorption system breakthrough VOC concentration of 100 ppmv and a hourly maximum throughput of 10 barrels per hour (based on the highest recorded daily rainfall in Corpus Christi) were assumed to calculate both annual and maximum hourly emissions for the wastewater/stormwater sump tank.
- The emissions were calculated for operational flexibility, assuming that the entire annual throughput could be sent through any one product storage tank. Therefore, working losses from the product storage tanks were calculated as a single cap emission limit, with each tank's breathing losses calculated individually.

3.3 Marine Loading Operations

The following is a summary of the key assumptions used:

- Vapors evolved from loading are collected and routed to a vapor combustor system with a minimum VOC Destruction Removal Efficiency (DRE) of 99.9%.
- A 99% collection efficiency for ocean-going barge and ship loading was used. Plains has committed to conduct testing to confirm the claimed efficiency in accordance

with TCEQ's draft "Testing Protocol for the Direct Measurement of Uncollected Volatile Organic Compound (VOC) Loading Losses During Marine Vessel Loading" (August 2014).

- The maximum loading rate for an ocean-going barge or ship is based on the maximum pumping capacity of 40,000 barrels per hour.
- The proposed annual throughput associated with the marine loading operations is 73,000,000 barrels per year.
- The crude oil/condensate being loaded is conservatively assumed to have an RVP of 9.5 psi.
- VOC emissions are calculated using Equation 1 of Section 5.2 of AP-42. The saturation factor used in Equation 1 is 0.2, which represents ships and ocean-going barges, according to the AP-42 background document, API Technical Document No. 2514A.
- H_2S and SO_2 emissions are calculated based on the ideal gas law, assuming a maximum hourly H_2S concentration of 1,000 ppmv and an annual average H_2S concentration of 100 ppmv is present in the vapor space of the ocean-going vessel during loading, a 99% collection efficiency at the dock, and a 98% conversion rate of H_2S to SO_2 in the VCU system. The concentration assumptions are higher than the concentration of H_2S present in the crude oil or condensate being loaded, to account for some potential residual H_2S in the empty cargo vessels.

3.4 Maintenance, Startup and Shutdown (MSS) Operations

Various activities will occur at The Facility associated with the planned maintenance, startup and shutdown of facilities. These emissions basis is summarized below and detailed emission calculations are provided in Appendix D.

3.4.1 Sample Pots and Strainer Maintenance

There will be up to ten sample pots at The Facility. The top of the 10-gallon pots will be opened for cleaning after every distinct batch or movement of oil. This process involves running the internal mixer of the pot and then draining the pot to a closed container. After it is drained, it will be opened to remove any debris that might have accumulated. A given sample pot can be cleaned in this manner several times per month. As a conservative assumption, it is assumed that two sample pots are cleaned per hour and each pot is cleaned once per day on average, for 3,650 openings per year with 10 gallons of saturated vapor released each time. These emissions are calculated in Appendix D, based on the ideal gas law, with the following assumptions:

- The maximum emissions would occur in July and two sample pots per hour would be cleaned for maintenance.
- Additionally, ten sample pots will be opened for maintenance no more than once per day for 365 days.

- The crude oil/condensate being stored is conservatively assumed to have an RVP of 9.5 psia.

3.4.2 Facility Piping Maintenance

As a part of any routine maintenance program, sections of facility piping are assumed to be occasionally taken out of service for maintenance. When segments of piping are removed from service, it is assumed that a volume of the crude oil/condensate inside will be drained to a closed system and that a layer of liquid (clingage) will remain on the interior surface of the piping segment. This liquid results in the saturation of the remaining vapor space inside the piping segment, which is then released to the atmosphere. These emissions are calculated in Appendix D, based on the ideal gas law, with the following assumptions:

- Plains conservatively assumes that the maximum emissions will occur in July and that a maximum of one piping segment per hour will be removed from service for maintenance.
- The volume of vapors in the piping segment are based on an estimated maximum pipeline segment size of 2 feet in diameter and 70 feet in length.
- Additionally, no more than twelve piping segments per year will be removed from service for maintenance. This estimate is based on one of the pipeline segments for each of the twelve tanks being removed from service each year.
- The crude oil/condensate being stored is conservatively assumed to have an RVP of 9.5 psia.

3.4.3 Pigging Activities

As a part of normal operation, pipelines entering and leaving The Facility are periodically opened to launch and receive pipeline pigs. When pipelines are opened to launch or receive pigs, it is assumed that a volume of the crude oil/condensate inside will be drained to a closed system and that a layer of liquid (clingage) will remain on the interior surface of the pipeline segment, often referred to as clingage. This liquid results in the saturation of the remaining vapor space inside the pipeline, which is then released to the atmosphere. These emissions are calculated in Appendix D, based on the ideal gas law and clingage losses, with the following assumptions:

- Plains conservatively assumes that the maximum emissions will occur in July and that a maximum of two pigging activities per hour will occur.
- Additionally, no more than seventy-two pigging activities per year are expected to occur annually (three pigs per month per line on average, and two lines, for a total of 6 per month x 12 months equals 72 per year).
- The volume of vapors in the pipeline segment are based on an estimated maximum pipeline segment size of 2 feet in diameter and 20 feet in length.

- The crude oil/condensate being stored is conservatively assumed to have an RVP of 9.5 psi, which is the maximum expected RVP for this facility.

3.4.4 Pump Maintenance

As a part of any routine maintenance program, pumps are assumed to be taken out of service for maintenance from time to time. When a pump is removed from service it is assumed that the crude oil/condensate inside will be drained and that a layer of liquid (clingage), conservatively assumed to be one gallon of liquid, will remain on the interior surface of the pump. This liquid results in the saturation of the remaining vapor space inside the pump, which is then released to the atmosphere. These emissions are calculated in Appendix D, based on the ideal gas law and clingage losses, with the following assumptions:

- Plains conservatively assumes that the maximum emissions would occur in July and that only one pump per hour would be removed from service for maintenance.
- Additionally, no more than five pumps per year are expected to be removed from service for maintenance. There are only five pumps at the facility and it is assumed each will need to be removed from service once per year
- The crude oil/condensate being stored is conservatively assumed to have an RVP of 9.5 psi, which is the maximum expected RVP for this facility.

3.4.5 Vacuum Truck Operations

Emissions from vacuum truck operations are calculated in Appendix D, and based on the ideal gas law and the following assumptions:

- Plains estimates a maximum loading rate of 150 gallons per minute per truck, equivalent to loading the largest size truck (9,000 gallons) in one hour.
- The emissions will be controlled by a carbon adsorption system which will have an outlet maximum VOC concentration of 100 ppmv.
- Plains estimates a maximum of two trucks operating per hour.
- Plains conservatively estimates maximum annual emissions from vacuum truck operation based on two trucks operating continuously (8,760 hours per year).

3.4.6 Tank Landings and Maintenance

The floating roofs on the internal floating roof product storage tanks will need to be landed on their support legs from time to time for two different routine activities: product change of service and maintenance/inspection activities. Roof landings result in a vapor space being created under the landed roof, which will be at least partly saturated with volatile components from the liquid that remain in the storage tank. The steps for emptying, degassing, cleaning, and refilling the storage vessels and the associated emissions are calculated in Appendix D, with the following assumptions:

- Plains conservatively assumes that the maximum emissions would occur in July and has used the meteorological data associated with this month for the hourly calculations. The annual calculations are based on the average annual temperature obtained from the Tanks 4.09 output.
- Tanks will stand idle after they have been de-inventoried for no more than one day.
- An estimated twelve product change of service activities (landing and refilling) and six maintenance activities (landing, degassing, and refilling) can occur per year. Since the calculations were based on a worst case assumption of a crude oil/condensate with an RVP of 9.5 psi, which is the maximum expected RVP for this facility. More product change of service or maintenance activities could occur in a year if the products stored were at a lower TVP. Plains would strongly prefer not to have an annual limit on the number of roof landing events as long as total site-wide emissions remain below the totals represented in this application and the resulting permit.
- If a tank is landed for maintenance activities, the vapor space under the roof is degassed after landing. The vapors are routed to the marine vapor combustor system with a VOC DRE of 99.9%. It is conservatively assumed the degassing activity will take one hour or less to complete.
- For maintenance activities, during the sludge removal stage, the tank will be ventilated for 10 hours per day for a maximum of five days. This is standard practice for this activity.
- During refilling of the tank after change of service and maintenance activities, the vapors under the roof are routed to the marine vapor combustor with a VOC DRE of 99.9% until the tank roof is floating above the legs. The maximum refilling rate (until the roof is floated) is 5,000 bbls/hr.
- The MSS calculations reflect a one-time emission representation for the initial filling of all twelve tanks. These emissions are included in the annual MSS refilling emissions.

Additionally, a BACT review can be found in Section 4 relating to emissions associated with MSS activities, in particular the practices required for product storage tank roof landings associated with degassing and refilling.

3.5 Vapor Combustor System

The vapor combustor system is guaranteed by the manufacturer to achieve a minimum VOC destruction efficiency of 99.9%. The combustor system controls emissions from marine loading and certain storage tank maintenance activities at the site.

Combustion emissions from waste gas, assist gas, and pilot gas combusted from controlled activities were estimated using different methodologies, depending on the pollutant. The vapor combustor system was designed by John Zink Company based on the maximum

throughputs and type of waste gas stream the system will be controlling. The manufacturer's specifications for the system are provided in Appendix E.

NOx and CO emissions were calculated based on lb/MMBtu emission factors and maximum heat release (MMBtu/hr) estimates provided by the vapor combustor system manufacturer (John Zink). Appendix E provides the manufacturer's specifications for the VCU system and the emission factor guarantees.

$PM/PM_{10}/PM_{2.5}$ emissions were calculated based on stack test data from a similar marine loading facility operated by Plains. The stack test report is provided in Appendix E.

VOC emissions from the waste gas combustion were calculated based on the mass loading rates and the 99.9% DRE. H_2S and SO_2 emissions from combustion of waste gas in the vapor combustor system were calculated using the maximum hourly and annual volume flow rates and the ideal gas law, assuming a maximum of 1,000 ppmv and average of 100 ppmv concentration of H_2S in the vapor space of ocean-going barges or ships during loading and an assumed 98% conversion of H_2S to SO_2. In addition to waste gas, the combustor system generates combustion emissions from the burning of natural gas as assist gas, and pilot gas for proper operation of the vapor combustor system. VOC emissions from natural gas combustion were calculated using the natural gas flow rates and a representative speciation profile of organic compounds present in the natural gas. A representative sample of natural gas from the supplier is provided in Appendix E.

3.6 Emergency Generator Engines

The emission rates for the emergency generator engines are based on manufacturer's data for the horsepower and emission factors provided in AP-42, Section 3.2, *Natural Gas-fired Reciprocating Engines* for PM, SO_2, and formaldehyde. Emission factors for NOx, CO, and VOC were based on limits in Table 1 "Emission Standards for Stationary Emergency Engines" of 40 CFR Part 60, Subpart JJJJ. The maximum annual operating schedule is the maximum number of hours that the engines will operate in non-emergency status (52 hours per year for testing and maintenance).

SECTION 4
BEST AVAILABLE CONTROL TECHNOLOGY

This section presents the Best Available Control Technology (BACT) analysis for the proposed facilities. TCEQ requires that all new or modified facilities apply BACT under the Texas Clean Air Act (TCAA).

For facilities subject to the TCAA, BACT is defined as: "an air pollution control method for a new or modified facility that through experience and research, has proven to be operational, obtainable, and capable of reducing or eliminating emissions from the facility, and is considered technically practical and economically reasonable for the facility. The emissions reduction can be achieved through technology such as the use of add-on control equipment or by enforceable changes in production processes, systems, methods, or work practice." [30 TAC 116.10(1)].

TCEQ's Three-Tiered Approach to BACT analyses is described in the TCEQ BACT guidance document "Air Pollution Control: How to Conduct a Pollution Control Evaluation" (TCEQ, 2011g). As described in the TCEQ's BACT guidance, TCEQ allows use of a three-tiered methodology to ensure that the BACT requirement is met. The evaluation begins at the first tier and progresses in sequence to the second and third tiers only if necessary. In each tier, BACT is evaluated on a case-by-case basis for technical practicability and economic reasonableness. The three tiers are briefly described as follows:

- Tier I - In the first tier, the BACT proposal is compared to the emission reduction performance levels accepted as BACT in recent NSR permit reviews for the same process and/or industry. The TCEQ has established Tier I BACT requirements for a number of industry types and the pertinent examples are cited in this application. These BACT requirements are subject to change through TCEQ case-by-case evaluation procedures.
- Tier II - If BACT requirements have not already been established for a particular process/industry or if there are compelling technical differences between the applicant facility's process and others in the same industry, the evaluation of the BACT proposal will proceed into the second tier. A Tier II BACT evaluation involves a comparison of the applicant's BACT proposal to the emission reduction performance levels that have been accepted as BACT in recent permit reviews for similar air emission streams in a different process or industry type. In-depth technical analysis, such as emission stream comparisons, may be required to determine the technical practicability of an emission reduction option that is normally used in a different process or industry type.
- Tier III -A BACT evaluation should proceed to the third tier only if the first two tiers of evaluation have failed to identify an emission reduction option(s) that is technically practicable and economically reasonable. A Tier III BACT evaluation involves a detailed technical and quantitative economic analysis of all emission reduction

options available for the process/industry under review. While technical practicability is established through the demonstrated success of an emission reduction option based on previous use and/or an engineering evaluation of a new technology, economic reasonableness is determined by the cost-effectiveness of controlling emissions (expressed as dollars per ton of pollutant reduced) and does not consider the effect of emission reduction costs on corporate economics.

Below is a BACT evaluation of the proposed facilities. Tables detailing Tier 1 BACT are included in Appendix F.

Additional BACT analyses, including a RACT/BACT/LAER Clearinghouse review and a BACT review of recently issued permits in Texas, Louisiana, Mississippi, and California, were provided in the October 9, 2014 submittal in response to a request by the TCEQ administrative review team. Those analyses further corroborate and support the BACT determinations described in this section. The portion of the submittal response that included the BACT analyses is included in Appendix G.

4.1 Fugitive Equipment Leaks (EPN: FUG-1)

TCEQ has evaluated the technical feasibility and economic reasonableness of various control technologies for equipment leak fugitives. Based on that evaluation, TCEQ has determined that controls in the form of instrument-based leak detection and repair (LDAR) monitoring programs are only justified if uncontrolled VOC emissions from equipment leak fugitives will be greater than 10 tpy. As shown on Table 1(a) in Appendix A, the uncontrolled VOCs emitted from EPN FUG-1 are estimated to be significantly less than 10 tpy; therefore, no additional control is required under current Tier I BACT Requirements for Equipment Leak Fugitives.

For further justification of no additional controls, an abbreviated economic analysis (Tier III BACT) was conducted. The additional level of control by implementing a LDAR program, would only result in a very small reduction in annual emissions. A cost analysis to reduce VOC emissions via an instrument-based LDAR program has been performed and the results are included in Table 4-1. According to this analysis, the cost-effectiveness of LDAR control is $46,757 per ton VOC emissions reduced, and this is not considered economically reasonable. In conclusion, since the fugitive emissions are relatively small and the control of implementing a LDAR program is not economically reasonable, no additional control is required.

Table 4-1 Cost Analysis for Fugitive Emissions Control with LDAR Program

Category	Value	Cost
Capital Cost	P&ID Markups	$3,000
	Tagging & Documentation	$20,000
	Database Setup	$4,000
	ODC's (Database, Analyzers, Safety Gear, etc.)	$8,000
	Total Capital Cost	$35,000
	Capital Recovery Factor[1]	0.0944
	Capital Cost, Annualized[2]	$3,304
O&M Cost	Annual Monitoring & Recordkeeping	$10,000
Annualized Control Cost	Total Annualized Cost	$13,304
	Uncontrolled VOC (TPY)	1.1906
	VOC with LDAR program (TPY)	0.9061
	VOC Reduction (TPY)	0.2845
	$/ton VOC removed	**$46,757**

Notes: Calculation method is from EPA Air Pollution Control Cost Manual, 6th Ed., Jan. 2002, EPA/452/B-02-001

1. *Capital Recovery Factor = $(IR * (1 + IR)^{CAP}) / ((1 + 1R)^{CAP} – 1)$, where:*
   CAP = Capital Annualizing Period = 20 years;
   IR = Interest Rate = 7%
2. *Capital Cost, Annualized = (Total Capital Cost) * (Capital Recovery Factor)*

4.2 Storage Tanks (EPNs: 27600, 27610, 27620, 27630, 27640, 27650, 35000, 35010, 35020, 35030, 35040, 35050, 27800, 27810)

TCEQ has evaluated the technical feasibility and economic reasonableness of various control technologies for storage tanks based on their size and content. Based on that evaluation, TCEQ has identified designs and controls that represent BACT for storage tanks that have the potential to emit VOC pollutants.

All of the product storage tanks to be constructed at The Facility will have a capacity greater than 25,000 gallons and store a liquid with a vapor pressure greater than 0.5 psia. The product storage tanks will exceed BACT by controlling VOC emissions with the use of an internal floating roof equipped with mechanical-shoe primary seals and rim-mounted

secondary seals. The tank will be painted white with uninsulated surfaces. The tank design will also reduce the number of fixed-roof support columns to 13 (as opposed to the default of 22) to further reduce emissions. These control methods are beyond BACT and exceed current BACT Requirements for Storage Tanks, as well as the minimum requirements of NSPS Subpart Kb and 30 TAC Chapter 115.

The two slop tanks (EPNs: 27800 and 27810) to be constructed at The Facility will have a capacity less than 25,000 gallons. These tanks will be submerged fill tanks with uninsulated surfaces and will be painted white. These control methods meet current BACT Requirements for Fixed Roof Storage Tanks.

4.3 Marine Loading Operations (EPNs: L-1, L-2)

TCEQ has evaluated the technical feasibility and economic reasonableness of control technologies for marine loading operations. Based on that evaluation, TCEQ has identified a VOC control device and vessel leak testing as BACT for marine loading operations for VOC when the vapor pressure of the material is greater than 0.5 psia.

At The Facility, vapors from all loading operations will be collected using methods that achieve a 99% collection efficiency and routed to a vapor combustor with a minimum VOC Destruction Removal Efficiency (DRE) of 99.9%. In addition, marine vessels will be submerged filled and subject to annual vapor tightness testing as specified in 40 CFR §63.565(c) or 40 CFR §61.304(f). These control methods meet or exceed current BACT requirements for marine loading operations.

4.4 Maintenance, Startup and Shutdown (MSS) Operations (EPN: MSS)

TCEQ has evaluated the technical feasibility and economic reasonableness of control technologies for MSS operations. Based on that evaluation, TCEQ has identified Tier 1 BACT for fixed roof tank draining and floating roof landings at storage tanks, vacuum truck operations, and small equipment maintenance.

Floating roof landings for maintenance will meet VOC BACT by degassing the tank within 24 hours of the roof landing and routing evolved vapors to the marine vapor combustor. Tank refilling emissions after maintenance activities will also be controlled by the marine vapor combustor (until the roof is re-floated). Additionally, the new tanks will be designed to be nearly drain-dry with a “cone-up” bottom and a sump on the side of the tank that is lower than the rest of the floor, so that liquids drain over to that side of the tank and into the sump. The small sump located at the bottom of the tank will have a surface area of approximately 7.1square feet and is designed to hold any liquids remaining after emptying the tank. Per discussions with the TCEQ Chemical New Source Review Team, this is Tier 1 BACT as long as the emissions from tank landings will also be demonstrated to meet the National Ambient Air Quality Standards (NAAQS) and will not cause or contribute to a condition of air pollution. Furthermore, designing a tank to be completely drain-dry is not recommended, since it creates buried piping containing petroleum liquids (to remove the heel

left in the sump). The proposed floating roof landings will therefore meet current BACT for Storage Tank MSS Activities.

Equipment maintenance such as pump maintenance and pipeline openings (pig receiver/launcher openings included) will meet VOC BACT by sending recovered liquids back into the tanks to be recovered. If there is any remaining liquid left in the pump or pipeline, it will be drained to a pan and put into a closed container. The proposed maintenance activities will therefore meet current BACT for Fugitive MSS Activities. With the above proposed measures, the emissions from these equipment maintenance activities are very small. Therefore, no additional controls are required.

Vacuum truck operations will be controlled by a carbon adsorption system with a maximum outlet/exhaust concentration of 100 ppmv, consistent with current BACT and recent permits issued for similar facilities in the same vicinity.

For further justification of the suggested controls, an analysis of MSS BACT for recently permitted similar facilities in Texas was conducted. This analysis verified the controls suggested are equivalent to MSS BACT approved in recently issued permits for these facilities.

4.5 Vapor Combustor System (EPNs: V-1, V-2)

TCEQ has evaluated the technical feasibility and economic reasonableness of control technologies for vapor combustors. Based on that evaluation, TCEQ has identified Tier 1 BACT for VOC destruction efficiency.

A vapor combustor system will be used to control VOC emissions from ocean-going barge or ship loading and certain tank MSS activities (i.e., degassing and refloating of IFR tanks). The chamber temperature of the vapor combustor will be monitored to assure the Destruction Removal Efficiency (DRE) of 99.9% is being achieved. Additionally, an initial stack test on the vapor combustor system (EPNs: V-1 and V-2) will be performed when the system is installed at The Facility. The fuel burned in the vapor combustor system will consist of commercially available pipeline quality sweet natural gas. The proposed vapor combustor system will therefore meet current BACT for Vapor Combustors. A review of the EPA's RACT/BACT/LAER Clearinghouse database was conducted as confirmation of BACT for vapor combustors. No BACT determinations were found for VOC, NOx, or any other criteria pollutants. Therefore, utilizing TCEQ Tier I BACT is appropriate.

4.6 Emergency Generators (EPNs: EMERGEN1, EMERGEN2)

The emergency engines will meet BACT by complying with the NSPS JJJJ, which requires that a catalyst emission control system for maintaining a VOC emission rate equal to or less than 1.0 grams VOC per brake horsepower-hour (g/bhp-hr), a NOx emission rate equal to or less than 2.0 g/bhp-hr, and), and a CO emission rate equal to or less than 4.0 g/bhp-hr. This control standard meets current BACT Requirements for Emergency Internal Combustion Engines.

SECTION 5
REGULATORY APPLICABILITY

Pursuant to TCEQ 30 TAC §116.111, Plains will meet all rules and regulations of the TCEQ and the intent of the Texas Clean Air Act (TCAA) for the emission sources and activities addressed in this permit application, as follows:

- §116.111 – All required documentation is included, and a completed Form PI-1 has been signed by an authorized representative of Plains and is included in Appendix A.
- §116.111(a)(1) – A completed Form PI-1 has been signed by an authorized representative of Plains and is included in Appendix A.
- §116.111(a)(2)(A) through (L) – These items are addressed individually below.
- §116.111(b) – Plains will comply with applicable 30 TAC 39 and (if necessary) 30 TAC 55 public notice and public participation requirements for this permit application.

5.1 General Application Requirements - §116.111(a)(2)(A)

The emissions associated with the proposed project will comply with all applicable air quality rules and regulations and with the intent of the Texas Clean Air Act, including protection of the health and the physical property of the people, as required by §116.111(a)(2)(A)(i). Following is a summary of rules and regulations as they apply to the proposed project:

<u>30 TAC 101 - General Rules</u>: The Facility will be operated in accordance with the General Rules relating to circumvention, nuisance, traffic hazard, notification requirements for major upset, notification requirements for unplanned maintenance, sampling, sampling ports, emission inventory requirements, sampling procedures and terminology, compliance with Environmental Protection Agency Standards, emissions fees, planned MSS activities, and all other applicable General Rules.

<u>30 TAC 111 - Visible Emissions and Particulate Matter</u>: The operation of this facility is not likely to result in visible emissions. The Facility will comply with all applicable opacity and particulate emission limits specified in Chapter 111.

<u>30 TAC 112 - Sulfur Compounds</u>: The fuel burned in the combustion units at the site will consist of commercially available pipeline quality sweet natural gas. Waste gas sent to the Vapor Combustor System from marine loading activities may contain some sulfur compounds. Upon request of the Executive Director, atmospheric dispersion modeling results will be submitted, verifying that the property line standards specified in Chapter 112 for sulfur dioxide and hydrogen sulfide emissions will not be exceeded.

30 TAC 113 - Toxic Materials: TCEQ has incorporated MACT standards (40 CFR 63) into Chapter 113 by reference. Therefore, by complying with the standards of MACT ZZZZ for the emergency generator engines, the requirements of Chapter 113 will be met. No other Part 63 regulations will apply to The Facility.

30 TAC 114 - Motor Vehicles: Chapter 114 does not apply to stationary industrial facilities.

30 TAC 115 - Volatile Organic Compounds: The proposed facility is located in Nueces County. The provisions under this regulation applicable to this permit application are as follows:

- Subchapter B/Division 1 – Storage of VOCs: The Facility storage tanks are subject to the regulatory requirements specified under Chapter 115. The crude oil/condensate storage tanks will comply with the required control requirements specified in §115.112, as they are equipped with an internal floating roof. All applicable control, inspection, monitoring and testing, recordkeeping and reporting requirements will be followed in accordance with Chapter 115.
- Subchapter C – VOC Transfer Operations: Loading and unloading operations of VOCs with a true vapor pressure of 1.5 psia or greater must be controlled in accordance with §115.212. All loading and unloading emissions of material with vapor pressure of 1.5 psia or greater are controlled with efficiency greater than 90%. All applicable control, recordkeeping, reporting, and monitoring requirements will be followed in accordance with Chapter 115.

30 TAC 116 - Permits for New Construction or Modification: This application is submitted to comply with Chapter 116 permitting requirements.

30 TAC 117 - Nitrogen Compounds: The Facility will operate as a minor source in an ozone attainment area, therefore, it is not subject to 30 TAC Chapter 117.

30 TAC 122 - Federal Operating Permits: The Facility will not be a major source facility and therefore will not be required to obtain a Federal Operating Permit prior to start of operation.

5.2 Measurement of Emissions - §116.111(a)(2)(B)

Emissions will be sampled upon request of the TCEQ.

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

Section 4 of this application presents a discussion of BACT for the emissions associated with this application.

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

Emission sources associated with this application will comply with any applicable 40 CFR 60 Subparts.

5.4.1 40 CFR Part 60, Subpart Kb

The storage vessels proposed to be constructed at The Facility will comply with all requirements of Subpart Kb, as applicable.

5.4.2 40 CFR Part 60, Subpart JJJJ

The emergency engines proposed to be installed at The Facility are subject to and will meet the requirements for new emergency stationary spark-ignited reciprocating internal combustion engines (RICE) with a maximum engine power greater than 25 HP.

5.5 National Emission Standards for HAPs (NESHAP) - §116.111(a)(2)(E)

No 40 CFR Part 61 standards are applicable to this facility.

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

Emission sources associated with this application will comply with any applicable 40 CFR 63 Subparts.

5.6.1 40 CFR Part 63, Subpart ZZZZ

The emergency engines proposed to be constructed at The Facility are subject to the requirements for new emergency stationary RICE with a site rating of less than 500 brake HP, and will meet those requirements by complying with NSPS JJJJ.

5.7 Performance Demonstration - §116.111(a)(2)(G)

The Facility will perform emissions demonstrations as represented in the permit application. Plains will provide additional data as requested to demonstrate that the proposed facility will achieve the performance specified in the permit application.

5.8 Non-attainment Review - §116.111(a)(2)(H)

The proposed facility is located in Nueces County, a designated attainment area for ozone. Therefore NNSR permitting is not applicable.

5.9 Prevention of Significant Deterioration (PSD) Review - §116.111(a)(2)(I)

TCEQ's SIP-approved PSD regulations define a "major stationary source" as a facility that emits or has the potential to emit 100 tons per year or more from one of the 28 categories of named sources. The Facility, as a petroleum storage and transfer unit with a total storage capacity exceeding 300,000 barrels, is one of the named sources. The major stationary source thresholds will not be exceeded and, therefore, a PSD Review is not required.

5.10 Air Dispersion Modeling - §116.111(a)(2)(J)

Plains will provide an air quality analysis after TCEQ approves the modeling protocol and emission calculations provided in the application.

5.11 FCAA §112(b) Hazardous Air Pollutants - §116.111(a)(2)(K)

The Federal Clean Air Act §112(g) requirements do not apply, since MACT standards have been promulgated for the types of emission sources that will be present at The Facility, and therefore a case-by-case MACT analysis is not required.

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

The proposed facility is located in Nueces County and therefore is not subject to the provisions of 30 TAC, Chapter 101, Subchapter H, Division 3 relating to Mass Emission Cap and Trade.

APPENDIX A
TCEQ ADMINISTRATIVE FORMS

The following TCEQ Administrative Forms and Tables are included in this appendix:

- TCEQ Core Data Form (included in initial submittal dated September 25, 2014);
- PI-1 General Application for Air Permits (included in initial submittal dated September 25, 2014; only the pages that have been revised are included in this submittal);
- TCEQ Table 1(a) – Emission Sources (revised);
- Table 2 – Material Balance (revised);
- Table 30 – Certification of Estimated Capital Cost and Permit Application Fee (included in initial submittal dated September 25, 2014); and
- Copy of Permit Application Fee Check (included in initial submittal dated September 25, 2014).

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: Plains Marketing, L.P.		
Texas Secretary of State Charter/Registration Number (if applicable):		
B. Company Official Contact Name: Troy E. Valenzuela		
Title: VP-EHS		
Mailing Address: 333 Clay Street, Ste. 1600		
City: Houston	State: TX	ZIP Code: 77002
Telephone No.: (713) 646-4614	Fax No.: (713) 646-4310	E-mail Address: tevalenzuela@paalp.com
C. Technical Contact Name: Richard S. Anderson		
Title: Director of Air Programs, EH&S Department		
Company Name: Plains All American Pipeline, LP		
Mailing Address: 333 Clay Street, Ste. 100		
City: Houston	State: TX	ZIP Code: 77002
Telephone No.: (713) 646-4286	Fax No.: (713) 646-4310	E-mail Address: rsanderson@paalp.com
D. Site Name: Corpus Christi Dock and Storage Terminal		
E. Area Name/Type of Facility: Dock and Storage Terminal		☒ Permanent ☐ Portable
F. Principal Company Product or Business: Petroleum Liquids Storage and Transport		
Principal Standard Industrial Classification Code (SIC): 4226		
Principal North American Industry Classification System (NAICS): 493190		
G. Projected Start of Construction Date: September 1, 2015		
Projected Start of Operation Date: April 1, 2016		
H. Facility and Site Location Information (If no street address, provide clear driving directions to the site in writing.):		
Street Address: 5500 Up River Road		
City/Town: Corpus Christi	County: Nueces	ZIP Code: 78407
Latitude (nearest second): 27° 48' 39.4"	Longitude (nearest second): 97° 27' 38.7"	

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):	
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): 601275134	
L.	Regulated Entity Number (RN): 107247298	
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, notice of violation, or enforcement action? If Yes, attach a copy of any correspondence from the agency and provide the RN in section I.L. above.	☐ YES ☒ NO
C.	Number of New Jobs: 10-12	
D.	Provide the name of the State Senator and State Representative and district numbers for this facility site:	
State Senator: Senator Juan 'Chuy' Hinojosa		District No.: 20
State Representative: Representative Abel Herrero		District No.: 34
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): 119683	
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 ☐ Plant-Wide Applicability Limit		
☐ Prevention of Significant Deterioration ☐ Hazardous Air Pollutant Major Source		
☐ Other:		
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.4.0		☐ 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: None.		
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.):		
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
☐ Operational Flexibility/Off-Permit Notification		☐ Streamlined Revision for GOP
☐ To be Determined		☒ 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).		
List:		
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): 87.66 tpy		
Sulfur Dioxide (SO2): 3.37 tpy		
Carbon Monoxide (CO): 80.41 tpy		
Nitrogen Oxides (NOx): 52.28 tpy		
Particulate Matter (PM): 6.30 tpy		
PM 10 microns or less (PM10): 6.30 tpy		
PM 2.5 microns or less (PM2.5): 6.30 tpy		
Lead (Pb): N/A		
Hazardous Air Pollutants (HAPs): 2.15 tpy		
Other speciated air contaminants not listed above: H_2S: 0.12 tpy		

V. Public Notice Information *(complete if applicable)*		
A. Public Notice Contact Name: Warren Fusilier		
Title: Director E&RC – Gulf Coast		
Mailing Address: 333 Clay Street, Ste. 1600		
City: Houston	State: TX	ZIP Code: 77345
B. Name of the Public Place: Corpus Christi Public Library – La Retama Central Library		
Physical Address *(No P.O. Boxes)*: 805 Comanche		
City: Corpus Christi	County: Nueces	ZIP Code: 78401
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: Samuel L. Neal, Jr.		
Mailing Address: 901 Leopard Street, Room 303		
City: Corpus Christi	State: Texas	ZIP Code: 78401
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 and Indian Governing Body; and identify the Federal Land Manager(s) for the location where the facility is or will be located.		
Chief Executive: Mayor Nelda Martinez		
Mailing Address: 1201 Leopard St.		
City: Corpus Christi	State: Texas	ZIP Code: 78401
Name of the Indian Governing Body: N/A, facility located > 100 km of Indian Tribal Lands		
Mailing Address:		
City:	State:	ZIP Code:

V.	**Public Notice Information *(complete if applicable) (continued)***	
C.	Concrete Batch Plants, PSD, and Nonattainment Permits	
3.	Provide the name, mailing address of the chief executive and Indian Governing Body; and identify the Federal Land Manager(s) for the location where the facility is or will be located. *(continued)*	
Name of the Federal Land Manager(s): N/A, facility located > 100 km of Class I Area		
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	
B.	Are any schools located within 3,000 feet of this facility?	☐ YES ☒ NO

VII.	**Technical Information**			
C.	Maximum Operating Schedule:			
Hour(s): 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

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.*	
C.	Does 40 CFR Part 63, Maximum Achievable Control Technology (MACT) standard apply to a facility in this application?	☒ YES ☐ NO
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: $ 75,000	
Paid online?		☐ YES ☒ NO
Company name on check: Plains Marketing, L.P.		
Is a copy of the check or money order attached to the original submittal of this application? – Fee Receipt Number R425663, Permit number 119683		☒ YES ☐ NO ☐ N/A
Is a Table 30 (Form 10196) entitled, Estimated Capital Cost and Fee Verification, attached?		☒ YES ☐ NO ☐ N/A

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: Richard S. Anderson
Signature: Richard S Anderson *Original Signature Required*
Date: 7/20/2015

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	7/16/2015	Permit No.:	119683	Regulated Entity No.:	RN107247298
Area Name:	Corpus Christi Dock and Storage Terminal			Customer Reference No.:	CN601275134

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 or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) POUND	(B) TPY
FUG-1	FUG-1	Fugitives	VOC	0.93	0.66
L-1, 2	L-1, 2	Loading	VOC	45.40	31.02
L-1, 2	L-1, 2	Loading	H_2S	0.20	0.02
V-1, 2	V-1, 2	Vapor Combustor	NO_X	56.16	52.20
V-1, 2	V-1, 2	Vapor Combustor	CO	86.40	80.31
V-1, 2	V-1, 2	Vapor Combustor	SO_2	45.29	3.37
V-1, 2	V-1, 2	Vapor Combustor	H_2S	0.49	0.04
V-1, 2	V-1, 2	Vapor Combustor	VOC	4.71	4.44
V-1, 2	V-1, 2	Vapor Combustor	$PM/PM_{10}/PM_{2.5}$	11.02	6.30
EMERGEN1	EMERGEN1	Emergency Generator Engine 1	NO_X	1.98	0.05
EMERGEN1	EMERGEN1	Emergency Generator Engine 1	CO	2.65	0.07
EMERGEN1	EMERGEN1	Emergency Generator Engine 1	SO_2	< 0.01	< 0.01
EMERGEN1	EMERGEN1	Emergency Generator Engine 1	VOC	0.70	0.02
EMERGEN1	EMERGEN1	Emergency Generator Engine 1	$PM/PM_{10}/PM_{2.5}$	0.01	< 0.01
EMERGEN2	EMERGEN2	Emergency Generator Engine 2	NO_X	1.01	0.03
EMERGEN2	EMERGEN2	Emergency Generator Engine 2	CO	1.35	0.04
EMERGEN2	EMERGEN2	Emergency Generator Engine 2	SO_2	< 0.01	< 0.01
EMERGEN2	EMERGEN2	Emergency Generator Engine 2	VOC	0.36	0.01
EMERGEN2	EMERGEN2	Emergency Generator Engine 2	$PM/PM_{10}/PM_{2.5}$	< 0.01	< 0.01

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	7/16/2015	Permit No.:	119683	Regulated Entity No.:	RN107247298
Area Name:	Corpus Christi Dock and Storage Terminal			Customer Reference No.:	CN601275134

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 or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) POUND	(B) TPY
MSS	EQUIPMSS	Equipments MSS Activities	VOC	35.37	0.80
MSS	TankMSS	Tank MSS Activities	VOC	154.58	22.60
27600	27600	Crude/Condensate Tank 27600	VOC	10.73	27.76
27610	27610	Crude/Condensate Tank 27610	VOC	10.73	
27620	27620	Crude/Condensate Tank 27620	VOC	10.73	
27630	27630	Crude/Condensate Tank 27630	VOC	10.73	
27640	27640	Crude/Condensate Tank 27640	VOC	10.73	
27650	27650	Crude/Condensate Tank 27650	VOC	10.73	
35000	35000	Crude/Condensate Tank 35000	VOC	10.73	
35010	35010	Crude/Condensate Tank 35010	VOC	10.73	
35020	35020	Crude/Condensate Tank 35020	VOC	10.73	
35030	35030	Crude/Condensate Tank 35030	VOC	10.73	
35040	35040	Crude/Condensate Tank 35040	VOC	10.73	
35050	35050	Crude/Condensate Tank 35050	VOC	10.73	
27800	27800	Slop Oil Tank 27800	VOC	14.82	0.17
27810	27810	Slop Oil Tank 27810	VOC	14.82	0.17
27820	27820	Wastewater Sump Tank 27820	VOC	< 0.01	0.01

EPN = Emission Point Number
FIN = Facility Identification Number

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	6/26/2015	Permit No.:	119683	Regulated Entity No.:	RN107247298
Area Name:	Corpus Christi Dock and Storage Terminal			Customer Reference No.:	CN601275134

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 Point			Source								
						5. Building	6. Height Above	7. Stack Exit Data			8. Fugitives			
EPN (A)	FIN (B)	Name (C)	Zone	East (Meters)	North (Meters)	Height (Ft.)	Ground (Ft.)	Diameter (Ft.) (A)	Velocity (FPS) (B)	Temperature (°F) (C)	Length (Ft.) (A)	Width (Ft.) (B)	Axis Degrees (C)
FUG-1	FUG-1	Fugitives	14	651008.70	3077429.36		varies				2395	820	17.50
L-1, 2	L-1, 2	Loading	14	651385.75	3077761.67		10.0	0.0033	0.0033	-460			
V-1, 2	V-1, 2	Vapor Combustor	14	651567.04	3077612.90		90	12.00	34.4	1390			
EMERGEN1	EMERGEN1	Emergency Generator Engine 1	14	651411.00	3077278.00		TBD	1.00	23.75	1382			
EMERGEN2	EMERGEN2	Emergency Generator Engine 2	14	651141.00	3077603.00		TBD	1.00	11.45	1063			
MSS	EQUIPMSS, TANKMSS	MSS Activities	14	651008.70	3077429.36		varies				2395	820	17.50
27600	27600	Crude/Condensate Tank 27600	14	651686.28	3077356.59		48				212	212	
27610	27610	Crude/Condensate Tank 27610	14	651589.14	3077385.99		48				212	212	
27620	27620	Crude/Condensate Tank 27620	14	651497.68	3077414.66		48				212	212	
27630	27630	Crude/Condensate Tank 27630	14	651405.86	3077442.46		48				212	212	
27640	27640	Crude/Condensate Tank 27640	14	651311.25	3077473.70		48				212	212	
27650	27650	Crude/Condensate Tank 27650	14	651218.26	3077501.14		48				212	212	
35000	35000	Crude/Condensate Tank 35000	14	651656.15	3077263.36		60				212	212	
35010	35010	Crude/Condensate Tank 35010	14	651565.38	3077291.32		60				212	212	
35020	35020	Crude/Condensate Tank 35020	14	651466.50	3077320.90		60				212	212	
35030	35030	Crude/Condensate Tank 35030	14	651377.35	3077348.46		60				212	212	
35040	35040	Crude/Condensate Tank 35040	14	651278.56	3077380.28		60				212	212	
35050	35050	Crude/Condensate Tank 35050	14	651190.75	3077408.15		60				212	212	
27800	27800	Slop Oil Tank 27800	14	651320.45	3077599.22		40.0	0.0033	0.0033	-460			
27810	27810	Slop Oil Tank 27810	14	651333.48	3077594.97		40.0	0.0033	0.0033	-460			
27820	27820	Wastewater Sump Tank 27820	14	TBD	TBD		TBD	TBD	TBD	TBD	TBD	TBD	TBD

EPN = Emission Point Number

FIN = Facility Identification Number

Table 2
Material Balance

This material balance table is used to quantify possible emissions of air contaminants and special emphasis should be placed on potential air contaminants; for example: If feed contains sulfur, show distribution to all products. Please relate each material (or group of materials) listed to its respective location in the process flow diagram by assigning point numbers (taken from the flow diagram) to each material.

List every material involved in each of the following groups	**Point No. from flow diagram**	**Max Hourly Rate (lbs/hr, scfh, gph) at standard conditions: 70 degrees F, 14.7 psia. Check appropriate column at right for each process**	**Measurement**	**Estimation**	**Calculation**
1) Raw Materials					
Crude Oil/Condensate Mixture		50,000 bbl/hr		X	
Slop Oil		58 bbl/hr		X	
2) Fuels					
Natural Gas		88,860 scf/hr		X	
3) Products and By-products -- Output					
Crude Oil/Condensate Mixture		50,000 bbl/hr		X	
Slop Oil		58 bbl/hr			
4) Solid Wastes -- Output					
N/A					
5) Liquid Wastes -- Output					
N/A					
6) Airborne Wastes (solid) -- Output					
N/A					
7) Airborne Wastes (gaseous) -- Output					
See Table 1(a)		See Table 1(a)		X	

APPENDIX B
TCEQ FEDERAL APPLICABILITY FORMS

The following TCEQ Federal Applicability Table is included in this appendix:

- TCEQ Table 1F (Revised)

TABLE 1F
AIR QUALITY APPLICATION SUPPLEMENT

Permit No.: 119683	Application Submittal Date: September 2014 (Revised June 2015)
Company: Plains Marketing, L.P.	
RN: 107247298	Facility Location: 5500 Up River Road
City: Corpus Christi	County: Nueces
Permit Unit I.D.: Corpus Christi Dock and Storage Terminal	Permit Name:
Permit Activity: ☒ New Source ☐ Modification	

Complete for all Pollutants with a Project Emission Increase.	**POLLUTANTS**							
	Ozone							
	VOC	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**HAP**	**Other[1]**
Nonattainment?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PSD?	NO	NO	NO	NO	NO	NO	NO	
Existing site PTE (tpy)?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Proposed project emission increases (tpy from 2F[2])?	87.7	52.3	80.4	6.3	6.3	3.4	2.2	
Is the existing site a major source?	NO	NO	NO	NO	NO	NO	NO	
If not, is the project a major source by itself?	NO	NO	NO	NO	NO	NO	NO	
If site is major source, is project increase significant?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
If netting required, estimated start of construction: Not Required								
5 years prior to start of construction contemporaneous: Not Applicable								
Estimated start of operation period: 2015 Q4								
Net contemporaneous change, including proposed project, from Table 3F. (tpy)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Major NSR Applicable?	NO	NO	NO	NO	NO	NO	NO	

Signature	*Title*	*Date*
[signature]	DIRECTOR OF AIR QUALITY COMPLIANCE	7/20/15

[1] Other pollutants. [Pb, H_2S, TRS, H_2SO_4, Fluoride excluding HF, etc.]

[2] Sum of proposed emissions minus baseline emissions, increases only.

The representations made above and on the accompanying tables are true and correct to the best of my knowledge.

APPENDIX C
TCEQ TECHNICAL APPLICATION TABLES

The following TCEQ technical application forms and tables are included in this appendix:

- Table 7(a) – Vertical Fixed Roof Storage Tank Summary (included in initial submittal dated September 25, 2014);
- Table 7(d) – Internal Floating Roof Storage Tank Summary (New);
- Table 4 – Combustion Units (Revised); and
- Table 29 – Reciprocating Engines (Revised).

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **27600** 4. Emission Point No. **27600**
5. FIN **27600** CIN **27600**
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: **48** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **12,684,000** gallons
   - d. Turnovers per year: **331**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **27600**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **27600**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **27610** 4. Emission Point No. **27610**
5. FIN **27610** CIN **27610**
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: **48** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **12,684,000** gallons
   - d. Turnovers per year: **331**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **27610**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **27610**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **27620** 4. Emission Point No. **27620**
5. FIN **27620** CIN **27620**
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: **48** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **12,684,000** gallons
   - d. Turnovers per year: **331**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **27620**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **27620**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **27630** 4. Emission Point No. **27630**
5. FIN **27630** CIN **27630**
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: **48** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **12,684,000** gallons
   - d. Turnovers per year: **331**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **27630**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **27630**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **27640** 4. Emission Point No. **27640**
5. FIN **27640** CIN **27640**
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: **48** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **12,684,000** gallons
   - d. Turnovers per year: **331**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **27640**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **27640**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **27650** 4. Emission Point No. **27650**
5. FIN **27650** CIN **27650**
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: **48** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **12,684,000** gallons
   - d. Turnovers per year: **331**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **27650**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **27650**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **35000** 4. Emission Point No. **35000**
5. FIN **35000** CIN **35000**
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: **60** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **15,834,000** gallons
   - d. Turnovers per year: **265**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

(Use the higher of the maximum fill rate or maximum withdrawal rate,)

   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **35000**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **35000**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **35010** 4. Emission Point No. **35010**
5. FIN **35010** CIN **35010**
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: **60** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **15,834,000** gallons
   - d. Turnovers per year: **265**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **35010**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **35010**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **35020** 4. Emission Point No. **35020**
5. FIN **35020** CIN **35020**
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: **60** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **15,834,000** gallons
   - d. Turnovers per year: **265**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **35020**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **35020**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **35030** 4. Emission Point No. **35030**
5. FIN **35030** CIN **35030**
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: **60** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **15,834,000** gallons
   - d. Turnovers per year: **265**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **35030**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **35030**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **35040** 4. Emission Point No. **35040**
5. FIN **35040** CIN **35040**
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: **60** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **15,834,000** gallons
   - d. Turnovers per year: **265**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* _____ ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **35040**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **35040**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 7(d)

02-95

INTERNAL FLOATING ROOF STORAGE TANK SUMMARY

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

1. Applicant's Name: **Plains Marketing, L.P.**
2. Location *(indicate on plot plan and provide coordinates):* **see plot plan**
3. Tank No. **35050** 4. Emission Point No. **35050**
5. FIN **35050** CIN **35050**
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: **60** ft.
   - b. Diameter: **212** ft.
   - c. Nominal Capacity of Tank Volume: **15,834,000** gallons
   - d. Turnovers per year: **265**
   - e. Net Throughput: **4,200,000,000** gallons/year
   - f. Maximum Pumping Rate: **840,000** gallons/hour

   (Use the higher of the maximum fill rate or maximum withdrawal rate,)
   - g. Self-Supported Roof? Yes [ ] No [**X**]
   - h. Number of Columns: **13**
   - i. Column Diameter: **24** ft.
2. Shell/Roof and Paint Characteristics
   - a. Shell Condition: Light Rust [**X**] Dense Rust [ ] Gunite Lining [ ]
   - b. Shell Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - c. Shell Condition: Good [**X**] Poor [ ]
   - d. Roof Color/Shade: White/White [**X**] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/ Primer [ ] Other [ ] (Describe)
   - e. Roof Condition: Good [**X**] Poor [ ]
3. Rim-Seal System
   - a. Primary Seal: Vapor-mounted [ ] Liquid-mounted [ ] Mechanical Shoe [**X**]
   - b. Secondary Seal: Yes [**X**] No [ ]
4. Deck Characteristics
   - a. Roof Type: Bolted [ ] Welded [**X**]
   - b. Deck Construction *(Bolted Tanks Only):*
     - Continuous Sheet Construction 6 ft. wide [ ]
     - Continuous Sheet Construction 7 ft. wide [ ]
     - Rectangular Panel Construction 5 X 7.5 ft. wide [ ]
     - Rectangular Panel Construction 5 X 12 ft. wide [ ]
   - c. Deck Seam Length *(Bolted Tanks Only):* ft.
5. Roof Fitting Loss Factor: **541.14** lb-mole/year

   Based upon Typical [**X**] Controlled [ ] or Actual [ ]

   Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 2

Permit No. **119683** Tank No. **35050**

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [ ] Crude Oils [**X**]
2. Single or Multi-Component Liquid
   Single [ ] *Complete Section III.3*
   Multiple [**X**] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: _____
   b. CAS Number: _____
   c. Average Liquid Surface Temperature: _____ °F
   d. True Vapor Pressure at Average Liquid Surface Temperature: _____ psia
   e. Liquid Molecular Weight: _____
4. Multiple Component Information
   a. Mixture Name: **Crude oil/ condensate**
   b. Average Liquid Surface Temperature: **73.50** °F
   c. Minimum Liquid Surface Temperature: **68.4** °F
   d. Maximum Liquid Surface Temperature: **78.6** °F
   e. True Vapor Pressure at Average Liquid Surface Temperature **8.66** 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: **207**
   i. Vapor Molecular Weight: **50**

j. Chemical Components Information

Chemical Name	CAS Number	Percentage of Total Liquid Weight (typical)	Percentage of Total Vapor Weight (typical)	Molecular Weight
2,2,4-Trimethlpentane	**540-84-1**	**0.10%**	**0.04%**	**114.23**
Hexane (-n)	**110-54-3**	**0.40%**	**0.51%**	**86.18**
Benzene	**71-43-2**	**0.59%**	**0.47%**	**78.11**
Methyl Mercaptan	**74-93-1**	**0.06%**	**0.74%**	**48.11**
Cumene	**98-82-8**	**0.10%**	**0.004%**	**120.19**
Toluene	**108-88-3**	**1.74%**	**0.41%**	**92.14**
Ethylbenzene	**100-41-4**	**0.54%**	**0.04%**	**106.17**
Xylenes (mixed isomers)	**1330-20-7**	**1.95%**	**0.13%**	**106.17**
Unidentified Components		**94.52%**	**97.64%**	**222.09**

Table 7(d) INTERNAL FLOATING ROOF TANK SUMMARY
Page 3
Permit No. **119683** Tank No. **35050**

IV. ***Fittings Information***

Fitting Type	Fitting Status	Quantity	Deck fitting loss factor K_F	Quantity X K_F
Acess Hatch (24-in. Diam.)	Bolted Cover, Gasketed	**1**	1.6	1.6
Acess Hatch (24-in. Diam.)	Unbolted Cover, Gasketed		11	0
Acess Hatch (24-in. Diam.)	Unbolted Cover, Ungasketed		25	0
Automatic Gauge Float Well	Bolted Cover, Gasketed	**1**	2.8	2.8
Automatic Gauge Float Well	Unbolted Cover, Gasketed		15	0
Automatic Gauge Float Well	Unbolted Cover, Ungasketed		28	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Gask.		33	0
Column Well (24-in. Diam.)	Built-Up Col. -Sliding Cover, Ungask.		47	0
Column Well (24-in. Diam.)	Pipe Col. -Flex. Fabric Sleeve Seal		10	0
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Gask.	**13**	25	325
Column Well (24-in. Diam.)	Pipe Col. -Sliding Cover, Ungask.		32	0
Ladder Well (36-in. Diam.)	Sliding Cover, Ungasketed		76	0
Ladder Well (36-in. Diam.)	Sliding Cover, Gasketed	**1**	56	56
Roof Leg (3-in. Diam.)	Adjustable, Center Area	**77**	0.82	63.14
Roof Leg (3-in. Diam.)	Adjustable, Pontoon Area	**31**	2	62
Sample Pipe or Well (24 in. Diam.)	Slit Fabric Seal 10% Open	**1**	12	12
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Gask.		44	0
Sample Pipe or Well (24 in. Diam.)	Slotted Pipe-Sliding Cover, Ungask.		57	0
Stub Drain (1-in. Diam.)			1.2	0
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Gask.	**3**	6.2	18.6
Vacuum Breaker (10-in. Diam.)	Weighted Mech. Actuation, Ungask.		0.9	0
			Total deck fitting loss factor, lb-mole/year	541.14

TABLE 4

COMBUSTION UNITS

OPERATIONAL DATA				
Number from flow diagram: V-1, V-2			Model Number (if available): ZCM-5/5/5-13-60-X-4/8-4/8	
Name of device: Vapor Combustor System			Manufacturer: John Zink	
CHARACTERISTICS OF INPUT				
Waste Material*	Chemical Composition			
	Material	Min. Value Expected lb/hr	Ave. Value Expected lb/hr	Design Maximum lb/hr
	1. Crude Oil/Condensate	0.0	937.9	4,636.4
	2.			
	3.			
	4.			
	5.			

Gross Heating Value of Waste Material (Wet basis if applicable)	Btu/lb	Air Supplied for Waste Material	Minimum SCFM (70˚F & 14.7 psia)	Maximum SCFM (70˚F & 14.7 psia)
	19,915	N/A	N/A	N/A

Waste Material of Contaminated Gas	Total Flow Rate lb/hr		Inlet Temperature ˚F	
	Minimum Expected	Design Maximum	Minimum Expected	Design Maximum
	0	2,634	Varies	Varies

Fuel	Chemical Composition			
	Material	Min. Value Expected lb/hr	Ave. Value Expected lb/hr	Design Maximum lb/hr
	1. Natural Gas	0.0	11,268.0	11,268.0
	2.			
	3.			
	4.			

Gross Heating Value of Fuel	Btu/lb	Air Supplied for Fuel	Minimum SCFM (70˚F & 14.7 psia)	Maximum SCFM (70˚F & 14.7 psia)
	8,238	N/A	N/A	N/A

*Describe how waste material is introduced into combustion unit on an attached sheet. Supply drawings, dimensioned and to scale to show clearly the design and operation of the unit.

TABLE 4
(continued)

COMBUSTION UNITS

CHARACTERISTICS OF OUTPUT				
Flue Gas Released	Chemical Composition			
	Material	Min. Value Expected lb/hr	Ave. Value Expected lb/hr	Design Maximum lb/hr
	1. See Table 1(a)	See Table 1(a)	See Table 1(a)	See Table 1(a)
	2.			
	3.			
	4.			
	5.			
Temperature at Stack Exit °F 1,390	Total Flow Rate lb/hr		Velocity at Stack Exit ft/sec	
	Minimum Expected ~ 0	Maximum Expected See Table 1(a)	Minimum Expected ~0	Maximum Expected 8.04

COMBUSTION UNIT CHARACTERISTICS		
Chamber Volume from Drawing ft^3 TBD	Chamber Velocity at Average Chamber Temperature ft/sec TBD	Average Chamber Temperature °F TBD
Average Residence Time sec TBD	Exhaust Stack Height ft 90	Exhaust Stack Diameter ft 12

ADDITIONAL INFORMATION FOR CATALYTIC COMBUSTION UNITS		
Number and Type of Catalyst Elements _____	Catalyst Bed Velocity ft/sec _____	Max. Flow Rate per Catalytic Unit (Manufacturer's Specifications) Specify Units _____

Attach separate sheets as necessary providing a description of the combustion unit, including details regarding principle of operation and the basis for calculation its efficiency. Supply an assembly drawing, dimensioned and to scale, to show clearly the design and operation of the equipment. If the device has bypasses, safety valves, etc., specify when such bypasses are to be used and under what conditions. Submit explanations on control for temperature, air flow rates, and other operating variables.

Texas Commission on Environmental Quality
Table 29 Reciprocating Engines

I. Engine Data			
Manufacturer: CUMMINS	Model No. TBD	Serial No. TBD	Manufacture Date: TBD
Rebuilds Date: N/A	No. of Cylinders: TBD	Compression Ratio: TBD	EPN: EMERGEN1

Application: ☐ Gas Compression ☐ Electric Generation ☐ Refrigeration ☐ Emergency/Stand by

☐ 4 Stroke Cycle ☐ 2 Stroke Cycle ☐ Carbureted ☒ Spark Ignited ☐ Dual Fuel ☐ Fuel Injected

☐ Diesel ☐ Naturally Aspirated ☐ Blower /Pump Scavenged ☐ Turbo Charged and I.C. ☐ Turbo Charged

☐ Intercooled ☐ I.C. Water Temperature ☒ Lean Burn ☐ Rich Burn

Ignition/Injection Timing: Fixed: Variable:

Manufacture Horsepower Rating: 300 HP Proposed Horsepower Rating: 300 HP

Discharge Parameters

Stack Height (Feet)	Stack Diameter (Feet)	Stack Temperature (°F)	Exit Velocity (FPS)
TBD	1	1382	23.75

II. Fuel Data

Type of Fuel: ☐ Field Gas ☐ Landfill Gas ☐ LP Gas ☒ Natural Gas ☐ Digester Gas ☐ Diesel

Fuel Consumption (BTU/bhp-hr): Heat Value: (HHV) (LHV)

Sulfur Content (grains/100 scf - weight %):

III. Emission Factors (Before Control)

NO_X		CO		SO_2		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv

Source of Emission Factors: ☐ Manufacturer Data ☐ AP-42 ☐ Other (specify):

IV. Emission Factors (Post Control)

NO_X		CO		SO2		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv
3		4		0.000588	lb/MMBtu	1		0.0528	lb/MMBtu	0.0099871	lb/MMBtu

Method of Emission Control: ☐ NSCR Catalyst ☒ Lean Operation ☐ Parameter Adjustment

☐ Stratified Charge ☐ JLCC Catalyst ☐ Other (Specify):_____

Note: *Must submit a copy of any manufacturer control information that demonstrates control efficiency.*

Is Formaldehyde included in the VOCs? ☒ Yes ☐ No

V. Federal and State Standards (Check all that apply)

☒ NSPS JJJJ ☒ MACT ZZZZ ☐ NSPS IIII ☐ Title 30 Chapter 117 - List County: _____

VI. Additional Information

1. Submit a copy of the engine manufacturer's site rating or general rating specification data.
2. Submit a typical fuel gas analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents.
3. Submit description of air/fuel ratio control system (manufacturer information is acceptable).

Texas Commission on Environmental Quality
Table 29 Reciprocating Engines

I. Engine Data			
Manufacturer: CUMMINS	Model No. WSG-1068	Serial No. TBD	Manufacture Date: TBD
Rebuilds Date: N/A	No. of Cylinders: 10	Compression Ratio: TBD	EPN: EMERGEN2

Application: ☐ Gas Compression ☐ Electric Generation ☐ Refrigeration ☐ Emergency/Stand by

☐ 4 Stroke Cycle ☐ 2 Stroke Cycle ☐ Carbureted ☒ Spark Ignited ☐ Dual Fuel ☐ Fuel Injected

☐ Diesel ☐ Naturally Aspirated ☐ Blower /Pump Scavenged ☐ Turbo Charged and I.C. ☐ Turbo Charged

☐ Intercooled ☐ I.C. Water Temperature ☒ Lean Burn ☐ Rich Burn

Ignition/Injection Timing: Fixed: Variable:

Manufacture Horsepower Rating: 153.2 HP Proposed Horsepower Rating: 153.2 HP

Discharge Parameters

Stack Height (Feet)	Stack Diameter (Feet)	Stack Temperature (°F)	Exit Velocity (FPS)
TBD	1	1063	11.45

II. Fuel Data

Type of Fuel: ☐ Field Gas ☐ Landfill Gas ☐ LP Gas ☒ Natural Gas ☐ Digester Gas ☐ Diesel

Fuel Consumption (BTU/bhp-hr): Heat Value: (HHV) (LHV)

Sulfur Content (grains/100 scf - weight %):

III. Emission Factors (Before Control)

NO_X		CO		SO_2		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv

Source of Emission Factors: ☐ Manufacturer Data ☐ AP-42 ☐ Other (specify):

IV. Emission Factors (Post Control)

NO_X		CO		SO2		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv
3		4		0.000588	lb/MMBtu	1		0.0528	lb/MMBtu	0.0099871	lb/MMBtu

Method of Emission Control: ☐ NSCR Catalyst ☒ Lean Operation ☐ Parameter Adjustment

☐ Stratified Charge ☐ JLCC Catalyst ☐ Other (Specify):_____

Note: *Must submit a copy of any manufacturer control information that demonstrates control efficiency.*

Is Formaldehyde included in the VOCs? ☒ Yes ☐ No

V. Federal and State Standards (Check all that apply)

☒ NSPS JJJJ ☒ MACT ZZZZ ☐ NSPS IIII ☐ Title 30 Chapter 117 - List County: _____

VI. Additional Information

1. Submit a copy of the engine manufacturer's site rating or general rating specification data.
2. Submit a typical fuel gas analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents.
3. Submit description of air/fuel ratio control system (manufacturer information is acceptable).

APPENDIX D
EMISSION CALCULATIONS

The detailed emissions calculations for this project are provided in this appendix. (Revised)

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
EMISSIONS TOTALS

		HOURLY EMISSIONS						
EPN	**Description**	**$PM/PM_{10}/PM_{2.5}$ (lb/hr)**	**NOx (lb/hr)**	**CO (lb/hr)**	**SO_2 (lb/hr)**	**VOC (lb/hr)**	**H_2S (lb/hr)**	**CH_2O (lb/hr)**
FUG-1	Fugitives	--	--	--	--	0.93	--	-
L-1, 2	Loading	--	--	--	--	45.40	0.20	-
V-1, 2	Vapor Combustor	11.02	56.16	86.40	45.29	4.71	0.49	-
EMERGEN1	Emergency Generator 1	<0.01	1.98	2.65	<0.01	0.70	--	0.04
EMERGEN2	Emergency Generator 2	<0.01	1.01	1.35	<0.01	0.36	--	0.02
MSS	MSS Activities	--	--	--	--	189.94	0.54	-
27600	Tank 27600	--	--	--	--	10.73	0.02	-
27610	Tank 27610	--	--	--	--	10.73	0.02	-
27620	Tank 27620	--	--	--	--	10.73	0.02	-
27630	Tank 27630	--	--	--	--	10.73	0.02	-
27640	Tank 27640	--	--	--	--	10.73	0.02	-
27650	Tank 27650	--	--	--	--	10.73	0.02	-
35000	Tank 35000	--	--	--	--	10.73	0.02	-
35010	Tank 35010	--	--	--	--	10.73	0.02	-
35020	Tank 35020	--	--	--	--	10.73	0.02	-
35030	Tank 35030	--	--	--	--	10.73	0.02	-
35040	Tank 35040	--	--	--	--	10.73	0.02	-
35050	Tank 35050	--	--	--	--	10.73	0.02	-
27800	Tank 27800	--	--	--	--	14.82	--	-
27810	Tank 27810	--	--	--	--	14.82	--	-
27820	Tank 27820	--	--	--	--	<0.01	--	-
TOTAL		**11.03**	**59.16**	**90.40**	**45.29**	**400.47**	**1.53**	**0.06**

		ANNUAL EMISSIONS								
EPN	**Description**	**$PM/PM_{10}/PM_{2.5}$ (tons/yr)**	**NOx (tons/yr)**	**CO (tons/yr)**	**SO_2 (tons/yr)**	**VOC (tons/yr)**	**H_2S (tons/yr)**	**HAPs (tons/yr)**	**CO_2e (tons/yr)**	**CH_2O (tons/yr)**
FUG-1	Fugitives	--	--	--	--	0.66	--	0.01	--	--
L-1, 2	Loading	--	--	--	--	31.02	0.02	0.52	--	--
V-1, 2	Vapor Combustor	6.30	52.20	80.31	3.37	4.44	0.04	0.07	66,177	--
EMERGEN1	Emergency Generator 1	<0.01	0.05	0.07	<0.01	0.02	--	<0.01	2.33	<0.01
EMERGEN2	Emergency Generator 2	<0.01	0.03	0.04	<0.01	<0.01	--	<0.01	1.20	<0.01
MSS	MSS Activities	--	--	--	--	23.40	0.07	0.38	--	--
27600	Tank 27600	--	--	--	--	27.76	<0.01	1.17	--	--
27610	Tank 27610	--	--	--	--					--
27620	Tank 27620	--	--	--	--					--
27630	Tank 27630	--	--	--	--					--
27640	Tank 27640	--	--	--	--					--
27650	Tank 27650	--	--	--	--					--
35000	Tank 35000	--	--	--	--					--
35010	Tank 35010	--	--	--	--					--
35020	Tank 35020	--	--	--	--					--
35030	Tank 35030	--	--	--	--					--
35040	Tank 35040	--	--	--	--					--
35050	Tank 35050	--	--	--	--					--
27800	Tank 27800	--	--	--	--	0.17	--	--	--	--
27810	Tank 27810	--	--	--	--	0.17	--	--	--	--
27820	Tank 27820	--	--	--	--	<0.01	--	--	--	--
TOTAL		**6.30**	**52.28**	**80.41**	**3.37**	**87.66**	**0.12**	**2.15**	**66,180**	**<0.01**

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
FUGITIVE EMISSIONS

Fugitive Emissions

Component	Count[1]	TCEQ Factor[2] (lb/hr-src)	Calculated Losses (lb/event)	VOC:THC Ratio (%)	Total Emissions (lb/hr)	Total Emissions (ton/yr)
LIGHT OIL						
FLANGES/CONNECTORS	1409	0.00001762	--	100	0.025	0.109
VALVES	352	0.0000948	--	100	0.033	0.146
PUMP SEALS[3]	35	0.00119	--	100	0.042	0.182
PIPE DISCONNECTS[4, 5]	1081	--	0.413	100	0.826	0.223
TOTAL EMISSIONS					**0.926**	**0.661**

1. Fugitive emission source counts were calculated based on current P&IDs for the facility.

2. Factors are from TCEQ Air Permit Technical Guidance for Chemical Sources: "Emission Factors for Equipment Leak Fugitive Components," Addendum to RG-360A, January 2008. Table 4 of this document, referencing Petroleum Marketing Terminal factors, was used to obtain the emission factors for the various components. Per phone conversation with Sage Environmental and Tony Ionescu on 4-2-2014 these factors are appropriate for the fugitive emissions for the proposed facility.

3. Mixers are considered as pump seals in the fugitive calculations. There are 2 mixers on each tank and five pumps in this facility.

4. Piping is connected and disconnected to barges or ships upon loading. Small emissions from these disconnections result from residual liquids evaporating from the piping. In order to load 73MMbbls of products, 540 ships are needed assuming 135,000 bbl as smallest ship size. There are two pipe disconnects per ship. This results in an estimated 1,081 disconnections per year.

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
FUGITIVE EMISSIONS

5. The following equation is used to estimate clingage losses from the inside of the piping resulting from the pipe disconnections upon loading. The equation assumes a clingage layer of 0.006 bbls/1,000 ft^2 and a surface area of the inside of the piping calculated from facility P&ID's.

Emissions = S * CF * D

where:

S: Surface Area of Piping (ft^2)

CF: Clingage Factor (bbls/1,000 ft^2)

D: Density of Petroleum Liquid (lb/gal)

S =Inner Diameter of Piping * Length of Piping Exposed

Inner Diameter of Piping Size 1:	22.63	inches
Length of Piping Size 1:	42	inches
Surface Area of Piping Size 1:	117.27	ft^2
Inner Diameter of Piping Size 2:	15	inches
Length of Piping Size 2:	55	inches
Surface Area of Piping Size 2:	67.50	ft^2
Total Area:	184.77	ft^2
Area * 25% Safety Margin:	230.96	ft^2

Product	Petroleum Liquid
Surface Area of Piping (ft^2)	230.96
Clingage Factor (bbls/1,000 ft^2)[1]	0.006
Density of Petroleum Liquid (lb/gal)	7.10
Emission Estimation (lbs/per event)	0.41
Pipe Disconnects Per Hour:	2

Notes:

1. Clingage layer based on AP-42, Chapter 7.1, Table 7.1-10 Average Clingage Factors - Factor for Crude Oil with Light Rust

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
IFR STORAGE TANK EMISSIONS

Hourly and Annual Storage Tank VOC Emissions Summary

							Standing Losses Per Tank[3]		Working Loss Subcap[4]	Total Emission (Standing Loss for all 12 tanks + Working Loss Subcap)[5] (tpy)
EPN	**Tank Description**	**Tank Contents**	**Shell Capacity (bbls)**	**Max Hourly Throughput[1] (bbl/hr)**	**Hourly Emissions[6] (lb/hr)**	**Annual Throughput[2] (bbl/yr)**	**Rim Seal Loss (tpy)**	**Deck Fitting Loss (tpy)**	**Withdrawal Loss (tpy)**	
27600	Tank 27600	Crude Oil/ Condensate	302,000	50,000	10.73	100,000,000	0.28	1.19	10.06	27.76
27610	Tank 27610	Crude Oil/ Condensate	302,000	50,000	10.73		0.28	1.19		
27620	Tank 27620	Crude Oil/ Condensate	302,000	50,000	10.73		0.28	1.19		
27630	Tank 27630	Crude Oil/ Condensate	302,000	50,000	10.73		0.28	1.19		
27640	Tank 27640	Crude Oil/ Condensate	302,000	50,000	10.73		0.28	1.19		
27650	Tank 27650	Crude Oil/ Condensate	302,000	50,000	10.73		0.28	1.19		
35000	Tank 35000	Crude Oil/ Condensate	377,000	50,000	10.73		0.28	1.19		
35010	Tank 35010	Crude Oil/ Condensate	377,000	50,000	10.73		0.28	1.19		
35020	Tank 35020	Crude Oil/ Condensate	377,000	50,000	10.73		0.28	1.19		
35030	Tank 35030	Crude Oil/ Condensate	377,000	50,000	10.73		0.28	1.19		
35040	Tank 35040	Crude Oil/ Condensate	377,000	50,000	10.73		0.28	1.19		
35050	Tank 35050	Crude Oil/ Condensate	377,000	50,000	10.73		0.28	1.19		

Notes:

1. Maximum hourly throughput is based on the maximum pipeline unloading rate of 50,000 bbls/hr.
2. Annual throughput was calculated based on a 100MM bbl/yr throughput assumption.
3. Standing and working losses taken from Tank 4.09d. Output summary results shown in Appendix D. Rim seal and deck fitting losses, or standing losses, will be attributed to each individual tank.
4. Total annual site throughput was used to determine working losses from all tanks. It is assumed that the throughput through each tank will vary significantly, therefore, the entire site throughput was input into the Tanks 4.09d program to estimate maximum working losses. These emissions can be experienced at one tank or an aggregate of all tanks. Therefore, the working losses are represented as a sub-cap for all tanks.
5. Total losses are a combination of each individual tanks standing losses and the total working loss sub-cap.
6. Hourly VOC emissions are calculated using the TCEQ equation from "Technical Guidance Package for Chemical Sources - Storage Tanks (Draft RG-166 Feb 2001):
   Annual Withdraw Loss Rate @ Qmax (Qmax = PRM * 8760) + Standing Storage Loss / 8760 = Short Term Emissions (lb/hr)

Annual Withdraw Loss Rate @ Qmax from Tank 4.09d based on the worst case month July = 88,085.86 lb/yr

Standing Storage Loss from Tank 4.09d based on the worst case month July = 5,919.72 lb/yr

Short Term Emissions (lb/hr) = (88,086 (lb/yr) + 5,920 (lb/yr))/ 8,760 (hr/yr)

Short Term Emissions (lb/hr) = 10.73 lb/hr

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
HAP SPECIATED EMISSIONS TO ATM EMISSIONS

I. Crude/Condensate Tank (IFR) Speciated Emissions[1]

					Speciated Emissions	
Component	Worst Case Hourly Weight%	Annual Weight %			lb/hr	tpy
2,2,4-Trimethylpentane (isooctane)	0.053%	0.042%			0.12	0.02
Hexane (-n)	0.624%	0.514%			0.53	0.13
Hydrogen Sulfide	0.282%	0.013%			0.02	0.00
Benzene	0.591%	0.470%			0.75	0.14
Methyl Mercaptan	0.791%	0.741%			0.13	0.14
Cumene	0.006%	0.004%			0.75	0.11
Toluene	0.557%	0.412%			2.14	0.30
Ethylbenzene	0.065%	0.044%			0.66	0.16
Xylenes (mixed isomers)	0.197%	0.134%			2.37	0.31
TOTAL	3.167%	2.375%			7.50	1.30
TOTAL HAP					7.36	1.17

Notes:

1. The speciation is from a potential worst case mixture of samples from streams that will be sent to the Facility. This liquid speciation was entered into Tanks 4.09d and the worst case hourly and average annual vapor weight percentage were calculated and used to determine annual and hourly HAP emissions.

II. MSS Speciated Emissions[1]

			VOC Emissions		Speciated Emissions	
Component	Worst Case Hourly Weight%	Annual Weight %	lb/hr	tpy	lb/hr	tpy
2,2,4-Trimethylpentane (isooctane)	0.053%	0.042%			0.10	0.01
Hexane (-n)	0.624%	0.514%			1.19	0.12
Hydrogen Sulfide	0.282%	0.013%			0.54	0.00
Benzene	0.591%	0.470%			1.12	0.11
Methyl Mercaptan	0.791%	0.741%	189.94	23.40	1.50	0.17
Cumene	0.006%	0.004%			0.01	<0.01
Toluene	0.557%	0.412%			1.06	0.10
Ethylbenzene	0.065%	0.044%			0.12	0.01
Xylenes (mixed isomers)	0.197%	0.134%			0.37	0.03
TOTAL	3.167%	2.375%			6.02	0.56
TOTAL HAP					4.51	0.38

Notes:

1. The speciation is from a potential worst case mixture of samples from streams that will be sent to the Facility. This liquid speciation was entered into Tanks 4.09d and the worst case hourly and average annual vapor weight percentage were calculated and used to determine annual and hourly HAP emissions.

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
HAP SPECIATED EMISSIONS TO ATM EMISSIONS

III. Fugitive Speciated Emissions[1]

			VOC Emissions		Speciated Emissions	
Component	Worst Case Hourly Weight%	Annual Weight %	lb/hr	tpy	lb/hr	tpy
2,2,4-Trimethylpentane (isooctane)	0.053%	0.042%			<0.01	<0.01
Hexane (-n)	0.624%	0.514%			0.01	<0.01
Hydrogen Sulfide	0.282%	0.013%			0.00	<0.01
Benzene	0.591%	0.470%			0.01	<0.01
Methyl Mercaptan	0.791%	0.741%	0.93	0.66	0.01	0.00
Cumene	0.006%	0.004%			<0.01	<0.01
Toluene	0.557%	0.412%			<0.01	<0.01
Ethylbenzene	0.065%	0.044%			<0.01	<0.01
Xylenes (mixed isomers)	0.197%	0.134%			<0.01	<0.01
TOTAL	3.167%	2.375%			0.03	0.02
TOTAL HAP					0.02	0.01

Notes:

1. The speciation is from a potential worst case mixture of samples from streams that will be sent to the Facility. This liquid speciation was entered into Tanks 4.09d and the worst case hourly and average annual vapor weight percentage were calculated and used to determine annual and hourly HAP emissions.

IV. Uncaptured Loading Speciated Emissions[1]

			VOC Emissions		Speciated Emissions	
Component	Worst Case Hourly Weight%	Annual Weight %	lb/hr	tpy	lb/hr	tpy
2,2,4-Trimethylpentane (isooctane)	0.053%	0.042%			0.02	0.01
Hexane (-n)	0.624%	0.514%			0.28	0.16
Hydrogen Sulfide[2]	0.438%	0.058%			0.20	0.02
Benzene	0.591%	0.470%			0.27	0.15
Methyl Mercaptan	0.791%	0.741%	45.40	31.02	0.36	0.23
Cumene	0.006%	0.004%			<0.01	<0.01
Toluene	0.557%	0.412%			0.25	0.13
Ethylbenzene	0.065%	0.044%			0.03	0.01
Xylenes (mixed isomers)	0.197%	0.134%			0.09	0.04
TOTAL	3.322%	2.420%			1.51	0.75
TOTAL HAP					1.15	0.52

Notes:

1. The speciation is from a potential worst case mixture of samples from streams that will be sent to the Facility. This liquid speciation was entered into Tanks 4.09d and the worst case hourly and average annual vapor weight percentage were calculated and used to determine annual and hourly HAP emissions.
2. Hourly and annual H_2S emission were calculated based on 1,000 ppmv and 100 ppmv which were more conservative than the worst case mixture of samples from streams.

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
HAP Sample Calculation

Crude/Condensate Tank (IFR) Speciated Emissions Sample Calculation

2,2,4-Trimethylpentane (isooctane)

Short Term Emissions (lb/hr) = 2,2,4-Trimethylpentane emissions in July (lbs/month) * 12 (months/yr) *2000 (lbs/ton) / 8760 hrs * 12 tanks

$$\frac{0.0037\ \text{lb}}{\text{month}} \cdot \frac{12\ \text{months}}{\text{year}} \cdot \frac{2000\ \text{lb}}{\text{ton}} \cdot \frac{\text{year}}{8760\ \text{hrs}} \cdot 12\ \text{tanks} = 0.12\ \text{lb/hr}$$

Annual Emission (tpy)= 2,2,4-Trimethylpentane Annual Withdraw losses rate (lbs) / 20000 (lb/ton) + 2,2,4-Trimethylpentane Annual Breathing losses (lbs) / 2000 (lb/ton) *

$$\frac{20.1109\ \text{lb}}{\text{year}} \cdot \frac{\text{ton}}{2000\ \text{lb}} + \frac{(0.2350\ \text{lb} + 0.9998\ \text{lb})}{\text{year}} \cdot \frac{\text{ton}}{2000\ \text{lb}} \cdot 12\ \text{tanks} = 0.02\ \text{tpy}$$

MSS Speciated Emissions Sample Calculation

2,2,4-Trimethylpentane (isooctane)

Short Term Emissions (lb/hr) = 2,2,4-Trimethylpentane Worst Case Hourly Weight (%) * VOC MSS hourly rate (lb/hr)
= 0.0004 * 189.94 lb/hr = 0.08 lb/hr

Annual Emission (tpy)= 2,2,4-Trimethylpentane Annual Weight % * VOC MSS annual rate (tpy)
= 0.0004 * 23.40 tpy = 0.01 tpy

VCU Speciated Emissions Sample Calculation

2,2,4-Trimethylpentane (isooctane)

Short Term Emissions (lb/hr) = 2,2,4-Trimethylpentane Worst Case Hourly Weight (%) * VCU VOC hourly rate (lb/hr)
= 0.0004 * 4.64 lb/hr = 0.0021 lb/hr

Annual Emission (tpy)= 2,2,4-Trimethylpentane Annual Weight % * VCU VOC annual rate (tpy)
= 0.0004 * 4.11 tpy = 0.0017 tpy

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
FRT STORAGE TANK EMISSIONS

I. Hourly Storage Tank Emissions Summary - FRT

EPN	Tank Description	Tank Contents	Capacity (bbl)	Max Hourly Throughput [1] (bbl/hr)	FR_M [1] (gal/hr)	M_V (lb/lb-mole)	P_{VA} (psia)	R (gas constant)	T (°R)	Uncontrolled Hourly Emissions[2] (lb/hr)
27800	Tank 27800	Slop Oil	400	29	1200	50	11	80.273	554.67	14.823
27810	Tank 27810	Slop Oil	400	29	1200	50	11	80.273	554.67	14.823

II. Annual Storage Tank Emissions Summary - FRT

EPN	Tank Description	Tank Contents	Annual Throughput[3] (bbl/yr)	Breathing Losses[4] (tpy)	Working Losses[4] (tpy)	Total Hourly Emissions (lb/hr)	Total Annnual Emissions (tpy)
27800	Tank 27800	Slop Oil	600	0.04	0.12	14.82	0.17
27810	Tank 27810	Slop Oil	600	0.04	0.12	14.82	0.17

1. Maximum hourly throughput for the slop tanks is based on a maximum pump rate of 20 gpm. Maximum hourly throughput for the wastewater/stormwater sump is 10 bbl/hr.
2. Hourly VOC emissions are calculated using the TCEQ equation from "Estimating Short Term Emission Rates from Tanks", APDG 6250:

Maximum Short-term (lb/hr) = $L_{MAX} = \frac{M_v \times P_{VA} \times FR_M}{R \times T}$

Where:

Mv = vapor molecular weight (lb/lb-mole)

P_{VA} = vapor pressure at worst-case temp. (psia)

FR_M = Max filling rate (gal/hr)

R = gas constant (80.273 (psia x gal)/(lbmol x ° R))

T = worst-case liquid surface temperature (°R)

3. Annual throughput was calculated based on 1.5 turnovers per year for each tank.
4. Standing and working losses taken from Tank 4.09d. Output summary results shown in Appendix D.

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FRT STORAGE TANK EMISSIONS

III. Storage Tank Emissions Summary - Underground Carbon Controlled Tank

A. Tank 27820 is a wastewater/stormwater sump tank located underground which will be controlled with carbon.

B. Emissions were calculated based on a carbon bed VOC breakthrough of 100 ppm.

IV. Calculations -- EPN 27820

Parameter	Value	Units	Basis
Tank Maximum Hourly Flow Rate	10	bbl/hr	Based off of highest recorded daily rainfall in Corpus Christi area averaged over 24 hours.
Annual Hours of Operation	8760	hours/yr	
Gas Constant	385	scf/lb-mole	
Vapor MW	50.0	lb/lb-mole	
Carbon Bed VOC Breakthrough	100	ppmv	In Series. Assumes BACT.

Pollutant	Emission Rate		Calculations
Maximum Hourly VOC Emissions	<0.01	lb/hr	VOC (lb/hr) = 10.00 bbl/hr x 42 gal/bbl x 0.133681 ft3/gal x 100 ppmv / 1,000,000 / 385.3 ft3/lb-mole * 50 lb/lb-mole
Annual Average VOC Emissions	<0.01	tpy	VOC (tpy) = max lb/hr x 8760 hours/yr / 2000 lbs/ton

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
LOADING EMISSIONS (EPN: L-1, 2)

Crude Oil/Condensate

Average Bulk Liquid Temp (°R) =	533.17	Annual average of 73.5 °F
Maximum Bulk Liquid Temp (°R) =	554.67	Hourly calculation based on Maximum of 95 °F
TVP @ MAX Temp (psia) =	12.03	AP-42 Equation 1-24
TVP @ Average Temp (psia) =	8.66	AP-42 Equation 1-24
Vapor Molecular Weight (lb/lbmol) =	50	
Max H_2S Concentration (ppmv) =	1000	Based off of conservative estimate of ships coming in
Avg. H_2S Concentration (ppmv) =	100	
Gas Constant (scf/lb-mole) =	385.3	
Destruction/Removal Efficiency[5] (DRE) =	99.9%	
Collection Efficiency (CE) =	99.0%	

I. Crude/Condensate Loading Emissions

Source	Maximum Annual Loading Rate (gal/yr)	Maximum Hourly Loading Rate[1] (bbl/hr)	Maximum Hourly Loading Rate (gal/hr)	Saturation Factor[2]	Hourly Loading Loss (lb/10^3 gal)[3]	Annual Loading Loss (lb/10^3 gal)[4]	Uncaptured Hourly VOC Emissions (lb/hr)	Uncaptured Annual VOC Emissions (tpy)	Uncaptured Hourly H_2S Emissions (lb/hr)	Uncaptured Annual H_2S Emissions (tpy)
Barge/Ship Loading (Crude Oil/Condensate)	3,066,000,000	40,000	1,680,000	0.20	2.7023	2.0234	45.40	31.02	0.199	0.018

Notes:

1. The maximum hourly loading rate is based on two ship or barge loading points with a maximum loading rate of 20M bbls each.
2. Saturation factor was obtained from Table 5.2-1 of AP-42, Section 5.2. This saturation factor was determined appropriate for the ships and ocean-going barges the facility will utilize as specified in API document 2514A, which is the basis for AP-42 Section 5.2. This source clearly indicates that the 0.2 saturation factor is appropriate for ocean-going barges as opposed to inland barges.
3. Total hourly loading loss calculated based on AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids using the maximum true vapor pressure.
4. Total annual loading loss calculated based on AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids using the average true vapor pressure.
5. Collected vapors evolved from loading are routed to the vapor combustor with a VOC destruction efficency of 99.9%.

Emission Equations:

Uncaptured Hourly VOC Emissions (EPN L-1) = (Maximum Hourly Loading Rate * Hourly Loading Loss / 1000) * (1 - CE)

Uncaptured Annual VOC Emissions (EPN L-1) = (Maximum Annual Loading Rate * TAnnual Loading Loss / 1000) * (1 - CE) / 2000 lbs/ton

Uncaptured Hourly H_2S Emissions (EPN L-1) = (Maximum Hourly Loading Rate (gals/hr) * 0.133681 ft^3/gal * Max H_2S conc./1000000 * 1 lb-mole/385.3 scf * 34.082 lbs/lb-mole * (1-CE)

Uncaptured Annual H_2S Emissions (EPN L-1) = (Maximum Annual Loading Rate (gals/yr) * 0.133681 ft^3/gal * Max H_2S conc./1000000 * 1 lb-mole/385.3 scf * 34.082 lbs/lb-mole * (1-CE) / 2000 lbs/ton

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
VAPOR COMBUSTOR EMISSIONS (EPN: V-1, 2)

Combined Stream Emissions

Total Combined Estimated Heat Release for System	432.00	MMBTU/hr	From Manufacturer Spec Sheet
Annual Maximum Throughput	74,357,900	bbls/yr (includes barge/ship loading and tank MSS)	
Maximum Hourly Loading Rate	40,000	bbls/hr (conservative assumption)	
Loading Operational Hours	1,859	hrs at maximum loading hourly rate	
Total Heat Release From Waste and Assist Gas	803,065.32	MMBTU/yr	
Total Combined Heat Release	803,065	MMBTU/yr	

Pollutant	Emission Factor	Units	lb/hr	tpy	Basis
NO_X	0.130	lb/MMBtu	56.16	-	Emission Factor Provided by Manufacturer
	0.130	lb/MMBtu	-	52.20	
CO	0.200	lb/MMBtu	86.40	-	Emission Factor Provided by Manufacturer
	0.200	lb/MMBtu	-	80.31	
CO_2	74.49	kg/MMBtu	70,956	65,951.92	Table C-1
CH_4	0.003	kg/MMBtu	2.86	2.66	Table C-2
N_2O	0.0006	kg/MMBtu	0.57	0.53	Table C-2
CO_2e	-	-	71197.95	66176.63	EPA Listed CO_2 Equivalents

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VAPOR COMBUSTOR EMISSIONS (EPN: V-1, 2)

I. Pilot, Assist Gas Emissions

Max Pilot Gas Flow:	360	scf/hour	From Manufacturer
Max Assist Gas Flow:	88,500	scf/hour	From Manufacturer
Average Pilot Gas Flow:	360	scf/hour	From Manufacturer
Average Assist Gas Flow:	44,250	scf/hour	Half of Manufactuer
Gas Molecular Weight:	18.15	lb/lb-mol	calculated from gas analysis
Gas Constant:	385.30	scf/lb-mol	Conversion constant (ideal gases)
Max Mass Flow Pilot, Assist Gas:	11,268	lb/hr	
Avg. Flow Pilot, Assist Gas:	11,268	lb/hr	
Max Hours Run Per Year:	8,760	hrs/yr	
Annual Mass Flow of Gas:	49,354	tpy	
Vapor Combustor DRE:	99.9%		

			TOC Emissions	
Component	**Wt%**	**Mol Wt[1]**	**lb/hr**	**tpy**
Methane	88.25%	16.04	9.944	43.555
Ethane	8.46%	30.07	0.954	4.176
Propane	0.49%	44.1	0.055	0.243
Iso Butane	0.05%	58.12	0.006	0.025
Butane	0.05%	58.12	0.006	0.026
Iso Pentane	0.02%	72.15	0.002	0.011
Pentane	0.01%	72.15	0.002	0.007
Hexane	0.05%	86.18	0.006	0.025
Carbon Dioxide	2.33%	44.01	-	-
Nitrogen	0.28%	28	-	-
TOTAL	100%	18.149	10.97	48.07
		VOC Emission	**0.08**	**0.34**

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
VAPOR COMBUSTOR EMISSIONS (EPN: V-1, 2)

II. Waste Gas Emissions

Max Hourly Loading Rate to VCU	45,000	bbls/hr (includes barge/ship loading and tank MSS)	
Max Annual Loading Rate to VCU	74,357,900	bbls/yr (includes barge/ship loading and tank MSS)	
VCU Collection Efficiency	99%		
VCU DRE	99.9%		
Molecular Weight	50	lb/lb-mol	
Max H_2S Concentration	1000	ppmv	Based off of conservative estimate of ships coming in
Avg. H_2S Concentration	100	ppmv	
Gas Constant:	385.3	scf/lb-mol	

Gas Stream	Origin of Stream	VOC Mass Flow Rate to VCU[1]		H_2S Volume Flow Rate to VCU[3]	
		lb/hr	lb/yr	scf/hr	scf/yr
1	Barge/Ship Loading	4,494.5	8,202,487	250.1	41,332
2	Tank Refilling	141.8	13,942	27.79	-0.0-
Total	All Gas Flow[1,2]	4,636.4	8,216,429	277.9	41,332

1. Total hourly flows are the sum of barge/ship loading and the higher of tank degassing and tank refilling, since degassing and refilling do not occur simultaneously.
2. Total hourly BTU rates are the sum of barge/ship loading and the higher of tank degassing and tank refilling, since degassing and refilling do not occur simultaneously.
3. Barges and ships coming into the facility might contain hydrogen sulfide vapors and these vapors will be routed to the VCU. There may also be H_2S in some of the crude oil being loaded into the barges and ships.

Pollutant	Emission Factor	Units	lb/hr	tpy	Basis
$PM/PM_{10}/PM_{2.5}$	0.00024	lb/bbl (max)	11.02	-	Stack test from a similar facility
	0.00017	lb/bbl (avg)	-	6.30	
VOC	4,636	lb/hr (mass flow rate)	4.64	-	Total VOC flow to VCU with 99.9% DRE
	8,216,429	lb/yr (mass flow rate)	-	4.11	
SO_2	1000	ppmv H_2S	45.29	-	Ideal gas law based on conservative H_2S concentration and 98% conversion to SO_2
	100	ppmv H_2S	-	3.37	
H_2S	1000	ppmv H_2S	0.49	-	
	100	ppmv H_2S	-	0.04	

III. Summary of Vapor Combustor Emissions

Pollutant	lb/hr	tpy
VOC	4.71	4.44
$PM/PM_{10}/PM_{2.5}$	11.02	6.30
SO_2	45.29	3.37
H_2S	0.49	0.04

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HAP SPECIATED VAPOR COMBUSTOR EMISSIONS

I. Crude/Condensate Barge Vapor Combustor Speciated Emissions[1]

			Controlled Emissions	
Component	Worst Case Hourly Weight%	Annual Weight %	lb/hr	tpy
2,2,4-Trimethylpentane (isooctane)	0.044%	0.042%	<0.01	<0.01
Hexane (-n)	0.542%	0.514%	0.03	0.02
Hydrogen Sulfide	0.292%	0.013%	0.01	<0.01
Benzene	0.500%	0.470%	0.02	0.02
Methyl Mercaptan	0.754%	0.741%	0.03	0.03
Cumene	0.004%	0.004%	<0.01	<0.01
Toluene	0.447%	0.412%	0.02	0.02
Ethylbenzene	0.049%	0.044%	<0.01	<0.01
Xylenes (mixed isomers)	0.148%	0.134%	<0.01	<0.01
TOTAL	2.782%	2.375%	0.13	0.10
TOTAL HAP			0.09	0.07

Notes:

1. The speciation is from a potential worst case mixture of samples from streams that will be sent to the Facility. This liquid speciation was entered into Tanks 4.09d and the worst case hourly and average annual vapor weight percentage were calculated and used to determine annual and hourly HAP emissions.

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
EMERGENCY ENGINE EMISSIONS

	RATED	RATED		MAXIMUM HOURLY EMISSIONS						ANNUAL EMISSIONS						
EPN	HP (hp)	DUTY (MMBTU/HR)	RUNTIME (hr/yr)	NOx (lb/hr)	CO (lb/hr)	VOC (lb/hr)	PM (lb/hr)	SO_2 (lb/hr)	CH_2O (lb/hr)	NOx (ton/yr)	CO (ton/yr)	VOC (ton/yr)	PM (ton/yr)	SO_2 (ton/yr)	CH_2O (ton/yr)	CO_2e (ton/yr)
EMERGEN1	300	0.76	52	1.984	2.646	0.702	0.008	<0.001	0.040	0.0516	0.0688	0.018	<0.001	<0.001	0.001	2.325
EMERGEN2	153	0.39	52	1.013	1.351	0.358	0.004	<0.001	0.021	0.0263	0.0351	0.009	<0.001	<0.001	<0.001	1.203
			TOTAL	**2.997**	**3.997**	**1.060**	**0.012**	**<0.001**	**0.061**	**0.0779**	**0.104**	**0.028**	**<0.001**	**<0.001**	**0.002**	**3.528**

	Emission Factors								
EPN	PM[1] (lb/MMBtu)	NO_X[2] (g/hp-hr)	SO_2[1] (lb/MMBtu)	CO[2] (g/hp-hr)	VOC[2] (g/hp-hr)	CH_2O[1] (lb/MMBtu)	CO_2[3] (kg/MMBtu)	CH_4[3] (kg/MMBtu)	N_2O[3] (kg/MMBtu)
EMERGEN1	0.0099871	3.0	0.000588	4.0	1.0	0.0528	53.06	0.001	0.0001
EMERGEN2	0.0099871	3.0	0.000588	4.0	1.0	0.0528	53.06	0.001	0.0001

1 Emission factor from AP-42 Section 3.2, Natural Gas Fired Reciprocating Engines, July 2000 (4SLB

2 Emission factor from 40 CFR Part 60 Subpart JJJJ, limitations for emergency SI engines.

3 Emission factor from 40 CFR Part 98 Subpart C, Tables C-1 and C-2 for natural gas.

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MSS SUMMARY EMISSIONS

I. Emission Activities[1]

Maintenance Activity	VOC Emissions (lb/hr)	VOC Emissions (tpy)	H_2S Emissions (lb/hr)	H_2S Emissions (tpy)
Sample Pots and Strainers	0.27	0.18	<0.01	<0.01
Pipeline Opening	22.22	0.10	0.06	<0.01
Pigging Activities	12.76	0.17	0.04	<0.01
Pump Maintenance	0.04	<0.01	<0.01	<0.01
Vacuum Trucks	0.08	0.34	<0.01	<0.01
Tank Landings (IFR)	154.58	22.60	0.45	0.07
Total VOCs (IFR)	**189.94**	**23.40**	**0.55**	**0.07**

Note:

1. All Emissions represented in this table are vented directly to the atmosphere.

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
SAMPLE POTS & STRAINERS EMISSIONS

I. Basis

A. There are 10 sample pots at the facility. These sample pots are closed systems and therefore no emissions occur from sampling, however they are required to be maintained. The maintenance activities for sample pots and strainers occur when they are cleaned after a distinct batch or movement of oil is processed. This process involves operating an internal mixer and then draining the pot to a covered container. After the liquid is drained, the pot is opened to remove any debris before it is put back in service. Emissions occur from evaporation losses resulting from opening the sample pots to the atmosphere.

B. Sample pot and strainer maintenance frequency is estimated from 10 sample pots being opened once per day, every day, resulting in 3650 openings per year.

C. The calculation for the max hourly emission rate is based on a frequency of 2 sample pots being open for cleaning per hour.

II. Calculations

The following empirical equation is an appropriate formula for calculating evaporation losses to the atmosphere from opening sample pots. Emissions result from evaporation of clingage to the sample jar. Calculation methodology is derived from AP-42, Section 5.2, Equation 1.

$$\text{Emissions} = V * P_V * MW_V / R / T$$

where:

V: Volume of Equipment (ft^3)

P_V: Vapor Pressure (psia)

MW_V: Vapor Molecular Weight (lb/lb-mol)

R: Gas Constant (psia ft^3/lb-mol °R)

T: Temperature (°R)

Product	Crude/Condensate
[1]Vapor Pressure (psia)	8.66
[3]Vapor Pressure (psia)	12.03
Vapor Molecular Weight (lb/lb-mol)	50
[1]Temperature (°R)	533.17
[3]Temperature (°R)	554.67
Gas Constant (psia ft^3/lb-mol °R)	10.731
[2]Volume of Equipment (ft^3)	1.34
Hourly Emission Estimation (lbs/per event)	0.1351
Annual Emission Estimation (lbs/per event)	0.1011

Notes:

1. Annual Emissions are based on annual average temperature from Tank4.09d.
2. The volume of equipment is from P&ID drawings.
3. Hourly emissions are based on a temperature of 95°F

III. Emissions

Max Hourly Frequency =	2	per hour
Annual Frequency =	3650	per year

Source	Component	Emissions	
		lb/hr	tpy
Sample Pots and Strainers	VOC	0.27	0.18

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
PIPELINE OPENING EMISSIONS

I. Basis

A. Prior to being opened to the taken out of service for maintenance, crude/condensate liquids in the pipeline are flushed to a closed system.

B. The calculation and emission rate are based on one pipeline volume of vapors released to the atmosphere.

II. Calculations

The following empirical equation is an appropriate formula for calculating evaporation losses from a opening equipment to the atmosphere for maintenance. This equation was obtained by manipulating the ideal gas law equation.

$$\text{Emissions} = V * P_V * MW_V / R / T$$

where:

V: Volume of Equipment (ft^3)

P_V: Vapor Pressure (psia)

MW_V: Vapor Molecular Weight (lb/lb-mol)

R: Gas Constant (psia ft^3/lb-mol °R)

T: Temperature (°R)

Product	Crude/Condensate
[1]Volume of Equipment (ft^3)	219.91
[2]Vapor Pressure (psia)	8.66
[3]Vapor Pressure (psia)	12.03
Vapor Molecular Weight (lb/lb-mol)	50.00
Gas Constant (psia ft^3/lb-mol °R)	10.731
[2]Temperature (°R)	533.17
[3]Temperature (°R)	554.67
Hourly Emission Estimation (lbs/per event)	22.22
Emission Estimation (lbs/per event)	16.64

Notes:

1. Equipment dimension: 2 ft in diameter and 70 feet long from site specific drawings.
2. Annual Emissions are based on annual average temperature from Tank4.09d.
3. Hourly emissions are based on a temperature of 95°F

III. Emissions

Max Hourly Frequency =	1	per hour
Annual Frequency =	12	per year

Source	Component	Emissions	
		lb/hr	tpy
Pipeline Opening to Atmosphere	VOC	22.22	0.10

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
PIGGING EMISSIONS

I. Basis

A. Emissions from pigging occur when a pig launcher or receiver is opened to insert a pig into or remove a pig from the pipeline. Evaporative losses are estimated using the known volume of the pig launcher or receiver and a conservative assumption for the clingage layer inside the pig launcher/receiver after clearing.

B. Maximum annual emissions are based on three pigging activities per month per line. There are an average of two lines in service at any time, and therefore an estimated 72 activities occur in total per year.

C. The calculation for the max hourly emission rate is based on a frequency of 2 openings in one hour during July.

II. Calculations

The following empirical equation is an appropriate formula for calculating evaporation losses from a opening a pig receiver/launcher to the atmosphere.

$$\text{Emissions} = V * P_V * MW_V / R / T + A * I / 12 * 7.48 * \rho$$

where:

V: Volume of Equipment (ft^3)
P_V: Vapor Pressure (psia)
MW_V: Vapor Molecular Weight (lb/lb-mol)
R: Gas Constant (psia ft^3/lb-mol °R)
T: Temperature (°R)
A: Wetted Surface Area (ft^2)
I: Clingage Layer (in)
ρ: Liquid Density (lb/gal)

Product	Crude/Condensate
[1]Volume of Equipment (ft^3)	62.83
[2]Vapor Pressure (psia)	8.66
[4]Vapor Pressure (psia)	12.03
Vapor Molecular Weight (lb/lb-mol)	50
Gas Constant (psia ft^3/lb-mol °R)	10.731
[2]Temperature (°R)	533.17
[4]Temperature (°R)	554.67
Wetted Surface Area (ft^2)	16
[3]Clingage Layer (in)	0.0004
Liquid Density (lb/gal)	7.1
Hourly Emission Estimation (lbs/per event)	6.3777
Annual Emission Estimation (lbs/per event	4.7825

Notes:

1. Equipment dimension : 2 ft in diameter and 20 ft long from P&IDs.
2. Annual Emissions are based on annual average temperature from Tank4.09d.
3. Per TCEQ guidance on routine equipment maintenance.
4. Hourly emissions are based on a temperature of 95°F

III. Emissions

Max Hourly Frequency = 2 per hour
Annual Frequency = 72 per year

Source	Component	Emissions	
		lb/hr	tpy
Pigging Activities	VOC	12.76	0.17

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
PUMP MAINTENANCE EMISSIONS

I. Basis

A. Pump maintenance frequency is estimated on 5 pumps being taken out of service for maintenance per year.

B. The calculation for the max hourly emission rate is based on a frequency of 1 pump in July being taken out of service for maintenance.

C. The calculation and emission rate is based on the displacing or purging of process fluids from equipment to the atmosphere.

II. Calculations

The following empirical equation is an appropriate formula for calculating evaporation losses from a opening a pump to atmosphere for maintenance.

$$\text{Emissions} = V * P_V * MW_V / R / T + A * I / 12 * 7.48 * \rho$$

where:

V: Volume of Equipment (ft^3)

P_V: Vapor Pressure (psia)

MW_V: Vapor Molecular Weight (lb/lb-mol)

R: Gas Constant (psia ft^3/lb-mol °R)

T: Temperature (°R)

A: Wetted Surface Area (ft^2)

I: Clingage Layer (in)

ρ: Liquid Density (lb/gal)

Product	Crude/Condensate
[1]Volume of Equipment (ft^3)	0.134
[2]Vapor Pressure (psia)	8.66
[4]Vapor Pressure (psia)	12.02970151
Vapor Molecular Weight (lb/lb-mol)	50
Gas Constant (psia ft^3/lb-mol °R)	10.731
[2]Temperature (°R)	533.17
[4]Temperature (°R)	554.67
Wetted Surface Area (ft^2)	16
[3]Clingage Layer (in)	0.0004
Liquid Density (lb/gal)	7.1
Hourly Emission Estimation (lbs/per event)	0.0418
Annual Emission Estimation (lbs/per event	0.0384

Notes:

1. Typical pump volume from P&IDs.
2. Annual Emissions are based on annual average temperature from Tank4.09d.
3. Per TCEQ guidance on routine equipment maintenance
4. Hourly emissions are based on a temperature of 95°F

III. Emissions

Max Hourly Frequency =	1	per hour
Annual Frequency =	5	per year

Source	Component	Emissions	
		lb/hr	tpy
Pump Maintenance	VOC	0.04	<0.01

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
VACUUM TRUCKS EMISSIONS

I. Basis

A. Vacuum trucks are utilized for storage tank heel de-inventory for maintenance.
B. Assumes two vacuum trucks loaded every hour of the year.

II. Calculations

Parameter	Value	Units	Basis
Vacuum Truck Maximum Hourly Exhaust Gas Flow Rate	150	gal/min/truck	Estimate worst case size of 9000 gallons.
Number of Vacuum Trucks Loaded Simultaneously	2	# of trucks	Assumed number of trucks for calculation purposes.
Annual Hours of Operation	8760	hours/yr	conservative assumption
Gas Constant	385	scf/lb-mole	
Vapor MW	50.0	lb/lb-mole	
Liquid Scrubber/Carbon Bed VOC Breakthrough	100	ppmv	Assumes BACT.

Pollutant	Emission Rate		Calculations
Maximum Hourly VOC Emissions	0.08	lb/hr	VOC (lb/hr) = 150.00 gal/min/truck x 0.133681 ft3/gal x 60 min/hr x 100 ppmv / 1,000,000 / 385.3 ft3/lb-mole * 50 lb/lb-mole x 2 trucks/hr
Annual Average VOC Emissions	0.34	tpy	VOC (tpy) = max lb/hr x 8760 hours/yr / 2000 lbs/ton

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
MSS TANK HOURLY EMISSIONS

Step 1: Initial Tank De-Inventory

Emissions during initial tank de-inventorying are assumed to be zero since tank vacuum breaker vents are pulling air into the tank to avoid collapse of the roof due to vacuum.

Step 2: De-Inventory of Heel by Pump

Pumps are used to remove the heel remaining below the lowest suction nozzle on the IFRTs.

Step 3: Standing Idle Loss - IFRT with Partial Heel - Heel Held in Sump at Tank Bottom

L_{SL}	**Standing Idle Loss (lb/hr)**	**154.58**	**Source/Notes/Assumptions**
L_{SLwind}	**Standing Idle Loss Due to Wind (lb/hr)**	**154.58**	
	$L_{SL} = \frac{n_d K_E \left(\frac{PVV}{RT}\right) M_V K_S}{24}$		AP-42 Chapter 7, Section 1, Equation 2-16 (November 2006). Dependent on number of days standing idle, instead of annual basis that assumes 365 days.
n_d	Number of days standing idle	*1.00*	Maximum 1 day idle per BACT.
K_E	Vapor space expansion factor	*0.84*	
	$K_E = \frac{\Delta T_V}{T_{LA}} + \frac{\Delta PV - 0}{P_A - PVA}$		AP-42, Equation 2-31
ΔT_V	Daily vapor temperature range, R	22.78	
	$\Delta T_V = 0.72\ \Delta T_A + 0.028\ \alpha\ I$		AP-42, Equation 1-8
α	Tank paint solar absorptance	*0.17*	White Tank Factor
I	Daily total solar isolation factor, Btu/ft^{2}d	*1987.38*	July Factor for Corpus Christi
ΔT_A	Daily ambient temperature range, R	*18.50*	Taken from Tank4.09d for July
V_V	Volume of vapor space (ft^3)	*211,794*	Tank with a diameter of 212 ft and a leg height of 6 ft.
P	Vapor pressure (psia)	*12.03*	Calculated TVP at Max Liquid Surface Temperature (95 F) per AP-42 Equation 1-24
R	Ideal Gas constant (psia ft^3 per lb-mole ºR)	*10.73*	
T	Daily Average Liquid Surface Temperature (°R)	*554.67*	Assume worst case scenario for hourly calculation, T = 95°F
M_V	Vapor molecular weight (lb/lb-mole)	*50.00*	Crude/Condensate Vapor Molecular Weight, from TANKS 4.09
K_S	Vented vapor saturation factor	*0.21*	
	$K_S = \frac{1}{1 + 0.053 P_{VA} H_{VO}}$		AP-42, Equation 1-20
P_{VA}	TVP at Daily Average Liquid Surface Temperature (psia)	*12.03*	Calculated TVP at Max Liquid Surface Temperature (95 F) per AP-42 Equation 1-24
H_{vo}	Vapor space outage (ft)	*6.00*	Tank leg height of 6ft with sump tank bottom.
D	Tank Diameter (ft)	*212.00*	Per tank drawings
h_r	Roof Leg Setting (ft)	*6.00*	Per tank drawings
P_A	Atmospheric Pressure (psia)	*14.70*	Atmospheric pressure at sea level.

Step 4: Degassing/Vapor Space Purge Loss

IFRT degassing is conducted until the vent gas is below 10,000 ppm, or below 1% LEL, using a vapor combustion unit (VCU) that achieves a minimum VOC destruction efficiency of 99.9%. Emissions are estimated assuming a partial heel in the tank. Combustion emissions are accounted for in the VCU combustion calculations.

L_P	Degassing/Vapor Space Purge Loss (lb/hr)	10.70	Source/Notes/Assumptions
	$L_P = \frac{\left(\frac{PV_V}{RT}\right) M_V S(1-K_D)}{t_{Deg}}$		Evaporative Loss from the Cleaning of Storage Tanks Draft dated November 8, 2006, prepared for API; equation 14. Please note that equation 14 has been modified to account for a control device and number of purges per year.
V_V	Volume of vapor space (ft^3)	*211,794*	Tank with a diameter of 212 ft and a leg height of 6 ft.
P	Vapor pressure (psia)	*12.03*	TVP at Max Liquid Surface Temperature (95 F) obtained from TANKS 4.09.
R	Ideal Gas constant (psia ft^3 per lb-mole ºR)	*10.73*	
T	Daily Average Liquid Surface Temperature (°R)	*554.67*	Assume worst case scenario for hourly calculation, T = 95°F
M_V	Vapor molecular weight (lb/lb-mole)	*50.00*	Crude/Condensate Vapor Molecular Weight, from TANKS 4.09
S	Filling saturation factor	*0.50*	Found in AP-42, 0.5 for partial heel or 0.6 for full heel. Used partial heel assumption for maintenance activities.
t_{DEG}	Time required to purge tank (hr)	*1.00*	Conservative assumption
K_D	Efficiency of control device	*99.9%*	Manufacturers efficiency guarantee.

Step 5: Sludge Removal Loss

Once degassing has been completed, a small manway is opened and the storage tank is water washed manually. The following empirical equation is an appropriate formula for calculating the mass transfer of vapors through the manway during the time that the manway is opened. A blower fan will be used to drive ventilation in this step.

L_{SR}	Sludge Removal Loss (lb/hr)	48.16	Source/Notes/Assumptions
	$L_{SR} = 60 Q_V C_V \frac{P_A M_V}{RT}$		Equation for losses due to sludge removal, assumes forced ventilation by a blower fan. Assume that $C_V \leq P / P_A$, additionally assume that this loss will be less than the Maximum Standing Idle Loss from Step 3.
Q_v	Ventilation fan rating (acfm)	*13,000*	Specific to blower fan, can be found in manufacturer data.
C_V	Vapor Concentration	*0.0005*	
	$C_V = \frac{LEL_{Avg}}{100} \cdot \frac{LEL_{CG}}{100} \cdot RF$		Average vapor concentration by volume during sludge removal.
LEL_{Avg}	Average Lower Exposure Limit (LEL) of Stock (%)	*1.00*	Base on the safety entry requirement.
LEL_{CG}	LEL of Calibration Gas, Volume % in Air (%)	*5.00*	Using Methane as the Calibration Gas.
RF	Meter Response Factor	*1.00*	If unknown use 1.0 as default.
P_A	Atmospheric Pressure (psia)	*14.70*	Atmospheric pressure at sea level.
M_V	Vapor molecular weight (lb/lb-mole)	*50.00*	Crude/Condensate Vapor Molecular Weight, from TANKS 4.09
R	Ideal Gas constant (psia ft^3 per lb-mole ºR)	*10.73*	
T	Daily Average Liquid Surface Temperature (°R)	*554.67*	Assume worst case scenario for hourly calculation, T = 95°F

Step 6: Tank Refilling Loss

Emissions from IFRT refilling are estimated assuming a tank with a partial heel where the roof is put onto long legs for maintenance.

L_F	**Refilling loss (lb/hr)**	**1.42**	**Source/Notes/Assumptions**
	$L_F = \frac{\left(\frac{PV_V}{RT}\right) M_V \; S\,(1 - K_D)}{t_f}$		API TR 2567, equation 20. Note that equation 20 has been modified to account for the time it will take to refill.
P	True vapor pressure of liquid (psia)	*12.03*	Calculated TVP at Max Liquid Surface Temperature (95 F) per AP-42 Equation 1-24
V_V	Volume of vapor space (ft^3)	*211,794*	Tank with a diameter of 212 ft and a leg height of 6 ft.
R	Ideal Gas constant (psia ft^3 per lb-mole ºR)	*10.73*	
T	Daily Average Liquid Surface Temperature (°R)	*554.67*	Assume worst case scenario for hourly calculation, T = 95°F
M_V	Vapor molecular weight (lb/lb-mole)	*50.00*	Vapor Molecular Weight of Crude/Condensate
S	Filling saturation factor	*0.50*	Depends on tank type and whether tank was cleaned before refilling (in which case, S=0.15). If not cleaned, value is either 0.5 or 0.6 depending on type of tank. Used partial heel assumption of 0.6 for change of service activities.
t_f	Time to refill (hr)	*7.54*	211,794 ft^3 * 7.48 (gal/ft3) / 42 (gal/bbl) / 5,000 (bbl/hr)
	$t_f = \frac{V_V}{Rate}$		Facility estimate, (refill rate = 5,000 bbls/hr).
V_V	Volume of vapor space (bbl)	*37719.43*	Volume of vapor space in ft^3 * 7.48 gal/ft^3 density / 42 bbl/gal.
Rate	Tank Refill Rate (bbl/hr)	*5000.00*	Facility design rate.
K_D	Efficiency of control device	*99.9%*	Manufacturers efficiency guarantee.

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CORPUS CHRISTI DOCK AND STORAGE TERMINAL
MSS TANK HOURLY EMISSIONS

Emissions to Atmosphere Summary - IFR Tank

Step 3: Standing Idle Loss - IFRT with Heel (lb/hr)		*154.58*
Step 5: Sludge Removal Loss (lb/hr)		*48.16*
Lmax	**Max Hourly Uncontrolled Emissions (lb/hr)***	***154.58***

*Maximum of idel loss and sludge removal, since they do not occur simultaneously.

Controlled Emissions from VCU Summary - IFR Tank

Step 4: Degassing/Vapor Space Purge Loss (lb/hr)		*10.70*
Step 6: Tank Refilling Loss (lb/hr)		*1.42*
Lmax	**Max Hourly Controlled Emissions (lb/hr)***	***10.70***

*Maximum of degassing and refilling, since they do not occur simultaneously.

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
MSS TANK ANNUAL EMISSIONS

Step 1: Initial Tank De-Inventory

Emissions during initial tank de-inventorying are assumed to be zero since tank vacuum breaker vents are pulling air into the tank to avoid collapse of the roof due to vacuu

Step 2: De-Inventory of Heel by Pump

Pumps are used to remove the heel remaining below the lowest suction nozzle on the IFRTs.

Step 3: Standing Idle Loss - IFRT with Partial Heel - Heel Held in Sump at Tank Bottom

L_{SL}	**Standing Idle Loss (tpy)**	**15.09**	**Source/Notes/Assumptions**
L_{SLwind}	**Standing Idle Loss Due to Wind (tpy)**	**15.09**	
	$L_{SL} = n_d K_E \left(\frac{PVV}{RT}\right) M_V K_S$		AP-42 Chapter 7, Section 1, Equation 2-16 (November 2006). Dependent on number of days standing idle, instead of annual basis that assumes 365 days.
n_d	Number of days standing idle	*18.00*	18 days idle for 1 day per tank landing (12 change of service and 6 maintenance activities per year)
K_E	Vapor space expansion factor	*0.39*	
	$K_E = \frac{\Delta T_V}{T_{LA}} + \frac{\Delta PV - 0}{P_A - PV_A}$		AP-42, Equation 2-31
ΔT_V	Daily vapor temperature range, R	*22.78*	
	$\Delta T_V = 0.72\ \Delta T_A + 0.028\ \alpha\ I$		AP-42, Equation 1-8
α	Tank paint solar absorptance	*0.17*	White Tank Factor
I	Daily total solar isolation factor, Btu/ft^{2}d	*1987.38*	July Factor for Corpus Christi
ΔT_A	Daily ambient temperature range, R	*18.50*	Taken from Tank4.09d for July
V_V	Volume of vapor space (ft^3)	*211,794*	Tank with a diameter of 212 ft and a leg height of 6 ft.
P	Vapor pressure (psia)	*8.66*	TVP at Annual Liquid Surface Temperature per AP-42 Equation 1-24
R	Ideal Gas constant (psia ft^3 per lb-mole ºR)	*10.73*	
T	Daily Average Liquid Surface Temperature (°R)	*533.17*	Annual Average
M_V	Vapor molecular weight (lb/lb-mole)	*50.00*	Crude/Condensate Vapor Molecular Weight, from TANKS 4.09
K_S	Vented vapor saturation factor	*0.27*	
	$K_S = \frac{1}{1 + 0.053 P_{VA} H_{VO}}$		AP-42, Equation 1-20
P_{VA}	TVP at Daily Average Liquid Surface Temperature (psia)	*8.66*	TVP at Annual Liquid Surface Temperature per AP-42 Equation 1-24
H_{vo}	Vapor space outage (ft)	*6.00*	Tank leg height of 6ft with sump tank bottom.
D	Tank Diameter (ft)	*212.00*	Per tank drawings
h_r	Roof Leg Setting (ft)	*6.00*	Per tank drawings
P_A	Atmospheric Pressure (psia)	*14.70*	Atmospheric pressure at sea level.

Step 4: Degassing/Vapor Space Purge Loss

IFRT degassing is conducted until the vent gas is below 10,000 ppm, or below 1% LEL, using a vapor combustion unit (VCU) that achieves a minimum VOC destruction efficiency of 99.9%. Emissions are estimated assuming a partial heel in the tank. Combustion emissions are accounted for in the VCU combustion calculations.

L_P	Degassing/Vapor Space Purge Loss (tpy)	0.02	Source/Notes/Assumptions
	$L_p = \frac{\left(\frac{PV_V}{RT}\right) M_V S(1-K_D) N_t}{2000 \, lb/ton}$		Evaporative Loss from the Cleaning of Storage Tanks Draft dated November 8, 2006, prepared for API; equation 14. Please note that equation 14 has been modified to account for a control device and number of purges per year.
V_V	Volume of vapor space (ft^3)	*211,794*	Tank with a diameter of 212 ft and a leg height of 6 ft.
P	Vapor pressure (psia)	*8.66*	TVP at Annual Liquid Surface Temperature per AP-42 Equation 1-24
R	Ideal Gas constant (psia ft^3 per lb-mole ºR)	*10.73*	
T	Daily Average Liquid Surface Temperature (°R)	*533.17*	Annual Average
M_V	Vapor molecular weight (lb/lb-mole)	*50.00*	Crude/Condensate Vapor Molecular Weight, from TANKS 4.09
S	Filling saturation factor	*0.50*	Found in AP-42, 0.5 for partial heel or 0.6 for full heel. Used partial heel assumption for maintenance activities.
Nt	Number of tanks per year	*6.00*	Six maintenance activities per year.
K_D	Efficiency of control device	*99.9%*	Manufacturers efficiency guarantee.

Step 5: Sludge Removal Loss

Once degassing has been completed, a small manway is opened and the storage tank is water washed manually. The following empirical equation is an appropriate formula for calculating the mass transfer of vapors through the manway during the time that the manway is opened. A blower fan will be used to drive ventilation in this

L_{SR}	Sludge Removal Loss (tpy)	7.51	Source/Notes/Assumptions
	$L_{SR} = 60 Q_V n_{SR} t_v C_V \frac{P_A M_V}{RT}$		Equation for losses due to sludge removal, assumes forced ventilation by a blower fan. Assume that $C_V \leq P / P_A$, additionally assume that this loss will be less than the Maximum Standing Idle Loss from Step 3.
Q_v	Ventilation fan rating (acfm)	*13,000*	Specific to blower fan, can be found in manufacturer data.
n_{SR}	Duration of ventilation (days)	*5*	Average days to finish a job (1 work week)
t_v	Hours per day of ventilation (hours/day)	*10.00*	Average hours worked per day
C_V	Vapor Concentration	*0.0005*	
	$C_V = \frac{LEL_{Avg}}{100} \cdot \frac{LEL_{CG}}{100} \cdot RF$		Average vapor concentration by volume during sludge removal.
N_t	Number of tanks per year	*6*	Six maintenance activities per year.
LEL_{Avg}	Average Lower Exposure Limit (LEL) of Stock (%)	*1.00*	Base on the safety entry requirement.
LEL_{CG}	LEL of Calibration Gas, Volume % in Air (%)	*5.00*	Using Methane as the Calibration Gas.
RF	Meter Response Factor	*1.00*	If unknown use 1.0 as default.
P_A	Atmospheric Pressure (psia)	*14.70*	Atmospheric pressure at sea level.
M_V	Vapor molecular weight (lb/lb-mole)	*50.00*	Crude/Condensate Vapor Molecular Weight, from TANKS 4.09
R	Ideal Gas constant (psia ft^3 per lb-mole ºR)	*10.73*	
T	Daily Average Liquid Surface Temperature (°R)	*533.17*	Annual Average

Step 6: Tank Refilling Loss

Emissions from IFRT refilling are estimated assuming a tank with a partial heel where the roof is put onto long legs for maintenance.

L_F	**Refilling loss (tpy) Total**	**0.07**	**Source/Notes/Assumptions**
L_F	Refilling loss (tpy) Initial Fill and Maintenance	0.02	
L_F	Refilling loss (tpy) Product Change of Service	0.05	
	$L_F = \left(\frac{PV_V}{RT}\right) M_V S (1 - K_D) N_t$		API TR 2567, equation 20. Note that equation 20 has been modified to account for number of tanks refilled per year.
P	True vapor pressure of liquid (psia)	*8.66*	TVP at Annual Liquid Surface Temperature per AP-42 Equation 1-24
V_V	Volume of vapor space (ft^3)	*211,794*	Tank with a diameter of 212 ft and a leg height of 6 ft.
R	Ideal Gas constant (psia ft^3 per lb-mole ºR)	*10.73*	
T	Daily Average Liquid Surface Temperature (°R)	*533.17*	Annual Average
M_V	Vapor molecular weight (lb/lb-mole)	*50.00*	Vapor Molecular Weight of Crude/Condensate
S	Filling saturation factor (Product Change of Service)	*0.50*	Depends on tank type and whether tank was cleaned before refilling (in which case, S=0.15). If not cleaned, value is either 0.5 or 0.6 depending on type of tank. Used partial heel assumption of 0.6 for 12 change of service activities.
S	Filling saturation factor (Maintenance and Initial Fill)	*0.15*	Depends on tank type and whether tank was cleaned before refilling (in which case, S=0.15). Used cleaned assumption of 0.15 for 12 initial fills and 6 maintenance activities.
N_t	Number of tanks per year	*30*	12 initial fill plus 12 change of service and 6 maintenance activities per year.
K_D	Efficiency of control device	*99.9%*	Manufacturers efficiency guarantee.

PLAINS MARKETING, L.P.
CORPUS CHRISTI DOCK AND STORAGE TERMINAL
MSS TANK ANNUAL EMISSIONS

Emissions to Atmosphere Summary - IFR Tank

Step 3: Standing Idle Loss - IFRT with Heel (tpy)		*15.09*
Step 5: Sludge Removal Loss (tpy)		*7.51*
Ltotal	**Total Annual Uncontrolled Emissions (tpy)**	***22.60***

Controlled Emissions from VCU Summary - IFR Tank

Step 4: Degassing/Vapor Space Purge Loss (tpy)		*0.02*
Step 6: Tank Refilling Loss (tpy)		*0.07*
Ltotal	**Total Annual Controlled Emissions (tpy)**	***0.09***

APPENDIX E
SUPPORTING DOCUMENTATION

The following documents supporting the emission calculation methodologies and data inputs are located in this appendix:

- Stabilized condensate sampling and analysis used to determine HAP speciation (New);
- John Zink VCU proposal and specifications (New);
- Natural gas sampling (New);
- VCU stack test report for the existing Plains Pipeline Corpus Christi marine loading facility (New); and
- Tanks 4.09d Program Output (Revised).

Manual of Petroleum Measurement Standards Chapter 19.4—Recommended Practice for Speciation of Evaporative Losses

SECOND EDITION, SEPTEMBER 2005

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Step 9: Calculate the mole fraction in the vapor phase, y_i, for each component, i:

$$y_i = P_i / P \tag{13}$$

Step 10: Determine the stock vapor molecular weight M_v.

Partial Speciation:

Typical stock vapor molecular weights for selected petroleum liquids are presented in Table 2. Alternatively, the stock vapor molecular weight can be determined by analysis. See 4.5.

Full Speciation:

The stock vapor molecular weight can be calculated as:

$$M_v = \Sigma(y_i M_i) \tag{9}$$

Step 11: Calculate the weight fraction in the vapor phase, z_i, for each component, i:

$$z_i = y_i M_i / M_v \tag{14}$$

Step 12: Calculate the emissions (weight) for each component, i:

$$L_i = z_i L_t \tag{15}$$

where

L_i = emissions (by weight) of component, i, and
L_t = total emissions (by weight) of all components

Table 4—Default Liquid-Phase Concentrations (weight percent) Used in TANKS 4.0

Compound	Gasoline	JP-4 (Jet Naphtha)	Jet A (Jet Kerosene)	Diesel (Distillate Fuel Oil No. 2)	Crude Oil
n-hexane	1.0	1.5	0.005	0.0001	0.4
benzene	1.8	0.6	0.004	0.0008	0.6
iso-octane {2,2,4 trimethylpentane}	4.0	0.0	0.0	0.0	0.1
toluene	7.0	2.0	0.133	0.032	1.0
ethylbenzene	1.4	0.5	0.127	0.013	0.4
xylenes (2)	7.0	2.5	0.31	0.29	1.4
cumene {isopropylbenzene}	0.5	0.2	0.0	0.0	0.1
MTBE	(3)	0.0	0.0	0.0	0.0
1,2,4 trimethylbenzene	2.5	0.0	0.0	1.0	0.33
cyclohexane	0.24	1.2	0.0	0.0	0.7

Notes:

1. Concentrations in this table are the default values in EPA's TANKS software[24]. These values match those in API 19.1 Table 9[3] except that, in 19.1, cyclohexane in gasoline is rounded to 0.2 and crude oil is not included. Actual product profiles may differ greatly from the TANKS default values, and TANKS has the ability to accept custom profiles.
2. Xylenes includes mixed isomers; for convenience, TANKS[24] uses m-xylene to represent all isomers of xylene.
3. MTBE concentrations vary significantly. EPA[24,33] suggests the following liquid-phase concentrations (weight percent):

Normal gasoline	Reformulated with MTBE	Oxygenated with MTBE
0	8.8	12.0

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Intertek

Report of Analysis

Client: Plains Marketing, LP
Job Location:
Our Reference Number: US320-0069074

Client Reference Number:
NONE

Sample ID: 2015-NOLA-001270-002
Sample Designated As: EAGLE FORD CONDENSATE
Vessel/Location: PLAINS CORPUS TERMINAL
Representing: TANK-1518 AVERAGE EAGLEFORD CONDENSATE

Date Taken: 03-February-2015
Date Submitted: 04-February-2015
Date Tested: 18-February-2015
Drawn By: Intertek

Method	Test	Result	Units
ASTM D4294	Sulfur Content in Petroleum Products by ED-XRF		
	Sample Preparation	Centrifuged	
	[1] Sulfur Content	0.0123	Wt %
ITM 3468	Determination of Hydrogen Sulfide in Vapor Phase of Volatile Samples		
	Test temperature	77	F
	Hydrogen Sulfide in vapor phase	<10	ppm v/v
ITM 6015	Determination of Benzene, Toluene, Ethylbenzene, m&p Xylene and o-Xylene by Gas Chromatography /Mass Spectrometry		
	Benzene	5859	ppm Wt
	Toluene	17371	ppm Wt
	Ethylbenzene	1735	ppm Wt
	m & p-Xylene	16871	ppm Wt
	o-Xylene	2672	ppm Wt
ASTM D5002	Density and Relative Density of Crude Oils		
	Average API Gravity	62.6	°API
UOP 163	Hydrogen Sulfide and Mercaptan Sulfur		
	H2S	< 1	ppm Wt

$\Sigma = 19,543$ ppmw

[1] *Out of Scope of the Method*

The information contained herein is based on laboratory tests and observations performed by Intertek . The sample was submitted by Plains Marketing - Corpus Christi, TX solely for testing. Intertek disclaims any and all liability for damage or injury which might result from the use of the information contained herein, and nothing contained herein shall constitute a guarantee, warranty on representation by Intertek with respect to the accuracy of the information, the sample, product or item described, or its suitability for use for any specific purpose.

Signed: _____ Date: _____

Intertek
Mark Brignac, Crude Quality Coordinator

149 Pintail Road, St. Rose, Louisiana 70087 USA
Tel.: +1 504 602 2000 Fax.: +1 504 602 2023

Shipped Samples Report of Analysis

Client: ---------- **Client Reference Number:**

Our Reference Number: 2015-CUSH-000136
Lab Reference Number: 2015-CUSH-000136

Description	Method	Test	Result	Units
Crude Oil Aspen WTS Composite				
2015-MIDL-000010-015	ASTM D4294	Sample Preparation	Centrifuged	
		Sulfur Content	2.13	Wt %
	ASTM D4530	Average Micro Method Carbon Residue	3.29	Wt %
	ASTM D4929	Procedure Used	B	
		Organic Chloride in Orig. Sample-Crude Oil	1.0	µg/g
	ASTM D5002	Average API Gravity	28.0	°API
	ASTM D5705 MOD	Test Temperature	77	°F
		H2S	> 4000	ppm v/v
	ASTM D5708	Procedure	Test Method B	
		Vanadium Content	7.02	mg/kg
		Nickel Content	2.73	mg/kg
		Iron Content	20.3	mg/kg
	ASTM D6377	VPCR 4 (37.8 ° C)	< 3.62	psi
	ASTM D664	Procedure Used	A	
		Alternative Solvent Used	Chloroform	
		Acid Number	1.05	mg KOH/g
	ASTM D6730 MOD	Methane	< 0.01	Vol %
		Ethane	0.04	Vol %
		Propane	0.18	Vol %
		Isobutane	0.20	Vol %
		n-Butane	0.55	Vol %
		Neopentane	0.01	Vol %
		Isopentane	0.81	Vol %
		n-Pentane	0.35	Vol %
		Cyclopentane	0.06	Vol %
		Cyclohexane	0.32	Vol %
		Methylcyclopentane	0.35	Vol %
		Benzene	< 0.01	Vol %
		Total Light Ends	2.87	Vol %
		Note	n/a	
	ASTM D7169	Boiling Point Distribution	See Attached Report	
	UOP 163	Hydrogen Sulfide as S	22	mg/kg
		Mercaptan as S	583	mg/kg
	ASTM D4294	Sample Preparation	Centrifuged	
		Sulfur Content	2.15	Wt %
	ITM 3468	Test temperature	77	F
		Hydrogen Sulfide in vapor phase	3003	ppm v/v
	ASTM D5002	Average API Gravity	27.9	°API
	UOP 163	Hydrogen Sulfide as S	9	mg/kg
		Mercaptan as S	543	mg/kg
	ASTM D6730 MOD	Benzene	< 0.01	Vol %
		Toluene	0.04	Vol %
		Ethylbenzene	0.11	Vol %
		m & p-Xylene	0.09	Vol %
		o-Xylene	0.07	Vol %
		Xylenes	0.16	Vol %

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Shipped Samples Report of Analysis

Description	Method	Test	Result	Units
	ASTM D6730 MOD	Note	n/a	

Authorized By: _____

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Shipped Samples Report of Analysis

Client: ---------- **Client Reference Number:**

Vessel: MCCamey / Driver 2.20.2015
Our Reference Number: 2015-CUSH-000175
Lab Reference Number: 2015-CUSH-000175

Description	Method	Test	Result	Units
Crude Oil Driver/McCamey				
2015-MIDL-000014-001	ASTM D4294	Sample Preparation	Centrifuged	
		Sulfur Content	0.0794	Wt %
	ASTM D4530	Average Micro Method Carbon Residue	0.55	Wt %
	ASTM D4929	Procedure Used	B	
		Organic Chloride in Orig. Sample-Crude Oil	< 1.0	µg/g
	ASTM D5002	Average API Gravity	42.4	°API
	ASTM D5705 MOD	Test Temperature	70	°F
		H2S	< 5	ppm v/v
	ASTM D5708	Procedure	Test Method B	
		Vanadium Content	0.315	mg/kg
		Nickel Content	0.536	mg/kg
		Iron Content	9.04	mg/kg
	ASTM D6377	VPCR 4 (37.8 ° C)	10.18	psi
	ASTM D664	Procedure Used	A	
		Alternative Solvent Used	Chloroform	
		Acid Number	< 0.10	mg KOH/g
	ASTM D6730 MOD	Methane	< 0.01	Vol %
		Ethane	0.13	Vol %
		Propane	1.15	Vol %
		Isobutane	0.44	Vol %
		n-Butane	2.48	Vol %
		Neopentane	0.01	Vol %
		Isopentane	1.54	Vol %
		n-Pentane	2.25	Vol %
		Cyclopentane	0.31	Vol %
		Cyclohexane	0.95	Vol %
		Methylcyclopentane	1.43	Vol %
		Benzene	0.16	Vol %
		Total Light Ends	10.85	Vol %
		Note	n/a	
	ASTM D7169	Boiling Point Distribution	See Attached Report	
		20% Boiling Point	248	°F
		50% Boiling Point	520	°F
		1020 °F + Residue	9.4	Wt %
	ASTM D5002	Average API Gravity	42.0	°API
	ASTM D4294	Sample Preparation	Centrifuged	
		Sulfur Content	0.0801	Wt %
	UOP 163	Hydrogen Sulfide as S	< 1	mg/kg
		Mercaptan as S	14	mg/kg
	ITM 3468	Sample was run D5705 mod which is ITM3468	True	
	ASTM D6730 MOD	Benzene	0.16	Vol %
		Toluene	0.44	Vol % = 0.5437
		Ethylbenzene	0.51	Vol % when converted
		m & p-Xylene	0.75	Vol % to wt %.
		o-Xylene	0.31	Vol %

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Shipped Samples Report of Analysis

Description	Method	Test	Result	Units
	ASTM D6730 MOD	Xylenes	1.06	Vol %
		Note	n/a	

Authorized By: Briley Charette 3-4-15

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JOHN ZINK® MARINE VAPOR COMBUSTION SYSTEM

Prepared for:

Scott Oswald

Of

Plains All American

Corpus Christi, TX

PREPARED BY	*LARISSA HESPEN*
DATE	*10-JUN-2015*
REVISION	*8*
JZ FILE NUMBER	*201406-45463-A*

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C. Preliminary Layout
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I. Introduction

John Zink Company, LLC is pleased to provide this proposal for two JOHN ZINK® **Model ZCM-5/5/5-13-70-X-4/8-4/8-4/8** Marine Vapor Combustion System (MVCS) to be located at Plain's petroleum products terminal in Corpus Christi, TX.

The system is designed in accordance with the appropriate sections of 33 CFR Part 154 to condition, transfer and combust the hydrocarbon vapors displaced during the loading of marine vessels. Loading will occur at one loading berth at a maximum combined rate of 50,000 BPH OR loading a single tank at a maximum loading rate of 6,000 BPH. The destruction efficiency will be a minimum of 99.9 percent as described in the Performance Guarantee section.

Through the execution of hundreds of vapor control projects, John Zink has developed a thorough understanding that our customers value safety, efficiency, and ease of installation, operation and maintenance in their equipment. The design of the proposed VCU incorporates several features which enhance safety, performance and reliability. John Zink also understands that, in addition to high-quality equipment, our customers value excellence in project execution and service. Purchasing a system from John Zink provides many advantages not limited to the following:

- Experienced design and project management staff dedicated to providing excellent customer service during the execution and installation phases of a project.
- In-house fabrication ability. Because John Zink owns its own 250,000 square foot manufacturing facility, we are able to assemble most systems in our own shop which allows us to better control quality and schedule. We also assemble our control panels in-house and perform a functional test of the control panel and MVCS skids prior to shipment.
- Large service organization. Our factory trained technicians provide both preventative maintenance and emergency call-out assistance 24/7.
- Spare parts inventory for quick turn arounds.
- Portable Emission Control Systems (PECS®) for temporary compliance needs.
- Installation assistance.
- John Zink proprietary anti-flashback burners. John Zink is the only VCU supplier to design and manufacture our own anti-flashback burners.
- Elimination of liquid seal. John Zink's anti-flashback burners allow for an additional level of safety so that liquid seal can be removed, reducing equipment maintenance.

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Scope of Supply Summary

Engineering

The following items are included as "Engineering Deliverables"

1. Piping and Instrument Diagrams
2. System pressure drop calculations
3. Natural gas enrichment requirements
4. Combustor emission data
5. Utility requirements
6. Design and specification for:
   - Dock Safety Units (DSUs)
   - Vapor Blower Unit (VBU)
   - Vapor Combustion Units (VCUs)
7. General arrangement drawings with complete tagging and assembly information.
8. Control panel(s) and junction box schematics.
9. Electrical one line diagrams.
10. Structural design of combustor with foundation information for design by others.
11. Structural design of skids with foundation information for design by others.
12. Written operational procedure.
13. Documentation package for the John Zink design that will be used as part of the documentation package to obtain an exemption from compliance with the requirement for a liquid seal found in 33CFR 154.828(b)(1).

Equipment

The proposed Marine Vapor Combustion System (MVCS) is designed to control hydrocarbon emissions from vapors displaced during the loading of marine vessels safely and effectively. The MVCS consists of three main process units, two (2) Dock Safety Unit (DSUs), one (1) Vapor Blower Unit (VBU), and two (2) Vapor Combustion Units (VCUs).

DSU equipment is located on the dock. The DSU serves as protection for the marine vessels from excessive pressure, excessive vacuum, flashback, and other shore-based hazards. Vapors displaced from the marine vessel will be conditioned with natural gas to a safe composition above the upper flammable limit. The DSU will be provided on a skid, and dual oxygen analyzers will be used to monitor the process conditions.

The VBU utilizes a centrifugal pressure blower to transfer the vapors from the DSU to the VCUs. The system operating pressure is controlled by varying the motor speed to match demand requirements. Vapors are transferred to the VCUs where they are thermally destroyed in a controlled manner. The control system is integrated between the five process units. Each unit includes numerous components that must interact with each other, automatically adjusting to changes in flow and composition. The MVCS uses an Allen Bradley CompactLogix

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programmable logic controller (PLC) to coordinate these interactions in an orderly manner. There is a PLC at each DSU and at each VCU.

The design and operation of the MVCS are strictly regulated by the U.S. Coast Guard as defined in Title 33 Code of Federal Regulations Part 154 (33 CFR 154). These regulations were promulgated on June 21, 1990 in response to the requirements in the Clean Air Act for vapor control during marine loading. The regulations did not require vapor control, but established safety requirements to prevent the marine vessel from excessive pressure or vacuum, overfilling, and fire or explosion when vapor control is used. The regulations originally addressed only the marine loading of crude oil, gasoline and benzene but have been extended to the loading of many other materials including distillates and chemicals. The regulations have not been revised to address the numerous technical complexities and new environmental regulations since they were promulgated. They have, however, been significantly supplemented by a large number of U.S. Coast Guard letters, guidelines and waivers. John Zink has been integrally involved in the evolution of these regulations and supplements and assures our customers that our MVCS will meet all U.S. Coast Guard requirements.

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II. Design Basis

This design basis was developed from bid specifications and from reasonable assumptions. This basis is critical to the performance of the MVCS, and both the site-specific information and the assumptions should be thoroughly reviewed to ensure that they are accurate and acceptable.

Number of Docks 1
Vessels Loaded ..... Ships
Vessels Atmospheres ..... Inert
Number of Vessels Loaded Simultaneously 1
Inerted and Non-Inerted Atmospheres Loaded Simultaneously ..... No

Number of Tanks 12
Tanks Loaded Simultaneously 1
Tanks and Marine Vessels Loaded Simultaneously ..... No*
Tank Pressure Control Set Point ..... ~0.5" w.c.g.

*JZ has assumed that marine loading and tank loading will never occur simultaneously.

Loading Rates
- DSU # 1 ..... 25,000 BPH
- DSU #2 ..... 25,000 BPH
- Tanks ..... 6,000 BPH
- Maximum Combined Loading Rate to VCUs ..... 50,000 BPH

Piping Layout (to be confirmed by customer)
- DSU #1 to VBU/VCU ..... 160' of 16" pipe* and ~500' of 24" pipe
- DSU #2 to VBU/VCU ..... 160' of 16" pipe* and ~500' of 24" pipe
- Tanks to VBU/VCU ..... 1,000' of 8" pipe

*USCG requires 120 pipe diameters from the DSU before expanding to a larger pipe size.

Products Loaded: ..... Crude Oil
Vapor Hydrocarbon Concentration (1) ..... 48 mol% maximum
True Vapor Pressure (1) ..... 10 psia maximum
Vapors without Growth from Each DSU ..... 2,339 scfm
Vapors with Growth from Each DSU ..... 2,924 scfm
Total Vapors with Growth from DSUs Combined ..... 5,848 scfm
Total Estimated Enrichment Gas 0
Total Estimated Assist Gas (4) ..... 0-1,475 scfm
Estimated Heat Release Per Stack ..... 216 MMBtu/hr

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Total Combined Estimated Heat Release for System.....432 MMbtu/hr
Estimated Pilot Gas [2].....1.0 scfm natural gas for each of the 6 pilots
Destruction Efficiency [3].....99.9% minimum

Tank Loading Assumptions
Total Vapor Flow Rate With Growth from Tank Loading.....702 scfm
Air Infiltration.....15%
Growth Factor.....25%
Total Vapor Flow Rate from Tank Loading[6].....807 scfm

Area Electrical Classification
DSU skids.....Class I, Div II, Group D
VBU/VCU skid..... Outdoor Unclassified
Motor Type .....TEFC
DSU Enclosure Type ..... NEMA 4X with Z-Purge
VCU Enclosure Type ..... NEMA 4X
Detonation Arrester Classification ..... Group D
Earthquake Zone.....UBC 0
Wind Velocity.....145 mph ASCE 7-10
Ambient Temperature .....40-100 ^{0}F
Electrical Power .....230/480 V, 3 Ph, 60 Hz and 120 V, 1 Ph, 60 Hz
Assist Gas .....Natural Gas @ 30 psig minimum
Instrument Air/Nitrogen.....80 psig (-40^{0}F dew point)

Notes to Design Basis

1. The maximum hydrocarbon concentration corresponds to approximately 70% saturation of a liquid with a true vapor pressure of 10 psia. We use a saturation level of approximately 70% based on our marine loading experience. John Zink believes that this a reasonable and accurate assumption. True vapor pressure needs to be verified by the customer.

   If 100% theoretical saturation was assumed, the maximum loading rate per stack would be 22,000 BPH. If for some reason the barge did remain connected at the dock for long enough to reach 100% saturation, the vessel would not be loading at the maximum loading rate, because the vessel would be full or very nearly full. For this case, a maximum loading rate of 44,000 BPH should be more than adequate. That being said, JZ stands by the assumption that the maximum saturation of the vapor space will not exceed 70% of theoretical saturation.

2. Pilot gas is required continuously at a rate of approximately 1.0 scfm per pilot.

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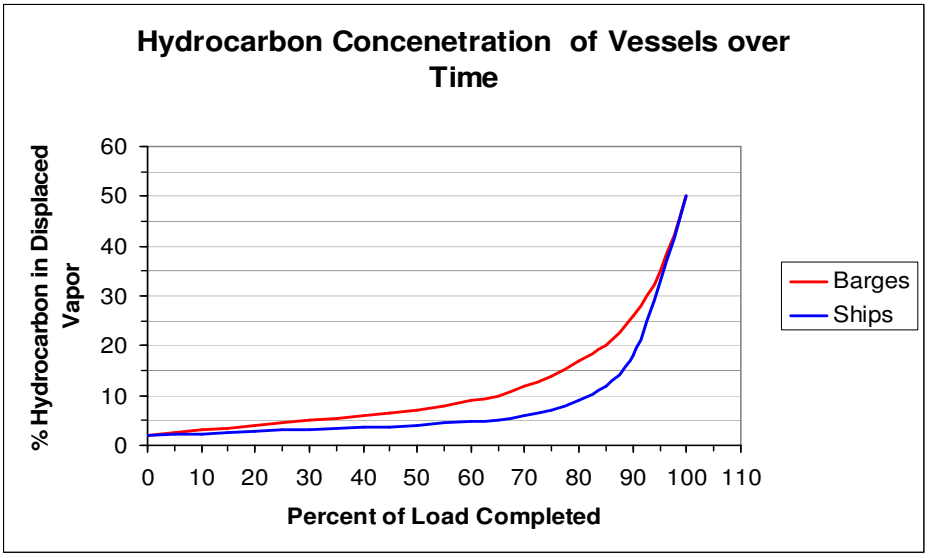
3. Refer to the Performance Guarantee in Section V.

4. The amount of assist gas required will vary considerably based on the vapor flow rate and the oxygen and hydrocarbon concentrations. At the beginning of the load, the hydrocarbon concentration is nearly zero. As the load progresses the hydrocarbon concentration increases. Therefore, the maximum assist gas flow rate occurs at the beginning of the loading of a vessel. The chart below is based on empirical data for gasoline loading and demonstrates concept:



5. Represents the maximum vapor flow rate from loading a single tank at 6,000 BPH including 25% for vapor growth and 15% for air infiltration. JZ has assumed that the VCU will receive vapor from only one tank at a time and therefore have not included any pressure control spools for the tanks. Should it be possible to load multiple tanks simultaneously or if breathing losses are to be sent to the VCU, JZ can provide pricing for pressure control spools for the tanks.

6. The design basis assumes that there is negligible H_2S and mercaptan. Higher concentrations may require additional precautions to protect against corrosion in the stack and vapor piping.

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III. Process Description

The P&IDs attached show a typical arrangement of the control equipment required to meet Coast Guard requirements. The three major components required by the regulations are the Dock Safety Unit (DSU), Vapor Blower Unit (VBU), and the Vapor Combustion Unit (VCU). For this project, there will be three Vapor Combustion Units. When the P&IDs are issued, one VCU will be designated as “A”, and the other as “B”.

All marine transport vessels (ships/barges) used for the transportation of organic liquids, are outfitted with a vapor collection header for the containment of the organic vapors generated during the loading process. The collected vapors are routed through a vapor hose and into the Dock Safety Unit (John Zink Supply).

The Dock Safety Unit is located at the dock and serves the purposes of protecting the marine vessel from fire/explosion, over and under pressure, and of conditioning the captured vapors to a nonflammable condition. At the DSU the vapors are conditioned by adding enough natural gas to the captured vapors to "enrich" the mixture to at least 170% of the upper flammability limit (UFL).

On the DSU, the vapors pass through an automatic quick closing block valve. The vapors are analyzed with the Dual Oxygen Analyzer System to verify that the oxygen concentration is below 8%. For an inert vessel, the system alarms when the oxygen concentration reaches 8 vol% and shuts the loading process down when the oxygen concentration reaches 9 vol%.

The vapors leaving the Dock Safety Unit travel through piping (provided by others) to the Knockout Vessel located upstream of the VBU (John Zink Supply). Any condensate that forms in the system will be collected here. The vapors will then go to a centrifugal blower. The blower provides the motive force for overcoming the pressure drop created during transportation of the vapors from the marine vessel to the emission control device. The blower is equipped with a variable speed drive to control the pressure in the vapor manifold at the desired level. A pressure transmitter at the DSU sends a signal to a second pressure controller. The pressure controller, in turn, automatically adjusts the pressure control valve at the dock to maintain a slight positive pressure (1-2” w.c.) at the facility vapor connection.

For the tank loading case, a pressure transmitter and pressure control valve are located in the tank header. The pressure transmitter at the tanks sends a signal to a pressure controller. The pressure controller, in turn, automatically adjusts the pressure control valve at the tanks to maintain a slight positive pressure (0.5” w.c.) at the tank being loaded.
The vapors discharged from the blower will be routed to the two combustion stacks, which will be staged on temperature and pressure. The Vapor Combustion Units will work together as one large system. The combustion process is aided in the combustion chamber by an assist air blower which provides part of the stoichiometric air necessary for combustion as well as providing mixing energy for efficient, smokeless operation. The remaining air required for

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combustion and for quenching is controlled via temperature by the natural draft dampers located at the bottom of the stack. The combusted vapors exit the VCU to the atmosphere.

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IV. Equipment Specifications

The proposed Marine Vapor Combustion System (MVCS) is provided in modular packages to allow for convenient field installation and to provide adequate equipment spacing for ease of operation and maintenance.

The Dock Safety Units (DSU), the Vapor Blower Unit (VBU), and the Vapor Combustion Units (VCU) will be furnished as separate skid mounted assemblies. Each dock is required to have a "control station" and therefore an operator control panel is mounted on each dock safety skid. The "main" control panel is included and mounted on each VCU skid. The equipment is described in detail below. All sizes, dimensions and specifications are preliminary and may be changed in final engineering.

25,000 BPH Marine Dock Safety Unit (DSU) Components

Two (2) Dock Safety Units (DSUs) are included and each are designed to handle the vapors from loading up to 25,000 BPH. The attached 150 series drawing is a preliminary P&ID of each DSU. Each DSU is expected to be installed in a hazardous area. The main DSU components for each DSU are described below.

Pressure / Vacuum Relief Valve
One pressure / vacuum relief valve in accordance with 33 CFR 154.814 will be provided to help protect the marine vessel from excessive pressure or excessive vacuum from the vapor blower. The valve is equipped with flame screens.

Detonation Arrester
A 16" detonation arrester in accordance with 33 CFR 154.822 is required for each loading spot to help protect the marine vessel from fire and explosion. It is a passive device that uses the element to extinguish a flame by absorbing its heat and is designed to withstand the velocities and high pressures that occur in a detonation. The arrester is designed for group D vapors and is constructed with a carbon steel body and a stainless steel element. A high temperature shutdown switch is provided on the element face to detect the presence of a flame on the face of the element. The element is removable for cleaning and inspection.

Cartridge Filter
A cartridge filter with 14" 150 # flanged connections designed to remove rust and scale that may be accumulated in the vessel's vapor piping system is included to reduce the maintenance chore of cleaning the detonation arresters. The filter is designed to remove 98% of particulates that are greater than 10 microns. The cartridge filter is designed as an ASME Sec VIII Div 1 vessel and fabricated from carbon.

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Vapor Piping System

A carbon steel vapor piping system in accordance with 33 CFR 154.810 will be provided for the introduction of vapors into the DSU. It consists of a facility vapor connection, a vertical vent pipe for the pressure relief valve effluent, an automatic isolation valve and a manual isolation valve.

Instrumentation

Pressure instruments in accordance with 33 CFR 154.814 are provided for the measurement of the vapor pressure. The instruments include a dual pressure transmitter for pressure control as well as high/low pressure warning and shutdown, a differential pressure transmitter for backflow detection, thermocouple element for high temperature alarm and shutdown, and pressure/temperature gauges for local indication.

Instrument Air Header

A galvanized instrument air header with local pressure indication and individual manual shut off valves to each individual instrument air user is furnished.

Oxygen Analyzer System

One oxygen analyzer system in accordance with 33 CFR 154.824 will be provided to sample and analyze the oxygen content of the vapors. The system consists of two oxygen analyzers, a common pumped sampling system with sample low-flow shutdown and a local indicator. The analyzer electronics are suitable for a hazardous area however the complete oxygen analyzer system will be provided in a NEMA 4X enclosure for weather protection.

Vessel Overfill Panel

A vessel overfill panel in accordance with 33 CFR 154.812 will be provided to alarm and shut down the MVCS if the marine vessel is overfilled at each facility connection. They are intrinsically safe and will be supplied with a 100 foot long cable for connection to the vessel.

Pressure Test Panel

A test panel will be provided to help perform the testing of the pressure alarms and shutdowns required by 33 CFR 154.850. The panel is permanently installed and consists of the components and instruments needed apply pressure and vacuum to the appropriate instruments in order to verify proper calibration and operation as required by USCG.

DSU Skid

The structural steel skid will be fabricated in accordance with AWS D1.1 and will be constructed of A36 carbon steel.

Vapor Blower Unit (VBU) Components

The Vapor Blower Unit (VBU) contains all vapor blower components. The main components are described below.

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Vapor Piping System

A carbon steel vapor piping system in accordance with 33 CFR 154.828 will be provided for the introduction of the vapors into the VBU.

VBU Skid

The structural steel skid will be fabricated in accordance with AWS D1.1 and will be constructed of A36 carbon steel.

Knockout Vessel and Accessories

A knockout vessel in accordance with 33 CFR 154.808 will be provided to help remove liquid from the vapors. The knockout will be shipped loose for field installation by customer upstream of VBU. It is a vertical carbon steel vessel designed and fabricated (but not stamped) as an ASME Section VIII vessel rated at 50 psig. The knockout has a diameter of 5 feet and a seam-to-seam height of 8 feet. Vessel connections include 24" 150 #flanges for the vapor inlet and outlet, a 2" flanged connections for the drain, two 2" flanged connections for the level bridle, and a 1" NPT connection for the relief valve.

The 1" relief valve is sized based on an external fire engulfing the vessel. The relief valve will have a flame screen on its discharge.

A 2" diameter level bridle with magnetic level gauge will be attached to the knockout vessel with 2" ball type isolation valves. The bridle will have switches for high level alarm and high level shutdown and ½" ball type vent and drain valves.

Vapor Blower and Accessories

Two single stage centrifugal vapor blowers (one 100% installed spare) in accordance with 33 CFR 154.824 are included to transfer the vapors approximately 600 feet from the loading connection at the dock safety units to the VCUs. The vapor blower also has the capacity to transfer the vapors from the tank loading operation to the VCUs.

The blower will have the capacity to handle the fully enriched (including a 25% expansion factor) vapors from loading at a rate of 50,000 BPH. The blower is designed for the pressure drop through the John Zink system plus 160 feet of 16" pipe and approximately 500' of 24" pipe from the dock to the VCU.

Variable Frequency Drive

A variable speed drive will be provided for each blower to control the pressure at the dock facility connection and tanks slightly above atmospheric. Each enclosure will be NEMA 1 for installation by customer inside a safe control room. Should an indoor area be unavailable, JZ can quote NEMA 3R enclosures upon request.

Liquid Seal

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A liquid seal in accordance with 33 CFR 154.828 is not provided as part of the package. Documentation will be provided to assist with the Coast Guard exemption process to operate without a liquid seal vessel. Requirements of the liquid seal vessel exemption will be supplied. The exemption with an appropriate "equivalent of safety added to the system has become standard operating procedure for the USCG when utilizing John Zink proprietary anti-flashback burners and should only be a formality.

Vapor Combustion Unit (VCU)

Two (2) Vapor Combustion Units are included. Each VCU consists of an enclosed vapor combustor sized to handle the vapors at a maximum loading rate of 25,000 BPH to be installed in a non-hazardous area and a staging skid as described below and shown on the attached P&ID (153 series). When the P&IDs are issued, one VCU will be designated as "A", and the other as "B". Each is a self-supported vertical stack that uses natural draft to provide combustion and quench air. The components included with each VCU are described below.

Vapor Isolation Valves

A 16" 150 # wafer style high performance butterfly valve is located upstream of combustor detonation arrester is provided with a pneumatic actuator to serve as a portion of the double combustor isolation valves required by the USCG. The second portion of the required double isolation is achieved with three similar valves that are downstream of the combustor detonation arrester located in parallel lines directing the vapors to different burner stages in the combustor.

During operation each of the three parallel valves leading to the burners is opened and closed based on the vapor flow rate. These valves are 10" 150 # wafer style firesafe butterfly valves and are provided with a pneumatic actuator.

Detonation Arrester

A 16" detonation arrester in accordance with 33 CFR 154.822 is required to help protect the marine vessel from fire and explosion. It is a passive device that uses the element to extinguish a flame by absorbing its heat and is designed to withstand the velocities and high pressures that occur in a detonation. The arrester is designed for group D vapors constructed with a carbon steel body and a stainless steel element. A high temperature shutdown switch is provided on the element face to detect the presence of a flame on the face of the element. The element is removable for cleaning and inspection.

Pilot System

A carbon steel pilot gas system will be provided to control the pilot gas flow including a strainer, regulator, pressure gauge, shutdown valve, high- and low-pressure shutdown switches, and manual valves.

Assist Gas System

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Assist gas will be added to the waste vapor stream to control temperature. A carbon steel assist gas system will be provided to control the assist gas flow including a regulator, pressure gauge, shutdown valve, control valve, and manual valve.

VCU Instrumentation

Instrumentation provided on the VCU includes:

- Thermocouple temperature elements for each combustion stage
- Thermocouple temperature element for detonation arrestor
- Differential pressure transmitter for backflow detection across detonation arrestor
- Pressure transmitter on vapor manifold for staging burners on/off and maintaining burner exit velocities at levels conducive for safe and stable combustion

VCU Skid

The structural steel skid will be fabricated in accordance with AWS D1.1 and will be constructed of A36 carbon steel.

Control System

The Marine Vapor Control System will be controlled by a programmable logic controller (PLC) and analog controllers. The main PLC unit will be located in the VCU control panel located on the VCU skid. A remote PLC will be located at each DSU. The use of the remote PLC units allows nearly all of the extensive wiring between the DSUs and VCU to be replaced with communication cables. The primary operator interface for the operation of the Vapor Control Combustion System will be at the DSU control panels. An auxiliary operator interface for the operation of the VCU will be provided at the VCU control panel. Analog controllers will be used for the oxygen content, vapor pressure and combustor temperature control functions. Independent controllers will be provided for the fuel gas and quench air, which will allow a lower temperature set point to be used for the fuel gas. Motor starters for the assist air blower and an ignition transformer enclosure will also be located on the VCU skid. All enclosures will be NEMA 4X except as noted and will be purged as necessary to meet the area classification. The electrical design and construction is in accordance with NFPA-70 of the NEC, except for Article 515, Table 515-2.

An Allen Bradley PanelView Plus Operator Interface Panel (OIP) is provided for each DSU control panel and each VCU control panel (4 included total). The warnings and shutdowns will be shown on the OIP.

The NEMA 1 vapor blower VFD will be provided for installation by others in a remote indoor unclassified area. If an indoor area is unavailable, JZ can quote a NEMA 3R enclosure for VFDs upon request.

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Mechanical Design

Each combustor has a diameter of 13 feet and an overall height of 70 feet. Two, 3" flanged sample ports, one sight glass per stage, various instrument and component connections, lifting lugs, and ladder and platform clips are provided. A ladder and 360 degree service platform is included for access to elevated stack instrumentation and sample ports and is designed in accordance with OSHA standards.

The design conditions used are a shell temperature of 500 ^{o}F, MDMT of –20 ^{o}F and no corrosion allowance. Material of construction is A-36 carbon steel welded in accordance with AWS D1.1.

The structural design is as follows

Earthquake .....Zone UBC 0
Wind Velocity.....145 mph ASCE 7-10

Other Combustor Features

Refractory:

Ceramic fiber refractory with Inconel pins and keepers will be provided in the enclosed combustor to protect it from the radiation and high temperature of combustion. This refractory does not require curing and does not limit the combustor heat-up or cool-down rates. A rainshield is installed on the top edge of the refractory to help protect it from the weather. The hot face temperature rating of the ceramic fiber is 2400 ^{o}F.

Anti-flashback Vapor Burners:

Three (3) combustion stages each equipped with four (4) 8" stainless steel anti-flashback burners will be provided for the introduction of the marine vapors into the combustion chamber. These proprietary burners help prevent flashbacks into the vapor piping by using technology similar to that used in flame and detonation arrestors.

Assist Air Blower:

Per Plain's requirement for the noise of the system to be less than 85 dBA, JZ has included low dBA blowers in lieu of our standard air assist blowers. JZ has included (1) New York Tubular Acoustafoil air assist blower with 7.5 HP, 600 volt/3 PH/60 cycle, 1800 rpm single speed motor per stage. Approximate housing radiated sound level on "A" weighted scale at Q=2 is 79 dB at 3 feet. Approximate single ducted sound level on "A" weighted scale Q=2 is 85 dB at 3 feet. The air assist blower provides partial combustion air and sufficient mixing energy to assure smokeless combustion. The forced air also reduces thermal radiation, shortens flame length and, by cooling burner tips, extends burner life. A manual damper is mounted on the blower inlet to control air assist flow. The air assist blower provides partial combustion air and sufficient mixing energy to assure smokeless combustion. The forced air also reduces thermal radiation, shortens flame length and, by cooling burner tips, extends burner life.

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Quench Air Damper(s):
Two (2) quench air dampers with pneumatic actuator will be provided to introduce combustion and quench air into the combustor. The damper blades operate in an opposed manner to maximize the control with the low available differential pressure. The damper frame is galvanized carbon steel, and the blades and bearings are stainless steel. The damper is hinged for easy entry to the inside of the combustor.

Pilot Gas System
One high-efficiency pilot will be provided for each section of vapor burners and for the assist gas burner to ensure that a stable, continuous ignition source is available for each stream. The pilots inspirate air from outside the combustor and mix it with fuel gas to provide a pre-mix stream to the tips. Fuel gas use is approximately one scfm per pilot due to the high efficiency design. An automatic ignition assembly will be provided.

Instrumentation

- One ultraviolet flame detector for each pilot. The detectors are used to ensure that the pilots have stable flames.

- The combustor will have two thermocouples near the exit of the exhaust. One is used to control the assist gas / quench air dampers and the other is used as a safety shutdown.

Tank Loading Equipment
JZ has included one (1) 8” detonation arrestor complete with differential pressure transmitter and temperature switch, one (1) pressure transmitter, and one (1) 8” pressure control valve with limit switches to be installed by Plains in the tank vapor line.

JZ has assumed that marine loading and tank loading will <u>never</u> occur simultaneously. JZ has also assumed that the VCU will receive vapor from only one tank at a time and therefore as not included any pressure control spools for the tanks. Should it be possible to load multiple tanks simultaneously, JZ can provide pricing for pressure control spools for the tanks.

All of the aforementioned equipment provided for tank loading shall be ship-loose for installation by Plains.

John Zink Fabrication Standards

<u>Piping</u>
Vapor piping is carbon steel and is built to ANSI B31.3 150# class. All piping 1.5” and smaller to be SCH 80, piping greater than 1.5” to be schedule 40. All piping connections greater than 2” will utilize 150# flanges; small-bore piping will have NPT connections with appropriately positioned unions to facilitate maintenance. Testing includes 5% radiograph and hydrotest.

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Coat of Paint

JZ is not in receipt of the Plains coating specification and therefore takes exception. JZ shall follow the same coating specifications used on the Plains Yorktown, VA MVCU supplied under JZ SO# 9131398/9128950.

Piping and Knockout Vessel shall be coated per the following:
Surface preparation per SSPC-SP6
Prime: Sherwin Williams Zinc Clad III HS Organic Zinc Rich Epoxy Primer, 3-5 mils DFT
Mid-Coat: Sherwin Williams Macropoxy 646 Epoxy Primer, 5-6 mils DFT
Finish: Sherwin Williams Acrolon 218 HS Acrylic Polyurethane, White, 3-5 mils DFT

Stack shall be coated per the following:
Surface preparation per SSPC-SP6
Prime: Sherwin Williams Zinc Clad II Plus Inorganic Zinc Primer, 3-4 mils DFT
Finish: Sherwin Williams High Temp Heat Flex 450, White with top 5' Black, 2-2.5 mils DFT

Skid, ladders and platforms, and panel rack shall be galvanized.

Components with a manufacturer's finish coat will not be painted. Components that could be damaged by blasting such as valves will be hand-tool cleaned (SSPC-SP-2) instead of blasted. Sherwin-Williams products are used.

Ladders and Platforms

A ladder with a 360 degree platform will be provided for each stack. The ladder and platform will be galvanized per ASTM.

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Optional Features

In the discussion that follows some optional features are offered. Each of the optional features offered are identified by a number and the pricing of each option is included in the Commercial Section of this proposal.

1. Access Platform for DSU Filters
   A ship-loose platform to access the top of the filter for easy removal and replacement of the filter element. Price includes one(1) access platform for each Dock Safety Unit.

2. Detonation Arrestor for Each Tank
   A 8" detonation arrestor will be provided to be installed by customer for each tank.

3. Flame Arrestor for Each Tank
   A 8" flame arrestor will be provided to be installed by customer for each tank.

4. Deduct for JZ Standard Air Assist Blowers
   JZ has included New York low dBA blowers for the air assist blowers in the base price of this proposal due to a requirement for low noise. Should JZ standard air assist blower be acceptable, this deduct may be applied.

5. Stainless Steel Vapor Piping for Both Dock Safety Units
   Vapor piping only shall be upgraded from JZ standard carbon steel to Schedule 10 316 stainless steel for both Dock Safety Units. All components shall be JZ standard carbon steel (valves, filter, ect.) and enrichment gas line shall remain JZ standard carbon steel. If this option is purchased, DSU piping shall not be painted.

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V. Performance Guarantee

John Zink Company guarantees the performance of the proposed vapor combustion unit to produce the following:

- a minimum 99.9% reduction in the total hydrocarbon vapor emissions routed through it
- a maximum of 0.13 lb/MMbtu of NOx
- a maximum of 0.20 lb/MMbtu of CO

The performance guarantee stated above is contingent upon the following:

1. The equipment is transported, stored, installed, operated, and maintained in compliance with manufactures' operating and maintenance guidelines (including operation records), accepted good industry practices, and within conditions as defined in "Design Basis" of this proposal.

2. Total hydrocarbons include evaporative hydrocarbon emissions naturally occurring during the marine loading of products listed in the Design Basis, plus natural gas added for enrichment or assist gas.

3. The use of natural gas for pilot, enrichment, and warm-up gas.

4. Determination of hydrocarbon emissions shall be measured according to the EPA Reference Methods 2A, 2B, 25A & 25B or any other equivalent test method acceptable by John Zink.

5. Emissions measurements shall be averaged over at least the last 50% of the total liquid cargo loaded. In addition, the hydrocarbon concentration of the inert vapor shall not exceed the minimum and maximum limits stated in the Design Basis.

6. John Zink Company is responsible only for those emissions that pass through the vapor control device supplied by John Zink.

7. The process guarantees apply only to the time period when loading is occurring. System purge, stack heat up, etc. are not included as part of the process performance test.

8. The performance guarantee as stated above is the only performance guarantee offered. Values stated for other parameters are good faith estimates and not to be construed as performance guarantees.

9. Any defects are reported immediately to John Zink.

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10. Performance testing shall be conducted by customer within sixty (60) days after the equipment has been placed in operation. John Zink Company shall be notified in writing prior to the test so that their representative may be present. It shall be the customer's responsibility to maintain equipment in good working order prior to and during the testing. Performance testing is the Customer's responsibility. However, if due to no fault of John Zink Company the equipment cannot be put into operation or for other reasons not tested within 12 months after equipped is ready to ship, then the Performance Guarantee shall be deemed to have been met for any and all purposes.

11. Should the equipment not meet the Performance Guarantee, John Zink and the Customer shall jointly determine, in accordance with recognized engineering procedures and practices, whether the failure is a result of a design deficiency. If it is established that the equipment failed to meet the Performance Guarantee and such failure is due to design deficiency, John Zink will take such action as it may determine necessary to correct the equipment to meet such guarantees. Customer agrees to give John Zink free and necessary access to the equipment when requested for the purpose of making correction.

12. The Performance Guarantees shall terminate 18 months after the date that the equipment is available for shipment or one year after start-up, whichever occurs first (the "Guarantee Period").

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VI. Commercial

Pricing, Delivery, And Terms

PRICE

The Sale Price (all prices are in US Dollars) for the John Zink Marine Vapor Combustion System proposed herein includes design and fabrication. The sales price excludes freight and handling to job site, field installation, commissioning (start-up) services, applicable taxes, fees, permits, or any other charges.

Price for MVCS with all standard features, $2,352,800

Price Adder (Deduct)

Option Number & Description		
1.	Access Platform for DSU Cartridge Filters	$12,800
2.	Detonation Arrestor for Each Tank	$11,200 per Detonation Arrestor
3.	Flame Arrestor for Each Tank	$3,900 per Flame Arrestor
4.	Deduct for JZ Standard Air Assist Blowers	($42,000)
5.	Stainless Steel Vapor Piping for Both Dock Safety Units	$78,600

One (1) hard copy and three (3) CD electronic copies of Installation/Operation/Maintenance Manuals are included. Extra copies ordered after the original manuals are printed will be supplied at $1,000.00 per copy. One (1) electronic set of customer drawings will be furnished in AutoCAD DWF format or PDF file format. Hard copies will be furnished on request.

Price is based on the terms of Master Service contract 028450-03092-PMLP.2.17.

Except as otherwise noted in this proposal, the prices quoted are valid for sixty (60) days from the date of the proposal. Should delivery be delayed past the quoted delivery by acts of Buyer or its agent, the quoted price will be subject to escalation.

Based on approval of credit, invoices will be submitted for payment as follows:

- 5% of net price on receipt of purchase order
- 10% of net price upon issue of P&IDs and mechanical component data sheets
- 25% of net price upon issue of General Arrangement drawings and purchase by John Zink Company of long lead items including vapor blower, detonation arrestor, and oxygen analyzer.
- 35% of net price upon receipt of major material by John Zink including detonation arrestors, and large automatic valves.
- 25% of net price when notified that the unit is ready for shipment.

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A guaranteed form of payment such as a letter of credit may be required.

Payments are due Net 30 from the date of invoice.

Trade Terms are FCA Point of Manufacture. John Zink will make shipping arrangements and prepay freight on behalf of customer. Freight and handling costs will be added to customer invoices. Risk of loss during shipment rests with customer.

SCHEDULE

The estimated readiness to ship is approximately 32-34 weeks after receipt of mutually agreed upon order. If drawing review and approval by customer is required this will extend the delivery. A detailed schedule will be provided after receipt of such order.

COMMISSIONING/START-UP

Commissioning (start-up) service rates are per the attached Standard Technical Assistance Agreement. Start-up services by a John Zink representative are required to retain the limited warranty. Start-up performed by others voids both the limited warranty and the performance guarantee.

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VII. Owner Requirements and Responsibilities

Note: This section is only intended to supply a general set of installation related comments. For a specific set of instructions please refer to the John Zink Operation and Maintenance Manual.

1. Inspect the equipment for any damage or shortages and document with the shipper.

2. Unload the DSU, VBU, VCU and other equipment.

3. Apply power to the DSU and VCU control panels and turn the heaters on to help protect the components and instruments and help prevent corrosion.

4. Provide properly designed foundations.

5. Set, level, and grout the DSU, VBU and VCU on the foundations. Weld the washer plates over the combustor anchor bolts. Install the top portion of combustor on the skid-mounted base, if applicable. Install six inches of aggregate in the bottom of the combustor.

6. Assemble the ladders and platforms and install on the combustor, as applicable.

7. Install, wire, and conduit for the following MVCS components on the combustor

   Thermocouples
   Scanners
   Blowers
   Dampers
   Pilots

8. Install the variable speed drive in climate-controlled building

9. Provide and install vapor, propane, nitrogen or instrument air piping as is appropriate to the DSU, VBU and VCU.

10. Correct minor misfits including moderate cutting, bending and welding.

11. Provide and install the following MVCS wiring.
    From the VCU control panel to the variable speed drive
    From the variable speed drive to the vapor blower motor
    From the DSU control panel to the VCU control panel
    Ground wires to stacks, skids and other equipment as required by NEC

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and local codes
Power (480 V) to the motor starters and variable speed drive
Power (120 V) to the DSU, and VCU control panels

12. Check alignment and maintain bearings on all rotating equipment.

13. Provide calibration gases for the oxygen analyzer (if needed).

14. Provide heat trace and insulation if required.

15. After a suitable run-in and test period, if electrical conduits are used, the customer is responsible to provide the necessary materials to pour the conduit sealant per appropriate electrical code requirements.

16. Certification by a U.S. Coast Guard-approved entity and compliance testing of the MVCS are the responsibility of the customer. Zink will support the process through documentation submittals. MVCS information will be integrated into the facility dock operation manual by others.

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VIII. Attachments

The following attachments are contained in this section:

A. John Zink Company Bid Clarifications and Exceptions
B. Bid Form
C. Preliminary Layout
D. Preliminary P&IDs

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CORPORATE MEASUREMENT SYSTEM
GPM CERTIFICATE REPORT

04/01/2015 09:27:43

Prod Date : **03/30/2015 00:00:00**

ENTERPRISE TEXAS PIPELINE LLC

Certificate of Gas Analysis

Sample Desc: SHOUP 6IN R0150 D0156

Sample Id: 442036

Effective Date: 3/30/2015 00:00:00

Sample Date: 3/30/2015 09:00:00

Analyzed Date:

Sample Frequency: DAILY

BTU Basis: Dry

GPA Version: GPA 2145-09

Pressure Base: 14.73

Sample Type: Daily Chrom

Sampled By:

Analyzed By:

Chromatograph Id: N/A

Analysis Id: 44203701

Temperature: 94.0

Pressure: 512.6

Component	Mole %	GPM
Methane:	93.8871	0.0000
Ethane:	4.8023	1.2840
Propane:	0.1904	0.0524
Iso Butane:	0.0150	0.0049
Butane:	0.0154	0.0049
Iso Pentane:	0.0051	0.0019
Pentane:	0.0032	0.0012
Neo Pentane:	0.0000	0.0000
Hexane:	0.0101	0.0045
Heptane:	0.0000	0.0000
Octane:	0.0000	0.0000
Nonane:	0.0000	0.0000
Decane:	0.0000	0.0000
H2s:	0.0000	0.0000
Sub Total GPM:	98.9286	1.3537

Inerts	Mole %	
Carbon Dioxide:	0.9030	0.0000
Nitrogen:	0.1684	0.0000
Hydrogen:	0.0000	0.0000
Oxygen:	0.0000	0.0000
Helium:	0.0000	0.0000
Argon:	0.0000	0.0000
Carbon Monoxide:	0.0000	0.0000
Total Mole %:	100.0000	1.3537

Gravity: 0.5904

Dry BTU: 1044.6

Wet BTU: 1026.4

As Del BTU:

Remarks:

EMISSION COMPLIANCE TESTS

MARINE VAPOR COMBUSTION UNIT (VCU)
(EMISSION POINT NO. COMB)

MARCH 11, 2014

Prepared for

PLAINS PIPELINE, LP
CORPUS CHRISTI DOCK
(TCEQ Regulated Entity No. RN106337934)

Corpus Christi, TX

MEC ENTEC SERVICES, LLC
a Montrose Environmental Group, Inc. Company

14530 Barringer Court
Baton Rouge, Louisiana 70809

entecservices.com - (225) 753-1115

ENTEC PROJECT NO. 614102

CERTIFICATION OF TEST RESULTS

ENTEC PROJECT NO. 614102

PLAINS PIPELINE, LP
CORPUS CHRISTI DOCK

EMISSION COMPLIANCE TESTS

MARINE VAPOR COMBUSTION UNIT (VCU)
(TCEQ Regulated Entity No. RN106337934)

MARCH 11, 2014

MEC Entec Services, LLC is a commercial laboratory operating within full accreditation of the Louisiana Environmental Laboratory Accreditation Program under Certificate Number 02074. The qualifications to provide defensible quality data as a certified commercial environmental testing firm as Agency Interest No. 30747 was granted by the Louisiana Department of Environmental Quality under the Louisiana Administrative Code of LAC 33.I. Chapter 45 et. al.

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

Brad Latham
District Manager AMS - Baton Rouge
MEC Entec Services, LLC

Wade Latham
QA/QC Director
MEC Entec Services, LLC

Ashley M. Swinney
Facility Representative
Plains All American Pipeline

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REPORT DISTRIBUTION AND REVISION HISTORY

REPORT	ELECTRONIC COPY (.PDF)		HARDCOPY		
	Date	Distributed To	Date	Distributed To	No. Copies
Summary	614102 Report 1.0 Summary.pdf		None	None	None
	04-10-2014	Ashley Swinney Plains Marketing, LP AMSwinney@paalp.com			
Draft	614102 Report 1.0 Draft.pdf		None	None	None
	04-17-2014	Ashley Swinney Plains Marketing, LP AMSwinney@paalp.com			
Final	614102 Report 1.0 Final.pdf		None	None	None
	05-07-2014	Ashley Swinney Plains Marketing, LP AMSwinney@paalp.com			
Final	614102 Report 1.1 Final.pdf		None	None	None
	05-08-2014	Ashley Swinney Plains Marketing, LP AMSwinney@paalp.com			

STANDARD REPORT NOTATIONS

<	Value is less than or equal to the method detection level. Stated value is the minimum detection level.
!	Value is detection level limited. The value is a result of two or more measured values where one or more of the values are less than or equal to the method detection level. Stated value is obtained using the full value of the minimum detection level.

1.0 INTRODUCTION

MEC Entec Services, LLC (Entec) conducted emission tests at the Plains Pipeline LP (Plains Pipeline) Corpus Christi Dock (TCEQ Regulated Entity No. RN 106337934, TCEQ permit number 100927) located near the city of Corpus Christi in Nueces County, Texas. Plains Pipeline is an operating partnership of Plains All American Pipelines L.P. (PAA). Tests were conducted on the Marine Vapor Combustion Unit (VCU) (emission point no. COMB) to determine the emission rates of filterable particulate, sulfur dioxide, oxides of nitrogen, carbon monoxide, and volatile organic compounds (VOC); the VOC emission factor (lb VOC/1000 gal oil loaded); the VOC destruction and removal efficiency (DRE); and to verify the absence of leaks in the vapor recovery system. These tests were conducted in order to demonstrate compliance with emission permit limits.

Emission tests were conducted utilizing EPA test methods as published in 40 CFR 60, Appendix A. Oxygen and carbon dioxide concentration was determined using EPA Method 3A. Sulfur dioxide, oxides of nitrogen, carbon monoxide, and VOC emissions at the VCU Outlet were conducted using EPA Methods 6C, 7E, 10, and 18 respectively. It should be noted that the original test plan called for VOC sampling at the VCU Outlet to be conducted per EPA Method 25A; however, on the date of the test, the test analyzer failed. Test personnel substituted EPA Method 18 in order to complete the test. The VOC concentration at the VCU Inlet was measured using EPA Method 25A (total hydrocarbons) which includes methane and ethane if present. Filterable particulate at the VCU Outlet was determined using EPA Method 5. The vapor recovery system leak check was conducted using EPA Method 21.

The Inlet vapor flow rate and gas molecular weight were measured using EPA Methods 2, 3, and using a moisture assumed to be saturated at the observed source gas temperature. The Outlet exhaust gas flow rate, gas molecular weight, and moisture were measured using EPA Methods 1 – 4.

The Entec test team was headed by Brad Latham with test crew members Alex LeJeune, Jonathan Lewis, and Jonathan Pakunpanya. Brian Morris represented Plains Pipeline and coordinated testing with facility operations. Ashley Swinney represented PAA and coordinated testing between Entec, Plains Pipeline, and the TCEQ. The TCEQ was given a minimum 30 day advance notice of the test; however, was not represented onsite during the tests.

2.0 SUMMARY OF TEST RESULTS

On March 11, 2014, MEC Entec Services, LLC (Entec) conducted emission tests on the Marine Vapor Combustion Unit (VCU) at the Plains Pipeline, Corpus Christi Dock. During the tests, the ship was loading at 14,500 bbl oil/hr, which is 72.5% of the maximum permitted rate of 20,000 bbl/hr. Tests were conducted at the VCU Outlet were conducted to determine the emission rates of filterable particulate, sulfur dioxide, oxides of nitrogen, carbon monoxide, and VOC; the VOC emission factor (lb VOC/ 1000 gal oil loaded); and the VOC destruction and removal efficiency (DRE). Tests at the VCU Inlet were conducted to determine the inlet rates of oxygen, carbon dioxide, and total hydrocarbons.

Tests consisted of one, 1-hr duration test, Run 1, and one, 2-hr duration test, Run 2. Tests were started after the ship was half full. A third test run could not be conducted since the ship loading was completed shortly after Run 2.

Immediately prior to testing, the entire vapor recovery system from the dock to the VCU, including transfer piping, was tested for leaks at valves, flanges, piping connections; pump and compressor seals, and pressure relief devices.

At the VCU Inlet, the VOC inlet rate was measured continuously throughout the test periods per EPA Method 25A using an on-site, continuous analyzer. The original Test Plan specified VCU Outlet VOC rates to also be measured per EPA Method 25A and an on-site, continuous analyzer; however, the analyzer failed to function properly during the pre-test calibrations. Therefore, VCU Outlet VOC emissions were determined per EPA Method 18 by metering a sample of the source gas into a Tedlar gas sample bag at a constant rate throughout the test periods. A single, 1-hr integrated sample was collected for Run 1 and two, 1-hr integrated samples were collected for Run 2.

At the VCU Outlet, analysis of the filterable particulate probe wash samples revealed the presence of what is in Entec's opinion, a metallic material that is foreign to and not produced by the source combustion process. These materials may have been dislodged from the stack walls or vapor recovery system piping. A further discussion is presented at the end of Section 2.1 of this report.

Other than noted above, there were no deviations from the test methods and no unusual conditions were noted. All raw test data, calculations, QA/QC documentation, and supporting documentation are contained in the appendices.

2.1 MARINE VAPOR COMBUSTION UNIT, OUTLET

Emission tests on the Marine VCU, Outlet were conducted to determine the emission rates of filterable particulate, sulfur dioxide, oxides of nitrogen, carbon monoxide, and VOC; and to determine the concentrations of oxygen and carbon dioxide. Stack gas moisture, velocity, and volumetric flow rate were also measured. Test results are presented in Table 2-1.

Oxides of nitrogen emissions averaged 14.63 lb/hr, which is greater than the 6.45 lb/hr permit limit. Carbon monoxide emissions averaged 0.170 lb/hr, which is less than the permit limit of 53.73 lb/hr. VOC emissions had an average emission rate of 0.466 lb/hr, which is less than the permit limit of 47.15 lb/hr permit limit; and an average emission factor of 0.0000008 lb/1000 gal oil loaded, which is less than the permitted limit of 0.1 lb/1000 gal oil loaded.

Results of the sulfur dioxide tests indicate an average emission concentration of 7.0 PPMv and an average emission rate of 4.302 lb/hr, which is greater than the permit limit of 0.01 lb/hr.

Results of the filterable particulate tests indicate an average emission rate of 2.457 lb/hr, which is greater than the permit limit of 0.80 lb/hr. Particulate collected on the filter was non-detected. Particulate in the probe-wash contained numerous, large particulate particles.

A simple qualitative analytical test of the collected probe-wash particulate matter (test with a magnet) indicates that the particulate is almost exclusively ferrous based. As these particles are foreign to the source and not representative of source emissions, an attempt was made to remove the particles from the sample and obtain a subsequent weight. Pictures of the removed particles are presented in the complete laboratory report in Appendix C.1. Filterable particulate emission results, calculated after removal of most but not all of the metallic particles, indicate an average emission rate of 1.117 lb/hr, which is still above the permit limit of 0.80 lb/hr. It is Entec's opinion that filterable emissions from the VCU are in compliance; however, test data are inconclusive due to the foreign, metallic particles.

TABLE 2-1
OUTLET EMISSION TEST RESULTS

PLAINS PIPELINE
CORPUS CHRISTI DOCK

MARINE VAPOR COMBUSTION UNIT (VCU) - OUTLET
(Emission Point No. COMB)

PARAMETER		Permit Limit Max./Avg.	RUN 1	RUN 2		AVERAGE
DATE		----------	11-Mar-14	11-Mar-14		----------
TIME; filterable particualte		----------	2048-2200	2232-2345		----------
TIME; O2, CO2, SO2, NOx,CO, and VOC		----------	1949-2048	2200-2359		----------
FILTERABLE PARTICULATE (1)(2)	grain/dscf		0.00673	0.00262		0.00468
	lb/hr	0.80	3.551	1.363		2.457
SULFUR DIOXIDE	PPMv dry		13.1	1.0		7.0
	lb/hr	0.01	8.006	0.597		4.302
OXIDES OF NITROGEN	PPMv dry		33.0	33.9		33.5
	lb/hr	6.45	14.56	14.70		14.63
CARBON MONOXIDE	PPMv dry		1.1	< 0.2		0.6
	lb/hr	53.73	0.290	< 0.050		0.170
VOLATILE ORGANIC COMPUNDS (VOC)	PPMv dry as propane		1.5	0.7		1.1
	lb/hr	47.15	0.622	0.310		0.466
	lb/1000 gal loaded	0.1	0.0000010	0.0000005		0.0000008
OXYGEN	Vol%		14.41	14.54		14.48
CARBON DIOXIDE	Vol%		4.36	4.83		4.59
STACK GAS DATA						
TEMPERATURE	F	>1000	1347	1434		1390
MOISTURE	vol%		7.059	8.308		7.684
VELOCITY	ft/sec		33.635	35.145		34.390
FLOW RATE	acfm		228241.2	238489.8		233365.5
	dscfm		61568.2	60587.6		61077.9
TOTAL OIL LOADED	bbl/hr		14500.00	14500.00		
	gal (42 gal/bbl)		609000	609000		
NATURAL GAS FIRING	ft3/hr					
(1) Particulate isokenetic samplic rate, % of the idea rate		90% - 110%	91.5800	96.7300		
(2) Filterable particuale emissions results after removal of metalic particles from the probe wash sample. (lb/hr).			1.363	0.872		1.117

2.2 MARINE VAPOR COMBUSTION UNIT, INLET

Emission tests at the Marine VCU inlet were conducted to determine the emission rate of VOC and the concentrations of oxygen and carbon dioxide. The average VOC inlet rate was measured to be 3300.483 lb/hr. Stack gas velocity and volumetric flow rate were measured with moisture of the source gas assumed to be saturated at the measured gas temperature. Results of the tests are presented in Table 2-2.

2.3 MARINE VAPOR COMBUSTION UNIT, VAPOR RECOVERY SYSTEM

The vapor recovery system included all piping, valves, and flanges from the ship to the VCU. At the beginning of the tests, with the ship loading at 14,500 bbl oil/hr, which is 72.5% of the maximum permitted rate. All sources of potential leaks in the vapor recovery system were tested using a FID VOC vapor analyzer per EPA Method 21. All valves, flanges, etc. were tested with a result of no detectable leaks with a leak definition of ≤ 1 PPMv response from the analyzer (<1 PPMv).

2.4 MARINE VAPOR COMBUSTION UNIT, DRE

Results of the VCU Inlet tests indicate an average total hydrocarbons rate of 3300.483 lb/hr and a VCU Outlet average VOC emission rate of 0.466 lb/hr. These rates indicate that the VCU is operating with a DRE of 99.986% with respect to VOC, which is greater than the 99% permit minimum.

TABLE 2-2
INLET EMISSION TEST RESULTS

PLAINS PIPELINE
CORPUS CHRISTI DOCK

MARINE VAPOR COMBUSTION UNIT (VCU) - INLET
(Emission Point No. COMB)

PARAMETER		Permit Limit Max./Avg.	RUN 1	RUN 2		AVERAGE
DATE		----------	11-Mar-14	11-Mar-14		----------
TIME; O2, CO2, THC		----------	1949-2048	2200-2359		----------
VOLATILE ORGANIC COMPUNDS (VOC)	PPMv dry as propane		285510.9	281462.8		283486.9
	lb/hr		3610.724	2990.242		3300.483
OXYGEN	Vol%		0.04	0.04		0.04
CARBON DIOXIDE	Vol%		0.27	0.21		0.24
STACK GAS DATA						
TEMPERATURE	F		64	62		63
MOISTURE	vol%		2.021	1.901		1.961
VELOCITY	ft/sec		25.521	21.322		23.422
FLOW RATE	acfm		1879.2	1570.0		1724.6
	dscfm		1842.8	1548.1		1695.5
VOC DRE						
VOC EMISSIONS, INLET	lb/hr		3610.724	2990.242		3300.483
VOC EMISSIONS, OUTLET	lb/hr		0.622	0.310		0.466
	DRE, %	>99	**99.9828**	**99.9896**		**99.9862**

3.0 PROCESS DESCRIPTION

3.1 MARINE VAPOR COMBUSTION UNIT

At the Plains Pipeline, Corpus Christi Dock, oil and condensate are loaded/ unloaded onto barges and ships. Vapors from these operations are collected by a vapor recovery system and are routed to the Marine Vapor Combustion Unit, where the vapors are destroyed through combustion.

4.0 TEST PROCEDURES AND ANALYTICAL TECHNIQUE

Emission tests were conducted using EPA test methods as published in 40 CFR 60, Appendix A. Tests were conducted without deviation from the methodology.

4.1 LOCATION OF SAMPLE POINT

4.1.1 MARNE VAPOR COMBUSTION UNIT, INLET EPA METHODS 2, 3A, AND 25A

Samples used to measure vapor flow rate and to determine the concentrations of total hydrocarbons, oxygen, and carbon dioxide were obtained from a single sample located at a point of average flow. The point of average flow was determined by an initial traverse of the Inlet flow.

4.1.2 MARNE VAPOR COMBUSTION UNIT, OUTLET EPA METHODS 3A, 6C, 7E, 10, AND 18

Samples used to determine the concentrations of oxygen, carbon dioxide, sulfur dioxide, oxides of nitrogen, carbon monoxide, and total hydrocarbons at the Outlet were obtained from a single sample located per EPA Method 7E.

4.1.3 MARNE VAPOR COMBUSTION UNIT, VAPOR RECOVERY EPA METHOD 21

Each of the flanges, valves, and other pipe connections; and relief valves, pumps and compressor seals, etc. were tested at points on the dock, transfer piping, and at the Marine Vapor Combustion Unit.

4.2 EPA METHOD 1 - MANUAL METHODS SAMPLE TRAVERSE AND VERIFICATION OF ABSENCE OF CYCLONIC FLOW

Selection and placement of sample traverse points was based on the inside diameter or dimensions of the stack and the distance (number of stack diameters) from the sample port to the nearest upstream and downstream flow disturbances.

Prior to the emission tests, tests were conducted at each of the selected traverse points to verify the absence of cyclonic flow. The magnitude of the flow yaw angle was measured at each point.

4.3 EPA METHOD 2 – STACK GAS VELOCITY AND FLOW RATE

Velocity of the stack gas was determined based on the average velocity head pressure and temperature of the gas stream as measured at each sample traverse point using a Type-S pitot tube and thermocouple per EPA Method 2. Flow rate was calculated using the velocity data, gas molecular weight data obtained per EPA Method 3, and vapor gas moisture data assumed to be dry.

4.4 EPA METHOD 3 – STACK GAS MOLECULAR WEIGHT

Stack gas molecular weight was calculated based on oxygen and carbon dioxide concentrations measured per EPA Method 3A and stack gas moisture measured per EPA Method 4. Balance of the stack gas composition was assumed to be nitrogen.

4.5 EPA METHOD 3A – OXYGEN AND CARBON DIOXIDE

Concentration of oxygen in the Outlet exhaust stack gas was determined continuously during each test period using a Servomex Model 1440 oxygen analyzer that was calibrated and operated per EPA Method 3A. Analyzer technical specifications are presented in Table 4-1.

Concentration of carbon dioxide in the Outlet exhaust stack gas was determined continuously during each test period using a Servomex Model 1440 carbon dioxide analyzer that was calibrated and operated per EPA Method 3A. Analyzer technical specifications are presented in Table 4-2.

TABLE 4-1

TECHNICAL SPECIFICATIONS OF THE OXYGEN ANALYZER

Manufacturer	Servomex
Model Number	1440
Detection Principle	Paramagnetic transducer
Range	0-10 and 0-25%
Accuracy	+/- 1.0% of measured value
Repeatability	+/- 0.2% of measured value
Response	90% fullscale in less than five seconds
Zero Drift	<0.1% over one month.
Span Drift	<0.1% over one month
Signal Output	0-1 and 0-10 volt
Input Power Requirements	120 VAC or 220 VAC, 50/60 Hz

TABLE 4-2
TECHNICAL SPECIFICATIONS OF THE CARBON DIOXIDE ANALYZER

Manufacturer	Servomex
Model Number	1440
Detection Principle	Paramagnetic transducer
Range	0-20 and 0-25 %
Accuracy	± 1.0 % of measured value
Repeatability	± 0.2 % of measured value
Response	90 % full scale in less than five seconds
Zero Drift	<0.1 % over one month.
Span Drift	<0.1 % over one month
Signal Output	0-1 and 0-10 volt
Input Power Requirements	120 VAC or 220 VAC, 50/60 Hz

Prior to and immediately after the test series, the test analyzer was calibrated using zero nitrogen and two EPA Protocol 1 gas standards selected at a mid and high percent of the analyzer span range. Analyzer calibration response was curve fitted into a linear regression for use in obtaining actual results. From the calibration data, calibration error was determined based on the actual gas standard values. Calibration drift was calculated based on the change in response to a specific gas standard between the initial and final calibration.

The test analyzer response time was also evaluated prior to the test series by introducing an upscale calibration gas (upscale response) followed by a low level calibration gas or zero gas (downscale response) at the outlet of the sample probe. Response time was determined through the entire sampling system as the amount of time required to obtain a response equal to 95% of the calibration gas value or 0.5 vol%.

Sampling system bias checks were conducted immediately before and after each test period by introducing a mid level calibration standard at the outlet of the sample probe. Analyzer response to the bias check was used to correct analyzer response during the test period for any sampling system bias.

Test analyzer response was recorded at 1-minute intervals. During each test period, a gas sample was continuously extracted from the stack using a heated stainless steel probe and was routed to a sample conditioning system through a heated Teflon sample line. The sample conditioning system removed water vapor and particulate matter from the sample gas prior to sample introduction to the analyzer.

4.6 EPA METHOD 4 – STACK GAS MOISTURE

Moisture of the stack gas was determined per EPA Method 4 by extracting a gas sample from the stack using a heated, glass probe. Sample gas exited the probe into a into a filter module maintained at a filtration temperature of 248 +/- 25 F (filter module added for combination with EPA Method 5). Sample gas exited the filter module into a sample collection system consisting of a series of four glass impingers connected in series, immersed in an ice-water bath. Initially, the first two impingers contained know masses of DI water, the third impinger was empty, and the fourth impinger contained a known mass of silica gel. Temperature of the gas exiting the last impinger was maintained at below 68 F in order to condense water vapor.

Sample flow was established using a diaphragm pump, was regulated using a valve, and was measured using a calibrated dry-gas meter. During the test, samples were collected at each of the sample traverse points for equal periods of time. Sample rate was maintained at a constant rate.

Immediately after sampling, on-site moisture analysis were conducted. Mass gain of each of the four impingers was determined. The resulting mass gain and sample gas volume were used as the basis for stack gas moisture calculation.

4.7 EPA METHOD 5 – FILTERABLE PARTICULATE

Particulate concentration and mass rate were determined per EPA Method 5. Stack gas was extracted at an isokinetic rate, insuring that the velocity of the sample entering the sample nozzle is the same as that of the stack gas, thereby eliminating bias due to particle size and density.

A sample of the stack gas was extracted from the stack using a heated, glass probe and stainless steel sample nozzle. Sample gas exited the probe into a filter module maintained at a filtration temperature of 248 +/- 25 F. Sample gas exited the filter module into a sample collection system (EPA Method 4) consisting of a series of four glass impingers connected in series and immersed in an ice-water bath. Initially, the first two impingers contained known masses of DI water, the third impinger was empty, and the fourth impinger contained a known mass of silica gel. Temperature of the gas exiting the last impinger was maintained at below 68°F in order to condense water vapor.

Sample flow was established using a diaphragm pump, was regulated using a valve, and was measured using a calibrated dry-gas meter. During the test, samples were collected at each of the sample traverse points for equal periods of time. Sample rate was maintained at an isokinetic rate.

At the conclusion of testing, the filter was collected into a glass petri dish. The probe nozzle, probe, and front-half of the filter holder were washed with 1-bromopropane. Washings were collected into a sample bottle. All samples were sealed, liquid levels marked, stored on ice, and prepared for shipment to Entec's off-site analytical laboratory. At the laboratory, the total particulate was determined gravimetrically.

4.8 EPA METHOD 6C – SULFUR DIOXIDE

Concentration of sulfur dioxide in the stack gas was determined continuously during each test period using an Ametek 921L sulfur dioxide analyzer that was calibrated and operated per EPA Method 6C. Technical specifications for the analyzer are presented in Table 4-3.

Prior to and immediately after the test series, the test analyzer was calibrated using zero nitrogen and two EPA Protocol 1 gas standards selected at a mid and high percent of the analyzer span range. Analyzer calibration response was curve fitted into a linear regression for use in obtaining actual results. From the calibration data, calibration error was determined based on the actual gas standard values. Calibration drift was calculated based on the change in response to a specific gas standard between the initial and final calibration.

TABLE 4-3

TECHNICAL SPECIFICATIONS OF THE SULFUR DIOXIDE ANALYZER

Manufacturer	Ametek
Model Number	Model 921L
Detection Principle	Ultraviolet Fluorescence
Ranges	0-50 to 0-5000 ppmv
Lower Detectable Limit	0.050 ppm
Zero Noise	0.025 ppm
Response Time	2.0 seconds
Zero Drift	0.050 ppm over 24 hours
Span Drift	< 1% full scale over 24 hours
Linearity	< 1% full scale
Sample Flow Rate	250 cc/min
Signal Output	0-1 and 0-10 millivolt 0-1, 0-5, and 0-10 volt
Input Power Requirements	115 VAC, 60 Hz

The test analyzer response time was also evaluated prior to the test series by introducing an upscale calibration gas (upscale response) followed by a low level calibration gas or zero gas (downscale response) at the outlet of the sample probe. Response time was determined through the entire sampling system as the amount of time required to obtain a response equal to 95% of the calibration gas value or 0.5 PPMv.

Sampling system bias checks were conducted immediately before and after each test period by introducing a mid level calibration standard at the outlet of the sample probe. Analyzer response to the bias check was used to correct analyzer response during the test period for any sampling system bias.

Test analyzer response was recorded at 1-minute intervals. During each test period, a gas sample was continuously extracted from the stack using a heated stainless steel probe and was routed to a sample conditioning system through a heated Teflon sample line. The sample conditioning system removed water vapor and particulate matter from the sample gas prior to sample introduction to the analyzer. Sample flow was established using a Teflon-lined diaphragm pump. Excess sample was directed away from the test area.

4.9 EPA METHOD 7E - OXIDES OF NITROGEN

Concentration of oxides of nitrogen in the exhaust stack gas was determined continuously during each test period using a Thermo Environmental Instruments Model 42C oxides of nitrogen analyzer that was calibrated and operated per EPA Method 7E. Technical specifications for the analyzer are presented in Table 4.4.

Prior to and immediately after the test series, the test analyzer was calibrated using zero nitrogen and two EPA Protocol 1 gas standards selected at a mid and high percent of the analyzer span range. Analyzer calibration response was curve fitted into a linear regression for use in obtaining actual results. From the calibration data, calibration error was determined based on the actual gas standard values. Calibration drift was calculated based on the change in response to a specific gas standard between the initial and final calibration.

Prior to and immediately after the test series, the test analyzer NO2 to NO converter was evaluated to determine the converter efficiency. A known concentration NO2 gas standard was introduced to the analyzer and the analyzer response was recorded. The efficiency of the NO2 to NO conversion was calculated based on analyzer response and calibration gas value.

The test analyzer response time was also evaluated prior to the test series by introducing an upscale calibration gas (upscale response) followed by a low level calibration gas or zero gas (downscale response) at the outlet of the sample probe. Response time was determined through the entire sampling system as the amount of time required to obtain a response equal to 95% of the calibration gas value or 0.5 PPMv.

TABLE 4-4

TECHNICAL SPECIFICATIONS OF THE OXIDES OF NITROGEN ANALYZER

Manufacturer	Thermo Environmental Instruments, Inc.
Model Number	Model 42C
Detection Principle	Chemiluminescence
Ranges	0-10, 0-20, 0-50, 0-100, 0-200, 0-500, 0-1,000, 0-2,000, and 0-5,000 ppm
Lower Detectable Limit	0.050 ppm
Zero Noise	0.025 ppm
Response Time	2.5 seconds - NO mode 5.0 seconds - NO_x mode
Zero Drift	0.050 ppm over 24 hours
Span Drift	± 1% full scale over 24 hours
Linearity	± 1% full scale
Sample Flow Rate Bypass Flow Rate	25 cc/min 250 to 1100 cc/min
Signal Output	0-1 and 0-10 millivolt 0-1, 0-5, and 0-10 volt
Input Power Requirements	115 VAC, 60 Hz

Sampling system bias checks were conducted immediately before and after each test period by introducing a mid level calibration standard at the outlet of the sample probe. Analyzer response to the bias check was used to correct analyzer response during the test period for any sampling system bias.

Test analyzer response was recorded at 1-minute intervals. During each test period, a gas sample was continuously extracted from the stack using a heated stainless steel probe and was routed to a sample conditioning system through a heated Teflon sample line. The sample conditioning system removed water vapor and particulate matter from the sample gas prior to sample introduction to the analyzer. Sample flow was established using a Teflon-lined diaphragm pump. Excess sample was directed away from the test area.

4.10 EPA METHOD 10 – CARBON MONOXIDE

Concentration of carbon monoxide in the Outlet exhaust stack gas was determined continuously during each test period using a Thermo Environmental Instruments Model 48C carbon monoxide analyzer that was calibrated and operated per EPA Method 10. Technical specifications for the analyzer are presented in Table 4.5.

Prior to and immediately after the test series, the test analyzer was calibrated using zero nitrogen and two EPA Protocol 1 gas standards selected at a mid and high percent of the analyzer span range. Analyzer calibration response was curve fitted into a linear regression for use in obtaining actual results. From the calibration data, calibration error was determined based on the actual gas standard values. Calibration drift was calculated based on the change in response to a specific gas standard between the initial and final calibration.

The test analyzer response time was evaluated prior to the test series by introducing an upscale calibration gas (upscale response) followed by a low level calibration gas or zero gas (downscale response) at the outlet of the sample probe. Response time was determined through the entire sampling system as the amount of time required to obtain a response equal to 95% of the calibration gas value or 0.5 PPMv.

Sampling system bias checks were conducted immediately before and after each test period by introducing a mid level calibration standard at the outlet of the sample probe. Analyzer response to the bias check was used to correct analyzer response during the test period for any sampling system bias.

Test analyzer response was recorded at 1-minute intervals. During each test period, a gas sample was continuously extracted from the stack using a heated stainless steel probe and was routed to a sample conditioning system through a heated Teflon sample line. The sample conditioning system removed water vapor and particulate matter from the sample gas prior to sample introduction to the analyzer. Sample flow was established using a Teflon-lined diaphragm pump. Excess sample was directed away from the test area.

TABLE 4-5

TECHNICAL SPECIFICATIONS OF THE CARBON MONOXIDE ANALYZER

Manufacturer	Thermo Environmental Instruments, Inc.
Model Number	Model 48C
Detection Principle	IR, Gas Filter Correlation
Ranges	0-50, 0-100, 0-200, 0-500, 0-1000, 0-2000, 0-5000, 0-10000 ppm, and 0-20000 ppm
Precision	± 0.1 ppm
Response Time	1 minute @ 1 liter per minute and 30 second integration time to 90% of full scale
Zero Drift	± 4 ppm over 24 hours
Span Drift	± 2% of full scale over 24 hours
Linearity	± 1% full scale
Sample Flow Rate	0.5 – 2 liter/min
Signal Output	0-1 and 0-10 millivolt 0-1, 0-5, and 0-10 volt
Input Power Requirements	115 VAC, 60 Hz

4.11 EPA METHOD 18 – DETERMINATION OF ORGANIC COMPOUNDS C1 TO C6 HYDROCARBONS AND VOC (Tedlar Bag Procedure)

Gaseous samples were collected by metering a sample of the source gas into a Tedlar gas sample bag, at a constant rate, over the duration of the test run (Integrated sample). The EPA Method 18 sample train consisted of a non-heated, stainless steel sample probe, non-heated, Teflon sample line, leak-free sample pump, rotameter flow controllers, and an evacuated Tedlar bag. The sample train, less the Tedlar bag, was leak checked prior to sampling. Tedlar bags were leak checked separately prior to the tests.

Testing was conducted by inserting the sample probe into the source with the tip located at the sample point. The sample pump was turned on and sample rate was adjusted using the flow controller to a rate needed to fill the Tedlar bag to approximately 90% of capacity over the test duration.

At the conclusion of the sampling period, the Tedlar bag was removed from the train, sealed, and prepared for shipment to the analytical laboratory.

4.12 EPA METHOD 21 – DETERMINATION OF VOLATILE ORGANIC COMPOUND LEAKS

Valves, flanges, and other piping connections; and pump and compressor seals, pressure relief devices, etc. were tested to locate leaks of volatile organic compounds (VOC). The method determines a leak or no leak condition based on a leak detection concentration specified in the applicable subpart.

A portable FID analyzer, calibrated using a propane standard, was used to determine VOC leaks. Technical specifications for the FID analyzer are presented in Table 4-6. At each valve, flange, etc., a gas sample was continuously drawn as the probe was slowly traced around the point of potential leaks. For example, for flanges, the probe as located as close as practical to the joint between the two mating flanges and was then moved slowly around the circumference of the flange union. Any VOC concentration detection at or above the leak rate specification was considered a leak.

TABLE 4-6

TECHNICAL SPECIFICATIONS OF THE PORTABLE FID ANALYZER

Manufacturer / Model Number	Servomex / 1440
Detection Principle	Paramagnetic transducer
Range	0-20 and 0-25 %
Accuracy	± 1.0 % of measured value
Repeatability	± 0.2 % of measured value
Response	90 % full scale in less than five seconds
Zero Drift	<0.1 % over one month.
Span Drift	<0.1 % over one month
Signal Output	0-1 and 0-10 volt

4.13 EPA METHOD 25A – TOTAL HYDROCARBONS (VOC)

Volatile organic compounds (VOC) concentration in the VCU Inlet and Outlet exhaust stack gas was determined with the assumption that all (total) hydrocarbons, including methane and ethane, are VOC. Concentration of total hydrocarbons (THC) in the stack gas was determined continuously during each test period using a THC analyzer, specifications of which are presented below.

Prior to and immediately after the test series, the test analyzer was calibrated using zero nitrogen and two EPA Protocol 1 gas standards selected at a mid and high percent of the analyzer span range. Analyzer calibration response was curve fitted into a linear regression for use in obtaining actual results. From the calibration data, calibration error was determined based on the actual gas standard values. Calibration drift was calculated based on the change in response to a specific gas standard between the initial and final calibration.

The test analyzer response time was also evaluated prior to the test series by introducing an upscale calibration gas (upscale response) followed by a low level calibration gas or zero gas (downscale response) at the outlet of the sample probe. Response time was determined through the entire sampling system as the amount of time required to obtain a response equal to 95% of the calibration gas value or 0.5 PPMv.

Sampling system bias checks were conducted immediately before and after each test period by introducing a mid level calibration standard at the outlet of the sample probe. Analyzer response to the bias check was used to correct analyzer response during the test period for any sampling system bias.

During the tests, test analyzer response was recorded at 1-minute intervals. During each test period, a gas sample was continuously extracted from the stack using a heated stainless steel probe and was routed to a sample conditioning system through a heated Teflon sample line. The sample conditioning system removed water vapor and particulate matter from the sample gas prior to sample introduction to the analyzer. Sample flow was established using a Teflon-lined diaphragm pump. Excess sample was directed away from the test area.

4.13.1 MARNE VAPOR COMBUSTION UNIT, INLET

At the VCU Inlet, THC was measured using a California Analytical Instruments Model 600-HFID THC analyzer that was calibrated and operated per EPA Method 25A. Technical specifications for the analyzer are presented in Table 4.7.

4.13.2 MARNE VAPOR COMBUSTION UNIT, OUTLET

At the VCU Outlet, THC was measured using a California Analytical Instruments Model 600-HFID THC analyzer that was calibrated and operated per EPA Method 25A. Technical specifications for the analyzer are presented in Table 4.8.

TABLE 4-7

TECHNICAL SPECIFICATIONS OF THE TOTAL HYDROCARBONS ANALYZER

Manufacturer	California Analytical Instruments
Model Number	Model 600-HFID
Detection Principle	Heated flame ionization detector
Ranges	User Selectable Minimum: 0-3 ppm C Maximum: 0-3% C
Resolution Detection Limit	10 ppb C
Repeatability	0.5% of full scale
Response Time	0-90% of full scale range in less than one second
Signal Output	0-1 or 0-10 volt
Zero Drift	± 1.0% of full scale over 24 hours
Span Drift	± 1.0% of full scale over 24 hours
Linearity	± 0.5% of full scale
Oxygen Effect	<2% with H_2/He fuel
Sample Flow Rate	1.5-3.0 L/min
Fuel Flow Rate	60-120 cc/min
Air Flow Rate	220-300 cc/min
Sample Cell Temperature	85-191°C (adjustable)
Ambient Operating Conditions	5-40°C
Input Power Requirements	115 VAC, 60 Hz, 500 Watts

TABLE 4-8

TECHNICAL SPECIFICATIONS OF THE TOTAL HYDROCARBONS ANALYZER

Manufacturer	California Analytical Instruments
Model Number	Model 600-HFID
Detection Principle	Heated flame ionization detector
Ranges	User Selectable Minimum: 0-3 ppm C Maximum: 0-3% C
Resolution Detection Limit	10 ppb C
Repeatability	0.5% of full scale
Response Time	0-90% of full scale range in less than one second
Signal Output	0-1 or 0-10 volt
Zero Drift	± 1.0% of full scale over 24 hours
Span Drift	± 1.0% of full scale over 24 hours
Linearity	± 0.5% of full scale
Oxygen Effect	<2% with H_2/He fuel
Sample Flow Rate	1.5-3.0 L/min
Fuel Flow Rate	60-120 cc/min
Air Flow Rate	220-300 cc/min
Sample Cell Temperature	85-191°C (adjustable)
Ambient Operating Conditions	5-40°C
Input Power Requirements	115 VAC, 60 Hz, 500 Watts

5.0 QA/QC PROCEDURES

Specific Quality Assurance / Quality Control (QA / QC) procedures were adhered to during this test project in accordance with the test methods and Entec SOP requirements to provide valid and scientifically defensible data. For any environmental field and laboratory measurement, a degree of uncertainty exists in the data due to inherent limitations of the measurement systems employed. The objective of the Entec QA/QC program is to define, limit, and quantify these uncertainties resulting in data of known precision and accuracy that are complete and representative of conditions as tested, and that are comparable to other tests conducted with the same methods at identical conditions.

5.1 FIELD TEST TEAM QUALITY REVIEW

As head of the field test team, I personally collected and/or supervised the collection of the data contained in this report. I have reviewed the contents of this report and believe the contents of this report to be true, accurate, and complete to the best of my knowledge.

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Brad Latham
District manager AMS - Baton Rouge, Entec Project No. 614102

6.0 CALIBRATION PROCEDURES

All of the emission test equipment used in this project was calibrated according to the procedures outlined in the 40 CFR 60, Appendix A and in the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III. Calibration records are located in the appendices of this report.

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

Identification

User Identification:	Corpus Christi IFR 212' x 48'
City:	Corpus Christi
State:	Texas
Company:	Plains All American Pipeline, LP
Type of Tank:	Internal Floating Roof Tank
Description:	1 of 6 302,000-bbl IFR tanks for crude/condensate service.

Tank Dimensions

Diameter (ft):	212.00
Volume (gallons):	12,674,611.00
Turnovers:	331.37
Self Supp. Roof? (y/n):	N
No. of Columns:	13.00
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	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Detail
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	13
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	31
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	77

Meterological Data used in Emissions Calculations: Corpus Christi, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

Corpus Christi IFR 212' x 48' - Internal Floating Roof Tank
Corpus Christi, 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
Crude Oil/Condensate Mixture (RVP9.5)	Jan	65.53	60.93	70.13	71.57	7.6126	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.6972	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3588	N/A	N/A	78.1100	0.0059	0.0043	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1312	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2056	N/A	N/A	86.1700	0.0040	0.0048	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						250.5957	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0590	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						22.8322	N/A	N/A	48.1100	0.0006	0.0072	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.3913	N/A	N/A	92.1300	0.0174	0.0037	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.5002	N/A	N/A	49.6967	0.9452	0.9778	222.07	
Xylene (-m)						0.1095	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Feb	67.34	62.21	72.47	71.57	7.8406	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7333	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4265	N/A	N/A	78.1100	0.0059	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1395	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3085	N/A	N/A	86.1700	0.0040	0.0049	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						257.1842	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0630	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						23.6398	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4133	N/A	N/A	92.1300	0.0174	0.0038	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.7528	N/A	N/A	49.6897	0.9452	0.9775	222.07	
Xylene (-m)						0.1164	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Mar	70.78	65.44	76.13	71.57	8.2901	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8066	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5633	N/A	N/A	78.1100	0.0059	0.0046	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1565	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5158	N/A	N/A	86.1700	0.0040	0.0050	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						270.1082	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0713	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						25.2444	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4580	N/A	N/A	92.1300	0.0174	0.0040	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.2507	N/A	N/A	49.6761	0.9452	0.9768	222.07	
Xylene (-m)						0.1308	N/A	N/A	106.1700	0.0195	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Apr	74.10	68.87	79.33	71.57	8.7415	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8828	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.7052	N/A	N/A	78.1100	0.0059	0.0047	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1745	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.7296	N/A	N/A	86.1700	0.0040	0.0052	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						283.0007	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0801	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						26.8713	N/A	N/A	48.1100	0.0006	0.0074	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5050	N/A	N/A	92.1300	0.0174	0.0042	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7502	N/A	N/A	49.6627	0.9452	0.9761	222.07	
Xylene (-m)						0.1460	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11

Crude Oil/Condensate Mixture (RVP9.5)	May	76.66	71.59	81.73	71.57	9.1021	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9455	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.8217	N/A	N/A	78.1100	0.0059	0.0049	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1895	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.9044	N/A	N/A	86.1700	0.0040	0.0053	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						293.2436	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0876	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						28.1819	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5438	N/A	N/A	92.1300	0.0174	0.0043	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.1492	N/A	N/A	49.6522	0.9452	0.9756	222.07	
Xylene (-m)						0.1587	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Jun	78.70	73.35	84.06	71.57	9.3982	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9983	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9195	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2023	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.0505	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						301.6199	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0940	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.2653	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5767	N/A	N/A	92.1300	0.0174	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4767	N/A	N/A	49.6437	0.9452	0.9752	222.07	
Xylene (-m)						0.1696	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Jul	79.73	74.03	85.42	71.57	9.5494	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						1.0256	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9700	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2090	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.1260	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						305.8828	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0973	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.8206	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5938	N/A	N/A	92.1300	0.0174	0.0045	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.6438	N/A	N/A	49.6393	0.9452	0.9750	222.07	
Xylene (-m)						0.1752	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Aug	79.61	74.10	85.13	71.57	9.5323	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						1.0225	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9643	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2083	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.1174	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						305.3999	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0969	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.7576	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5918	N/A	N/A	92.1300	0.0174	0.0045	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.6248	N/A	N/A	49.6398	0.9452	0.9750	222.07	
Xylene (-m)						0.1746	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Sep	77.86	72.83	82.90	71.57	9.2758	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9763	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.8788	N/A	N/A	78.1100	0.0059	0.0049	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1970	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.9898	N/A	N/A	86.1700	0.0040	0.0053	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						298.1604	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0913	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						28.8166	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5630	N/A	N/A	92.1300	0.0174	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3413	N/A	N/A	49.6472	0.9452	0.9754	222.07	
Xylene (-m)						0.1650	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Oct	74.43	69.20	79.66	71.57	8.7871	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8906	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.7198	N/A	N/A	78.1100	0.0059	0.0047	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1763	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.7516	N/A	N/A	86.1700	0.0040	0.0052	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Hydrogen Sulfide						284.3000	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0811	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						27.0366	N/A	N/A	48.1100	0.0006	0.0074	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5098	N/A	N/A	92.1300	0.0174	0.0042	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8008	N/A	N/A	49.6614	0.9452	0.9761	222.07	
Xylene (-m)						0.1476	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Nov	70.39	65.51	75.26	71.57	8.2373	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7978	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5470	N/A	N/A	78.1100	0.0059	0.0046	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1544	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4912	N/A	N/A	86.1700	0.0040	0.0050	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						268.5956	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0703	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						25.0552	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4527	N/A	N/A	92.1300	0.0174	0.0040	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.1922	N/A	N/A	49.6777	0.9452	0.9769	222.07	
Xylene (-m)						0.1290	N/A	N/A	106.1700	0.0195	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Dec	66.88	62.30	71.47	71.57	7.7827	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7241	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4092	N/A	N/A	78.1100	0.0059	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1374	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2822	N/A	N/A	86.1700	0.0040	0.0049	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						255.5135	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0620	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						23.4344	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4077	N/A	N/A	92.1300	0.0174	0.0038	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.6887	N/A	N/A	49.6915	0.9452	0.9776	222.07	
Xylene (-m)						0.1147	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11

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

Corpus Christi IFR 212' x 48' - Internal Floating Roof Tank
Corpus Christi, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	38.2310	39.9043	43.3562	47.0482	50.1812	52.8905	54.3248	54.1603	51.7545	47.4353	42.9399	39.4747
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:	0.1803	0.1882	0.2045	0.2219	0.2367	0.2495	0.2562	0.2555	0.2441	0.2238	0.2025	0.1862
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.6126	7.8406	8.2901	8.7415	9.1021	9.3982	9.5494	9.5323	9.2758	8.7871	8.2373	7.7827
Tank Diameter (ft):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106
Number of Columns:	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000
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.):	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
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):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Deck Fitting Losses (lb):	162.6442	169.7625	184.4480	200.1547	213.4833	225.0092	231.1110	230.4114	220.1765	201.8016	182.6769	167.9349
Value of Vapor Pressure Function:	0.1803	0.1882	0.2045	0.2219	0.2367	0.2495	0.2562	0.2555	0.2441	0.2238	0.2025	0.1862
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400
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):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Total Losses (lb):	1,876.7858	1,885.5774	1,903.7148	1,923.1135	1,939.5751	1,953.8103	1,961.3463	1,960.4823	1,947.8417	1,925.1475	1,901.5274	1,883.3202

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	7.0709
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	12.3741
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	13	25.00	0.00	0.00	1,436.2822
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	247.4825
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	53.0320
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3	6.20	1.20	0.94	82.1995
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	31	2.00	0.37	0.91	273.9984
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	77	0.82	0.53	0.14	279.0365

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

Corpus Christi IFR 212' x 48' - Internal Floating Roof Tank
Corpus Christi, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil/Condensate Mixture (RVP9.5)	561.70	20,110.93	2,389.61	0.00	23,062.24
2,2,4-Trimethylpentane (isooctane)	0.24	20.11	1.00	0.00	21.35
Benzene	2.66	117.83	11.31	0.00	131.80
Ethylbenzene	0.25	109.34	1.08	0.00	110.67
Hexane (-n)	2.91	80.44	12.36	0.00	95.71
Hydrogen Sulfide	0.08	0.02	0.32	0.00	0.42
Isopropyl benzene	0.02	20.11	0.09	0.00	20.22
Methyl Mercaptan	4.17	11.72	17.73	0.00	33.62
Toluene	2.34	349.35	9.94	0.00	361.62
Unidentified Components	548.29	19,008.97	2,332.55	0.00	21,889.81
Xylene (-m)	0.76	393.03	3.24	0.00	397.02

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

Identification

User Identification:	Corpus Christi IFR 212' x 48' Hourly
City:	Corpus Christi
State:	Texas
Company:	Plains All American Pipeline, LP
Type of Tank:	Internal Floating Roof Tank
Description:	1 of 6 302,000-bbl IFR tanks for crude/condensate service.

Tank Dimensions

Diameter (ft):	212.00
Volume (gallons):	12,674,611.00
Turnovers:	1,451.41
Self Supp. Roof? (y/n):	N
No. of Columns:	13.00
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	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Detail
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	13
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	31
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	77

Meterological Data used in Emissions Calculations: Corpus Christi, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

Corpus Christi IFR 212' x 48' Hourly - Internal Floating Roof Tank
Corpus Christi, 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
Crude Oil/Condensate Mixture (RVP9.5)	Jan	65.53	60.93	70.13	71.57	7.6126	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.6972	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3588	N/A	N/A	78.1100	0.0059	0.0043	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1312	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2056	N/A	N/A	86.1700	0.0040	0.0048	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						250.5957	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0590	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						22.8322	N/A	N/A	48.1100	0.0006	0.0072	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.3913	N/A	N/A	92.1300	0.0174	0.0037	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.4651	N/A	N/A	49.7636	0.9452	0.9750	222.09	
Xylene (-m)						0.1095	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Feb	67.34	62.21	72.47	71.57	7.8406	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7333	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4265	N/A	N/A	78.1100	0.0059	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1395	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3085	N/A	N/A	86.1700	0.0040	0.0049	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						257.1842	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0630	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						23.6398	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4133	N/A	N/A	92.1300	0.0174	0.0038	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.7168	N/A	N/A	49.7564	0.9452	0.9746	222.09	
Xylene (-m)						0.1164	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Mar	70.78	65.44	76.13	71.57	8.2901	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8066	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5633	N/A	N/A	78.1100	0.0059	0.0046	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1565	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5158	N/A	N/A	86.1700	0.0040	0.0050	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						270.1082	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0713	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						25.2444	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4580	N/A	N/A	92.1300	0.0174	0.0040	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.2129	N/A	N/A	49.7423	0.9452	0.9740	222.09	
Xylene (-m)						0.1308	N/A	N/A	106.1700	0.0195	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Apr	74.10	68.87	79.33	71.57	8.7415	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8828	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.7052	N/A	N/A	78.1100	0.0059	0.0047	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1745	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.7296	N/A	N/A	86.1700	0.0040	0.0052	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						283.0007	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0801	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						26.8713	N/A	N/A	48.1100	0.0006	0.0074	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5050	N/A	N/A	92.1300	0.0174	0.0042	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7107	N/A	N/A	49.7285	0.9452	0.9733	222.09	
Xylene (-m)						0.1460	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11

Crude Oil/Condensate Mixture (RVP9.5)	May	76.66	71.59	81.73	71.57	9.1021	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9455	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.8217	N/A	N/A	78.1100	0.0059	0.0049	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1895	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.9044	N/A	N/A	86.1700	0.0040	0.0053	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						293.2436	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0876	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						28.1819	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5438	N/A	N/A	92.1300	0.0174	0.0043	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.1082	N/A	N/A	49.7176	0.9452	0.9728	222.09	
Xylene (-m)						0.1587	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Jun	78.70	73.35	84.06	71.57	9.3982	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9983	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9195	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2023	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.0505	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						301.6199	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0940	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.2653	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5767	N/A	N/A	92.1300	0.0174	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4345	N/A	N/A	49.7088	0.9452	0.9724	222.09	
Xylene (-m)						0.1696	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Jul	79.73	74.03	85.42	71.57	9.5494	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						1.0256	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9700	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2090	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.1260	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						305.8828	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0973	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.8206	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5938	N/A	N/A	92.1300	0.0174	0.0045	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.6010	N/A	N/A	49.7043	0.9452	0.9722	222.09	
Xylene (-m)						0.1752	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Aug	79.61	74.10	85.13	71.57	9.5323	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						1.0225	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9643	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2083	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.1174	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						305.3999	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0969	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.7576	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5918	N/A	N/A	92.1300	0.0174	0.0045	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5821	N/A	N/A	49.7048	0.9452	0.9722	222.09	
Xylene (-m)						0.1746	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Sep	77.86	72.83	82.90	71.57	9.2758	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9763	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.8788	N/A	N/A	78.1100	0.0059	0.0049	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1970	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.9898	N/A	N/A	86.1700	0.0040	0.0053	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						298.1604	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0913	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						28.8166	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5630	N/A	N/A	92.1300	0.0174	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.2996	N/A	N/A	49.7124	0.9452	0.9726	222.09	
Xylene (-m)						0.1650	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Oct	74.43	69.20	79.66	71.57	8.7871	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8906	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.7198	N/A	N/A	78.1100	0.0059	0.0047	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1763	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.7516	N/A	N/A	86.1700	0.0040	0.0052	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Hydrogen Sulfide						284.3000	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0811	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						27.0366	N/A	N/A	48.1100	0.0006	0.0074	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5098	N/A	N/A	92.1300	0.0174	0.0042	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7610	N/A	N/A	49.7271	0.9452	0.9733	222.09	
Xylene (-m)						0.1476	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Nov	70.39	65.51	75.26	71.57	8.2373	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7978	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5470	N/A	N/A	78.1100	0.0059	0.0046	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1544	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4912	N/A	N/A	86.1700	0.0040	0.0050	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						268.5956	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0703	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						25.0552	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4527	N/A	N/A	92.1300	0.0174	0.0040	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.1547	N/A	N/A	49.7440	0.9452	0.9740	222.09	
Xylene (-m)						0.1290	N/A	N/A	106.1700	0.0195	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Dec	66.88	62.30	71.47	71.57	7.7827	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7241	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4092	N/A	N/A	78.1100	0.0059	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1374	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2822	N/A	N/A	86.1700	0.0040	0.0049	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						255.5135	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0620	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						23.4344	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4077	N/A	N/A	92.1300	0.0174	0.0038	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.6529	N/A	N/A	49.7582	0.9452	0.9747	222.09	
Xylene (-m)						0.1147	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11

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

Corpus Christi IFR 212' x 48' Hourly - Internal Floating Roof Tank
Corpus Christi, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	38.2310	39.9043	43.3562	47.0482	50.1812	52.8905	54.3248	54.1603	51.7545	47.4353	42.9399	39.4747
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:	0.1803	0.1882	0.2045	0.2219	0.2367	0.2495	0.2562	0.2555	0.2441	0.2238	0.2025	0.1862
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.6126	7.8406	8.2901	8.7415	9.1021	9.3982	9.5494	9.5323	9.2758	8.7871	8.2373	7.7827
Tank Diameter (ft):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883
Number of Columns:	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000
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.):	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
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):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
	162.6442	169.7625	184.4480	200.1547	213.4833	225.0092	231.1110	230.4114	220.1765	201.8016	182.6769	167.9349

Deck Fitting Losses (lb):												
Value of Vapor Pressure Function:	0.1803	0.1882	0.2045	0.2219	0.2367	0.2495	0.2562	0.2555	0.2441	0.2238	0.2025	0.1862
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400
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):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Total Losses (lb):	7,541.3635	7,550.1551	7,568.2925	7,587.6912	7,604.1528	7,618.3880	7,625.9241	7,625.0601	7,612.4194	7,589.7253	7,566.1051	7,547.8979

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	7.0709
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	12.3741
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	13	25.00	0.00	0.00	1,436.2822
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	247.4825
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	53.0320
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3	6.20	1.20	0.94	82.1995
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	31	2.00	0.37	0.91	273.9984
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	77	0.82	0.53	0.14	279.0365

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

Corpus Christi IFR 212' x 48' Hourly - Internal Floating Roof Tank
Corpus Christi, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil/Condensate Mixture (RVP9.5)	561.70	88,085.86	2,389.61	0.00	91,037.18
2,2,4-Trimethylpentane (isooctane)	0.24	88.09	1.00	0.00	89.32
Benzene	2.66	516.10	11.31	0.00	530.07
Ethylbenzene	0.25	478.92	1.08	0.00	480.25
Hexane (-n)	2.91	352.34	12.36	0.00	367.61
Hydrogen Sulfide	1.66	1.94	7.05	0.00	10.64
Isopropyl benzene	0.02	88.09	0.09	0.00	88.20
Methyl Mercaptan	4.17	51.35	17.73	0.00	73.25
Toluene	2.34	1,530.14	9.94	0.00	1,542.42
Unidentified Components	546.71	83,257.43	2,325.82	0.00	86,129.96
Xylene (-m)	0.76	1,721.46	3.24	0.00	1,725.46

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

Identification

User Identification:	Corpus Christi IFR 212' x 60'
City:	Corpus Christi
State:	Texas
Company:	Plains All American Pipeline, LP
Type of Tank:	Internal Floating Roof Tank
Description:	1 of 6 377,000-bbl IFR tanks for crude/condensate service.

Tank Dimensions

Diameter (ft):	212.00
Volume (gallons):	15,843,263.00
Turnovers:	265.10
Self Supp. Roof? (y/n):	N
No. of Columns:	13.00
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	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Detail
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	13
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	31
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	77

Meterological Data used in Emissions Calculations: Corpus Christi, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

Corpus Christi IFR 212' x 60' - Internal Floating Roof Tank
Corpus Christi, 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
Crude Oil/Condensate Mixture (RVP9.5)	Jan	65.53	60.93	70.13	71.57	7.6126	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.6972	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3588	N/A	N/A	78.1100	0.0059	0.0043	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1312	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2056	N/A	N/A	86.1700	0.0040	0.0048	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						250.5957	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0590	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						22.8322	N/A	N/A	48.1100	0.0006	0.0072	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.3913	N/A	N/A	92.1300	0.0174	0.0037	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.5002	N/A	N/A	49.6967	0.9452	0.9778	222.07	
Xylene (-m)						0.1095	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Feb	67.34	62.21	72.47	71.57	7.8406	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7333	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4265	N/A	N/A	78.1100	0.0059	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1395	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3085	N/A	N/A	86.1700	0.0040	0.0049	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						257.1842	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0630	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						23.6398	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4133	N/A	N/A	92.1300	0.0174	0.0038	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.7528	N/A	N/A	49.6897	0.9452	0.9775	222.07	
Xylene (-m)						0.1164	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Mar	70.78	65.44	76.13	71.57	8.2901	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8066	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5633	N/A	N/A	78.1100	0.0059	0.0046	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1565	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5158	N/A	N/A	86.1700	0.0040	0.0050	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						270.1082	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0713	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						25.2444	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4580	N/A	N/A	92.1300	0.0174	0.0040	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.2507	N/A	N/A	49.6761	0.9452	0.9768	222.07	
Xylene (-m)						0.1308	N/A	N/A	106.1700	0.0195	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Apr	74.10	68.87	79.33	71.57	8.7415	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8828	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.7052	N/A	N/A	78.1100	0.0059	0.0047	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1745	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.7296	N/A	N/A	86.1700	0.0040	0.0052	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						283.0007	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0801	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						26.8713	N/A	N/A	48.1100	0.0006	0.0074	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5050	N/A	N/A	92.1300	0.0174	0.0042	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7502	N/A	N/A	49.6627	0.9452	0.9761	222.07	
Xylene (-m)						0.1460	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11

Crude Oil/Condensate Mixture (RVP9.5)	May	76.66	71.59	81.73	71.57	9.1021	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9455	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.8217	N/A	N/A	78.1100	0.0059	0.0049	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1895	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.9044	N/A	N/A	86.1700	0.0040	0.0053	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						293.2436	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0876	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						28.1819	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5438	N/A	N/A	92.1300	0.0174	0.0043	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.1492	N/A	N/A	49.6522	0.9452	0.9756	222.07	
Xylene (-m)						0.1587	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Jun	78.70	73.35	84.06	71.57	9.3982	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9983	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9195	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2023	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.0505	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						301.6199	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0940	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.2653	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5767	N/A	N/A	92.1300	0.0174	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4767	N/A	N/A	49.6437	0.9452	0.9752	222.07	
Xylene (-m)						0.1696	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Jul	79.73	74.03	85.42	71.57	9.5494	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						1.0256	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9700	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2090	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.1260	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						305.8828	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0973	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.8206	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5938	N/A	N/A	92.1300	0.0174	0.0045	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.6438	N/A	N/A	49.6393	0.9452	0.9750	222.07	
Xylene (-m)						0.1752	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Aug	79.61	74.10	85.13	71.57	9.5323	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						1.0225	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9643	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2083	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.1174	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						305.3999	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0969	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.7576	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5918	N/A	N/A	92.1300	0.0174	0.0045	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.6248	N/A	N/A	49.6398	0.9452	0.9750	222.07	
Xylene (-m)						0.1746	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Sep	77.86	72.83	82.90	71.57	9.2758	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9763	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.8788	N/A	N/A	78.1100	0.0059	0.0049	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1970	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.9898	N/A	N/A	86.1700	0.0040	0.0053	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						298.1604	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0913	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						28.8166	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5630	N/A	N/A	92.1300	0.0174	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3413	N/A	N/A	49.6472	0.9452	0.9754	222.07	
Xylene (-m)						0.1650	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Oct	74.43	69.20	79.66	71.57	8.7871	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8906	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.7198	N/A	N/A	78.1100	0.0059	0.0047	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1763	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.7516	N/A	N/A	86.1700	0.0040	0.0052	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Hydrogen Sulfide						284.3000	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0811	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						27.0366	N/A	N/A	48.1100	0.0006	0.0074	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5098	N/A	N/A	92.1300	0.0174	0.0042	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8008	N/A	N/A	49.6614	0.9452	0.9761	222.07	
Xylene (-m)						0.1476	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Nov	70.39	65.51	75.26	71.57	8.2373	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7978	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5470	N/A	N/A	78.1100	0.0059	0.0046	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1544	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4912	N/A	N/A	86.1700	0.0040	0.0050	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						268.5956	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0703	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						25.0552	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4527	N/A	N/A	92.1300	0.0174	0.0040	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.1922	N/A	N/A	49.6777	0.9452	0.9769	222.07	
Xylene (-m)						0.1290	N/A	N/A	106.1700	0.0195	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Dec	66.88	62.30	71.47	71.57	7.7827	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7241	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4092	N/A	N/A	78.1100	0.0059	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1374	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2822	N/A	N/A	86.1700	0.0040	0.0049	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						255.5135	N/A	N/A	34.0800	0.0000	0.0001	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0620	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						23.4344	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4077	N/A	N/A	92.1300	0.0174	0.0038	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.6887	N/A	N/A	49.6915	0.9452	0.9776	222.07	
Xylene (-m)						0.1147	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11

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

Corpus Christi IFR 212' x 60' - Internal Floating Roof Tank
Corpus Christi, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	38.2310	39.9043	43.3562	47.0482	50.1812	52.8905	54.3248	54.1603	51.7545	47.4353	42.9399	39.4747
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:	0.1803	0.1882	0.2045	0.2219	0.2367	0.2495	0.2562	0.2555	0.2441	0.2238	0.2025	0.1862
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.6126	7.8406	8.2901	8.7415	9.1021	9.3982	9.5494	9.5323	9.2758	8.7871	8.2373	7.7827
Tank Diameter (ft):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106	1,675.9106
Number of Columns:	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000
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.):	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000	350,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
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):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Deck Fitting Losses (lb):	162.6442	169.7625	184.4480	200.1547	213.4833	225.0092	231.1110	230.4114	220.1765	201.8016	182.6769	167.9349
Value of Vapor Pressure Function:	0.1803	0.1882	0.2045	0.2219	0.2367	0.2495	0.2562	0.2555	0.2441	0.2238	0.2025	0.1862
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400
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):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Total Losses (lb):	1,876.7858	1,885.5774	1,903.7148	1,923.1135	1,939.5751	1,953.8103	1,961.3463	1,960.4823	1,947.8417	1,925.1475	1,901.5274	1,883.3202

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	7.0709
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	12.3741
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	13	25.00	0.00	0.00	1,436.2822
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	247.4825
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	53.0320
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3	6.20	1.20	0.94	82.1995
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	31	2.00	0.37	0.91	273.9984
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	77	0.82	0.53	0.14	279.0365

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

Corpus Christi IFR 212' x 60' - Internal Floating Roof Tank
Corpus Christi, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil/Condensate Mixture (RVP9.5)	561.70	20,110.93	2,389.61	0.00	23,062.24
2,2,4-Trimethylpentane (isooctane)	0.24	20.11	1.00	0.00	21.35
Benzene	2.66	117.83	11.31	0.00	131.80
Ethylbenzene	0.25	109.34	1.08	0.00	110.67
Hexane (-n)	2.91	80.44	12.36	0.00	95.71
Hydrogen Sulfide	0.08	0.02	0.32	0.00	0.42
Isopropyl benzene	0.02	20.11	0.09	0.00	20.22
Methyl Mercaptan	4.17	11.72	17.73	0.00	33.62
Toluene	2.34	349.35	9.94	0.00	361.62
Unidentified Components	548.29	19,008.97	2,332.55	0.00	21,889.81
Xylene (-m)	0.76	393.03	3.24	0.00	397.02

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

Identification

User Identification:	Corpus Christi IFR 212' x 60' Hourly
City:	Corpus Christi
State:	Texas
Company:	Plains All American Pipeline, LP
Type of Tank:	Internal Floating Roof Tank
Description:	1 of 6 377,000-bbl IFR tanks for crude/condensate service.

Tank Dimensions

Diameter (ft):	212.00
Volume (gallons):	15,843,263.00
Turnovers:	1,161.12
Self Supp. Roof? (y/n):	N
No. of Columns:	13.00
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	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Detail
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	13
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	31
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	77

Meterological Data used in Emissions Calculations: Corpus Christi, Texas (Avg Atmospheric Pressure = 14.7 psia)

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

Corpus Christi IFR 212' x 60' Hourly - Internal Floating Roof Tank
Corpus Christi, 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
Crude Oil/Condensate Mixture (RVP9.5)	Jan	65.53	60.93	70.13	71.57	7.6126	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.6972	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3588	N/A	N/A	78.1100	0.0059	0.0043	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1312	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2056	N/A	N/A	86.1700	0.0040	0.0048	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						250.5957	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0590	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						22.8322	N/A	N/A	48.1100	0.0006	0.0072	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.3913	N/A	N/A	92.1300	0.0174	0.0037	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.4651	N/A	N/A	49.7636	0.9452	0.9750	222.09	
Xylene (-m)						0.1095	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Feb	67.34	62.21	72.47	71.57	7.8406	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7333	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4265	N/A	N/A	78.1100	0.0059	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1395	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3085	N/A	N/A	86.1700	0.0040	0.0049	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						257.1842	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0630	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						23.6398	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4133	N/A	N/A	92.1300	0.0174	0.0038	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.7168	N/A	N/A	49.7564	0.9452	0.9746	222.09	
Xylene (-m)						0.1164	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Mar	70.78	65.44	76.13	71.57	8.2901	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8066	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5633	N/A	N/A	78.1100	0.0059	0.0046	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1565	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5158	N/A	N/A	86.1700	0.0040	0.0050	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						270.1082	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0713	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						25.2444	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4580	N/A	N/A	92.1300	0.0174	0.0040	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.2129	N/A	N/A	49.7423	0.9452	0.9740	222.09	
Xylene (-m)						0.1308	N/A	N/A	106.1700	0.0195	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Apr	74.10	68.87	79.33	71.57	8.7415	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8828	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.7052	N/A	N/A	78.1100	0.0059	0.0047	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1745	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.7296	N/A	N/A	86.1700	0.0040	0.0052	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						283.0007	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0801	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						26.8713	N/A	N/A	48.1100	0.0006	0.0074	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5050	N/A	N/A	92.1300	0.0174	0.0042	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7107	N/A	N/A	49.7285	0.9452	0.9733	222.09	
Xylene (-m)						0.1460	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11

Crude Oil/Condensate Mixture (RVP9.5)	May	76.66	71.59	81.73	71.57	9.1021	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9455	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.8217	N/A	N/A	78.1100	0.0059	0.0049	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1895	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.9044	N/A	N/A	86.1700	0.0040	0.0053	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						293.2436	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0876	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						28.1819	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5438	N/A	N/A	92.1300	0.0174	0.0043	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.1082	N/A	N/A	49.7176	0.9452	0.9728	222.09	
Xylene (-m)						0.1587	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Jun	78.70	73.35	84.06	71.57	9.3982	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9983	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9195	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2023	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.0505	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						301.6199	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0940	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.2653	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5767	N/A	N/A	92.1300	0.0174	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4345	N/A	N/A	49.7088	0.9452	0.9724	222.09	
Xylene (-m)						0.1696	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Jul	79.73	74.03	85.42	71.57	9.5494	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						1.0256	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9700	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2090	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.1260	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						305.8828	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0973	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.8206	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5938	N/A	N/A	92.1300	0.0174	0.0045	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.6010	N/A	N/A	49.7043	0.9452	0.9722	222.09	
Xylene (-m)						0.1752	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Aug	79.61	74.10	85.13	71.57	9.5323	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						1.0225	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.9643	N/A	N/A	78.1100	0.0059	0.0050	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.2083	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.1174	N/A	N/A	86.1700	0.0040	0.0054	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						305.3999	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0969	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						29.7576	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5918	N/A	N/A	92.1300	0.0174	0.0045	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5821	N/A	N/A	49.7048	0.9452	0.9722	222.09	
Xylene (-m)						0.1746	N/A	N/A	106.1700	0.0195	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Sep	77.86	72.83	82.90	71.57	9.2758	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.9763	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.8788	N/A	N/A	78.1100	0.0059	0.0049	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1970	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.9898	N/A	N/A	86.1700	0.0040	0.0053	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						298.1604	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0913	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						28.8166	N/A	N/A	48.1100	0.0006	0.0075	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5630	N/A	N/A	92.1300	0.0174	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.2996	N/A	N/A	49.7124	0.9452	0.9726	222.09	
Xylene (-m)						0.1650	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Oct	74.43	69.20	79.66	71.57	8.7871	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.8906	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.7198	N/A	N/A	78.1100	0.0059	0.0047	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1763	N/A	N/A	106.1700	0.0054	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.7516	N/A	N/A	86.1700	0.0040	0.0052	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Hydrogen Sulfide						284.3000	N/A	N/A	34.0800	0.0000	0.0029	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0811	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						27.0366	N/A	N/A	48.1100	0.0006	0.0074	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.5098	N/A	N/A	92.1300	0.0174	0.0042	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7610	N/A	N/A	49.7271	0.9452	0.9733	222.09	
Xylene (-m)						0.1476	N/A	N/A	106.1700	0.0195	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Nov	70.39	65.51	75.26	71.57	8.2373	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7978	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5470	N/A	N/A	78.1100	0.0059	0.0046	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1544	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4912	N/A	N/A	86.1700	0.0040	0.0050	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						268.5956	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0703	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						25.0552	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4527	N/A	N/A	92.1300	0.0174	0.0040	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.1547	N/A	N/A	49.7440	0.9452	0.9740	222.09	
Xylene (-m)						0.1290	N/A	N/A	106.1700	0.0195	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil/Condensate Mixture (RVP9.5)	Dec	66.88	62.30	71.47	71.57	7.7827	N/A	N/A	50.0000			207.00	Option 4: RVP=9.5
2,2,4-Trimethylpentane (isooctane)						0.7241	N/A	N/A	114.2300	0.0010	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4092	N/A	N/A	78.1100	0.0059	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1374	N/A	N/A	106.1700	0.0054	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2822	N/A	N/A	86.1700	0.0040	0.0049	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						255.5135	N/A	N/A	34.0800	0.0000	0.0030	34.08	Option 2: A=7.402419, B=959.9034, C=273.15
Isopropyl benzene						0.0620	N/A	N/A	120.2000	0.0010	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Methyl Mercaptan						23.4344	N/A	N/A	48.1100	0.0006	0.0073	48.11	Option 2: A=7.4786015, B=1285.706, C=273.15
Toluene						0.4077	N/A	N/A	92.1300	0.0174	0.0038	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.6529	N/A	N/A	49.7582	0.9452	0.9747	222.09	
Xylene (-m)						0.1147	N/A	N/A	106.1700	0.0195	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11

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

Corpus Christi IFR 212' x 60' Hourly - Internal Floating Roof Tank
Corpus Christi, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	38.2310	39.9043	43.3562	47.0482	50.1812	52.8905	54.3248	54.1603	51.7545	47.4353	42.9399	39.4747
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:	0.1803	0.1882	0.2045	0.2219	0.2367	0.2495	0.2562	0.2555	0.2441	0.2238	0.2025	0.1862
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.6126	7.8406	8.2901	8.7415	9.1021	9.3982	9.5494	9.5323	9.2758	8.7871	8.2373	7.7827
Tank Diameter (ft):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883	7,340.4883
Number of Columns:	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000
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.):	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000	1,533,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
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):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
	162.6442	169.7625	184.4480	200.1547	213.4833	225.0092	231.1110	230.4114	220.1765	201.8016	182.6769	167.9349

Deck Fitting Losses (lb):												
Value of Vapor Pressure Function:	0.1803	0.1882	0.2045	0.2219	0.2367	0.2495	0.2562	0.2555	0.2441	0.2238	0.2025	0.1862
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400	541.1400
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):	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000	212.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Total Losses (lb):	7,541.3635	7,550.1551	7,568.2925	7,587.6912	7,604.1528	7,618.3880	7,625.9241	7,625.0601	7,612.4194	7,589.7253	7,566.1051	7,547.8979

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	7.0709
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	12.3741
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	13	25.00	0.00	0.00	1,436.2822
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	247.4825
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	53.0320
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3	6.20	1.20	0.94	82.1995
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	31	2.00	0.37	0.91	273.9984
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	77	0.82	0.53	0.14	279.0365

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

Corpus Christi IFR 212' x 60' Hourly - Internal Floating Roof Tank
Corpus Christi, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil/Condensate Mixture (RVP9.5)	561.70	88,085.86	2,389.61	0.00	91,037.18
2,2,4-Trimethylpentane (isooctane)	0.24	88.09	1.00	0.00	89.32
Benzene	2.66	516.10	11.31	0.00	530.07
Ethylbenzene	0.25	478.92	1.08	0.00	480.25
Hexane (-n)	2.91	352.34	12.36	0.00	367.61
Hydrogen Sulfide	1.66	1.94	7.05	0.00	10.64
Isopropyl benzene	0.02	88.09	0.09	0.00	88.20
Methyl Mercaptan	4.17	51.35	17.73	0.00	73.25
Toluene	2.34	1,530.14	9.94	0.00	1,542.42
Unidentified Components	546.71	83,257.43	2,325.82	0.00	86,129.96
Xylene (-m)	0.76	1,721.46	3.24	0.00	1,725.46

APPENDIX F
TCEQ TIER I BACT TABLES

Detailed TCEQ BACT Tables are located in this appendix.

TCEQ Chemical Sources
Current Best Available Control Technology (BACT) Requirements

Equipment Leak Fugitives

Year	Source Type	Pollutant	Minimum Acceptable Control	Control Efficiency or Details
2011	Equipment Leak Fugitives	Uncontrolled VOC emissions < 10 tpy	None	
		10 tpy < uncontrolled VOC emissions < 25 tpy	28M leak detection and repair program	75% credit for 28M
		Uncontrolled VOC emissions > 25 tpy	28VHP leak detection and repair program	97% credit for valves, 85% for pumps and compressors
		VOC vp < 0.002 psia	No inspection required	No fugitive emissions expected
		Approved odorous compounds: NH3, C12, H2S, etc.	Audio/Visual/Olfactory (AVO) inspection twice per shift	Appropriate credit for AVO program

TCEQ Chemical Sources
Current Best Available Control Technology (BACT) Requirements

Loading Operations

Year	Source Type	Pollutant	Minimum Acceptable Control	Control Efficiency or Details
2011	Loading Operations	VOC vp < 0.5 psia	Submerged or bottom loading	No splash loading
		VOC vp > 0.5 psia	Route to VOC control device	See specific control device requirements
			Annual truck leak checking per NSPS XX Low back pressure	98.7% collection efficiency for annual NSPSXX leak check on non-gasoline loading
	Marine Loading Operations	VOC vp > 0.5 psia	Route to VOC control device Vessel leak testing: the marine vessel must pass an annual vapor tightness test as specified in 40 CFR §63.565(c) or 40 CFR §61.304(f)	95% collection efficiency from loading operation See specific control device requirement

TCEQ Chemical Sources
Current Best Available Control Technology (BACT) Requirements

Storage Tanks

This information is maintained by the Chemical NSR Section and is subject to change. (Last Revision Date 08/01/2011

Year	Source Type	Pollutant	Minimum Acceptable Control	Control Efficiency or Details
2011	Storage Tanks	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 Alternative 2: Primary seal: vapor mounted and Secondary seal: rim 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

TCEQ Chemical Sources
Current Best Available Control Technology (BACT) Requirements

Flares and Vapor Combustors

Year	Source Type	Pollutant	Minimum Acceptable Control	Control Efficiency or Details
2011	Flares	VOC	Flare required to meet 40 CFR 60.18	Destruction Efficiency: 99% for certain compounds up to three carbons, 98% otherwise No flaring of halogenated compounds allowed Flow monitor will be required. Composition or BTU analyzer may be required.
		Non-VOC	Case-by-case	Case-by-case Flow monitor will be required. Composition or BTU analyzer may be required.
	Vapor Combustors	VOC	Monitor temperature, perform initial test	99% destruction efficiency

TCEQ CHEMICAL SOURCES
CURRENT BACT REQUIREMENTS FOR MSS ACTIVITIES

Storage Tanks

This information is maintained by the CHEMICAL NSR Section and is subject to change. Last update 4/2008.

Year	Source Type	Pollutant	Minimum Acceptable Control	Control Efficiency or Details
2006	Storage Tanks	All	Same as current BACT requirements, except as stated on this table.	Same as current BACT requirements, except as stated on this table.
	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.	Control device must meet BACT.
		Acid	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.	Control device must meet BACT.
	Floating Roof Landings	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. For change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.
		All	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 desinged to be drain dry with connections to control vapors under a landed roof.	Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi.

TCEQ CHEMICAL SOURCES
CURRENT BACT REQUIREMENTS FOR MSS ACTIVITIES

Equipment Leak Fugitives

This information is maintained by the CHEMICAL NSR Section and is subject to change. Last update 11/17/2006

Year	Source Type	Pollutant	Minimum Acceptable Control	Control Efficiency or Details
2006	Equipment Leak Fugitives	Uncontrolled VOC emissions < 10 tpy	Same as current BACT requirements, except as stated on this table.	Same as current BACT requirements, except as stated on this table.
		Approved odorous compounds: NH3, Cl2, H2S, etc.	Same as current BACT requirements, except as stated on this table.	Same as current BACT requirements, except as stated on this table.
	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 and properly dispose of it.
		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
		Acid	Neutralize acid with caustic and drain to the sewer.	
		Sour water	Route sour water to the sour water unit.	Alternative: Pump sour water to sour water strippers
		Sulfur	Clear sulfur to pits or sump.	
	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.	
		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.
		Sour Water	Route sour water to the sour water unit.	Alternative 1: Pump sour water to sour water strippers
				Alternative 2: Send sour water to a frac tank. Verify that there are no emissions from frac tanks.

TCEQ CHEMICAL SOURCES
CURRENT BACT REQUIREMENTS FOR MSS ACTIVITIES

Equipment Leak Fugitives

This information is maintained by the CHEMICAL NSR Section and is subject to change. Last update 11/17/2006

Year	Source Type	Pollutant	Minimum Acceptable Control	Control Efficiency or Details
		Sulfur	Clear sulfur to pits or sump.	
		Fuel gas	Purge fuel gas, natural gas, and LNG to the furnace and/or waste heat boiler.	
		Acid	Neutralize acid with caustic and drain to the sewer	
	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.	
		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.
		Sour water	Route sour water to the sour water unit.	Alternative: Pump sour water to sour water strippers.
				Alternative: Send sour water to a frac tank. Verify that there are no emissions from frac tanks.
		Sulfur	Clear sulfur to pits or sump.	
	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.
		Acid/Sulfur Recovery Unit Tail Gases	Clear acid gas, wastewater acid gas, and tail gas to reactor burners or incinerators. Send the remainder of the material to the acid gas flare.	

TCEQ COMBUSTION SOURCES
CURRENT BEST AVAILABLE CONTROL TECHNOLOGY (BACT) GUIDELINES

INTERNAL COMBUSTION ENGINES

This information is maintained by the Combustion/Coatings Section and is subject to change. Last update 3/2010

Year	Source Type	Pollutant	Minimum Acceptable Control	Control Efficiency or Details
2010	Gas Fired Internal Combustion Engines (ICE) Spark Ignited	NOx (<500 hp) NOx (>=500 hp) CO VOC	1.0 g/bhp-hr 0.5 g/bhp-hr 3.0 g/bhp-hr 1.0 g/bhp-hr	catalytic converter for rich burn no liquid fuel except for back-up (limited hours) Electric Generating Units May Be Authorized By Standard Permit
	Liquid Fired ICE Compression Ignited		Usually Authorized By PBR	Alternative (Low Emission) Fuels Only
	Electric Generating Unit Greater than 10MW	NOx (>300 hrs) NOx (<=300 hrs)	0.14 lb/MW-hr (over 300 hr/yr) 0.38 lb/MW-hr (under 300 hr/yr)	May Be Authorized By Standard Permit
	Electric Generating Unit Less than 10MW East Texas	NOx	1.90 lb/MW-hr	May Be Authorized By Standard Permit Only Units Firing Landfill Gas, Oil Field Gas, or Digester Gas With Less Than 30 Grains Sulfur per 100 dscf
		NOx (>300 hrs) NOx (<=300 hrs)	0.47 lb/MW-hr 1.65 lb/MW-hr	May Be Authorized By Standard Permit Units Installed before 1/1/2005
		NOx (>300 hrs and >250 kw) NOx (<=300 hrs or <250 kw)	0.14 lb/MW-hr 0.47 lb/MW-hr	May Be Authorized By Standard Permit Units Installed On or After 1/1/2005
	Electric Generating Unit Less than 10MW West Texas	NOx (>300 hrs) NOx (<=300 hrs)	3.11 lb/MW-hr 21 lb/MW-hr	May Be Authorized By Standard Permit
	Electric Generating Unit	SO2	Gaseous Fuel: 10 grains Sulfur per 100 dscf Liquid Fuel: 0.05 wt % Sulfur	

TCEQ Chemical Sources
Current Best Available Control Technology (BACT) Requirements

Adsorption Systems

Year	Source Type	Pollutant	Minimum Acceptable Control	Control Efficiency or Details
2011	□dsor□tio□ □□ste□s	VOC	□is□os□□e s□ste□: Mi□i□□ o□two ca·bɔn □□isters i□ series; □o□ti□□o□s e□issio□s □o□itor (CE M) an1 re□order □e□ore t□e □st □□ister, bu; □eriodi□□o□itori□□ □e□ore t□e □st □□ister may □e □□e□t□□e □or si□□e □o□□o□□d or □ow □se r□te s□ste□s	□re□t□ro□□□ □o□□e□tr□tio□ 20-100 ppm □□sed o□□e□dor re□rese□t□tio□s □or s□e□i□ □o□□o□□ds
			□e□e□er□ti□e s□ste□: Mi□i□□ o□two ca·bɔn □□isters i□ pa·al ə|; CE M o□t□e □r□o□□ed o□t□et □e□t□s), □o□itor □or vacuum d□ri□□re□e□er□tio□	□re□t□ro□□□ □o□□e□tr□tio□ 20-100 ppm □□sed o□□e□dor re□rese□t□tio□s □or s□e□i□ □o□□o□□ds; □□to□□ti□ala·m i□ □re□t□ro□□□is app·oach□d; □□to□□ti□s□□tdow□i□ □re□t□ro□□□o□□□rs

APPENDIX G
OCTOBER 9TH, 2014 TCEQ SUBMITTAL

The BACT analysis portion of the October 9th, 2014 response submittal to the TCEQ is located in this appendix.

ATTACHMENT B
Revised BACT Analysis (Section 4 of Permit Application)

SECTION 4
BEST AVAILABLE CONTROL TECHNOLOGY

This section presents the Best Available Control Technology (BACT) analysis for the proposed facilities. TCEQ requires that all facilities with pollutants subject to PSD review must evaluate and apply BACT as defined by federal regulations prior to the evaluation and application of BACT under the Texas Clean Air Act (TCAA). For facilities with pollutants subject to PSD review, BACT is defined as: "an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Federal Clean Air Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant." 30 TAC 116.160(c)(1)(A) (incorporating 40 CFR 52.21(b)(12)).

For facilities subject to the TCAA, BACT is defined as: "an air pollution control method for a new or modified facility that through experience and research, has proven to be operational, obtainable, and capable of reducing or eliminating emissions from the facility, and is considered technically practical and economically reasonable for the facility. The emissions reduction can be achieved through technology such as the use of add-on control equipment or by enforceable changes in production processes, systems, methods, or work practice." 30 TAC 116.10(1).

Just as there are two definitions of BACT, there are two methodologies for conducting BACT analyses—the TCEQ's Three-Tiered Approach and EPA's Top-Down Approach. Both methodologies are described in the TCEQ BACT guidance document "Air Pollution Control: How to Conduct a Pollution Control Evaluation" (TCEQ, 2011g). As described in the TCEQ's BACT guidance, TCEQ allows use of a three-tiered methodology to ensure that the BACT requirement is met. The evaluation begins at the first tier and progresses in sequence to the second and third tiers only if necessary. In each tier, BACT is evaluated on a case-by-case basis for technical practicability and economic reasonableness. The three tiers are briefly described as follows:

- Tier I - In the first tier, the BACT proposal is compared to the emission reduction performance levels accepted as BACT in recent NSR permit reviews for the same process and/or industry. The TCEQ has established Tier I BACT requirements for a number of industry types and the pertinent examples are cited in this application. These BACT requirements are subject to change through TCEQ case-by-case evaluation procedures.

- Tier II - If BACT requirements have not already been established for a particular process/industry or if there are compelling technical differences between the applicant facility's process and others in the same industry, the evaluation of the BACT proposal will proceed into the second tier. A Tier II BACT evaluation involves a comparison of the applicant's BACT proposal to the emission reduction performance levels that have been accepted as BACT in recent permit reviews for similar air emission streams in a different process or industry type. In-depth technical analysis, such as emission stream comparisons, may be required to determine the technical practicability of an emission reduction option that is normally used in a different process or industry type.
- Tier III -A BACT evaluation should proceed to the third tier only if the first two tiers of evaluation have failed to identify an emission reduction option(s) that is technically practicable and economically reasonable. A Tier III BACT evaluation involves a detailed technical and quantitative economic analysis of all emission reduction options available for the process/industry under review. While technical practicability is established through the demonstrated success of an emission reduction option based on previous use and/or an engineering evaluation of a new technology, economic reasonableness is determined by the cost-effectiveness of controlling emissions (expressed as dollars per ton of pollutant reduced) and does not consider the effect of emission reduction costs on corporate economics.

Below is a BACT evaluation of the proposed facilities. Tier I or Tier II BACT is appropriate for each of the proposed facilities. Tables detailing Tier 1 BACT are included in Appendix E.

4.1 Fugitive Equipment Leaks (EPN: FUG-1)

TCEQ has evaluated the technical feasibility and economic reasonableness of various control technologies for equipment leak fugitives. Based on that evaluation, TCEQ has determined that controls in the form of leak detection and repair (LDAR) programs are only justified if uncontrolled VOC emissions from equipment leak fugitives will be greater than 10 tpy. As shown on Table 1(a) in Appendix A, the uncontrolled VOCs emitted from EPN FUG-1 are estimated to be < 10 tpy, therefore, no additional control is required under current BACT Requirements for Equipment Leak Fugitives.

4.2 Storage Tanks (EPNs: 27600, 27610, 27620, 27630, 27640, 27650, 35000, 35010, 35020, 35030, 35040, 35050, 27800, 27810)

TCEQ has evaluated the technical feasibility and economic reasonableness of various control technologies for storage tanks based on their size and content. Based on that evaluation, TCEQ has identified designs and controls that represent BACT for storage tanks that have the potential to emit VOC pollutants.

All of the product storage tanks to be constructed at the Corpus Christi Terminal will have a capacity greater than 25,000 gallons and store a liquid with a vapor pressure greater than 0.5 psia. The product storage tanks will meet BACT by controlling VOC emissions with the use

of an external floating roof equipped with mechanical shoe primary seals and rim mounted secondary seals. The tank will be painted white with uninsulated surfaces. These control methods meet current BACT Requirements for Storage Tanks.

The two slop tanks (EPNs: 27800 and 27810) to be constructed at the Corpus Christi Terminal will have a capacity less than 25,000 gallons. These tanks will be submerged fill tanks with uninsulated surfaces and will be painted white. These control methods meet current BACT Requirements for Storage Tanks.

4.3 Marine Loading Operations (L-1)

TCEQ has evaluated the technical feasibility and economic reasonableness of control technologies for marine loading operations. Based on that evaluation, TCEQ has identified a VOC control device and vessel leak testing as BACT for marine loading operations for VOC when the vapor pressure of the material is greater than 0.5 psia.

At the Corpus Christi Terminal, vapors from all loading operations will be collected using methods that achieve a 99% collection efficiency and routed to a vapor combustor with a minimum VOC Destruction Removal Efficiency (DRE) of 99.5%. In addition, marine vessels will be submerged filled and subject to annual vapor tightness testing as specified in 40 CFR §63.565(c) or 40 CFR §61.304(f). This control method meets current BACT Requirements for Loading Operations.

4.4 Maintenance, Startup and Shutdown (MSS) Operations (EPN: MSS)

TCEQ has evaluated the technical feasibility and economic reasonableness of control technologies for MSS operations. Based on that evaluation, TCEQ has identified Tier 1 BACT for fixed roof tank draining and floating roof landings at storage tanks, vacuum truck operations, and small equipment maintenance.

Floating roof landings for maintenance will meet VOC BACT by degassing the tank within 24 hours of the roof landing and routing evolved vapors to the marine vapor combustor. Additionally, the new tanks will be designed to be nearly “drain dry” with a small sump located at the bottom of the tank designed to hold any liquids remaining after emptying the tank. This sump will have a surface area of less than 10 square feet. Per discussions with the TCEQ Chemical New Source Review Team, this is Tier 1 BACT as long as the emissions from tank landings will also be demonstrated to meet the National Ambient Air Quality Standards (NAAQS). The proposed floating roof landings will therefore meet current BACT for Storage Tank MSS Activities.

Small equipment maintenance such as pump maintenance and pipeline openings (pig receiver/launcher openings included) will meet VOC BACT by sending materials back into the tanks to be recovered. If there is any remaining liquid left in the pump or pipeline, it will be drained to a pan and put into a closed container. The proposed small maintenance activities will therefore meet current BACT for Fugitive MSS Activities.

Vacuum truck operations will be controlled by a carbon adsorption system with a maximum outlet/exhaust concentration of 100 ppmv, consistent with current BACT and recent permits issued for similar facilities in the same vicinity.

4.5 Vapor Combustor (EPN: V-1)

TCEQ has evaluated the technical feasibility and economic reasonableness of control technologies for vapor combustors. Based on that evaluation, TCEQ has identified Tier 1 BACT for VOC destruction efficiency.

A vapor combustor will be used to control VOC emissions from ocean-going barge or ship loading and tank MSS activities. The chamber temperature of the vapor combustor will be monitored to assure the Destruction Removal Efficiency (DRE) of 99.5% is being achieved. Additionally, an initial stack test on the vapor combustor (EPN: V-1) will be performed when the vapor combustor is installed at the facility. The fuel burned in the vapor combustor will consist of commercially available pipeline quality sweet natural gas. The proposed vapor combustor will therefore meet current BACT requirements.

4.6 Emergency Generator (EPN: EMERGEN)

TCEQ has evaluated the technical feasibility and economic reasonableness of control technologies for internal combustion engines. Based on that evaluation, TCEQ has identified Tier 1 BACT for engine combustion control efficiencies.

The emergency engine will meet VOC BACT by maintaining a VOC emission rate equal to or less than 1.0 grams VOC per brake horsepower-hour (g/bhp-hr). The engine will be manufactured in compliance with NSPS JJJJ which will ensure the emission rate of 1 g/bhp-hr or less. This control method meets current BACT Requirements for Internal Combustion Engines.

ATTACHMENT C
BACT Summary from Recent Texas Permits

Summary of BACT Requirements for Recently Issued Permits in Texas

Emission Source	Magellan Terminals Holdings, Permit Number 56470 Issued Date: 03/2014	Trafigura Terminals, LLC Permit Numbers 106594 and PSDTX1324 Issued Date: 02/2014
Storage Tanks	**Emission Control Options:** - IFR with either 1) liquid mounted seal; 2) two continuous seals mounted one above the other; or 3) mechanical shoe seal. OR - EFR with primary seal consisting of mechanical shoe seal or liquid mounted seal and secondary rim-mounted seal.	**Emission Control Options:** - IFR with either 1) liquid mounted seal; 2) two continuous seals mounted one above the other; or 3) mechanical shoe seal. OR - EFR with primary seal consisting of mechanical shoe seal or liquid mounted seal and secondary rim-mounted seal.
Marine Loading	- All loading shall be submerged. - Emissions from the loading of all products with vapor pressures greater than 0.5 pound per square inch, absolute (psia) shall be controlled by routing the emissions from the vessel to the vapor combustors (99.5% control).	- All loading shall be submerged. - Control: Vapor combustor achieve 99.5% control - Annual vapor tightness testing required [40 CFR 63.565(c) or 61.304(f)]
Vapor Combustion Unit	- Achieve 99.5% control of the loading emissions directed to it. - Fuel gas combusted at this facility shall be sweet natural gas containing no more than 5 grains of total sulfur per 100 dry standard cubic feet.	- Achieve 99.5% control of the loading emissions directed to it. - Fuel gas combusted at this facility shall be sweet natural gas containing no more than 5 grains of total sulfur per 100 dry standard cubic feet.
Equipment Fugitives	28M LDAR Program.	28VHP LDAR program.
MSS	**Tank Floating Roof Landing** - The tank shall not remain idle for more than 24 hours after emptying it. - Controlled Tank Degassing: floating roof is routed to control or a controlled recovery system and maintain until the VOC concentration is less than 10,000 ppmv or 10 percent of the LEL - Controlled Tank Refilling: 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 **Vacuum and air mover truck operations *(03/14)*** - If the VOC partial pressure of the liquid in or being transferred to the truck is greater than 0.50 psi at 95°F, the vacuum/blower exhaust shall be routed to a control device or a controlled recovery system	**Tank Floating Roof Landing:** - The tank shall not remain idle for more than 24 hours after emptying it. - Controlled Degassing: 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 VOC concentration is less than 10,000 ppmv or 10 percent of the LEL. - Controlled Tank Refilling: 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 **Vacuum and air mover truck operations** - If the VOC partial pressure of the liquid in or being transferred to the truck is greater than 0.50 psi at 95°F, the vacuum/blower exhaust shall be routed to a control device or a controlled

ATTACHMENT D
BACT Summary from Recent Louisiana Permits

Louisiana DEQ
PSD Permits Issued between January 1, 201 and October 1, 2014

	AI Number	AI Name	Permit Writer Name	Final Task	Final Task Date	AI Parish	Activity Type	Activity Number	Permit Type	Permit Number	Application Received
	152139	ADA Carbon Solutions (Red River) LLC - Red River Plant	Duhon, Dustin	Issue Final Decision	22-Dec-11	Red River	Modification Application	PER20110006	PSD Permit Modification	PSD-LA-727(M-1)	22-Dec-11
	152139	ADA Carbon Solutions (Red River) LLC - Red River Plant	Ghosn, Hassan	Issue Final Decision	20-Dec-13	Red River	Modification Application	PER20130001	PSD Permit Modification	##nopermitno##	06-May-13
	180618	Air Products & Chemicals Inc - Norco Hydrogen Plant	Nguyen, Dan	Issue Final Decision	15-Dec-10	St. Charles	New Application	PER20100002	PSD Permit Initial	PSD-LA-750	17-Aug-10
	180618	Air Products & Chemicals Inc - Norco Hydrogen Plant	Nguyen, Dan	Issue Final Decision	04-Sep-12	St. Charles	Modification Application	PER20120003	PSD Permit Modification	PSD-LA-750 (M-1)	29-Feb-12
1	3116	Alon Refining Krotz Springs Inc	Zhang, Qingming	Issue Final Decision	01-Oct-10	St. Landry	Modification Application	PER20080014	PSD Permit Modification	PSD-LA-745	16-Oct-08
2	3116	Alon Refining Krotz Springs Inc	Zhang, Qingming	Issue Final Decision	18-Jul-11	St. Landry	Modification Application	PER20110003	PSD Permit Modification	PSD-LA-745 (M-1)	22-Mar-11
3	3116	Alon Refining Krotz Springs Inc	Zhang, Qingming	Issue Final Decision	26-Apr-12	St. Landry	Modification Application	PER20120004	PSD Permit Modification	PSD-LA-745 (M-2)	28-Mar-12
4	3116	Alon Refining Krotz Springs Inc	Zhang, Qingming	Issue Final Decision	26-Sep-13	St. Landry	Modification Application	PER20130005	PSD Permit Modification	PSD-LA-745 (M-3)	14-Aug-13
	2384	Americas Styrenics LLC - St James Plant	Zhang, Qingming	Issue Final Decision	11-Apr-11	St. James	Modification Application	PER20100010	PSD Permit Modification	PSD-LA-551 (M-8)	11-Nov-10
	2384	Americas Styrenics LLC - St James Plant	Zhang, Qingming	Issue Final Decision	13-Mar-14	St. James	Modification Application	PER20140002	PSD Permit Modification	PSD-LA-551 (M-9)	13-Feb-14
	185670	Benteler Steel/Tube Manufacturing Corp	Nguyen, Dan	Issue Final Decision	17-May-13	Caddo	New Application	PER20130002	PSD Permit Initial	PSD-LA-774	15-Jan-13
	188813	Big Lake Fuels LLC	Prestenbach, Kyle	Issue Final Decision	23-May-14	Calcasieu	New Application	PER20130002	PSD Permit Initial	PSD-LA-781	04-Sep-13
	1647	Boise Cascade Wood Products LLC - Florien Plywood Plant	Pusateri, Shannon	Issue Final Decision	31-Jan-12	Sabine	Modification Application	PER20100002	PSD Permit Modification	PSD-LA-755	19-Feb-10
	4045	Boise Cascade Wood Products LLC - Oakdale Plywood Plant	Jack, Rusty	Issue Final Decision	27-Jun-13	Allen	Modification Application	PER20100007	PSD Permit Modification	PSD-LA-743 (M-1)	23-Dec-10
	19933	Boise Inc - DeRidder Paper Mill	Smith, Christopher	Issue Final Decision	28-Jun-13	Beauregard	Modification Application	PER20120007	PSD Permit Modification	PSD-LA-77(M-3)	02-Jun-11
	19933	Boise Inc - DeRidder Paper Mill	Smith, Christopher	Issue Final Decision	28-Jun-13	Beauregard	Modification Application	PER20120009	PSD Permit Modification	PSD-LA-687(M-1)	02-Jun-11
	19933	Boise Inc - DeRidder Paper Mill	Smith, Christopher	Issue Final Decision	09-Sep-14	Beauregard	Modification Application	PER20140003	PSD Permit Modification	PSD-LA-687(M-2)	24-Jun-14
	19901	Cabot Corp - Canal Plant	Ghosn, Hassan	Issue Final Decision	03-Dec-12	St. Mary	Modification Application	PER20110005	PSD Permit Modification	PSD-LA-591 (M-3)	12-Aug-11
	99407	Cameron LNG LLC - Cameron LNG Facility	Nguyen, Dan	Issue Final Decision	01-Oct-13	Cameron	New Application	PER20120002	PSD Permit Initial	PSD-LA-766	21-Aug-12
	99407	Cameron LNG LLC - Cameron LNG Facility	Nguyen, Dan	Issue Final Decision	26-Jun-14	Cameron	Modification Application	PER20140006	PSD Permit Modification	PSD-LA-766 (M-1)	04-Jun-14
	51854	Carville Energy LLC - Carville Energy Center	Smith, Christopher	Issue Final Decision	20-Aug-13	Iberville	Modification Application	PER20130001	PSD Permit Modification	PSD-LA-638(M-3)	04-Mar-13
	2416	CF Industries Nitrogen LLC - Donaldsonville Nitrogen Complex	Wittenburg, Kermit	Issue Final Decision	04-Apr-12	Ascension	Modification Application	PER20110005	PSD Permit Initial	PSD-LA-758	24-Oct-11
	2245	CF Industries Nitrogen LLC - Donaldsonville Nitrogen Complex	Wittenburg, Kermit	Issue Final Decision	23-Jul-12	Ascension	New Application	PER20110008	PSD Permit Initial	PSD-LA-757	23-Nov-11
	2416	CF Industries Nitrogen LLC - Donaldsonville Nitrogen Complex	Wittenburg, Kermit	Issue Final Decision	15-Jul-13	Ascension	New Application	PER20120005	PSD Permit Initial	PSD-LA-772	20-Dec-12
	2416	CF Industries Nitrogen LLC - Donaldsonville Nitrogen Complex	Wittenburg, Kermit	Issue Final Decision	15-Dec-10	Ascension	Modification Application	PER20100006	PSD Permit Modification	PSD-LA-744 (M-1)	30-Aug-10
	50619	Cheniere Creole Trail Pipeline LP - Gillis Compressor Station	Mccurry, Doug	Issue Final Decision	31-Oct-13	Beauregard	New Application	PER20120002	PSD Permit Initial	##nopermitno##	30-Apr-12
	189205	Cheniere Creole Trail Pipeline LP - Mamou Compressor Station	Chu, Dasheng	Issue Final Decision	02-Jun-14	Evangeline	New Application	PER20130002	PSD Permit Initial	PSD-LA-782	30-Sep-13
5	1250	Citgo Petroleum Corp - Lake Charles Manufacturing Complex	Randall, Anthony	Issue Final Decision	05-Jan-11	Calcasieu	Modification Application	PER20100010	PSD Permit Modification	PSD-LA-222 (M-1)	08-Oct-10
6	1250	Citgo Petroleum Corp - Lake Charles Manufacturing Complex	Randall, Anthony	Issue Final Decision	27-Jul-11	Calcasieu	Modification Application	PER20110003	PSD Permit Modification	PSD-LA-180(M-1)	14-Feb-11
7	1250	Citgo Petroleum Corp - Lake Charles Manufacturing Complex	Randall, Anthony	Issue Final Decision	22-May-14	Calcasieu	Modification Application	PER20140001	PSD Permit Modification	PSD-LA-643(M-2)	03-Feb-14
	2922	CLECO - Brame Energy Center	Duhon, Dustin	Issue Final Decision	05-Dec-12	Rapides	Modification Application	PER20120001	PSD Permit Modification	PSD-LA-711 (M-3)	03-Feb-12
	2922	CLECO - Brame Energy Center	Jack, Rusty	Issue Final Decision	23-Feb-11	Rapides	Modification Application	PER20100013	PSD Permit Modification	PSD-LA-711 (M-2)	22-Nov-10
1	27646	Colonial Pipeline Co - Baton Rouge Tank Farm	Nguyen, Dan	Issue Final Decision	12-Feb-14	East Feliciana	Modification Application	PER20130004	PSD Permit Modification	PSD-LA-741 (M-3)	25-Sep-13
2	27646	Colonial Pipeline Co - Baton Rouge Tank Farm	Nguyen, Dan	Issue Final Decision	20-Nov-12	East Feliciana	Modification Application	PER20120002	PSD Permit Modification	PSD-LA-741(M-2)	15-Jun-12
	44779	Columbia Gulf Transmission Co - Alexandria Compressor Station	Chu, Dasheng	Issue Final Decision	21-Jul-14	Rapides	New Application	PER20140002	PSD Permit Initial	PSD-LA-787	11-Apr-14
	4998	Columbian Chemicals Co - North Bend Plant	Capone, Erika	Issue Final Decision	26-Apr-13	St. Mary	Modification Application	PER20120006	PSD Permit Modification	PSD-LA-580 (M-7)	28-Dec-12
	4998	Columbian Chemicals Co - North Bend Plant	Jack, Rusty	Issue Final Decision	26-Apr-11	St. Mary	Modification Application	PER20100005	PSD Permit Modification	PSD-LA-580 (M-6)	12-Jan-10
	1357	Cornerstone Chemical Co	Hurst, Fritz	Issue Final Decision	03-May-12	Jefferson	Modification Application	PER20110016	PSD Permit Modification	PSD-LA-575 (M-2)	22-Mar-11
	27985	DCP Midstream LP - Minden Gas Plant	Nguyen, Tuongvan	Issue Final Decision	01-Nov-12	Webster	Modification Application	PER20120002	PSD Permit Modification	PSD-LA-614 (M-4)	12-Oct-12
	27985	DCP Midstream LP - Minden Gas Plant	Pan, Dawei	Issue Final Decision	26-Jan-11	Webster	Modification Application	PER20100002	PSD Permit Modification	PSD-LA-614 (M-3)	09-Jul-10
	184235	Dyno Nobel LA Ammonia LLC - Ammonia Plant at Cornerstone Fortier Facilty	Chu, Dasheng	Issue Final Decision	27-Mar-13	Jefferson	New Application	PER20120002	PSD Permit Initial	PSD-LA-768	05-Oct-12
	184235	Dyno Nobel LA Ammonia LLC - Ammonia Plant at Cornerstone Fortier Facilty	Chu, Dasheng	Issue Final Decision	14-Oct-13	Jefferson	Modification Application	PER20130002	PSD Permit Modification	PSD-LA-768 (M-1)	04-Oct-13
	1255	Eagle US 2 LLC - Lake Charles Complex	Zhang, Qingming	Issue Final Decision	14-Oct-11	Calcasieu	Modification Application	PER20110009	PSD Permit Modification	PSD-LA-637 (M-3)	15-Apr-11
	1255	Eagle US 2 LLC - Lake Charles Complex	Zhang, Qingming	Issue Final Decision	27-Jan-10	Calcasieu	Modification Application	PER20090033	PSD Permit Modification	PSD-LA-637 (M-2)	11-Dec-09
	17715	EnLink Processing Services LLC - Eunice Gas Extraction Plant	Zhang, Qingming	Issue Final Decision	01-May-13	Acadia	Modification Application	PER20120005	PSD Permit Modification	PSD-LA-569 (M-1)	21-Sep-12
	17715	EnLink Processing Services LLC - Eunice Gas Extraction Plant	Zhang, Qingming	Issue Final Decision	14-Feb-14	Acadia	Modification Application	PER20140002	PSD Permit Modification	PSD-LA-569 (M-2)	03-Feb-14
	184873	EnLink Processing Services LLC - Plaquemine NGL Fractionation Plant	Mccurry, Doug	Issue Final Decision	24-May-13	Iberville	New Application	PER20120002	PSD Permit Initial	PSD-LA-771	07-Nov-12
	81859	Entergy Gulf States LA LLC - Calcasieu Plant	Green, Lance	Issue Final Decision	21-Dec-11	Calcasieu	New Application	PER20090003	PSD Permit Initial	##nopermitno##	06-Nov-09
	1186	Entergy Gulf States LA LLC - Louisiana Station Electrical Generating Plant	Smith, Christopher	Issue Final Decision	16-Dec-13	East Baton Rouge	Modification Application	PER20130005	PSD Permit Modification	PSD-LA-538 (M-4)	07-Aug-13
	9142	Entergy Gulf States LA LLC - Nelson Industrial Steam Co (NISCO)	Ghosn, Hassan	Issue Final Decision	05-Jan-12	Calcasieu	Modification Application	PER20110001	PSD Permit Modification	##nopermitno##	25-Jul-11
	2841	Entergy Louisiana LLC - Ninemile Point Plant	Smith, Christopher	Issue Final Decision	16-Aug-11	Jefferson	New Application	PER20100005	PSD Permit Initial	PSD-LA-752	03-Sep-10
	2841	Entergy Louisiana LLC - Ninemile Point Plant	Smith, Christopher	Issue Final Decision	07-Feb-14	Jefferson	Modification Application	PER20130005	PSD Permit Modification	PSD-LA-752(M-1)	12-Dec-13
8	2638	ExxonMobil Baton Rouge Refinery	Pan, Dawei	Issue Final Decision	01-Oct-13	East Baton Rouge	New Application	PER20130004	PSD Permit Initial	PSD-LA-775	31-Jan-13
9	2638	ExxonMobil Baton Rouge Refinery	Pan, Dawei	Issue Final Decision	22-Jan-10	East Baton Rouge	Modification Application	PER20090010	PSD Permit Modification	PSD-LA-667(M-3)	10-Jun-09
10	2638	ExxonMobil Baton Rouge Refinery	Pan, Dawei	Issue Final Decision	13-Oct-11	East Baton Rouge	Modification Application	PER20100021	PSD Permit Modification	PSD-LA-667(M-4)	15-Nov-10
11	1376	ExxonMobil Oil Corp - Chalmette Refining LLC	Quadri, Syed	Issue Final Decision	14-Jul-10	St. Bernard	Modification Application	PER20100006	PSD Permit Modification	PSD-LA-199(M-9)	19-Mar-10
12	1376	ExxonMobil Oil Corp - Chalmette Refining LLC	Quadri, Syed	Issue Final Decision	01-Oct-10	St. Bernard	Modification Application	PER20100023	PSD Permit Modification	PSD-LA-199(M-10)	20-Jul-10
13	1376	ExxonMobil Oil Corp - Chalmette Refining LLC	Quadri, Syed	Issue Final Decision	07-Sep-12	St. Bernard	Modification Application	PER20120006	PSD Permit Modification	##nopermitno##	05-Sep-12
	166443	FloPam Inc - Flopam Facility	Nguyen, Dan	Issue Final Decision	14-Jun-10	Iberville	New Application	PER20090002	PSD Permit Initial	PSD-LA-747	21-Aug-09
	166443	FloPam Inc - Flopam Facility	Nguyen, Dan	Issue Final Decision	26-Apr-11	Iberville	Modification Application	PER20100005	PSD Permit Modification	PSD-LA-747 (M-1)	18-Nov-10
	166443	FloPam Inc - Flopam Facility	Nguyen, Dan	Issue Final Decision	05-Jul-12	Iberville	Modification Application	PER20120005	PSD Permit Modification	PSD-LA-747 (M-2)	01-Jun-12
	166443	FloPam Inc - Flopam Facility	Nguyen, Dan	Issue Final Decision	13-May-13	Iberville	Modification Application	PER20130003	PSD Permit Modification	PSD-LA-747 (M-3)	28-Feb-13
	288	Formosa Plastics Corp Louisiana	Dugas, Lourdes	Issue Final Decision	01-Jul-10	East Baton Rouge	Modification Application	PER20090015	PSD Permit Modification	PSD-LA-560 (M-5)	23-Dec-09
	12483	Georgia Pacific Wood Products South LLC	Smith, Charles	Issue Final Decision	31-Jan-14	Beauregard	New Application	PER20120002	PSD Permit Initial	PSD-LA-770	18-May-12
	2617	Georgia-Pacific Consumer Operations LLC - Port Hudson Operations	Nguyen, Dan	Issue Final Decision	07-Feb-11	East Baton Rouge	Modification Application	PER20100007	PSD Permit Modification	##nopermitno##	14-Oct-10
	2617	Georgia-Pacific Consumer Operations LLC - Port Hudson Operations	Nguyen, Dan	Issue Final Decision	01-May-12	East Baton Rouge	Modification Application	PER20120003	PSD Permit Modification	PSD-LA-581(M-6)	30-Jan-12
	183941	Hinterland LLC - Hinterland Manufacturing Facility	Bains, Frank	Issue Final Decision	07-Apr-14	Concordia	New Application	PER20130003	PSD Permit Initial	PSD-LA-776	22-Mar-13
	1993	Hunt Forest Products Inc - Pollock Plywood Mill	Jack, Rusty	Issue Final Decision	25-May-11	Grant	New Application	PER20100004	PSD Permit Initial	PSD-LA-753	20-Sep-10
	4885	International Matex Tank Terminals - St Rose Terminal	Mathis, Corbet	Issue Final Decision	20-May-10	St. Charles	Modification Application	PER20090011	PSD Permit Modification	PSD-LA-736(M-2)	13-Aug-09
	38936	International Paper - Bogalusa Mill	Clary, Shane	Issue Final Decision	02-Feb-11	Washington	New Application	PER20060003	PSD Permit Initial	PSD-LA-748	14-Sep-06
	38936	International Paper - Bogalusa Mill	Clary, Shane	Issue Final Decision	02-Feb-11	Washington	Modification Application	PER20100001	PSD Permit Modification	PSD-LA-547(M-3)	05-May-10
	38936	International Paper - Bogalusa Mill	Nguyen, Dan	Issue Final Decision	25-Apr-14	Washington	Modification Application	PER20130004	PSD Permit Modification	PSD-LA-547 (M-4)	28-Mar-13

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	38936	International Paper - Bogalusa Mill	Nguyen, Dan	Issue Final Decision	25-Apr-14	Washington	Modification Application	PER20130005	PSD Permit Modification	PSD-LA-657 (M-1)	28-Mar-13
	328	International Paper Co - Mansfield Mill	Clary, Shane	Issue Final Decision	04-Mar-11	DeSoto	Modification Application	PER20100008	PSD Permit Modification	PSD-LA-93 (M-8)	02-Dec-10
	2645	International Paper Red River Mill	Clary, Shane	Issue Final Decision	09-May-11	Natchitoches	Modification Application	PER20100006	PSD Permit Modification	PSD-LA-562 (M-4)	14-Sep-10
	2073	KPAQ Industries LLC - St Francisville Operations	Ghosn, Hassan	Issue Final Decision	26-Nov-12	West Feliciana	Modification Application	PER20120002	PSD Permit Modification	PSD-LA-540 (M-4)	16-Jul-12
	179048	LA Energy & Power Authority (LEPA) - Morgan City Power Plant	Prestenbach, Kyle	Issue Final Decision	26-Sep-13	St. Mary	New Application	PER20120002	PSD Permit Initial	PSD-LA-767	25-Sep-12
	185544	LA Pellets Inc - Urania Mill	Zhang, Qingming	Issue Final Decision	28-May-13	LaSalle	New Application	PER20120002	PSD Permit Initial	PSD-LA-773	27-Dec-12
	160213	Lake Charles Clean Energy LLC - Lake Charles Gasification Facility	Nguyen, Dan	Issue Final Decision	29-Jun-12	Calcasieu	Modification Application	PER20120003	PSD Permit Modification	PSD-LA-742 (M-2)	17-May-12
	160213	Lake Charles Clean Energy LLC - Lake Charles Gasification Facility	Nguyen, Dan	Issue Final Decision	30-Dec-10	Calcasieu	Modification Application	PER20100002	PSD Permit Modification	PSD-LA-742 (M-1)	17-Dec-10
	11917	Louisiana Generating LLC - Big Cajun 1 Power Plant (Steam)	Jack, Rusty	Issue Final Decision	31-May-13	Pointe Coupee	Modification Application	PER20120004	PSD Permit Modification	PSD-LA-660(M-2)	16-Nov-12
	11496	Louisiana Pigment Co LP - Titanium Dioxide Plant	Wittenburg, Kermit	Issue Final Decision	21-Dec-10	Calcasieu	Modification Application	PER20090007	PSD Permit Modification	PSD-LA-749	12-Nov-09
14	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	08-Jul-10	St. John the Bapt	Modification Application	PER20080020	PSD Permit Modification	PSD-LA-719(M-2)	06-Jun-08
15	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	29-Nov-10	St. John the Bapt	Modification Application	PER20100011	PSD Permit Modification	(GME)PSD-LA-719(M-	19-Oct-10
16	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	07-Sep-12	St. John the Bapt	Modification Application	PER20120013	PSD Permit Modification	##nopermitno##	30-May-12
17	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	19-Feb-14	St. John the Bapt	Modification Application	PER20130012	PSD Permit Modification	PSD-LA-719(M-9)	27-Jan-14
18	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	08-Jun-11	St. John the Bapt	Modification Application	PER20110005	PSD Permit Modification	(GME)PSD-LA-719(M-	08-Feb-11
19	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	29-Sep-11	St. John the Bapt	Modification Application	PER20110012	PSD Permit Modification	PSD-LA-640(M-2)	24-May-11
20	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	29-Sep-11	St. John the Bapt	Modification Application	PER20110011	PSD Permit Modification	##nopermitno##	24-May-11
21	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	21-Dec-11	St. John the Bapt	Modification Application	PER20110013	PSD Permit Modification	(GME)PSD-LA-719(M-	24-May-11
22	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	13-Jun-12	St. John the Bapt	Modification Application	PER20110022	PSD Permit Modification	##nopermitno##	29-Nov-11
23	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	17-Jun-13	St. John the Bapt	Modification Application	PER20130005	PSD Permit Modification	PSD-LA-PSD(M-8)	31-Jan-13
24	3165	Marathon Petroleum Co LP - LA Refining Division - Garyville Refinery	Quadri, Syed	Issue Final Decision	21-Jul-14	St. John the Bapt	Modification Application	PER20140004	PSD Permit Modification	PSD-LA-719(M-10)	24-Mar-14
	32484	Martco Limited Partnership - Chopin Mill	Ghosn, Hassan	Issue Final Decision	18-Mar-14	Natchitoches	New Application	PER20130003	PSD Permit Initial	##nopermitno##	07-Nov-13
	125298	Martco Limited Partnership - Oakdale OSB Plant	Pusateri, Shannon	Issue Final Decision	22-Aug-11	Allen	Modification Application	PER20090004	PSD Permit Modification	PSD-LA-710 (M-1)	08-Sep-09
	181192	Methanex USA LLC - Geismar Methanol Plant	Zhang, Qingming	Issue Final Decision	07-Nov-12	Ascension	New Application	PER20120002	PSD Permit Initial	PSD-LA-761	22-Mar-12
	181192	Methanex USA LLC - Geismar Methanol Plant	Chu, Dasheng	Issue Final Decision	12-Sep-13	Ascension	Modification Application	PER20130003	PSD Permit Modification	PSD-LA-761 (M-1)	16-Apr-13
	181192	Methanex USA LLC - Geismar Methanol Plant	Chu, Dasheng	Issue Final Decision	14-Jan-14	Ascension	Modification Application	PER20140002	PSD Permit Modification	PSD-LA-761 (M-2)	02-Jan-14
	2425	Mosaic Fertilizer LLC - Faustina Plant	Dugas, Lourdes	Issue Final Decision	18-Aug-14	St. James	New Application	PER20130007	PSD Permit Initial	PSD-LA-783	30-Aug-13
	2425	Mosaic Fertilizer LLC - Faustina Plant	Pusateri, Shannon	Issue Final Decision	21-Jan-10	St. James	Modification Application	PER20090006	PSD Permit Modification	PSD-LA-602(M-2)	12-Oct-09
25	1406	Motiva Enterprises LLC - Norco Refinery	Quadri, Syed	Issue Final Decision	08-Jul-10	St. Charles	Modification Application	PER20100013	PSD Permit Modification	PSD-LA-618(M-1)	21-Apr-10
	1388	Noranda Alumina LLC	Ghosn, Hassan	Issue Final Decision	15-Feb-11	St. James	Modification Application	PER20070006	PSD Permit Modification	PSD-LA-684 (M-1)	09-Apr-07
	157847	Nucor Steel Louisiana LLC - Nucor Steel Direct Reduced Iron Facility	Wittenburg, Kermit	Issue Final Decision	24-May-10	St. James	New Application	PER20080002	PSD Permit Initial	PSD-LA-740	12-May-08
	157847	Nucor Steel Louisiana LLC - Nucor Steel Direct Reduced Iron Facility	Green, Lance	Issue Final Decision	27-Jan-11	St. James	New Application	PER20100004	PSD Permit Initial	PSD-LA-751	20-Aug-10
	157847	Nucor Steel Louisiana LLC - Nucor Steel Direct Reduced Iron Facility	Johnston, Bryan	Issue Final Decision	16-Nov-12	St. James	Modification Application	PER20120002	PSD Permit Modification	PSD-LA-751(M-1)	20-Jul-12
	157847	Nucor Steel Louisiana LLC - Nucor Steel Direct Reduced Iron Facility	Wittenburg, Kermit	Issue Final Decision	09-Jul-13	St. James	Modification Application	PER20130002	PSD Permit Modification	PSD-LA-740 (M-1)	04-Apr-13
	157847	Nucor Steel Louisiana LLC - Nucor Steel Direct Reduced Iron Facility	Mathis, Corbet	Issue Final Decision	26-Nov-13	St. James	Modification Application	PER20130005	PSD Permit Modification	PSD-LA-751(M-2)	16-Jul-13
	1137	Occidental Chemical Corp - Taft Plant	Duhon, Dustin	Issue Final Decision	22-Jun-10	St. Charles	Modification Application	PER20090014	PSD Permit Modification	PSD-LA-633(M-2)	12-Oct-09
26	2418	Phillips 66 Co - Alliance Refinery	Mathis, Corbet	Issue Final Decision	25-Jul-12	Plaquemines	New Application	PER20110009	PSD Permit Initial	PSD-LA-760	19-Dec-11
27	2538	Phillips 66 Co - Lake Charles Refinery	Zhang, Qingming	Issue Final Decision	16-Sep-13	Calcasieu	New Application	PER20120013	PSD Permit Initial	PSD-LA-763	31-May-12
28	2538	Phillips 66 Co - Lake Charles Refinery	Zhang, Qingming	Issue Final Decision	14-Jun-11	Calcasieu	Modification Application	PER20110001	PSD Permit Modification	PSD-LA-699 (M-1)	14-Feb-11
29	2366	Placid Refining Co LLC - Placid Refining Co	Quadri, Syed	Issue Final Decision	19-Jan-11	West Baton Roug	Modification Application	PER20100007	PSD Permit Modification	PSD-LA-11(M-1)	21-Oct-10
	119267	Sabine Pass LNG LP - Sabine Pass LNG Terminal	Nguyen, Dan	Issue Final Decision	22-Mar-13	Cameron	Modification Application	PER20120003	PSD Permit Modification	PSD-LA-703 (M-4)	29-Jun-12
	119267	Sabine Pass LNG LP - Sabine Pass LNG Terminal	Nguyen, Dan	Issue Final Decision	06-Dec-11	Cameron	Modification Application	PER20100002	PSD Permit Modification	PSD-LA-703 (M-3)	21-Dec-10
	3271	Sasol North America Inc - Lake Charles Chemical Complex	Johnston, Bryan	Issue Final Decision	23-May-14	Calcasieu	New Application	PER20130026	PSD Permit Initial	PSD-LA-778	30-Apr-13
	3271	Sasol North America Inc - Lake Charles Chemical Complex	Johnston, Bryan	Issue Final Decision	23-May-14	Calcasieu	New Application	PER20130016	PSD Permit Initial	PSD-LA-779	30-Apr-13
	3271	Sasol North America Inc - Lake Charles Chemical Complex	Nguyen, Dan	Issue Final Decision	29-Nov-10	Calcasieu	Modification Application	PER20090010	PSD Permit Modification	PSD-LA-291 (M-3)	17-Sep-09
	126578	Shintech Louisiana LLC - Shintech Plaquemine Plant	Randall, Anthony	Issue Final Decision	29-Jun-10	Iberville	New Application	PER20070012	PSD Permit Initial	PSD-LA-739	26-Dec-07
	126578	Shintech Louisiana LLC - Shintech Plaquemine Plant	Randall, Anthony	Issue Final Decision	04-Sep-13	Iberville	New Application	PER20120021	PSD Permit Initial	PSD-LA-777	26-Nov-12
	126578	Shintech Louisiana LLC - Shintech Plaquemine Plant	Randall, Anthony	Issue Final Decision	25-Sep-13	Iberville	Modification Application	PER20120018	PSD Permit Modification	PSD-LA-709 (M-2)	26-Nov-12
	126578	Shintech Louisiana LLC - Shintech Plaquemine Plant	Randall, Anthony	Issue Final Decision	25-Sep-13	Iberville	Modification Application	PER20120020	PSD Permit Modification	PSD-LA-731(M-1)	26-Nov-12
	188074	South LA Methanol LP - St James Methanol Plant	Chu, Dasheng	Issue Final Decision	23-Dec-13	St. James	New Application	PER20130002	PSD Permit Initial	PSD-LA-780	11-Jul-13
	182519	Sundrop Fuels Louisiana LLC - Rapides Station Fuels Facility	Chu, Dasheng	Issue Final Decision	13-Nov-12	Rapides	New Application	PER20120002	PSD Permit Initial	PSD-LA-764	14-Jun-12
	182519	Sundrop Fuels Louisiana LLC - Rapides Station Fuels Facility	Chu, Dasheng	Issue Final Decision	04-Sep-13	Rapides	Modification Application	PER20130002	PSD Permit Modification	PSD-LA-764 (M-1)	03-Jun-13
	17897	Targa Midstream Services LLC - Venice Gas Processing Plant	Randall, Anthony	Issue Final Decision	08-Jun-11	Plaquemines	Modification Application	PER20110001	PSD Permit Modification	PSD-LA-612 (M-1)	28-Feb-11
	2083	Union Carbide Corp - St Charles Operations	Dugas, Lourdes	Issue Final Decision	07-Feb-11	St. Charles	Modification Application	PER20100017	PSD Permit Modification	PSD-LA-590 (M1)	18-Dec-09
	2083	Union Carbide Corp - St Charles Operations	Dugas, Lourdes	Issue Final Decision	31-Jan-13	St. Charles	Modification Application	PER20110026	PSD Permit Modification	PSD-LA-583 (M-1)	27-Jun-11
30	1238	Valero Refining - Meraux LLC - Meraux Refinery	Quadri, Syed	Issue Final Decision	27-Mar-14	St. Bernard	Modification Application	PER20130005	PSD Permit Modification	PSD-LA-566(M-1)	24-Jun-13
31	26003	Valero Refining Co - New Orleans LLC - St Charles Refinery	Nguyen, Dan	Issue Final Decision	15-Dec-10	St. Charles	New Application	PER20100009	PSD Permit Initial	PSD-LA-750	17-Aug-10
32	26003	Valero Refining Co - New Orleans LLC - St Charles Refinery	Nguyen, Dan	Issue Final Decision	31-Dec-10	St. Charles	Modification Application	PER20100008	PSD Permit Modification	PSD-LA-619 (M-6)	30-Jul-10
33	26003	Valero Refining Co - New Orleans LLC - St Charles Refinery	Nguyen, Dan	Issue Final Decision	02-Oct-12	St. Charles	Modification Application	PER20110006	PSD Permit Modification	PSD-LA-619 (M-7)	08-Aug-11
34	26003	Valero Refining Co - New Orleans LLC - St Charles Refinery	Nguyen, Dan	Issue Final Decision	08-Nov-12	St. Charles	Modification Application	PER20120016	PSD Permit Modification	PSD-LA-619 (M8)	05-Nov-12
35	26003	Valero Refining Co - New Orleans LLC - St Charles Refinery	Nguyen, Dan	Issue Final Decision	28-Dec-12	St. Charles	Modification Application	PER20120018	PSD Permit Modification	PSD-LA-619(M-9)	27-Nov-12
36	26003	Valero Refining Co - New Orleans LLC - St Charles Refinery	Nguyen, Dan	Issue Final Decision	29-Apr-13	St. Charles	Modification Application	PER20130008	PSD Permit Modification	PSD-LA-619 (M10)	11-Apr-13
37	26003	Valero Refining Co - New Orleans LLC - St Charles Refinery	Nguyen, Dan	Issue Final Decision	05-Mar-14	St. Charles	Modification Application	PER20130014	PSD Permit Modification	PSD-LA-619 (M-11)	24-Oct-13
	2866	West Fraser Inc - Joyce Sawmill	Nguyen, Dan	Issue Final Decision	16-Aug-11	Winn	Modification Application	PER20110002	PSD Permit Modification	PSD-LA-701 (M-1)	02-Feb-11
	6164	Westlake Chemical OPCO LP	Burke, David	Issue Final Decision	12-Apr-11	Calcasieu	Modification Application	PER20110002	PSD Permit Modification	##nopermitno##	12-Jan-11
	6164	Westlake Chemical OPCO LP	Burke, David	Issue Final Decision	12-Apr-11	Calcasieu	Modification Application	PER20110001	PSD Permit Modification	##nopermitno##	12-Jan-11
	6164	Westlake Chemical OPCO LP	Hurst, Fritz	Issue Final Decision	31-Oct-13	Calcasieu	Modification Application	PER20130004	PSD Permit Modification	##nopermitno##	07-Mar-13
	6164	Westlake Chemical OPCO LP	Hurst, Fritz	Issue Final Decision	31-Oct-13	Calcasieu	Modification Application	PER20130005	PSD Permit Modification	##nopermitno##	07-Mar-13
	1138	Westlake Vinyls Co LP	Nguyen, Dan	Issue Final Decision	06-Dec-11	Ascension	New Application	PER20110002	PSD Permit Initial	PSD-LA-754	11-Jan-11
	4294	Weyerhaeuser NR Co - Dodson Divison	Dugas, Lourdes	Issue Final Decision	30-Dec-13	Winn	Modification Application	PER20130002	PSD Permit Modification	##nopermitno##	30-Jul-13
	4294	Weyerhaeuser NR Co - Dodson Divison	Randall, Anthony	Issue Final Decision	02-Dec-11	Winn	Modification Application	PER20100006	PSD Permit Modification	PSD-LA-627 (M-2)	19-Nov-10
	5565	Williams Olefins LLC - Geismar Ethylene Plant	Nguyen, Dan	Issue Final Decision	11-Apr-12	Ascension	New Application	PER20110004	PSD Permit Initial	PSD-LA-759	12-Dec-11

Louisiana DEQ
Relevant PSD Permits Issued between January 1, 2010 and October 1, 2014

NOT PERTINENT	1	6/4/2014	**COLUMBIA GULF TRANSMISSION COMPANY - ALEXANDRIA COMPRESSOR STATION AI Number 44779** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT SIGNIFICANT MODIFICATION AND INITIAL PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT & THE ASSOCIATED ENVIRONMENTAL ASSESSMENT STATEMENT (EAS)**	No proposed changes to a "crude oil / condensate storage terminal with marine loading" is listed in the public notice.
NOT PERTINENT	2	6/4/2014	**MARATHON PETROLEUM COMPANY LP; LOUISIANA REFINING DIVISION - GARYVILLE REFINERY AI Number 3165** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT MODIFICATION AND PSD PERMIT**	No proposed changes to a "crude oil / condensate storage terminal with marine loading" is listed in the public notice.
NOT PERTINENT	3	3/25/2014	**BIG LAKE FUELS LLC / G2G PLANT AI Number 188813** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED INITIAL PART 70 OPERATING PERMIT, INITIAL PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT, AND ENVIRONMENTAL ASSESSMENT STATEMENT (EAS)**	This is a G2G plant. No proposed changes to a "crude oil / condensate storage terminal with marine loading" is listed in the public notice.
HIT	4	1/16/2014	**VALERO REFINING NEW ORLEANS, LLC - ST. CHARLES REFINERY AI Number 26003** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT AND PSD PERMIT MODIFICATION** http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=9221947&ob=yes&child=yes	This permit looks pertinent. The public notice summary states, "However, a PSD review is required to include the BACT for the proposed hydrotreater, **storage tanks, and MVR Combustion Unit**, and to revise BACT for the boilers, thermal oxidizers, **and marine loading operations**. Therefore, PSD requirements, including best available control technology (BACT), apply to the proposed equipment. The selection of BACT was based on a "top down" approach; a more thorough discussion of the BACT selection process can be found in proposed permit PSD-LA-619(M11). Neither the project nor the general commercial, residential, industrial, or other growth associated with it is expected to have a significant adverse impact on soil, vegetation, visibility, or air quality in the area of the facility or any Class I area."
NOT PERTINENT	5	10/18/2013	**CAMERON INTERSTATE PIPELINE, LLC/HOLBROOK COMPRESSOR STATION AI Number 184545** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED INITIAL PART 70 AIR OPERATING AND PREVENTION OF SIGNFICANT DETERIORATION (PSD) PERMITS**	No proposed changes to a "crude oil / condensate storage terminal with marine loading" is listed in the public notice.
NOT PERTINENT	6	8/16/2013	**VALERO REFINING-MERAUX LLC / MERAUX REFINERY AI Number 1238** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	PUBLIC HEARING AND REQUEST FOR PUBLIC COMMENT ON THE **PROPOSED PART 70 AIR OPERATING PERMIT RENEWAL / MODIFICATION, AND PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT MODIFICATION**	Uncertain - certain tanks are being built, contents are not mentioned, no MVR discussed in the public notice project summary - will review to be sure.
NOT PERTINENT	7	8/16/2013	**CHENIERE CREOLE TRAIL PIPELINE, LP / GILLIS COMPRESSOR STATION AI Number 50619** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT AND PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT**	Construction of a new natural gas pipeline compressor station. Will inlcude a condensate tank, but in is not associated with crude oil, and there is no mention of MVR.
NOT PERTINENT	8	7/17/2013	**SUNDROP FUELS LOUISIANA, L.L.C., RAPIDES STATION FUELS FACILITY AI Number 182519** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT SIGNIFICANT MODIFICATION AND PROPOSED PREVENTION OF SIGNIFICANT DETERIORATION (PSD)**	No proposed changes to a "crude oil / condensate storage terminal with marine loading" is listed in the public notice.
NOT PERTINENT	9	9/28/2012	**PHILLIPS 66 COMPANY / LAKE CHARLES REFINERY AREA B AI Number 2538** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING MODIFICATION AND PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMITS**	N/A - only involves the construction of a new boiler.

NOT PERTINENT	10	10/3/2012	**COLONIAL PIPELINE COMPANY/BATON ROUGE JUNCTION FACILITY AI Number 27646** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING RENEWAL/MODIFICATION AND PREVENTION OF SIGNIFICANT DETERIORATION (PSD) MODIFICATION PERMITS**	No proposed changes to a "crude oil / condensate storage terminal with marine loading" is listed in the public notice.
NOT PERTINENT	11	9/28/2012	**PHILLIPS 66 COMPANY / LAKE CHARLES REFINERY AREA B AI Number 2538** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING MODIFICATION AND PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMITS**	N/A - only involves the construction of a new boiler.
NOT PERTINENT	12	7/19/2012	**VALERO REFINING Ã¢â‚¬â€œ NEW ORLEANS, LLC / ST. CHARLES REFINERY AI Number 26003** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT RENEWAL/MODIFICATION AND PREVENTION OF SIGNIFICANT DETERIORATION (PSD) MODIFICATION**	No proposed changes to a "crude oil / condensate storage terminal with marine loading" is listed in the public notice.
NOT PERTINENT	13	6/5/2012	**CONOCOPHILLIPS COMPANY / ALLIANCE REFINERY UNIT 308F Ã¢â‚¬â€œ FLARES UNIT UNIT 293 - GULFINING UNIT UNIT 412 - OFFSITES UNIT UNIT 292 - DIESEL HYDROTREATER UNIT UNIT 2291 - HYDROGEN PRODUCTION UNIT ULTRA LOW SULFUR DIESEL PSD AI Number 2418** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING INITIAL PERMITS, PERMIT RENEWALS &/OR MODIFICATIONS, AND A PSD PERMIT**	N/A. Proposed PSD projects include the FLARES UNIT UNIT 293 - GULFINING UNIT UNIT 412 - OFFSITES UNIT UNIT 292 - DIESEL HYDROTREATER UNIT UNIT 2291 - HYDROGEN PRODUCTION UNIT ULTRA LOW SULFUR DIESEL; no mention of any changes to crude or condensate tankage, no MVR mentioned.
NOT PERTINENT	14	4/28/2012	**MARATHON PETROLEUM COMPANY, LP / LA REFINING DIVISION, GARYVILLE MAJOR EXPANSION (GME) AI Number 3165** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR PERMIT RENEWAL/MODIFICATION AND PSD MODIFICATION** PSD-LA-719-(M-6)	N/A. The final permit is not posted in EDMS THE PROJECT SUMMARY STATES THAT: "Along with the above referenced changes the facility will also increase the crude capacity of the Garyville Major Expansion Project from 270,000 to 290,000 barrels per calendar day (annual average) which will increase the production of gasoline, ultra low sulfur diesel, and asphalt. Basically the facility is undertaking two different projects which are stand alone project, the DOP and HOP and the increase in crude capacity from 270,000 to 290,000 BPD." MVR is not mentioned.
NOT PERTINENT	15	10/8/2011	**MARATHON PETROLEUM COMPANY, LP, LOUISIANA REFINING DIVISION / GARYVILLE MAJOR EXPANSION (GME) AI Number 3165** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT MINOR MODIFICATION**	No proposed changes to a "crude oil / condensate storage terminal with marine loading" is listed in the public notice.
NOT PERTINENT	16	8/11/2011	**MOTIVA ENTERPRISES LLC / NORCO REFINERY, HYDROCRACKER UNIT AI Number 1406** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT MODIFICATION**	No proposed changes to a "crude oil / condensate storage terminal with marine loading" is listed in the public notice.
NOT PERTINENT	17	5/13/2011	**ALON REFINING KROTZ SPRINGS, INC. / KROTZ SPRINGS REFINERY AI Number 3116** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT MODIFICATION AND PSD PERMIT MODIFICATION**	N/A. "These permit modifications incorporate an emission reduction project for nitrogen oxides emissions from heaters and boilers at the facility."
NOT PERTINENT	18	4/29/2011	**CONOCOPHILLIPS COMPANY, LAKE CHARLES REFINERY AI Number 2538** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT RENEWALS AND PSD PERMIT MODIFICATION**	N/A. "The PSD permit modification updates firing rate for a steam boiler and updates CO and PM10 emission factors for some emission sources"

NOT PERTINENT	19	3/9/2011	**EXXONMOBIL REFINING AND SUPPLY COMPANY BATON ROUGE REFINERY - SULFUR RECOVERY COMPLEX AI Number 2638** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING PERMIT RENEWAL/MODIFICATION**	N/A. ExxonMobil Refining and Supply Company requested to cancel the construction projects authorized under Permit No. 2300-V0 and Permit PSD-LA-717, update the Specific Requirements related to emission limits on capped sources to reflect cancellation of the construction projects, delete the Specific Requirements which are no longer applicable, and renew the Part 70 Permit.
NOT PERTINENT	20	11/18/2010	**VALERO REFINING NEW ORLEANS, LLC - ST. CHARLES REFINERY AI Number 26003** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**PROPOSED PART 70 AIR OPERATING AND PREVENTION OF SIGNFICANT DETERIORATION (PSD) PERMITS MODIFICATION** PSD-LA-619(M6),	"Valero requests this permit modification (2520-00027-V9) to 1) install an SCR system on Boiler 401-F (EQT0323), 2) update service options for sulfuric acid tanks and install a combustion device to control VOC emissions from sulfuric acid tanks and loading, 3) set up a mass emissions limit (cap) for the marine vapor recovery units (MVRU) (EQT0350 and EQT0351), 4) update regulatory requirements for the cooling towers, 5) update emissions from the cooling towers, wastewater treatment unit, flares and flare caps, startups and shutdowns, 5) remove a storage tank (EQT0134) and three heaters (EQT0004, EQT0005, EQT0063), and 6) rename two heaters (EQT0203 and EQT0204). "
NOT PERTINENT	21	9/30/2010	**VALERO REFINING NEW ORLEANS, LLC HYDROGEN PLANT AI Number 26003** VIEW ATTACHMENTS FOLLOWING PUBLIC NOTICE	**INITIAL PART 70 AIR OPERATING AND PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMITS**	N/A. "Valero Refining – New Orleans, LLC requested a Part 70 air operating and PSD permits for the proposed Hydrogen Plant at its St. Charles Refinery in Norco, St. Charles Parish. Natural gas (methane) will be pretreated, mixed with steam, and then reformed over a catalyst to produce hydrogen and carbon monoxide. The reforming step will be followed by a shift reaction to further react steam with carbon monoxide to increase the hydrogen content of the process stream. Hydrogen will be recovered and then sent to the nearby refinery. Tail gas from the purification (pressure swing adsorption unit) will be combined with the refinery fuel gas for use as fuel in the steam methane reforming (SMR) heaters."

ATTACHMENT E
BACT Summary from Recent Mississippi Permits

Summary of BACT Requirements for Recently Issued Permits in Mississippi

Facility	Permit No.	Equipment	Applicable Requirement	Rule Reference	Determination
Collins BioEnergy Partners, LLC	0640-00058	Tanks	Such air emission equipment shall be operated as efficiently as possible to provide maximum reduction of air contaminants	APC-S-2 II.B(10)	No requirements
Hunt Southland Refining Company	1440-00011	N/A	No emissions controls required	N/A	No requirements
Hunt Southland Refining Company	2780-00059	VFR Tanks	No controls for vertical fixed roof tanks storing liquid with tvp < 0.5 psia	N/A	No requirements; not applicable
Hunt Southland Refining Company	2780-00059	IFR Tanks	Controls for internal floating roof tanks storing liquid with tvp <11.1 psia shall comply with applicable requirements of NSPS Kb	40 CFR 60, Subpart Kb (Standards of Performace for VOL Storage Vessels)	Applicable
Hunt Southland Refining Company	2780-00059	N/A	Compliance with NESHAP BBBBBB	40 CFFR 63, Subpart BBBBBB (NESHAP for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities)	Not applicable - requirement applies to gasoline distribution facilities
Kinder Morgan Southeast Terminals LLC, Collins Terminal	0640-00024	Tanks	Such air emission equipment shall be operated as efficiently as possible to provide maximum reduction of air contaminants	APC-S-2 II.B(10)	No requirements
Plains Marketing LP, Moss Point Rail Facility	1280-00142	VCU	Marine loading shall be controlled by VCU with DRE of 99% or greater	APC-S-2 II.B(10)	Applicable

ATTACHMENT F
BACT Summary from RBLC Research

Comparison of Proposed BACT for the Plains Marketing Corpus Christi Dock and Storage Terminal with RBLC BACT Determinations

Equipment	Pollutant	BACT Proposed for this Project	RBLC Control	RBLC Equivalency Determination
Fugitive Equipment Leaks	VOC	No controls required because the site has < 10 tpy uncontrolled emissions	- Leak Detection and Repair (LDAR) program - Leakless/sealless or low-emission pumps, valves, and compressors (RBLCID:OH-0317) - Comply with Part 60, Subpart VV or Vva - Comply with Refinery MACT II LDAR requirements - Comply with Part 65, Subpart F	-Not Equivalent - the uncontrolled VOCs emitted from EPN FUG-1 are estimated to be < 10 tpy, therefore, no additional control is required under current BACT Requirements for Equipment Leak Fugitives. -RBLC control requirements not applicable because facility is not subject to Part 60 Subpart VV or Va (pertains to organic chemical manufacturing facilities), Refinery MACT (peratains to refineries), or Part 65 Subpart F (pertains to synthetic organic chemical manufacturing facilities)
Storage Tank	VOC	- Capacity greater than 25,000gallons: Use of an external floating roof equipped with mechanical shoe primary seals and rim mounted secondary seals; painted white with uninsulated surfaces - Capacity less than 25,000 gallons: Submerged fill tanks with uninsulated surfaces; painted white	- Scrubber - Collected by a vapor compression system - submerged filled line - Stage 1 vapor control - White Tank Shell - Equipped with fixed roof and comply with 40 CFR 63, SUBPART CC, SUBPART FFFF - Requires domes on external floating roof tanks. - Internal floating roof - External floating roof tank equipped with double seals - Tanks ducted to carbon adsorber	-The Tier I control selected for this project is equivalent to or more stringent than the most stringent control found in the RBLC search. -Facility not subject to Part 63 Subpart CC because it pertains to petroleum refineries. -Facility not subject to Part 63 Subpart FFFF because it pertains to organic chemical manufacturing facilities.
Marine Loading Operations	VOC	- Achieve 99% capture efficiency. - Route to a vapor combustor with a minimum DRE of 99.5% reduction in VOCs. - Perform annual vapor tightness testing as specified in 40 CFR §63.565(c) or 40 CFR§61.304(f). - submerged filling.	Controlled by marine vapor combustor	The Tier I control selected for this project is equivalent or more stringent control than the most stringent control found in the RBLC search.
Maintenance, Startup and Shutdown	VOC	- Floating Roof Tank Landings: Route degassing and refilling emissions to a vapor combustor; - Designed to "drain dry" with a small sump located at the bottom of the tank - Small equipment maintenance: send materials back into the tanks to be recovered; remaining liquid drained to a pan and put into a closed container	- Vent to control until VOC concentration < 10,000 PPMV; - Best Practice	The Tier I control selected for this project is equivalent or more stringent control than the most stringent control found in the RBLC search.
Vapor Combustor	VOC	- Minimum DRE of 99.5% - The fuel burned in the vapor combustor will consist of commercially available pipeline quality sweet natural gas	- Comply with 40 CFR 60.18.	Not Equivalent. 40 CFR 60.18 pertains to flares, not marine vapor combustors.
Emergency Generator	VOC	- Maintain a VOC emission rate equal to or less than 1 grams VOC per horsepower-hour - Compliance with NSPS JJJJ	- 3 Way Catalyst - Good combustion practices - Use of Natural Gas, and - Emission Limit : 0.15 G/B-HP-H	Equivalent

RBLC BACT Determinations for Equipment Leaks

RBLCID	Facility Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit And Timframe	Case-By-Case Basis
AZ-0046	Arizona Clean Fuels Yuma	AZ	04/14/2005	Equipment Leaks	VOC		0	BACT-PSD
AZ-0046	Arizona Clean Fuels Yuma	AZ	04/14/2005	Equipment Leaks	H2S		0	BACT-PSD
FL-0318	Highlands Ethanol Facility	FL	12/10/2009	Facility-Wide Fugitive Voc Equipment Leaks	VOC	The Most Practical Method Of Controlling Fugitive VOC Emissions From HEF Is To Promptly Repair Any Leaking Components. HEF Is Subject To NSPS 40 CFR 60, Subpart Vva - VOC Equipment Leaks In The Synthetic Chemical Manufacturing Industry (Socmi). NSPS Subpart Vva Requires A LDAR Program. HEF Must Come In To Compliance With Subpart Vva, Including The LDAR Program, No Later Than 180 Days After HEF Becomes Operational.	19.6 TPY	BACT-PSD
IA-0088	Adm Corn Processing - Cedar Rapids	IA	06/29/2007	Voc Emission From Equipment Leaks	VOC	Leak Detection And Repair (LDAR) Monitoring System	47.67 TPY, 12-Month Rolling Total	BACT-PSD
IA-0089	Homeland Energy Solutions, LLC, Pn 06-672	IA	08/08/2007	Voc Emissions From Equipment Leaks, F60 (07-A-	VOC	Best Practices To Reduce Emissions From Leaking Equipment Such As Pumps, Connections, And Valves.	13.68 TPY, BACT	BACT-PSD
*IA-0106	Cf Industries Nitrogen, LLC - Port Neal Nitrogen Complex	IA	07/12/2013	Voc Emissions From Equipment Leaks	VOC	Leak Detection And Repair (LDAR) Monitoring System	1.1 TPY, Rolling Twelve (12) Month Total	BACT-PSD
*IN-0180	Midwest Fertilizer Corporation	IN	06/04/2014	Fugitive Emissions From Equipment Leaks	VOC	Leak Detection And Repair (LDAR) Program Using 40 CFR 60, Subpart Vva Procedures	0	BACT-PSD
LA-0240	Flopam Inc.	LA	06/14/2010	Equipment Leaks (Fugitives)	VOC	Comply With 40 CFR 65 Subpart F	2 lb/hr, Hourly Maximum	LAER
*MO-0079	American Energy Producers, Inc.	MO	01/25/2008	Equipment Leaks	VOC	Subpart Vv Leak Detection And Repair (LDAR) Program.	0	BACT-PSD
NC-0111	Avoca, Inc.	NC	07/29/2004	Rotocel Operation Equipment Leaks	VOC	Leak Detection And Repair (LDAR)	0	BACT-PSD
NC-0111	Avoca, Inc.	NC	07/29/2004	Recovery Operation Equipment Leaks	VOC	Leak Detection And Repair (LDAR)	0	BACT-PSD
NC-0111	Avoca, Inc.	NC	07/29/2004	Botanical Extraction Equipment Leaks	VOC	Leak Detection And Repair (LDAR)	0	BACT-PSD
NE-0029	Abengoa Bioenery Corporation -	NE	01/21/2004	Equipment Leaks	VOC	A Leak Detection And Repair Program	0	BACT-PSD
OH-0317	Ohio River Clean Fuels, LLC	OH	11/20/2008	Equipment Leaks	VOC	Leakless/Sealless Or Low-Emission Pumps, Valves, And Compressors	1.7 TPY, Per Rolling 12-Month Period	BACT-PSD
OK-0102	Ponca City Refinery	OK	08/18/2004	Equipment Leaks	VOC	Refinery Mact Ii Standards (LDAR): Leak Detection, Monitoring	0	BACT-PSD
OK-0138	South Council Oil Mill	OK	01/21/2010	Equipment Leaks	VOC	Leak Detection And Repair (LDAR) Program- Comply With NSPS, Subpart Vva	0.014 Gal/T, 12-Month Rolling Total	BACT-PSD

RBLC BACT Determinations for Storage Tanks

RBLCID	Facility Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit And Timeframe	Case-By-Case Basis	Percent Efficiency
AL-0191	Hyundai Motor Manufacturing Of Alabama, LLC	AL	03/23/2004	Storage Tanks	VOC	Submerged Fill Pipes, Stage I On Large Gasoline Tanks.	0	BACT-PSD	0
AL-0226	Toray Carbon Fiber America, Inc. (CFA)	AL	03/06/2007	132,086 Gallon Solvent Delivery Storage Tank Vented To Scrubber	VOC	Scrubber TA2-2	95% Reduction	N/A	0
AL-0226	Toray Carbon Fiber America, Inc. (CFA)	AL	03/06/2007	211,338 Gallon Acrylonitrile Delivery Strorage Tank Vented To Scrubber TA2-2	VOC	Scrubber TA2-2	95% Reduction	N/A	0
AL-0242	Tuscaloosa Refinery	AL	05/20/2008	Cooling Tower & Amp; Storage Tanks	VOC	Adhere To The Requirements Of 40 CFR 63, Subpart CC, Which Refers To The Requirements Of 40 CFR 60 Subpart Ggga, And 40 CFR 63 Subpart FFFF.	0	BACT-PSD	0
AZ-0046	Arizona Clean Fuels Yuma	AZ	04/14/2005	Tank Farm Thermal Oxidizer	VOC		99.9% Destruction, This Is A Design Standard 20 ppmv, Max Outlet Conc. When Inlet <20,000 ppm	BACT-PSD	0
AZ-0046	Arizona Clean Fuels Yuma	AZ	04/14/2005	Group A Storage Tanks	VOC	The Emissions From Group A Storage Tanks Must Be Collected By A Vapor Compression System And Routed To The Refinery Fuel Gas System. No Emissions Are Permitted To Be Released Into The Air Except For Equipment Leaks.	0	BACT-PSD	0
AZ-0046	Arizona Clean Fuels Yuma	AZ	04/14/2005	Group D Storage Tanks	VOC	The Tanks Are Required To Be Under Pressure So That No Emissions Are Emitted To The Atmosphere.	0	BACT-PSD	0
AZ-0046	Arizona Clean Fuels Yuma	AZ	04/14/2005	Sour Water Tank	VOC	Fixed Roof Tank With Internal Floating Roof. Head Space Routed To A Carbon Adsorption System.	0	BACT-PSD	0
AZ-0046	Arizona Clean Fuels Yuma	AZ	04/14/2005	Group B Storage Tanks	VOC	Internal Floating Roofs With Headspace Routed To The Tank Farm Thermal Oxidizer.	0		0
CA-1180	Chevron Products Co	CA	08/24/2011	Recovered Oil Storage Tank, External Floating Roof With Dome	VOC	Requires Domes On External Floating Roof Tanks.	0	OTHER CASE-BY-CASE	0
FL-0285	Progress Bartow Power Plant	FL	01/26/2007	Two Nominal 3.5 Million Gallon Distillate Fuel Oil Storage Tanks	VOC		0	BACT-PSD	0
FL-0286	Fpl West County Energy Center	FL	01/10/2007	Two Nominal 6.3 Million Gallon Distillate Fuel Oil Storage Tanks	VOC		0	BACT-PSD	0
FL-0322	Sweet Sorghum-To-Ethanol Advanced Biorefinery	FL	12/23/2010	Storage Tanks	VOC	Emissions Of Voc From The Blending And Storage Tanks Will Be Controlled By The Proper Construction Of The Tanks Per 40 CFR 60.110B(A)(2) Which Requires Internal Floating Roofs In The Tanks Or The Equivalent.	0	BACT-PSD	0
*FL-0328	Eni - Holy Cross Drilling Project	FL	10/27/2011	Storage Tanks	VOC	Use Of Good Maintenance Practices Based On The Current Manufacturer?S Specifications For Each Tank	0.27 Tons Per Year, 12-Month Rolling	BACT-PSD	0
IA-0084	Adm Polymers	IA	11/30/2006	Laidig Tanks	VOC		80 TPY, 365 Day Rolling Total 3500 ppmd, 30 Day Rolling Average	BACT-PSD	0
IA-0084	Adm Polymers	IA	11/30/2006	Antifoam Storage Tank	VOC		0.01 TPY, Rolling 12 Month Total	BACT-PSD	0
IA-0084	Adm Polymers	IA	11/30/2006	Bdo Storage Tank	VOC		0.01 TPY, Rolling 12 Month Total	BACT-PSD	0
IA-0084	Adm Polymers	IA	11/30/2006	Broth Holding Tanks	VOC		0.02 lb/hr, Average Of Three (3) 1-Hr Test Runs	BACT-PSD	0
IA-0088	Adm Corn Processing - Cedar Rapids	IA	06/29/2007	Denatured Ethanol Storage Tank	VOC	Internal Floating Roof	1.26 TPY, 12-Month Rolling Total	BACT-PSD	0
IA-0088	Adm Corn Processing - Cedar Rapids	IA	06/29/2007	Wastewater Treatment Plant (Wwtp) Aeration Tank	VOC		20 ppmvd, Average Of 3 Test Runs	BACT-PSD	0
IA-0088	Adm Corn Processing - Cedar Rapids	IA	06/29/2007	Alcohol Day Tank (200 Proof)	VOC	Internal Floating Roof	1.14 TPY, 12-Month Rolling Total	BACT-PSD	0
IA-0088	Adm Corn Processing - Cedar Rapids	IA	06/29/2007	Alcohol Quality Control Tank	VOC	Internal Floating Roof	1.22 TPY, 12-Month Rolling Total	BACT-PSD	0
IA-0088	Adm Corn Processing - Cedar Rapids	IA	06/29/2007	Alcohol Reclaim Tank	VOC	Internal Floating Roof	1.22 TPY, 12-Month Rolling Total	BACT-PSD	0

RBLC BACT Determinations for Storage Tanks

RBLCID	Facility Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit And Timeframe	Case-By-Case Basis	Percent Efficiency
IA-0088	Adm Corn Processing - Cedar Rapids	IA	06/29/2007	Denaturant Storage Tank	VOC	Internal Floating Roof	0.51 TPY, 12-Month Rolling Total	BACT-PSD	0
IA-0088	Adm Corn Processing - Cedar Rapids	IA	06/29/2007	Corrosion Inhibitor Storage Tank	VOC		0.85 TPY, 12-Month Rolling Total	BACT-PSD	0
IA-0088	Adm Corn Processing - Cedar Rapids	IA	06/29/2007	190 Proof Tank	VOC	Internal Floating Roof	3.18 TPY, 12-Month Rolling Total	BACT-PSD	0
IA-0089	Homeland Energy Solutions, LLC, Pn 06-672	IA	08/08/2007	Denatured Ethanol Storage Tank, T61 And T62 (07-A-972P And 07-A-973P)	VOC	Internal Floating Roof	0.36 TPY, BACT	BACT-PSD	0
IA-0089	Homeland Energy Solutions, LLC, Pn 06-672	IA	08/08/2007	200 Proof Anyhdrous Ethanol Storage Tank, T63 (07-A-974P)	VOC	Internal Floating Roof	0.61 TPY, BACT	BACT-PSD	0
IA-0089	Homeland Energy Solutions, LLC, Pn 06-672	IA	08/08/2007	Denaturant Storage Tank, T64 (07-A-975P)	VOC	Internal Floating Roof	1.49 TPY, BACT	BACT-PSD	0
IA-0089	Homeland Energy Solutions, LLC, Pn 06-672	IA	08/08/2007	190-Proof Ethanol Storage Tank, T65 (07-A-976P)	VOC	Internal Floating Roof	0.61 TPY	BACT-PSD	0
IA-0089	Homeland Energy Solutions, LLC, Pn 06-672	IA	08/08/2007	Additive (Corrosion Inhibitor) Tank, T66 (07-A-977P)	VOC		0.05 TPY, BACT	BACT-PSD	0
IA-0092	Southwest Iowa Renewable Energy	IA	04/19/2007	Ethanol Storage Tanks	VOC	Internal Floating Roof	0	BACT-PSD	0
IA-0095	Tate & Lyle Indgredients Americas, Inc.	IA	09/19/2008	Alcohol Qc Tank	VOC	Internal Floating Roof	0.28 TPY, 12-Month Rolling Total	BACT-PSD	0
IA-0095	Tate & Lyle Indgredients Americas, Inc.	IA	09/19/2008	Corrosion Inhibitor Tank	VOC	Carbon Filtration System	0.062 TPY, 12-Month Rolling Total	BACT-PSD	0
IA-0095	Tate & Lyle Indgredients Americas, Inc.	IA	09/19/2008	Ethanol Storage Tanks (2)	VOC	Internal Floating Roof	0	BACT-PSD	0
IA-0095	Tate & Lyle Indgredients Americas, Inc.	IA	09/19/2008	Gasoline Storage Tank	VOC	Internal Floating Roof	0	BACT-PSD	0
IA-0105	Iowa Fertilizer Company	IA	10/26/2012	Mdea Storage Tank	VOC	Nitrogen Gas Blanket	0.1 Tons/Yr, Rolling 12 Month Total	BACT-PSD	0
*IA-0106	Cf Industries Nitrogen, LLC - Port Neal Nitrogen Complex	IA	07/12/2013	Diesel Belly Tanks	VOC		0.1 Tons/Yr, Rolling Twelve (12) Month Total	BACT-PSD	0
*IA-0106	Cf Industries Nitrogen, LLC - Port Neal Nitrogen Complex	IA	07/12/2013	Methyl-Diethanol Amine (Mdea) Storage Tank	VOC	Nitrogen Gas Blanket	0.1 Tons/Yr, Rolling Twelve (12) Month Total	BACT-PSD	0
*IA-0106	Cf Industries Nitrogen, LLC - Port Neal Nitrogen Complex	IA	07/12/2013	Urea Uf-85 Storage Tank	VOC	Packed Bed Scrubber	0.046 lb/hr, Average Of Three (3) Stack Test Runs	BACT-PSD	0
IN-0133	Grain Processing Corporation	IN	11/23/2011	Distillation Head Storage Tank (Ap83)	VOC	Internal Floating Roof	0.03 lb/hr	OTHER CASE-BY-CASE	99
*IN-0158	St. Joseph Enegry Center, LLC	IN	12/03/2012	Turbine Lube Oil Storage Tanks	VOC	Good Combustion Practice And Fuel Specification	0	BACT-PSD	0
*IN-0158	St. Joseph Enegry Center, LLC	IN	12/03/2012	Emergency Generator Ulsd Tanks	VOC	Good Design And Operating Practices	0	BACT-PSD	0
*IN-0158	St. Joseph Enegry Center, LLC	IN	12/03/2012	Fire Pump Engine Ulsd Tanks	VOC	Good Cumbustion Practice And Fuel Specification	0	BACT-PSD	0
*IN-0158	St. Joseph Enegry Center, LLC	IN	12/03/2012	Vehicle Gasoline Dispensing Tank	VOC	Submerged Fill Pipes And Stage 1 Vapor Control	0	BACT-PSD	0
*IN-0158	St. Joseph Enegry Center, LLC	IN	12/03/2012	Vehicle Diesel Tank	VOC	Good Cumbustion Practice And Fuel Specification	0	BACT-PSD	0

RBLC BACT Determinations for Storage Tanks

RBLCID	Facility Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit And Timeframe	Case-By-Case Basis	Percent Efficiency
*IN-0158	St. Joseph Enegry Center, LLC	IN	12/03/2012	Emergency Generator Ulsd Tank	VOC	Good Cumbustion Practice And Fuel Specification	0	BACT-PSD	0
*IN-0172	St. Joseph Enegry Center, LLC	IN	09/25/2013	Two (2) Uan Storage Tanks	VOC	White Tank Shells, Use Submerged Fill.	0	BACT-PSD	0
*IN-0172	St. Joseph Enegry Center, LLC	IN	09/25/2013	Three (3) Uan Day Tanks	VOC	White Tank Shells, Submerged Fill	0	BACT-PSD	0
*IN-0172	St. Joseph Enegry Center, LLC	IN	09/25/2013	One (1) Diesel Exhaust Fluid (Def) Tank	VOC	White Tank Shell, Submerged Fill	0	BACT-PSD	0
*IN-0172	St. Joseph Enegry Center, LLC	IN	09/25/2013	Two (2) Nitric Acid Storage Tanks	VOC	Submerged Fill	0.0015 Lb Nox/Ton 57% Acid, 3- Hr Average	BACT-PSD	0
*IN-0179	St. Joseph Enegry Center, LLC	IN	09/25/2013	Two (2) Uan Storage Tanks	VOC	White Tank Shells, Use Submerged Fill.	0	BACT-PSD	0
*IN-0179	St. Joseph Enegry Center, LLC	IN	09/25/2013	Three (3) Uan Day Tanks	VOC	White Tank Shells, Submerged Fill	0	BACT-PSD	0
*IN-0179	St. Joseph Enegry Center, LLC	IN	09/25/2013	One (1) Diesel Exhaust Fluid (Def) Tank	VOC	White Tank Shell, Submerged Fill	0	BACT-PSD	0
*IN-0179	St. Joseph Enegry Center, LLC	IN	09/25/2013	Two (2) Nitric Acid Storage Tanks	VOC	Submerged Fill	0.0015 Lb Nox/Ton 57% Acid, 3- Hr Average	BACT-PSD	0
LA-0182	St. Rose Terminal	LA	02/16/2005	1,286,714 Gal Heavy Fuel Oil Storage Tanks (2)	VOC		71.96 TPY, Annual Maximum, See Note	BACT-PSD	0
LA-0182	St. Rose Terminal	LA	02/16/2005	3,383,615 Heavy Fuel Oil Storage Tanks (2)	VOC		71.96 TPY, Annual Maximum, See Note	BACT-PSD	0
LA-0182	St. Rose Terminal	LA	02/16/2005	2,541,471 Gal Heavy Fuel Oil Storage Tanks (2)	VOC		71.9 TPY, Annual Maximum, See Note	BACT-PSD	0
LA-0182	St. Rose Terminal	LA	02/16/2005	4,219,180 Gal Heavy Fuel Oil Storage Tanks (11)	VOC		71.9 TPY, Annual Maximum, See Note	BACT-PSD	0
LA-0211	Garyville Refinery	LA	12/27/2006	Emergency Generators (Dock &Amp; Tank Farm) (21-08 &Amp; 22-08)	VOC	Use Of Diesel With A Sulfur Content Of 15 Ppmv Or Less	0.0025 lb/hrp-H, Annual Average	BACT-PSD	0
LA-0211	Garyville Refinery	LA	12/27/2006	Thermal Drying Unit-Wastewater Sump &Amp; Feed Tanks (124-9-91, 124 10-91, 124-11-91, &Amp; 124-12-91)	VOC	124-10-91: Submerged Fill Pipe 124-11-91: Submerged Fill Pipe 124-12-91: Submerged Fill Pipe	0	BACT-PSD	0
LA-0211	Garyville Refinery	LA	12/27/2006	External Floating Roof Storage Tanks	VOC	External Floating Roofs; Comply With 40 CFR 63 Subpart CC	0	BACT-PSD	0
LA-0211	Garyville Refinery	LA	12/27/2006	Fixed Roof Storage Tanks	VOC	Comply With 40 CFR 63 Subpart CC	0	BACT-PSD	0
LA-0211	Garyville Refinery	LA	12/27/2006	Internal Floating Roof Storage Tanks	VOC	Internal Floating Roofs; Comply With 40 CFR 63 Subpart CC	0	BACT-PSD	0
LA-0232	Sterlington Compressor Station	LA	06/24/2008	Condensate Storage Tank	VOC	Submerged Fill Pipe	1.28 lb/hr, Hourly Maximum 5.62 TPY, Annual Maximum	BACT-PSD	0
LA-0237	St. Rose Terminal	LA	05/20/2010	Heavy Fuel Oil Storage Tanks (18)	VOC	Fixed Roof	67.53 TPY, (Cap For 18 Tanks)	BACT-PSD	0
LA-0265	St. Charles Refinery	LA	10/02/2012	Fr Storage Tanks Eqt0087 And Eqt0088	VOC	Comply With 40 CFR 63 Subpart CC (Group 2)	0	BACT-PSD	0
LA-0265	St. Charles Refinery	LA	10/02/2012	Efr Storage Tank Eqt0169	VOC	Comply With 40 CFR 60 Subpart Kb Using An Efr	0	BACT-PSD	0
*LA-0272	Ammonia Production Facility	LA	03/27/2013	Amdea Storage Tank (2009-F)	VOC		0	BACT-PSD	0

RBLC BACT Determinations for Storage Tanks

RBLCID	Facility Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit And Timeframe	Case-By-Case Basis	Percent Efficiency
*MO-0081	American Energy Producers, Inc.	MO	01/22/2009	Methanol Storage Tanks	VOC	Breathing Losses From Stoarage Tanks Controlled By Nitrogen Blanketing. Working Losses Controlled During Truck Or Railcar Unloading By Use Of A Vapor Balance System.	0	BACT-PSD	0
*MO-0085	Continental Cement Company - Ilasco Plant	MO	07/24/2007	Lhwdf Storage Tanks	VOC	Vent All Vapors From Storage Tanks To A Carbon Adsorption Bed.	0	BACT-PSD	0
NC-0111	Avoca, Inc.	NC	07/29/2004	Rotocel Operation Wastewater Tanks And Other Similar Vessels	VOC	Fixed Roofs	0	BACT-PSD	0
NC-0111	Avoca, Inc.	NC	07/29/2004	Recovery Operation Arcon Tank Process Vent	VOC	Chilled Water-Cooled Condenser And Packed Tower Scrubber	0.8 lb/hr, Per Hour 3.5 TPY, Per Year	BACT-PSD	0
NC-0111	Avoca, Inc.	NC	07/29/2004	Recovery Operation Arcon Tank Process Vent	VOC	Chilled Water-Cooled Condenser	8.76 lb/hr, Per Hour 0.63 TPY, Per Year	BACT-PSD	0
NC-0111	Avoca, Inc.	NC	07/29/2004	Recovery Operation Process/Storage Tanks	VOC	Fixed Roofs	0	BACT-PSD	0
NC-0111	Avoca, Inc.	NC	07/29/2004	Recovery Operation Wastewater Tanks And Other Similar Vessels	VOC	Fixed Roofs And Biological Treatment	95 %, Mass Removal From Ww Stream Cons Of Meoh	BACT-PSD	95
NC-0111	Avoca, Inc.	NC	07/29/2004	Botanical Extraction Wastewater Tanks And Other Similar Vessels	VOC	Fixed Roofs	0	BACT-PSD	0
NC-0111	Avoca, Inc.	NC	07/29/2004	Rotocel Operation Solvent Recycle Tanks	VOC	Chilled Water-Cooled Condenser And Packed Tower Scrubber	0.94 lb/hr, Per Hour 4.11 TPY, Per Year Combined Total	BACT-PSD	0
NC-0111	Avoca, Inc.	NC	07/29/2004	Rotocel Operation Solvent Recycle Tanks	VOC	Chilled Water-Cooled Condenser	0.47 lb/hr, Per Hour 0.19 TPY, Per Year Combined Total	BACT-PSD	0
ND-0020	Richardton Plant	ND	08/04/2004	Ethanol Storage Tanks	VOC	Internal Floating Roof	95% Reduction	BACT-PSD	95
NE-0029	Abengoa Bioenery Corporation - York	NE	01/21/2004	Storage Tanks	VOC	The Tanks T-800, T-801, T-802, And T-807 Shall Each Be Equipped With An Internal Floating Roof. Tanks T803-T806, T-808, T-830, And T-1501A-T-1501D Shall Each Be Controlled By A Vapor Recovery System With A Flare.	0	BACT-PSD	0
NE-0046	Aventine Renewable Energy - Aurora West LLC	NE	09/27/2007	Organic Liquid Process And Storage Tanks	VOC	Internal Floating Roof For All But Corrosion Inhibitor Tank	0	BACT-PSD	0
NM-0050	Artesia Refinery	NM	12/14/2007	Storage Tanks	VOC	External Floating Roof Tank Equipped With Double Seals .	0	BACT-PSD	0
NM-0050	Artesia Refinery	NM	12/14/2007	Sour Water Tank	VOC	External Floating Roof Equipped With Double Seals	0	BACT-PSD	0
OH-0288	Owens Corning Medina	OH	06/14/2004	Asphalt Coater/Surge Tank #1	VOC		4.62 lb/hr 14.75 TPY, Per Rolling 12-Months	BACT-PSD	0
OH-0288	Owens Corning Medina	OH	06/14/2004	Alphalt Coater/Surge Tank #2	VOC		6.59 lb/hr 25.16 TPY, Per Rolling 12-Months	BACT-PSD	0
OH-0288	Owens Corning Medina	OH	06/14/2004	Oxidized Asphalt Fixed Roof Storage Tanks (3)	VOC	Thermal Incinerator	0.05 lb/hr, Each Tank 0.21 TPY, Each Tank, Per Rolling 12-Months	BACT-PSD	95
OH-0303	Asa Bloomingburg, LLC	OH	08/10/2006	Ethanol Storage Tanks (4)	VOC		3.63 TPY	BAT (Non-US ONLY)	0
OK-0097	Quad Graphics OKC FAC	OK	02/03/2004	Storage Tanks	VOC	Tanks Ducted To Carbon Adsorber	1.94 TPY, Nonmethane Hydrocarbons	BACT-PSD	98
OK-0138	South Council Oil Mill	OK	01/21/2010	Residual Crude Oil Storage Tanks	VOC	Operation Of Vacuum Stripper To Remove Solvent From Crude Oil	0.04 Gal/T, 12-Month Rolling Total	BACT-PSD	0
OK-0138	South Council Oil Mill	OK	01/21/2010	Solvent Storage Tanks	VOC	Vapor Recovery System Routed To Atmospheric Condenser	0	BACT-PSD	0
PA-0257	Sunnyside Ethanol, LLC	PA	05/07/2007	Storage Tanks	VOC	Floating Roof Tanks	1.11 TPY 0.045 TPY, For VHAPs	OTHER CASE-BY-CASE	0

RBLC BACT Determinations for Storage Tanks

RBLCID	Facility Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit And Timeframe	Case-By-Case Basis	Percent Efficiency
SC-0115	Gp Clarendon LP	SC	02/10/2009	Storage Tanks	VOC		0.16 lb/hrr 0.7 TPY	BACT-PSD	0
*SC-0142	Showa Denko Carbon, Inc.	SC	06/08/2012	Mill, Mix, Extrusion (Binder Pitch Tank)	VOC	Vent Condenser	0.4 lb/hr	BACT-PSD	0
*SC-0142	Showa Denko Carbon, Inc.	SC	06/08/2012	Impregnation Pitch Storage Tanks	VOC	Vent Condenser	0.055 TPY (Total)	BACT-PSD	0
TX-0464	Continental Carbon Sunray Plant	TX	03/18/2005	Small Storage Tank	VOC	The Fixed Roof Tanks Are Considered Bact Due To The Low Vapor Pressure Of The Feedstock Oil.	0.01 lb/hr 0.01 TPY	BACT-PSD	0
TX-0464	Continental Carbon Sunray Plant	TX	03/18/2005	Large Storage Tank	VOC	The Fixed Roof Tanks Are Considered Bact Due To The Low Vapor Pressure Of The Feedstock Oil.	0.01 lb/hr 0.01 TPY	BACT-PSD	0
TX-0478	Citgo Corpus Christi Refinery - West Plant	TX	04/20/2005	Storage Tank 13A&Amp;B	VOC		1.6 lb/hr 3.9 TPY	N/A	0
TX-0478	Citgo Corpus Christi Refinery - West Plant	TX	04/20/2005	Storage Tanks 6020-6023	VOC		4.4 lb/hr 3.3 TPY	N/A	0
TX-0478	Citgo Corpus Christi Refinery - West Plant	TX	04/20/2005	Storage Tanks 6011-6012	VOC		0.8 lb/hr 1.4 TPY	N/A	0
TX-0478	Citgo Corpus Christi Refinery - West Plant	TX	04/20/2005	Sour Water Tank	VOC		17.9 lb/hr 2 TPY	N/A	0
TX-0485	Inland Paperboard And Packaging Orange Mill	TX	10/05/2004	Green Liquor Equalization Tank	VOC	Voc Emissions Are Significantly Lower Than The Pulping Process Of Virgin Fiber Because Most Of The Organics Contained In The Fiber Have Been Released Already	0.03 lb/hr 0.09 TPY	BACT-PSD	0
TX-0485	Inland Paperboard And Packaging Orange Mill	TX	10/05/2004	No. 1 And No. 2 Dissolving Tank	VOC		17.93 lb/hr 50.12 TPY	BACT-PSD	0
TX-0485	Inland Paperboard And Packaging Orange Mill	TX	10/05/2004	Storage Tanks (3)	VOC	Voc Emissions Are Significantly Lower Than The Pulping Process Of Virgin Fiber Because Most Of The Organics Contained In The Fiber Have Been Released Already	0.01 lb/hr 0.02 TPY	BACT-PSD	0
TX-0485	Inland Paperboard And Packaging Orange Mill	TX	10/05/2004	Gasoline Tank/No. 2 Fuel Oil Tank	VOC		0.2 TPY	BACT-PSD	0
TX-0485	Inland Paperboard And Packaging Orange Mill	TX	10/05/2004	No.4 White Liquor Storage Tank	VOC		0.57 lb/hr 1.59 TPY	BACT-PSD	0
TX-0537	Lbc Houston Bayport Terminal	TX	10/26/2009	Two New Storage Tanks	VOC	Ifr Configuration For Routine Emissions @ Each Of 2 New Tks (Limit 1) Flares/Ice For Refill&Degas (Limit 2); Overall Permit Limit Is 19.74Tpy For Affected Flares; Limit 2 Attributable To 2 New Tanks	1.83 TPY 6.62 TPY	OTHER CASE-BY-CASE	98
TX-0538	Lbc Houston Bayport Terminal	TX	10/26/2009	Two New Storage Tanks	VOC	Ifr Configuration For Routine Emissions @ Each Of 2 New Tks (Limit 1) Flares/Ice For Refill&Degas (Limit 2); Overall Permit Limit Is 19.74Tpy For Affected Flares; Limit 2 Attributable To 2 New Tanks	1.83 TPY 6.62 TPY	OTHER CASE-BY-CASE	98
TX-0574	Valero Three Rivers Refinery	TX	08/19/2010	Mss For Process Equipment And Storage Tanks	VOC	Vent To Control Until Voc Concentration < 10,000 ppmv	0	BACT-PSD	98
VA-0313	Transmontaigne Norfolk Terminal	VA	04/22/2010	Storage Tank Breathing, Working, And Floating Roof Landing Losses (Including Emergency Roof Landings)	VOC	Floating Roof And Seal Systems Meeting NSPS Kb, Mact Bbbbbb Requirements For Tanks In Gasoline Service	114.1 TPY	OTHER CASE-BY-CASE	0
WI-0207	Ace Ethanol - Stanley	WI	01/21/2004	Storage Tanks	VOC	Fixed Roof Tanks With Internal Floating Roof (Subject To NSPS)	0	BACT-PSD	0
WI-0227	Port Washington Generating Station	WI	10/13/2004	Fuel Oil Storage Tank (T01)	VOC	Fixed Roof Tank With Submerged Fill Pipe. Tank May Only Be Used To Store Distillate Fuel Oil	0	BACT-PSD	0
WI-0251	Enbridge Energy	WI	07/21/2009	T36-T40 Crude Oil Storage Tanks	VOC	External Floating Roof Tank	0.53 T/VOC/Mo., 12 Mo. Avg., Excluding Landing Events 1 Landing (Average Over All New/Modified Tanks)	BACT-PSD	0
WI-0251	Enbridge Energy	WI	07/21/2009	F01 - New And Modified Tanks, New Pipelines, And Associated Fugitive Voc	VOC	Use Of An Instrument Based Leak Detection And Repair (LDaR) Program, Combined With Non-Instrumental Methods (Sight, Sound And Smell), And Good Operating Practices.	0	BACT-PSD	0
*WY-0071	Sinclair Refinery	WY	10/15/2012	Storage Tank	VOC	External Floating Roof Tank	0	BACT-PSD	0

RBLC BACT Determinations for Marine Loading

RBLCID	Facility Name	Facility State	Permit Issuance Date	Process Name	Throughput	Throughput Unit	Pollutant	Control Method Description	Emission Limit and Timeframe	Case-By-Case Basis
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	50,000	BBL/hr EA.	VOC	Source Is Control Device For VOC. Comply with 40 CFR 60.18. Control Products Having A True Vapor Pressure Greater Than 0.5 Psia.	0	BACT-PSD
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	50,000	BBL/hr EA.	CO	Comply with 40 CFR 60.18.	0	BACT-PSD
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	50,000	BBL/hr EA.	NOx	Comply with 40 CFR 60.18.	0	BACT-PSD
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	50,000	BBL/hr EA.	FPM10	Comply with 40 CFR 60.18.	0	BACT-PSD
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	50,000	BBL/hr EA.	SO2	Comply with 40 CFR 60.18.	0	BACT-PSD
TX-0494	Flint Hills Resources Installation Of Boilers	TX	01/24/2005	Uncontrolled Marine Loading			VOC		277.8 LB/H 13.02 T/YR	BACT-PSD

RBLC BACT Determinations for MSS

RBLC ID	Facility Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Case-By-Case Basis
TX-0481	Air Products Baytown I I	TX	11/02/2004	MSS-Noncondensibles (Propylene Venting)	CO		N/A
TX-0481	Air Products Baytown I I	TX	11/02/2004	MSS-Noncondensibles (Propylene Venting)	NOX		N/A
TX-0481	Air Products Baytown I I	TX	11/02/2004	MSS-Noncondensibles (Propylene Venting)	Propylene		N/A
TX-0481	Air Products Baytown I I	TX	11/02/2004	MSS Process Steam Vent	VOC		N/A
TX-0515	International Paper Company Pulp And Paper Mill	TX	01/11/2006	No 1 Recovery Furnace North/South Stack-MSS	FPM10		BACT-PSD
TX-0515	International Paper Company Pulp And Paper Mill	TX	01/11/2006	No 2 Recovery Furnace East/West Stack-MSS	FPM10		BACT-PSD
TX-0519	Agrifos Sulfuric Acid Plant	TX	11/10/2005	H2S04 Plant Stack (Including MSS)	PM		BACT-PSD
TX-0519	Agrifos Sulfuric Acid Plant	TX	11/10/2005	H2S04 Plant Stack (Including MSS)	VOC		BACT-PSD
TX-0519	Agrifos Sulfuric Acid Plant	TX	11/10/2005	H2S04 Plant Stack (Including MSS)	Sulfuric Acid (Mist, Vapors, Etc)		BACT-PSD
TX-0519	Agrifos Sulfuric Acid Plant	TX	11/10/2005	H2S04 Plant Stack (Including MSS)	CO		BACT-PSD
TX-0519	Agrifos Sulfuric Acid Plant	TX	11/10/2005	H2S04 Plant Stack (Including MSS)	NOX		BACT-PSD
TX-0519	Agrifos Sulfuric Acid Plant	TX	11/10/2005	H2S04 Plant Stack (Including MSS)	SO2		BACT-PSD
TX-0526	Air Products Hydrogen, Steam, And Electricity Production	TX	08/18/2006	Flare-MSS	VOC		BACT-PSD
TX-0526	Air Products Hydrogen, Steam, And Electricity Production	TX	08/18/2006	Flare-MSS	CO		BACT-PSD
TX-0526	Air Products Hydrogen, Steam, And Electricity Production	TX	08/18/2006	Flare-MSS	NOX		BACT-PSD
TX-0526	Air Products Hydrogen, Steam, And Electricity Production	TX	08/18/2006	Flare-MSS	SO2		BACT-PSD
TX-0574	Valero Three Rivers Refinery	TX	08/19/2010	Flare MSS	SOX	Best Practices	BACT-PSD
TX-0574	Valero Three Rivers Refinery	TX	08/19/2010	Flare MSS	VOC	Best Practices	BACT-PSD
TX-0574	Valero Three Rivers Refinery	TX	08/19/2010	Flare MSS	CO	Best Practices	BACT-PSD
TX-0574	Valero Three Rivers Refinery	TX	08/19/2010	MSS For Process Equipment And Storage Tanks	VOC	Best Practices	BACT-PSD
TX-0574	Valero Three Rivers Refinery	TX	08/19/2010	MSS For Process Equipment And Storage Tanks	VOC	Vent To Control Until VOC Concentration < 10,000	BACT-PSD
TX-0574	Valero Three Rivers Refinery	TX	08/19/2010	MSS For Process Equipment And Storage Tanks	CO	Best Practices	BACT-PSD
TX-0622	Corpus Christi Plant	TX	10/24/2012	Petrochecmial Manufacturing Facility Planned Maintenance, Startup And	VOC	Flare	BACT-PSD

RBLC BACT Determinations for Vapor Combustors

RBLCID	Facility Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit and Timeframe	Case-By-Case Basis
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	VOC	Source Is Control Device For VOC. Comply With 40 CFR 60.18. Control Products Having A True Vapor Pressure Greater Than 0.5 Psia.	0	BACT-PSD
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	CO	Comply With 40 CFR 60.18.	0	BACT-PSD
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	NOx	Comply With 40 CFR 60.18.	0	BACT-PSD
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	FPM10	Comply With 40 CFR 60.18.	0	BACT-PSD
LA-0211	Garyville Refinery	LA	12/27/2006	Marine Vapor Combustor (55-08) &Amp; Marine Loading Vapor Combustor (107-90)	SO2	Comply With 40 CFR 60.18.	0	BACT-PSD
LA-0212	Zachary Station	LA	02/01/2007	Loading Rack (Vapor Combustor) (V-1)	VOC	Vapor Combustor To Control VOC Emissions From Products Having A True Vapor Pressure Greater Than 1.5 Psia	10 MG/L	BACT-PSD
TX-0494	Flint Hills Resources Installation Of	TX	01/24/2005	Marine Vapor Combustor	VOC		125.07 lb/hr, 30.71 TPY	BACT-PSD
TX-0494	Flint Hills Resources Installation Of	TX	01/24/2005	Marine Vapor Combustor	CO		76.92 lb/hr, 18.44 TPY	BACT-PSD
TX-0494	Flint Hills Resources Installation Of	TX	01/24/2005	Marine Vapor Combustor	NOx		19.32 lb/hr, 4.62 TPY	BACT-PSD
TX-0494	Flint Hills Resources Installation Of	TX	01/24/2005	Marine Vapor Combustor	SO2		0.01 lb/hr, 0.09 TPY	BACT-PSD

RBLC BACT Determinations for Engines

RBLCID	Facility Name	FACILITY STATE	PERMIT ISSUANCE DATE	Process Name	Primary Fuel	Throughput	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit and Timeframe	Case-By-Case Basis
CA-1125	Montecito Retirement Association	CA	10/25/2004	Ice: Spark Ignition, Natural Gas	Natural Gas	268	BHP	Equip: Packaged Unit Serving An Retirement Facility, Mfr: Hess Microgen 200I Cogeneration System, Type: Two 250 Kw Cogeneration Units, Model: Daewoo, Func Equip: Provides Electricit And Hot Water, Fuel_Type: , Schedule: Continuous, H/D: 24, D/W: 7, W/Y: 52, Notes: The Proje Includes Two 200 Kw Hess Microgen 200I Engines/Generators, Heat Exchangers, A Heat Dump/Balance Radiator, Piping, Pumps And Ancillary Electrical Equipment And Controls. The Equipment Is Contained In An Enclosure Designed For Noise Reduction And Visual Screening Heat Is Recovered From The Engine Jacket And Exhaust In The Form Of Hot Water And Is Connected To The Existing Heating Hot Water And Domestic Hot Water Systems Located In Th Basement Of The Medical Center. Mine-X Model 2-Dc49-4 3-Way Nscr And Air/Fuel Ratio Controller Is Gill Instruments Hess Af100 Source Test Results: Tested 12/07/2005: Engine #1. Nox = 1 Ppmv At 15% O2 Co = 2 Ppmv At 15% O2 Voc = 5 Ppmv At 15% O2 Engine #2 Nox = 2 Ppmv At 15% O2 Co = 4 Ppmv At 15% O2 Voc = 4 Ppmv At 15% O2	VOC	3-Way Nscr W/ An Afrc	0.15 G/B-HP-H, 6-MIN AV	BACT-PSD
CA-1125	Montecito Retirement Association	CA	10/25/2004	Ice: Spark Ignition, Natural Gas	Natural Gas	268	BHP	Equip: Packaged Unit Serving An Retirement Facility, Mfr: Hess Microgen 200I Cogeneration System, Type: Two 250 Kw Cogeneration Units, Model: Daewoo, Func Equip: Provides Electricit And Hot Water, Fuel_Type: , Schedule: Continuous, H/D: 24, D/W: 7, W/Y: 52, Notes: The Proje Includes Two 200 Kw Hess Microgen 200I Engines/Generators, Heat Exchangers, A Heat Dump/Balance Radiator, Piping, Pumps And Ancillary Electrical Equipment And Controls. The Equipment Is Contained In An Enclosure Designed For Noise Reduction And Visual Screening Heat Is Recovered From The Engine Jacket And Exhaust In The Form Of Hot Water And Is Connected To The Existing Heating Hot Water And Domestic Hot Water Systems Located In Th Basement Of The Medical Center. Mine-X Model 2-Dc49-4 3-Way Nscr And Air/Fuel Ratio Controller Is Gill Instruments Hess Af100 Source Test Results: Tested 12/07/2005: Engine #1. Nox = 1 Ppmv At 15% O2 Co = 2 Ppmv At 15% O2 Voc = 5 Ppmv At 15% O2 Engine #2 Nox = 2 Ppmv At 15% O2 Co = 4 Ppmv At 15% O2 Voc = 4 Ppmv At 15% O2	CO	3-Way Nscr W/ An Afrc	0.6 G/B-HP-H, 6-MIN AV	BACT-PSD
CA-1125	Montecito Retirement Association	CA	10/25/2004	Ice: Spark Ignition, Natural Gas	Natural Gas	268	BHP	Equip: Packaged Unit Serving An Retirement Facility, Mfr: Hess Microgen 200I Cogeneration System, Type: Two 250 Kw Cogeneration Units, Model: Daewoo, Func Equip: Provides Electricit And Hot Water, Fuel_Type: , Schedule: Continuous, H/D: 24, D/W: 7, W/Y: 52, Notes: The Proje Includes Two 200 Kw Hess Microgen 200I Engines/Generators, Heat Exchangers, A Heat Dump/Balance Radiator, Piping, Pumps And Ancillary Electrical Equipment And Controls. The Equipment Is Contained In An Enclosure Designed For Noise Reduction And Visual Screening Heat Is Recovered From The Engine Jacket And Exhaust In The Form Of Hot Water And Is Connected To The Existing Heating Hot Water And Domestic Hot Water Systems Located In Th Basement Of The Medical Center. Mine-X Model 2-Dc49-4 3-Way Nscr And Air/Fuel Ratio Controller Is Gill Instruments Hess Af100 Source Test Results: Tested 12/07/2005: Engine #1. Nox = 1 Ppmv At 15% O2 Co = 2 Ppmv At 15% O2 Voc = 5 Ppmv At 15% O2 Engine #2 Nox = 2 Ppmv At 15% O2 Co = 4 Ppmv At 15% O2 Voc = 4 Ppmv At 15% O2	NOx	3-Way Nscr W/ An Afrc	0.15 G/B-HP-H, 6-MIN AV	BACT-PSD
CA-1132	City Of Sacramento Pw	CA	05/03/2004	Ice: Emergency, Spark Ignition	Natural Gas	310	BHP	Equip: Natural Gas Engine Driving A Standby Generator, Mfr: Cummins, Type: Natural Gas Engine, Model: Gta855A, Func Equip: Emergency Standby Power, Fuel_Type: , Schedule: Variable, H/D: , D/W: , W/Y: , Notes: Emergency Equipment Limited To 100 Hours Per Year Fo Maintenance And 200 Hours Per Year Total Operation. Source Test Results:	SOX	Na	0.002 G/B-HP-H	BACT-PSD
CA-1132	City Of Sacramento Pw	CA	05/03/2004	Ice: Emergency, Spark Ignition	Natural Gas	310	BHP	Equip: Natural Gas Engine Driving A Standby Generator, Mfr: Cummins, Type: Natural Gas Engine, Model: Gta855A, Func Equip: Emergency Standby Power, Fuel_Type: , Schedule: Variable, H/D: , D/W: , W/Y: , Notes: Emergency Equipment Limited To 100 Hours Per Year Fo Maintenance And 200 Hours Per Year Total Operation. Source Test Results:	VOC	3 Way Catalyst	0.449 G/B-HP-H	BACT-PSD
CA-1132	City Of Sacramento Pw	CA	05/03/2004	Ice: Emergency, Spark Ignition	Natural Gas	310	BHP	Equip: Natural Gas Engine Driving A Standby Generator, Mfr: Cummins, Type: Natural Gas Engine, Model: Gta855A, Func Equip: Emergency Standby Power, Fuel_Type: , Schedule: Variable, H/D: , D/W: , W/Y: , Notes: Emergency Equipment Limited To 100 Hours Per Year Fo Maintenance And 200 Hours Per Year Total Operation. Source Test Results:	CO	3 Way Catalyst	1.6 G/B-HP-H	BACT-PSD

RBLC BACT Determinations for Engines

RBLCID	Facility Name	FACILITY STATE	PERMIT ISSUANCE DATE	Process Name	Primary Fuel	Throughput	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit and Timeframe	Case-By-Case Basis
CA-1132	City Of Sacramento Pw	CA	05/03/2004	Ice: Emergency, Spark Ignition	Natural Gas	310	BHP	Equip: Natural Gas Engine Driving A Standby Generator, Mfr: Cummins, Type: Natural Gas Engine, Model: Gta855A, Func Equip: Emergency Standby Power, Fuel_Type: , Schedule: Variable, H/D: , D/W: , W/Y: , Notes: Emergency Equipment Limited To 100 Hours Per Year Fo Maintenance And 200 Hours Per Year Total Operation. Source Test Results:	NOX	3 Way Catalyst	2.13 G/B-HP-H	BACT-PSD
CA-1132	City Of Sacramento Pw	CA	05/03/2004	Ice: Emergency, Spark Ignition	Natural Gas	310	BHP	Equip: Natural Gas Engine Driving A Standby Generator, Mfr: Cummins, Type: Natural Gas Engine, Model: Gta855A, Func Equip: Emergency Standby Power, Fuel_Type: , Schedule: Variable, H/D: , D/W: , W/Y: , Notes: Emergency Equipment Limited To 100 Hours Per Year Fo Maintenance And 200 Hours Per Year Total Operation. Source Test Results:	FPM10	Na	0.152 G/B-HP-H	BACT-PSD
IA-0102	Davenport Works	IA	02/01/2012	Emergency Generator	Natural Gas	2115	cf/h	225 Kw Engine	VOC	Good Combustion Practices	0.66 LB/H, AVERAGE OF 3 STACK TEST RUNS	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Emergency Generator	Natural Gas	620	HP	Emergency Natural Gas Generator, Identified As Eu017, Exhausts To Stack Sv016.	TPM10	Use Of Natural Gas And Good Combustion Practices	500 H/YR, 12-MONTH PERIOD 0.2 G/KW-H, 3 HOURS	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Emergency Generator	Natural Gas	620	HP	Emergency Natural Gas Generator, Identified As Eu017, Exhausts To Stack Sv016.	TPM2.5	Use Of Natural Gas And Good Combustion Practices	500 H/YR, 12-MONTH PERIOD 0.2 G/KW-H, 3 HOURS	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Emergency Generator	Natural Gas	620	HP	Emergency Natural Gas Generator, Identified As Eu017, Exhausts To Stack Sv016.	CO2E	Use Of Natural Gas And Good Combustion Practices	144 T/YR, 12-MONTH PERIOD 500 H/YR, 12-MONTH PERIOD	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Emergency Generator	Natural Gas	620	HP	Emergency Natural Gas Generator, Identified As Eu017, Exhausts To Stack Sv016.	FLUORIDES, TOTAL	Use Of Natural Gas And Good Combustion Practices	500 H/YR, 12 MONTH PERIOD	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Emergency Generator	Natural Gas	620	HP	Emergency Natural Gas Generator, Identified As Eu017, Exhausts To Stack Sv016.	NOX	Use Of Natural Gas And Good Combustion Practices	0.5 G/HP-H, 3 HOURS 500 H/YR, 12-MONTH PERIOD	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Emergency Generator	Natural Gas	620	HP	Emergency Natural Gas Generator, Identified As Eu017, Exhausts To Stack Sv016.	FPM	Restricted To Use Of Natural Gas And Good Combustion Practices	500 H/YR, 12-MONTH PERIOD 0.2 G/KW-H, 3 HOURS	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Emergency Generator	Natural Gas	620	HP	Emergency Natural Gas Generator, Identified As Eu017, Exhausts To Stack Sv016.	SO2	Use Of Natrual Gas And Good Combustion Practices	0.0015 G/KW-H, 3 HOURS 500 H/YR, 12-MONTH PERIOD	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Fire Water Pump	Natural Gas	300	HP	Consisting Of One (1) Natural Gas Engine, The Backup Jockey Fire Water Pump, Identified As Eu018, Exhausts To Stack Sv017	TPM10	Use Of Natural Gas And Good Combustion Practices	500 H/YR, 12-MONTH PERIOD 0.2 G/KW-H, 3 HOURS	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Fire Water Pump	Natural Gas	300	HP	Consisting Of One (1) Natural Gas Engine, The Backup Jockey Fire Water Pump, Identified As Eu018, Exhausts To Stack Sv017	TPM2.5	Use Of Natural Gas And Good Combustion Practices	500 H/YR, 12-MONTH PERIOD 0.2 G/KW-H, 3 HOURS	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Fire Water Pump	Natural Gas	300	HP	Consisting Of One (1) Natural Gas Engine, The Backup Jockey Fire Water Pump, Identified As Eu018, Exhausts To Stack Sv017	CO2E	Use Of Natural Gas And Good Combustion Practices	66 T/YR, 12-MONTH PERIOD 500 H/YR, 12-MONTH PERIOD	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Fire Water Pump	Natural Gas	300	HP	Consisting Of One (1) Natural Gas Engine, The Backup Jockey Fire Water Pump, Identified As Eu018, Exhausts To Stack Sv017	FLUORIDES, TOTAL	Use Of Natural Gas And Good Combustion Practices	500 H/YR, 12-MONTH PERIOD	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Fire Water Pump	Natural Gas	300	HP	Consisting Of One (1) Natural Gas Engine, The Backup Jockey Fire Water Pump, Identified As Eu018, Exhausts To Stack Sv017	NOX	Use Of Natural Gas And Good Combustion Practices	0.5 G/HP-YR, 3 HOURS 500 H/YR, 12-MONTH PERIOD	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Fire Water Pump	Natural Gas	300	HP	Consisting Of One (1) Natural Gas Engine, The Backup Jockey Fire Water Pump, Identified As Eu018, Exhausts To Stack Sv017	FPM	Use Of Natural Gas And Good Combustion Practices	500 H/YR, 12-MONTH PERIOD 0.2 G/KW-H, 3 HOURS	BACT-PSD
*IN-0167	Magnetation LLC	IN	04/16/2013	Fire Water Pump	Natural Gas	300	HP	Consisting Of One (1) Natural Gas Engine, The Backup Jockey Fire Water Pump, Identified As Eu018, Exhausts To Stack Sv017	SO2	Use Of Natual Gas And Good Combustion Practices	0.0015 G/KW-H, 3 HOURS 500 H/YR, 12-MONTH PERIOD	BACT-PSD
WA-0316	Northwest Pipeline Corp.-Mt Vernon Compressor	WA	06/14/2006	IC Engine, Standby Generator	Natural Gas	450	KW	Generator Limited To Operating < 500 H/Yr.	NOX	Non Selective Catalytic Reduction	82 G/H 0.24 G/B-HP-H, CALCULATED	BACT-PSD

APPENDIX H
DETAILED LIST OF CHANGES FROM SEPTEMBER 2014 APPLICATION

Section 1

1.1

- The first paragraph mentions representing changes and additional BACT requirements in the revised application to reduce emissions.
- 12 External Floating Roof (EFR) Tanks were changed to Internal Floating Roof (IFR) Storage Tanks.
    - The tanks were switched to IFR for an increased level of control.
- Added clarification that slop oil tanks have a capacity of 400 bbl each.
- Added clarification that wastewater sump tank has a capacity of approximately 1,100 gallons.
- Added emergency generator engine and specified 2 emergency generator engines as opposed to 1.
- The Facility is noted as a minor source and is not subject to Title V or PSD review.
    - Overall VOC decreased as a result of changes to the tanks and loading calculations. (See the next point for further details)
- Table 1-1 Annual Emissions changed – VOC and HAPs decreased while NOx and CO emissions increased. Also two loading spots and VCU's represented instead of one.
    - The decrease in VOC is due to the tank change from EFR to IFR tanks and an updated destruction efficiency for the marine loading VCU. After speaking with the VCU vendor, it was agreed that the VCU could achieve a 99.9% destruction efficiency for VOC as opposed to 99%. This change along with the improved control of the IFR tanks lowered the VOC emissions under the major source threshold. The NOx and CO emissions were revised based on estimates from the manufacturer instead of factors from a similar facility. The loading loss factor for the marine loading was also revised to represent a more conservative amount of vapor going to the VCU. These two changes resulted in an increase of combustion emissions from the VCU.
    - The Facility was updated to represent the capability of two dock loading points (to increase the hourly marine loading rate) and a redesigned VCU system consisting of two VCU stacks for added operational flexibility.

1.2

- The Facility is considered a minor source as opposed to a major source. In the September 2014 application submittal, the emissions were subject to PSD and Title V review as the potential emissions were greater than major threshold for VOC.

1.3

- Appendix E – added documents supporting emissions calculations basis and inputs.
- Appendix G – added Oct 9th 2014 TCEQ response submittal including additional BACT analyses.

Section 2

2.1

- Added clarification that up to 100 MMbbl of crude oil and condensate will be handled annually.
    - This is through tanks only. (See comments on increase in Section 3.2 below)
- Added clarification that up to 73 MMbbl can be loaded to ships and barges annually.
- Increased maximum hourly loading rate and clarified new rate is 40,000 bbl/hr (rate changed from 20,000 bbl/hr).
    - This increase was due to the addition of a second loading spot at the dock area.
- Increased maximum hourly withdrawal rate for tanks and clarified this rate will not exceed 50,000 bbl/hr (rate changed from 20,000 bbl/hr).
    - This increase was due to a required change in the hourly withdrawal rate to accommodate for the additional dock loading spot.
- Added a detailed list of equipment at The Facility.
- Added a detailed list of planned MSS activities that will contribute to emission totals and a reference to calculations for these activities.
- Updated Figures 2-2 and 2-3 to more accurately represent equipment and processes at the Facility.

Section 3

3.1

- Added clarification that the fugitive component count was determined from P&ID diagrams.
- Revised methodology for pipe disconnect activity and clarified methodology assumes entire "clingage layer" is released into the atmosphere. Methodology uses a clingage layer of 0.006 bbl/1000 ft^2 and the surface area of the inside of the piping to estimate emissions per disconnect event.
- Added clarification that storage tank mixer seals are treated similar to pump seals and counted in the pump seals category.

3.2

- Changed EFRs to IFRs at The Facility and clarified the tanks will be equipped with double rim seals and 13 fixed roof support columns.
- Increased the maximum pumping rate from 20,000 bbl/hr to 50,000 bbl/hr.
- Increased annual site throughput from 73 MMbbl/yr to 100 MMbbl/yr.
    - Plains determined that in addition to the throughput from the pipelines to the tanks to the dock for loading, there would be additional throughput entering and exiting The Facility by pipeline only. Therefore, to account for potential emissions from these activities, the annual throughout for the tanks was increased.
- Crude oil/condensate updated RVP of 9.5 psi. The September 2014 application represented TVP of 11 psia.

    - Calculations in the September 2014 application were conservative based on a maximum true vapor pressure at all storage conditions of 11 psia. The basis for this figure is NSPS Subpart Kb. The pipelines that will supply crude and condensate to The Facility are contractually limited to a maximum Reid vapor pressure (RVP) of 9.0 psi. This information was not known at the time the September 2014 application was submitted. Revising the storage tanks calculations to RVP 9.5 provides some margin of conservatism and more accurately reflects the actual characteristics of the products to be stored at The Facility.
- Clarified tank design of 13 fixed-roof support columns rather than AP-42 default value of 22.
- Added clarification CAS breakthrough VOC concentration of 100 ppmv and a hourly maximum throughput of 10 bbl/hr were assumed to calculate both annual and maximum hourly emissions for the wastewater/stormwater sump tank instead of using estimations from Tank 4.09d.

3.3

- Increased VOC Destruction Removal Efficiency (DRE) from 99% to 99.9%.
    - This was increased due to consultation with the VCU manufacturer and the manufacturer's guarantee of 99.9% DRE.
- Maximum pumping capacity increased from 20,000 bbl/hr to 40,000 bbl/hr.
- Crude oil/condensate updated RVP of 9.5 psi. The September 2014 application represented TVP of 11 psia.
- Added clarification for VOC emission calculation methodology, showing use of a 0.2 saturation factor in the updated loading loss equation (Equation 1 instead of Equation 2).
    - The loading loss equation used for the VOC emissions from loading was updated to the equation for petroleum liquid loaded onto ships (Equation 1 in Section 5.2 of AP-42) instead of the loading loss equation for crude oil loaded onto marine vessels (Equation 2 in Section 5.2 of AP-42).
- Added clarification that H_2S and SO_2 are calculated based on the ideal gas law using a maximum H_2S concentration of 1,000 ppmv and an average annual concentration of 100 ppmv with a 98% conversion rate of H_2S to SO_2.

3.4.1

- Added clarification that there will be ten 10 gallon sample pots at The Facility.
- Added clarification that the top of the pots will be opened after every distinct batch of oil for cleaning.
- Added clarification for assumption of 2 sample pots cleaned per hour.
- Added clarification for assumption of each pot cleaned once per day on average.
- Added clarification for assumption that 10 sample pots will be opened for maintenance no more than once per day for 365 days.

- Crude oil/condensate updated RVP of 9.5 psi. The September 2014 application represented TVP of 11 psia.

3.4.2

- Added clarification that the volume of vapors in the piping segments are based on an estimated maximum pipeline segment size of 2 feet in diameter and 70 feet in length.
- Added clarification that no more than 12 piping segments per year (based on one per tank) removed for maintenance. The September 2014 application estimated 30 per year.
- Crude oil/condensate updated RVP of 9.5 psi. The September 2014 application represented TVP of 11 psia.

3.4.3

- Added clarification that there will be no more than 72 pigging activities per year, based on three pigs per month, per pipeline (two pipelines). The September 2014 application estimated 24 total pigging activities per year.
- Added clarification that the volume of vapors released is based on pipeline segment size of 2 feet in diameter and 20 feet in length.
- Crude oil/condensate updated RVP of 9.5 psi. The September 2014 application represented TVP of 11 psia.

3.4.4

- Added clarification that no more than 5 pumps per year will be removed for maintenance, this accounts for all pumps removed once per year. The September 2014 application estimated 20 per year.
- Crude oil/condensate updated RVP of 9.5 psi. The September 2014 application represented TVP of 11 psia.

3.4.5

- Updated the estimated maximum loading rate of 150 gallons per minute per truck based on the largest truck size of 9,000 gallons being loaded in 1 hour. The September 2014 application estimated 84 gallons per minute.

3.4.6

- Clarified calculation methodology was represented for IFRs instead of EFRs.
- Added clarification that annual calculations are based on the average annual temperature based on Tanks 4.09d.
- Updated product change of services activities to 12 activities per year as opposed to 13.
- Crude oil/condensate updated RVP of 9.5 psi. The September 2014 application represented TVP of 11 psia.
- Updated VOC DRE of 99.9% as opposed to 99%.
- Updated assumption for degassing to 1 hour or less to be conservative. The estimation in the September 2014 application was 7.5 hours.

- Added clarification that the maximum tank filling rate will be 5,000 bbl/hr.

3.5

- Updated VOC DRE of 99.9% as opposed to 99%.
- Clarified design of vapor combustion system.
- Added clarification that the combustion emissions are based on the maximum throughputs and type of waste gas stream the VCU system will be controlling.
- Added clarification that the NOx and CO emissions were based on lb/MMBtu emission factors and maximum heat release estimates provided by the manufacturer.
- Added clarification that 1000 ppmv maximum concentration of H_2S in the vapor space of ocean going barges and ships was used to calculate SO_2 emissions.
- Added clarification that a 98% conversion of H_2S to SO_2 was used in the SO_2 calculation methodology.
- Updated the maximum annual operating schedule based on number of hours the engine will operate in non-emergency status (52 hours per year). The September 2014 application estimate assumed the maximum number of hours allowed per NSPS JJJJ (100 hours).

<u>Section 4</u>

4.1

- Added an abbreviated economic analysis (TIER III BACT) for the fugitive emission control and determined the cost-effectiveness of LDAR control is not considered economically reasonable.
- Added Table 4-1: "Cost Analysis for Emissions Control using LDAR Program".

4.2

- Updated the BACT analysis to reference IFR's instead of EFR's and note these controls exceed current BACT, Chapter 115, and NSPS Kb requirements.

4.3

- Updated VOC DRE of 99.9% as opposed to 99%.

4.4

- Added clarification that a "cone up" bottom and sump on the side of the tank will be installed in the storage tanks to ensure the new tanks added will be nearly drain dry.
- Updated the surface area of the sump to approximately 7.1 square feet per site drawings. The September 2014 application estimated 10 feet.
- Added clarification from TCEQ Chemical NSR Team that the standards noted are accepted as Tier I BACT as long as the emissions from tank landings will also be demonstrated to meet NAAQS and will not cause or contribute to a condition of air pollution.

- Added clarification that an analysis of MSS BACT was conducted for permitted similar facilities in the same vicinity.

4.5

- Updated VOC DRE of 99.9% as opposed to 99%.
- Clarified that there are two VCUs in the Vapor Combustor System.

4.6

- Clarified allowable emission rates for NOx and CO (NOx: 2.0 g/bhp-hr, CO: 4.0 g/bhp-hr).
- Clarified that the emission rates meet current BACT requirements.

Section 5 – (This Section is now Regulatory Applicability because PSD review is not required)

5.4.1

- Updated clarifications for Kb applicability.

5.9

- Clarified that PSD review is not required.
- Clarified that major stationary source thresholds are not exceeded.

Appendix A

- Table 1(a) – Revised per updated calculations
- Table 2 (Material Balance) – Revised per updated calculations

Appendix B

- Table 1F – Revised per updated calculations

Appendix C

- Added – Table 7(d) for the IFRs
- Table 4 – Revised
- Table 29 – Revised for additional engine

Appendix D

- Emissions Calculations Tables are revised and updated to new values per updated methodology noted in application.

Appendix E

- Added – Stabilized condensate sampling and analysis used to determine HAP speciation.
- Added – John Zink proposal and specifications.
- Added – Natural gas sampling.

- Added – VCU stack test report for an existing Plains Pipeline Corpus Christi marine loading facility.
- Tanks 4.09d Program Output – Revised to reflect vapor pressure and temperature changes.

Appendix F

- Added – Detailed TCEQ BACT tables.

Appendix G

- Added – October 9th TCEQ submittal.