Chevron Phillips Chemical Company LP

Cedar Bayou Plant
New Ethylene Unit 1594
Greenhouse Gas PSD Permit Application

December 2011

SEE Solutions, LLC   11601 Shadow Creek Pkwy, Suite 111   Pearland, Texas 77584

TABLE OF CONTENTS

1.0 INTRODUCTION

Chevron Phillips Chemical Company LP (Chevron Phillips) owns and operates an olefins and polyolefins complex at Cedar Bayou in Harris County. This facility currently operates an ethylene cracking unit, polyethylene units, and normal- and polyalphaolefins manufacturing units. Chevron Phillips proposes to expand its olefins production capacity at the Cedar Bayou Plant by constructing new ethylene steam cracking furnaces and supporting equipment. The modification will include an additional design production capacity of approximately 1.5 million metric tonnes per year of polymer grade ethylene. Other products include fuel gas, a C3+ stream, and other small hydrocarbon streams. Chevron Phillips proposes to initiate construction on this ethylene cracking unit expansion in November 2014, with final construction and startup by 2017.

The proposed expansion represents a major modification to an existing major source with respect to Nonattainment New Source Review (NNSR) for the ozone precursors nitrogen oxide (NOx) and volatile organic compounds (VOC), as well as Prevention of Significant Deterioration (PSD) review for NOx, carbon monoxide (CO), particulate matter (PM), and sulfur dioxide (SO_2). Additionally, as compared to the contemporaneous baseline, the project represents an increase in the potential to emit (PTE) greenhouse gases (GHGs) above the significance levels established by the U.S. Environmental Protection Agency (EPA) in its PSD Tailoring Rule of June 3, 2010. Likewise, there are no significant decreases in GHGs in the contemporaneous period that could potentially result in the project's netting out of GHG PSD review. Therefore, detailed GHG contemporaneous netting is not included in this application.

Chevron Phillips has submitted a new source review permit amendment application to the Texas Commission on Environmental Quality (TCEQ) to authorize construction of this olefins unit expansion and its associated emissions of NOx, CO, VOC, PM, and SO_2. The TCEQ permit amendment will incorporate NNSR for ozone (with VOC and NOx as regulated precursors) as well as PSD review for NOx, CO, PM, and SO_2. Pursuant to the EPA Tailoring Rule, Chevron Phillips is also submitting this PSD application for the expansion project to EPA to authorize the project's GHG emissions.

The balance of this permit application includes the following sections:

2.0 Administrative Information and Associated Forms

3.0 Area Map and Plot Plan

4.0 Process Description

5.0 Emissions Estimates

6.0 Best Available Control Technology Analysis

7.0 Other PSD Requirements

2.0 ADMINISTRATIVE INFORMATION AND ASSOCIATED FORMS

As required by 40 CFR §52.21(n), Chevron Phillips is providing administrative information related to this permit application on the following form. This information includes:

- Company name;
- Company official and associated contact information;
- Technical contact and associated contact information;
- Project location, Standard Industrial Code (SIC), and North American Industry Classification System (NAICS) code;
- Projected start of construction and start of operation dates; and
- Company official signature transmitting the application.

Additionally, in this section Chevron Phillips also provides a summary table demonstrating the project's PSD applicability with respect to the Tailoring Rule requirements.

Administrative Information
Greenhouse Gas Prevention of Significant Deterioration
Preconstruction Permit Application

I. Applicant Information		
A. Company or Other Legal Name: Chevron Phillips Chemical Company, LP		
B. Company Official Contact Name: Mr. Van Long		
Title: Plant Manager		
Mailing Address: 9500 Interstate 10 East		
City: Baytown	State: Texas	ZIP Code: 77521
Telephone No.: 281-421-6578	Fax No.: 281-421-6463	E-mail Address: longvg@cpchem.com
C. Technical Contact Name: Dr. Cynthia Gleason		
Title: Environmental Advisor		
Company Name: Chevron Phillips Chemical Company, LP		
Mailing Address: 10001 Six Pines Dr.		
City: The Woodlands	State: Texas	ZIP Code: 77380
Telephone No.: 832-813-4676	Fax No.: 832-813-4680	E-mail Address: gleascl@cpchem.com
D. Site Name: Cedar Bayou Plant		
E. Area Name/Type of Facility: Cedar Bayou		☒ Permanent ☐ Portable
F. Principal Company Product or Business: Organic Chemical Manufacturing		
Principal Standard Industrial Classification Code (SIC): 2869		
Principal North American Industry Classification System (NAICS): 325199		
G. Projected Start of Construction Date: November 2014		
Projected Start of Operation Date: November 2016		
H. Facility and Site Location Information (If no street address, provide clear driving directions to the site in writing.):		
Street Address: 9500 Interstate 10 East		
City/Town: Baytown	County: Harris	ZIP Code: 77521
Latitude (nearest second): 29° 49′ 20″ N	Longitude (nearest second): 94° 55′ 18″ W	
II. 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 I understand my signature indicates that this application meets applicable prevention of significant deterioration permitting requirements.		

Name: Van Long

Signature: Van Long

Original Signature Required

Date: Dec 12, 2011

GHG PSD Applicability Summary

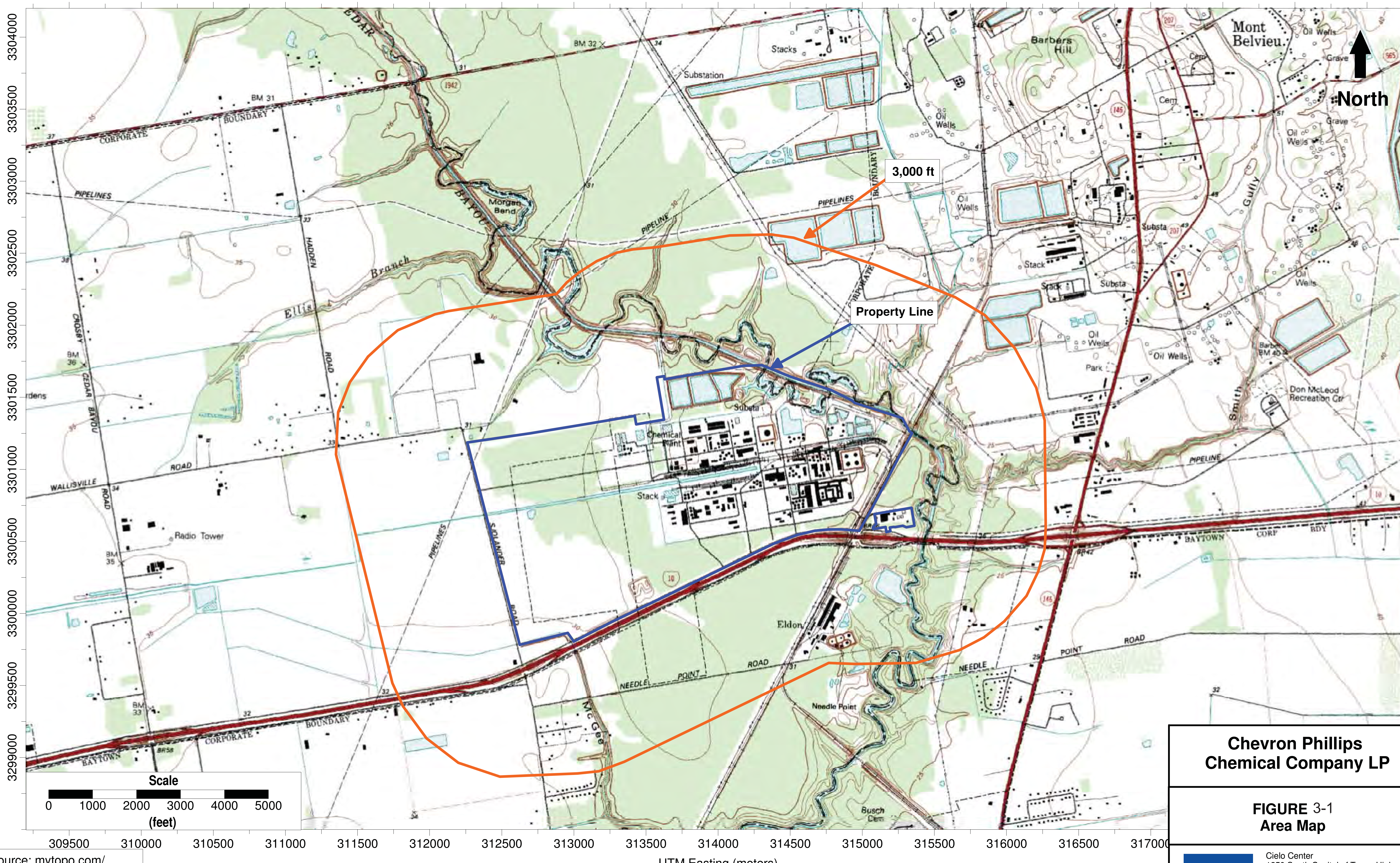
Permit No.: TBD	Application Submittal Date: December 19, 2011
Company: Chevron Phillips Chemical Company, LP	
Facility Location: 9500 Interstate 10 East	
City: Baytown	County: Harris
Permit Unit I.D.: New Cracking Furnaces, Boiler, VDU, Flare, Piping Fugitives, and Emergency Generators	Permit Name: Ethylene Unit 1594
Permit Activity: ☐ New Source ☒ Modification	
Project or Process Description: Ethylene Unit 1594 Expansion	

Complete for all Pollutants with a Project Emission Increase.	POLLUTANTS						
	Ozone		CO	PM_{10}	NO_X	SO_2	Other[1]
	VOC	NO_X					**CO2e**
Nonattainment? (yes or no)					NO	NO	NO
Existing site PTE (tpy)?							>100,000
Proposed project emission increases (tpy)							1,607,000
Is the existing site a major source[2]? If not, is the project a major source by itself[2]? (yes or no)							Yes
If site is major, is project increase significant?							Yes
If netting required, estimated start of construction?	November 2014 (Netting not relied upon for this permit)						
Five years prior to start of construction	November 1999						contemporaneous
Estimated start of operation	November 2016						period
Net contemporaneous change, including proposed project (tpy)							>100,000
FNSR APPLICABLE? (yes or no)							Yes (PSD)

1 Other PSD pollutants.
2 40 CFR §52.21(b)(49)(v).

3.0 AREA MAP AND PLOT PLAN

An area map is provided in Figure 3-1 which details 3,000-feet distance markings. An overall plot plan of the Cedar Bayou Plant is provided in Figure 3-2 which details the location of the facilities referenced in this submittal. Additionally, Chevron Phillips owns other property in the area that is not marked because it is not currently fenced. Figure 3-3 is a detailed plot plan showing the new Unit 1594 equipment and associated facility identification numbers/emission point numbers (FINs/EPNs).



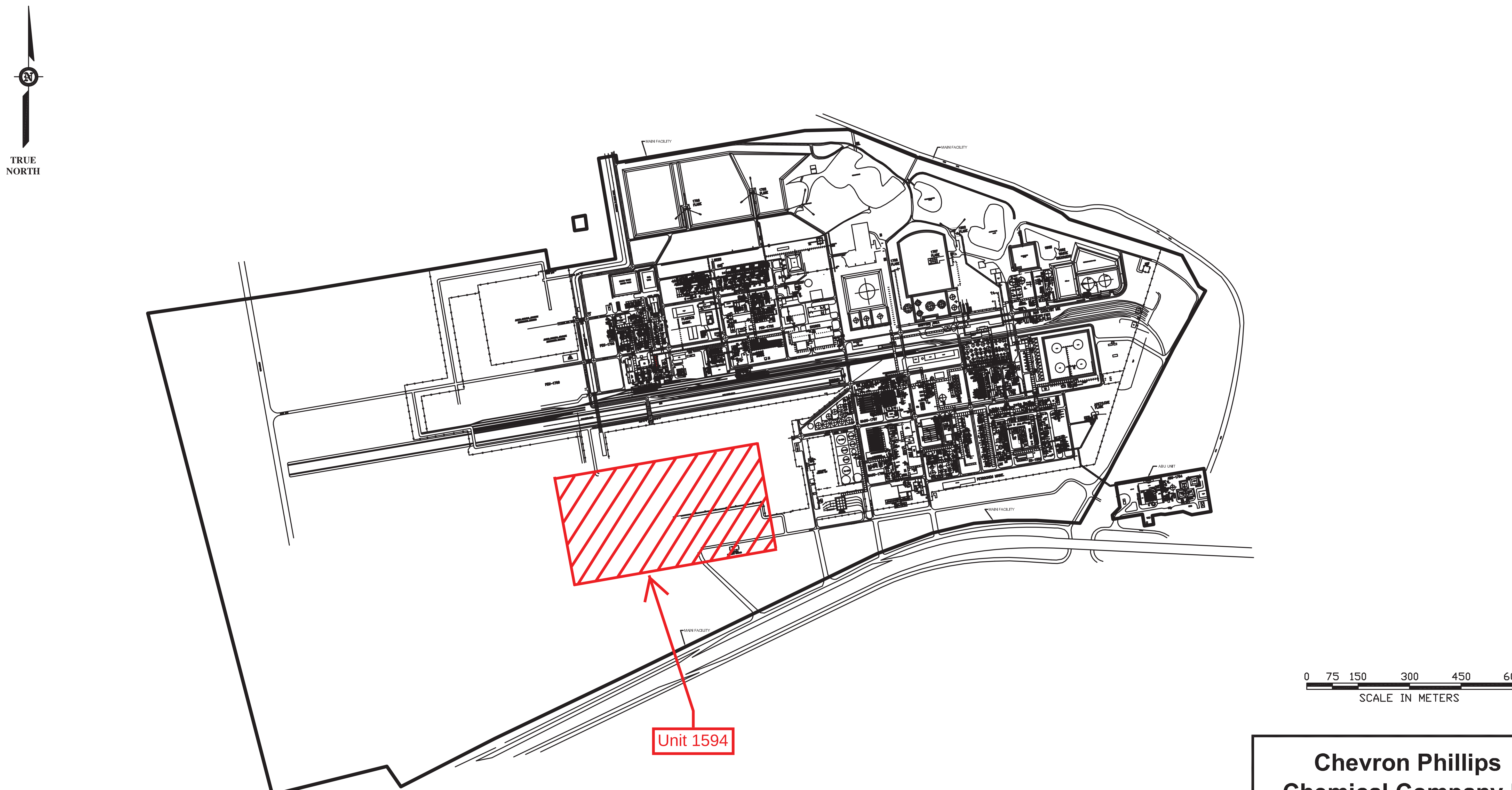
Source: mytopo.com/
Zone: 15
Map: Mont Belvieu

Chevron Phillips Chemical Company LP

FIGURE 3-1
Area Map

RPS

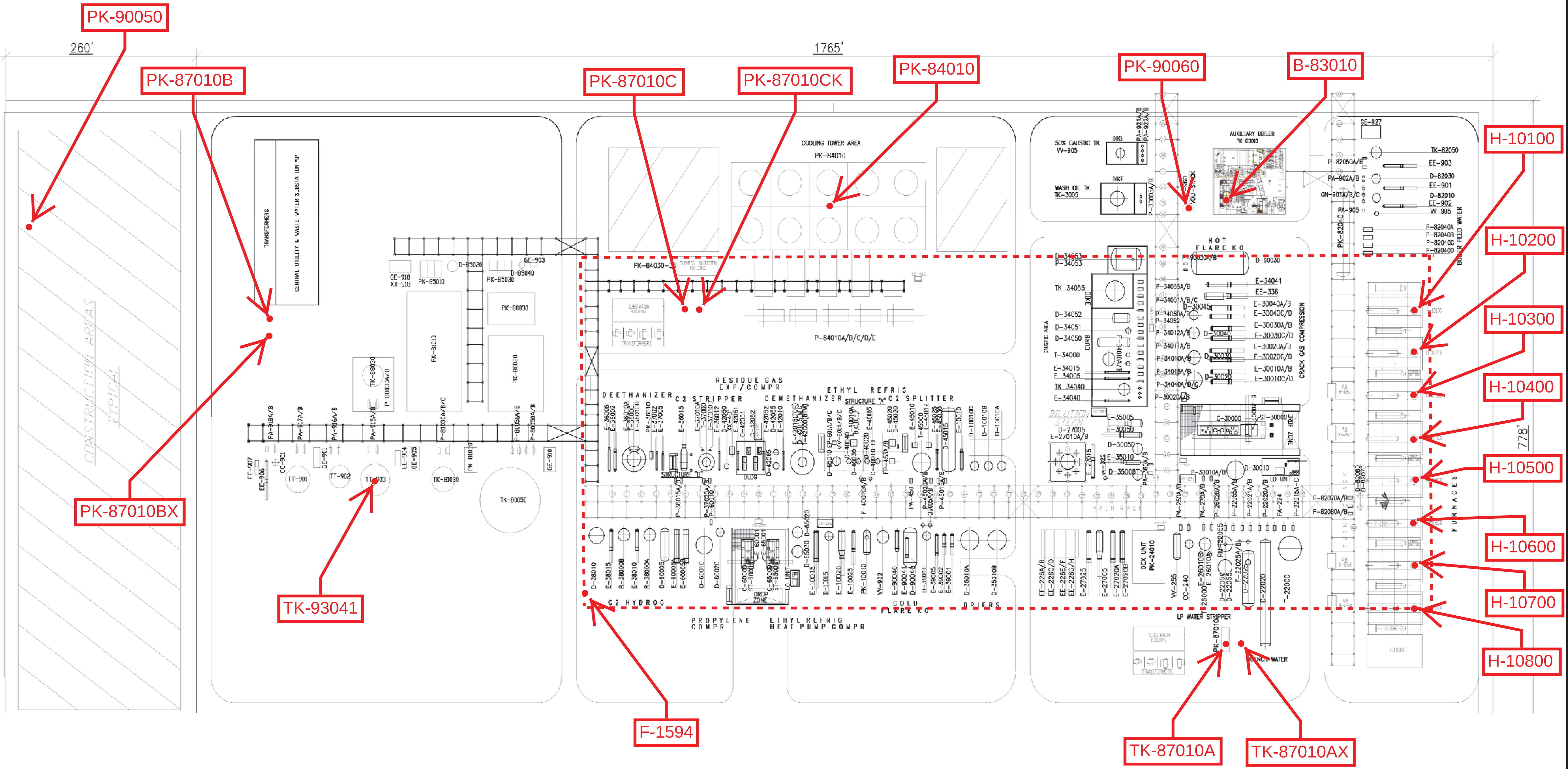
Cielo Center
1250 South Capital of Texas Highway
Building Three, Suite 200
Austin, Texas 78746, USA



Chevron Phillips Chemical Company LP

FIGURE 3-2
Overall Plot Plan

RPS
Cielo Center
1250 South Capital of Texas Highway
Building Three, Suite 200
Austin, Texas 78746, USA



Chevron Phillips Chemical Company LP

Figure 3-3

Unit 1594 - Plot Plan

RPS
Cielo Center
1250 South Capital of Texas Highway
Building Three, Suite 200
Austin, Texas 78746, USA

4.0 PROCESS DESCRIPTION

This section describes the process for the new ethylene unit (Unit 1594) and supporting utilities. A simplified process flow diagram for the ethylene unit is included as Figure 4-1. Figure 4-2 provides a simplified process flow diagram for the associated wastewater collection and treatment system. A completed materials balance table, which shows the materials and rates associated with specified points on the process flow diagram, is provided in Table 4-1 at the end of this section. Represented feed and product rates in the materials balance table are not intended as enforceable limits as production rates can vary depending on the feed and associated operating conditions.

4.1 Ethylene Unit

4.1.1 Feed Preparation

Fresh ethane feed from storage is filtered and dewatered in a coalescer before going through ethane feed dryers. Typically, two dryers will be in operation at any given time and the third will be on regeneration or standby. After the ethane is dried, it is chilled on its way to the ethane feed flash drum. Liquid from the flash drum is mixed with recycle ethane and the combined stream is preheated and mixed with the vapor from the flash drum as feed for the cracking furnaces.

4.1.2 Furnace Section

The cracking furnaces consist of eight (8) proprietary Ultra Selective Conversion induced draft furnaces (EPNs H-10100 to H-10800). The unit typically operates with seven furnaces with one furnace available for decoking and hot steam standby. The furnaces are equipped with low NOx burners and selective catalytic reduction (SCR) systems to control NOx emissions. Continuous Emission Monitoring Systems (CEMS) for NOx, CO, and oxygen, will be installed on each furnace. The pyrolysis of hydrocarbons forms coke in the heater tubes that must be periodically removed by using steam/air decoking. The furnaces typically operate for approximately fifty days before being taken off-line for decoking. The decoking procedure oxidizes and spalls the coke. Furnace fuel is plant fuel gas supplemented by natural gas.

4.1.3 Quench Water System

The quench water (QW) tower receives the cracking furnace effluent, condenses the dilution steam from the cracked gas, segregates the heavy components, and recovers the process surplus heat against other suitable process streams. The water/hydrocarbon mixture from the bottom of the QW tower is routed to an oil/tar/water separation system. The oil/tar mixture from the separation is routed to tanks where it is collected for subsequent processing in an existing unit. Water from the separation system is recycled to the QW tower. A blowdown stream from the recycled water is routed to the benzene stripper and then to new wastewater treatment units.

4.1.4 Cracked Gas Compression

The cracked gas compression system utilizes a five-stage compressor which is driven by a steam turbine. The overhead from the QW Tower is mixed with recycled methane from the demethanizer system and is fed to the first stage suction drum to remove liquid droplets that are entrained in the cracked gas. The cracked gas is then fed to the first stage of the cracked gas compressor and the vapor proceeds through the fourth stage of the compressor before being routed to the caustic wash system.

4.1.5 Caustic Wash System

The acid gases such as CO2 and/or H2S must be removed from the cracked gas to meet ethylene product specifications, and to protect the acetylene hydrogenation catalyst from H2S poisoning. The caustic tower consists of four sections; three lower sections are used for caustic scrubbing and the top section is use for washing the treated gas to avoid caustic carryover to the downstream equipment. Spent caustic is deoiled and degassed to flash dissolved light hydrocarbons. Degassed spent caustic is sent to the spent caustic tank. Vapor from the caustic tower proceeds to the fifth stage of the cracked gas compressor.

4.1.6 Dehydration

The cracked gas dehydrator system has two vessels containing molecular sieves, with one in operation and the other on regeneration/standby. The molecular sieves are regenerated by heating the bed with warm tail gas. The effluent from the operating molecular sieve is cooled to separate condensed water from the gas. The condensed water is sent to the QW Tower. The vapor proceeds to the fuel gas system.

4.1.7 HP Deethanizer & LP Stripper

The dried cracked gas vapor is fed to the high pressure (HP) deethanizer. The uncondensed vapor, consisting of C2s and lighter components, passes to the acetylene hydrogenation system. The HP deethanizer bottoms are routed to the low pressure (LP) C2 stripper. The C2s in the bottoms of the HP deethanizer are recovered in the LP C2 stripper and recycled to the cracked gas compressor third stage discharge. The C3+ bottoms product from the LP stripper are routed to the distillation section of the existing Unit 1592 ethylene plant.

4.1.8 Acetylene Hydrogenation

The HP deethanizer overhead is heated before passing to the acetylene reactors. There are two reactors operating in series. These reactors convert acetylene to ethylene/ethane. The effluent of the first reactor is cooled before entering the second reactor. The gas is then dried before passing to the demethanization system.

4.1.9 Demethanization System

In the demethanization system, condensing and separation of the C2 and heavier components from the cracked gas is done in the chilling train, by use of progressively colder levels of ethylene, propylene, and process refrigeration in plate fin exchangers. The liquid condensates thus formed are already partially fractionated via the chilling train and are fed forward to the demethanizer tower. The bottoms from the demethanizer tower are routed to the C2 splitter. The overhead stream from the demethanizer tower is used as fuel gas for the cracking furnaces and, as needed, the very high pressure (VHP) boiler.

4.1.10 C2 Splitter and Heat Pump System

The C2 splitter is a low-pressure ethylene-ethane superfractionator that is part of an open-loop heat pump system that is integrated with the ethylene refrigeration system. The fractionation in the C2 splitter separates ethylene/ethane feed into a high purity ethylene overhead vapor product stream and an ethane bottoms stream for recycle cracking.

4.1.11 Ethylene and Propylene Refrigeration

The ethylene refrigeration (C2R) system supplies process chilling at three levels. The propylene refrigeration (C3R) system supplies process chilling at two levels. Both the C2R refrigerant/heat pump compressor and the C3R compressor are driven by steam turbines.

4.2 VHP Boiler

The VHP boiler (EPN B-83010) designed to supply very high pressure steam to the cracker during start-up. Also, low pressure vent streams collected throughout the cracker plant are routed to the boiler firebox for control. The boiler is equipped with ultra-low NOx burners, an SCR system, and NOx, CO, and oxygen CEMS, with ammonia slip calculated by mass balance.

4.3 Low Pressure Vent System and Vapor Destruction Unit

Low pressure vent streams from various points in the process are collected and routed to the firebox of the VHP boiler for destruction. For periods when the boiler is down, the low pressure vent streams are routed to a backup vapor destruction unit (VDU) (EPN PK-90060) while maintenance or inspections are conducted on the boiler.

4.4 Low Profile Flare System

The low profile flare is designed for the safe control of gases vented from the ethylene cracker and support units. The low profile flare consists of multiple stage rows with several high capacity burners on each row. There is one staged burner for low pressure vents such as sweep gas, fugitive-like sources such as “leak by” from safety relief and pressure control valves, small volume maintenance activities such as clearing small volume equipment such as pumps, analyzers, instruments, and associated piping. The high capacity burners handle high pressure discharges due to emergencies, start-up and shutdown operations, and other large volume maintenance clearing. The system is equipped with a totalizing flow meter and an on-line analyzer to speciate the hydrocarbons in the flare gases, including Highly Reactive Volatile Organic Compounds (HRVOCs).

4.5 Emergency Generator

The ethylene unit includes three emergency generators, with an approximate aggregate power output of 4 MW total. The units are each powered by a diesel engine and there is one diesel tank associated with each emergency generator. Each generator engine's normal operation is to run one hour per week to test for proper operation, in the event it needs to be used in an emergency situation.

4.6 Storage Tanks

The cracker plant has one spherical (pressurized) tank for C3+ product storage. There are ten nitrogen blanketed tanks including the spent caustic tank, two benzene stripper tanks, the oily wastewater equalization tank, two slop oil tanks, the sludge holding tank and a sulfiding agent tank. The sulfiding agent is used as an additive in the process. All these tanks vent to the low pressure vent system. The cracker plant includes additional tanks, which vent to atmosphere, that are in wastewater and utility service. These tanks are not expected to contain hydrocarbons.

4.7 Cooling Tower

The cooling water system supplies cooling water to the plant. The cooling water is used to cool exchangers and condensers. The cooling tower (EPN PK-84010) is a multi-cell, induced draft, counter-flow type cooling tower.

4.8 Wastewater Collection and Treatment System

There are six oily wastewater and chemical wastewater sumps located throughout the cracker plant (Unit 1594) that collect process wastewater from sources such as pump pans, minor equipment leaks, and drains. These sumps are covered, sealed, and nitrogen blanketed with the sump vents discharging to the low pressure vent system. The wastewater from the sumps is sent to the oily wastewater equalization tank.

Spent caustic is treated in a wet air oxidation (WAO) system to convert sulfides to sulfates prior to being routed to the oily water equalization tank. The WAO system vents to the low pressure vent system.

Contact storm water (PC storm water) is collected from sections of ethylene unit 1594 where liquid hydrocarbons may wash from equipment surfaces or other sources to the concrete pad. There are four PC storm water sumps which collect and pump storm water to the PC stormwater equalization tank. The system is designed to collect the first flush of storm water and allow any remaining storm water to overflow to the clean storm water sewers and ditches.

The oily wastewater equalization tank pumps and PC storm water equalization tank pumps send wastewater to a corrugated plate interceptor (CPI) oil/water separator system. The CPI is a sealed unit and is nitrogen blanketed with vapors going to the low pressure vent system. Wastewater effluent from the CPI discharges to an induced gas floatation (IGF) unit. Vapors from the IGF unit are routed to the low pressure vent system. The IGF effluent is sent to an aerobic bio-treatment unit and clarifier.

The benzene stripper system provides treatment to wastewaters whose sources contain benzene at 10 ppm or more. These streams are collected, pretreated in an IGF unit, and then sent to the benzene stripper equalization tanks, which are vented to the low pressure vent system. The effluent of the equalization tank is sent to the benzene stripper. Overheads from the benzene stripper are recycled to the QW tower. Stripped wastewater is routed to the aerobic bio-treatment unit and clarifier mentioned above.

4.9 Miscellaneous Utilities

Various utilities will be constructed in support of the new ethylene unit that do not have air emissions and so do not require permit authorization by the TCEQ. These include a raw water treatment system, a demineralized water system, and plant air/instrument air systems.

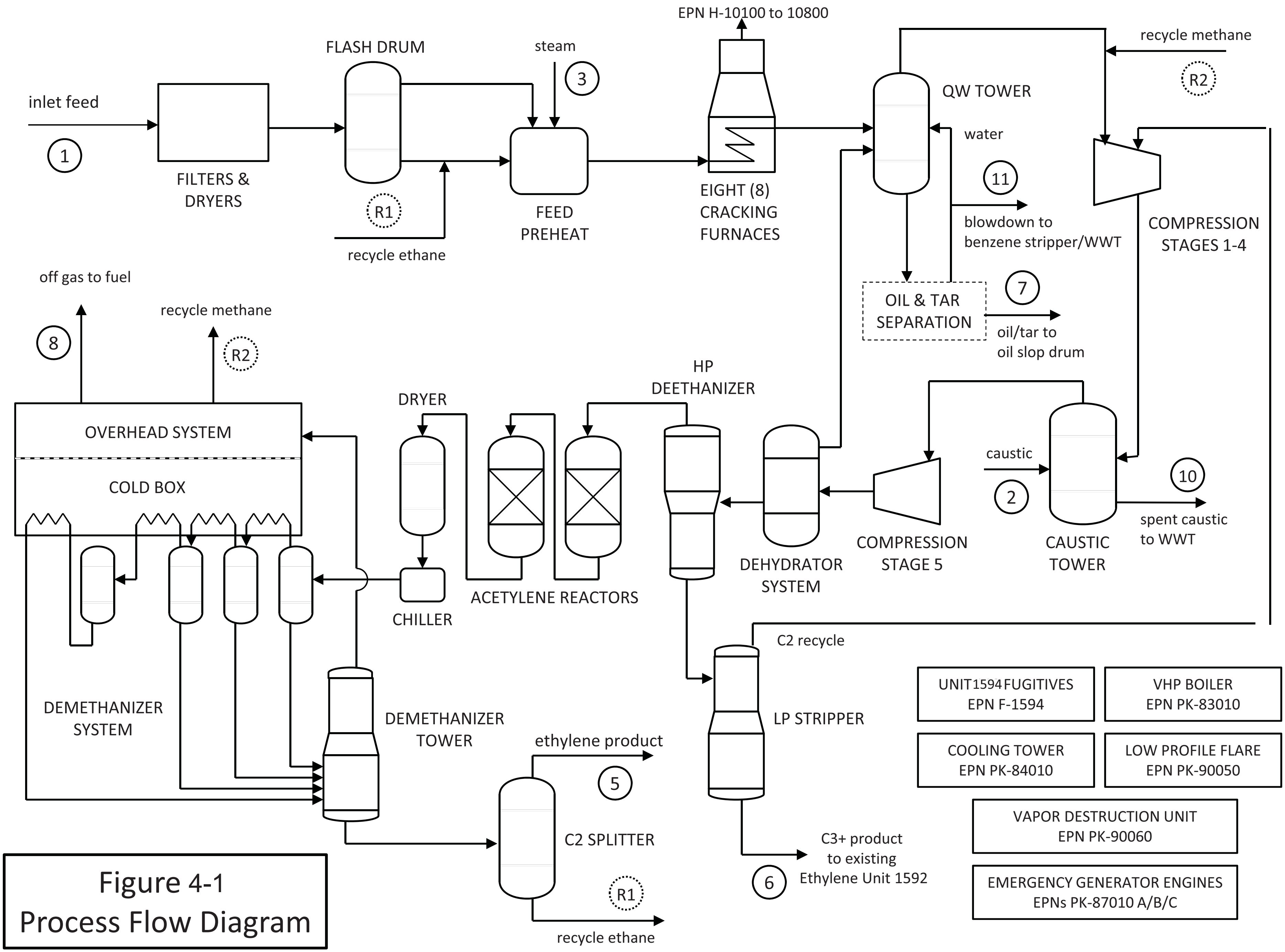


Figure 4-1
Process Flow Diagram

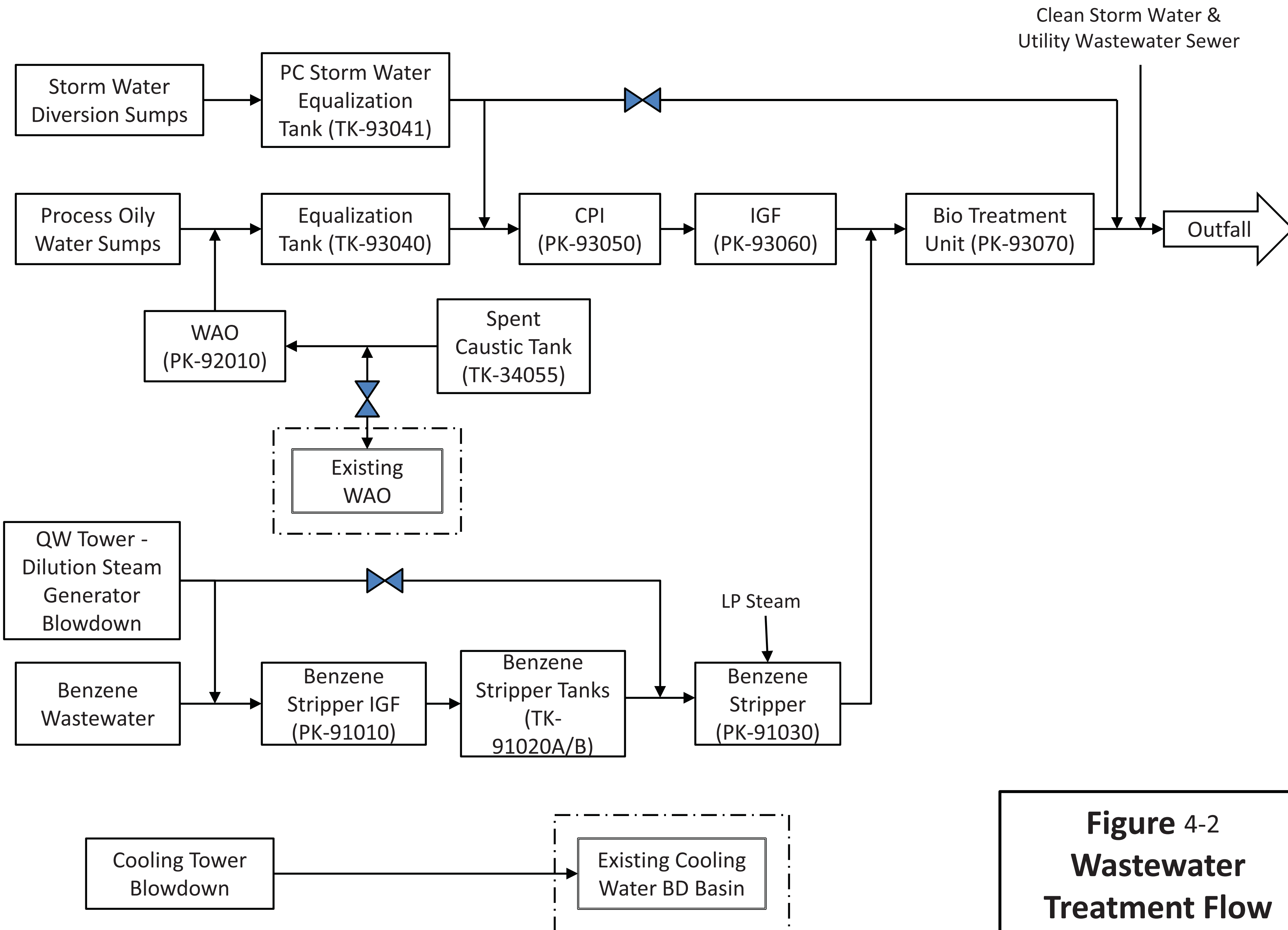


Figure 4-2 **Wastewater Treatment Flow Diagram**

TABLE 4-1
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	Process Rate (lbs/hr or SCFM) standard conditions: 70°F 14.7 PSIA. Check appropriate column at right for each process.	Measurement	Estimation	Calculation
1. Raw Materials - Input **Ethane, propane** **Fresh Caustic** **Process water**	**1** **2** **3**	**640,000 lb/hr**		**X**	
2. Fuels Input **Natural Gas**	**4**	**2,400 scfm**		**X**	
3. Products & By-Products - Output **Ethylene** **C3+ Product** **Tail Gas to Fuel**	**5** **6** **8**	**590,000.0 lb/hr**		**X**	
4. Solid Wastes - Output **Spent catalysts, oil, tar, coke, spent dehydrator media, wastewater treatment sludges, maintenance wastes**	**9**	**TBD**			
5. Liquid Wastes - Output **Wastewater effluent**		**53,000 lb/hr**		**X**	
6. Airborne Waste (Solid) - Output					
7. Airborne Wastes (Gaseous) - Output **GHGs (CO2, CH4, N2O, CO2e)**		**See Table 5-1**		**X**	

Note: Throughput rates are representative of expected operations and should not be considered enforceable limits.

5.0 EMISSIONS ESTIMATES

Some of the proposed equipment discussed in Section 4.0, Process Description, is not expected to emit GHGs. Therefore, the following discussion includes only those proposed emissions units with an anticipated potential to emit (PTE) one or more GHGs. The GHGs emitted from ethylene cracking Unit 1594 will include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Chevron Phillips does not anticipate emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), or sulfur hexafluoride (SF_6) from the new ethylene cracker process, Unit 1594.

As discussed in more detail in the following sections, the estimated GHG PTE from Unit 1594 is 1,607,000 tons/yr of CO_2 equivalent (CO2e). Table A-1 in Appendix 1 further summarizes these emissions by individual GHG annual mass rates as well as corresponding annual CO2e rates from the following GHG-generating emissions units:

- Cracking furnaces,
- VHP boiler,
- Vapor destruction unit,
- Low profile flare,
- Routine emergency generator testing, and
- Fugitive emissions from piping components in GHG service.

Chevron Phillips estimated CO2e emissions based on the estimated annual mass rates for each applicable GHG multiplied by the global warming potential (GWP) for each specific GHG as provided in Table A-1 of Subpart A of 40 CFR part 98.

Table 5-1, at the end of this section, provides emission source details, including stack parameters and proposed emission rates for individual GHGs and corresponding CO2e.

5.1 Steam Cracking Furnaces

The new cracker plant will incorporate eight steam cracking furnaces. Furnace GHG emissions from ethane cracking operations are detailed in Table A-2 of Appendix A; GHG emissions from decoking operations appear in Table A-3.

5.1.1 Normal Firing

Typically, the ethane steam cracking furnaces will combust plant tail gas ("fuel gas"); however, the furnaces may also operate on pipeline quality natural gas. To provide fuel flexibility, Chevron Phillips estimated annual GHG emissions from both fuel gas and natural gas firing and is proposing the that annual emissions for the furnaces be established at the maximum estimated PTE, as shown in Table A-2, with fuel stream characteristics presented in Table A-9.

Although maximum hourly fuel firing rates are represented in Table A-2 for reference, annual emissions estimates for routine operations assume continuous operation at the expected annual average firing rate, 412 MMBtu/hr/furnace. Chevron Phillips expects that only seven furnaces will operate at a given time, since one furnace will be available for decoking and hot steam standby. Therefore, Chevron Phillips proposes to cap the annual PTE emissions contribution from all eight furnaces' routine firing at a level consistent with annual operation of seven furnaces, plus decoking (as discussed in Section 5.1.2). Further, since steam generation from the furnaces is integrated with steam generation from the VHP boiler, the annual GHG emissions from the boiler, as discussed in Section 5.2, are included in this annual combustion unit emissions cap. In this way, although each individual furnace and the boiler may operate at each unit's proposed annual emissions, the aggregate of the eight furnaces' normal and decoking operations plus the boiler will not exceed the proposed combustion unit GHG emissions caps.

Chevron Phillips estimated the GHG emissions from the furnaces using EPA's GHG reporting methodology as detailed in 40 CFR Part 98, Subpart X, §98.243(d) for ethylene production processes.

5.1.2 Decoke Operations

During routine decoking of the furnace tubes, carbon (coke) on the tubes is combusted to form primarily CO_2 and a small amount of carbon monoxide (CO). To conservatively estimate GHGs from decoking operations, Chevron Phillips assumed 100% of the coke converts to CO_2 during decoking. Although the furnaces are fired during decoke operations, firing is at a lower rate than the 412 MMBtu/hr basis used for annual fuel firing for each furnace. Therefore, fuel firing during decoke operations is already accounted for in the 8,760 hr/yr/furnace normal firing scenarios discussed in Section 5.1.1. Therefore, decoke GHG emissions estimates shown in Table A-3 of Appendix A represent only the incremental GHGs generated during decoking from coke conversion to GHGs.

Although typical decoke cycles are approximately once every 50 days, more frequent coking may be required depending on actual operating conditions. Therefore, up to 12 decokes/yr/furnace were assumed in the decoking calculations.

5.2 VHP Boiler

Similar to the cracking furnaces, the VHP boiler may fire either natural gas or plant fuel gas. Therefore, Chevron Phillips estimated GHG emissions using both fuels, as shown in Table A-4 of Appendix A, and is proposing the higher of the two annual rates to provide required fuel flexibility. Also, the boiler's contribution to the annual GHG emissions cap from combustion devices is based on 720 hr/yr at the maximum firing rate (500 MMBtu/hr), 48 hr/yr in startup (at 500 MMBtu/hr), and the balance at the normal firing rate of 150 MMBtu/hr.

As discussed in Section 5.1.1, the interdependence of steam supply among the operation of the eight furnaces and the VHP boiler necessitates including the boiler's annual GHG emissions in the overall combustion cap. In this way, the boiler may operate up to its proposed individual annual GHG emission rates in any given year, but aggregate GHG emissions from the boiler plus the furnaces will not exceed the proposed annual caps. Also, the boiler's contribution to the annual GHG emissions cap from combustion devices is based on 720 hr/yr at the maximum firing rate (500 MMBtu/hr), 48 hr/yr in startup (at 500 MMBtu/hr), and the balance at the normal firing rate of 150 MMBtu/hr. Although these assumptions represent the basis for calculating the annual furnace/boiler emission caps, Chevron Phillips is not proposing specific limitations on boiler operating rates or schedule as long as compliance with the annual emission caps is demonstrated.

Because the boiler can fire plant fuel gas or natural gas, Chevron Phillips estimated GHG emissions from the VHP boiler consistent with the methodology used for the cracking furnaces: that for GHG reporting for ethylene processes as found in 40 CFR Part 98, Subpart X, §98.243(d).

5.3 Vapor Destruction Unit

The Vapor Destruction Unit (VDU) is used as a backup control device for process vent streams while maintenance or inspections are being performed on the VHP boiler. The VDU GHG emission calculations are based on the unit operating up to four weeks (672 hours) per year; however, longer boiler downtimes may occur as long as the allowable GHG emissions from sources authorized by this permit are not exceeded. For the remainder of the year, the VDU will remain on hot standby with only the pilots combusting fuel, which is the basis for calculating the remaining annual GHG emissions from the VDU.

As with the furnaces and the VHP boiler, Chevron Phillips estimated GHG emissions from the VDU using the methodology from 40 CFR Part 98, Subpart X, §98.243(d). Table A-5 in Appendix A details the VDU GHG emissions estimates.

5.4 Low Profile Flare

The flare is a low profile flare is a safety device. The first stage is a low pressure burner that is steam-assisted. The 14 remaining stages are high pressure burners that are unassisted. Table A-6 in Appendix A details the GHG emissions estimates for this flare system.

Normal flaring operations control streams from vents that can be classified into three main types of activities: fugitive-like sources such as "leak-by" from safety relief and pressure control valves that are closed during routine operation, maintenance activities, and process adjustments to maintain product quality. These activities are expected to use the low pressure burner. The flow rate is based on measured values of a similar plant with adjustments for capacity and complexity.

Estimated emissions from the flare due to scheduled maintenance, start-up and shutdown (MSS) activities are broken down by activity type. Maintenance flaring includes control of streams generated from maintenance performed on converters, dryers, filters, pumps, and exchangers. Start-up flaring includes control of streams generated from startup activities in seven different sections of the facility. Shutdown stream flaring is assumed to be approximately one half of each of the start-up streams.

For each flared stream, the total mass of vapors and the weight percent of each component were used to estimate stream properties and corresponding GHG emissions. The stream characteristics used for the flare GHG emissions basis are provided in Table A-10 of Appendix A. Although these stream details are provided for emissions estimation purposes, speciation and total flow rates are based on process design as well as similar operating facilities' typical streams. Speciation and or flow volume may vary depending on process conditions and additional compounds similar to those represented may be present.

Natural gas-fired pilots remain lit during normal operation to ensure the flare is available when needed. The flare has 30 pilots, each with a flow rate of 85 scfh.

GHG emissions estimates are based on natural gas firing for the pilots and petrochemical process vent firing for the balance of the flared stream. Therefore, 40 CFR Part 98, Subpart X, §98.243(d) is the appropriate emissions estimation methodology, which Chevron Phillips used for the flare.

5.5 Emergency Generators

Three diesel-fired emergency generators will be located at the site with an aggregate power output of 4 MW. The generators will only operate during emergencies and on regularly scheduled intervals for testing. It is estimated that the generators will be operated a maximum of 52 hours per year each for testing. There will be no other emissions from the generator during normal operation.

GHG emissions from these diesel-fired engines follow the approach for general combustion devices represented in 40 CFR Part 98, Subpart C and the emission factors for No. 2 distillate fuel represented in Tables C-1 and C-2 of Part 98. The resulting GHG emissions estimates are included in Table A-7 of Appendix A.

5.6 Piping Fugitives

Table A-8 of Appendix A details the fugitive emissions from piping components in fuel gas and natural gas piping in the new cracking unit. Fuel gas and natural gas both contain primarily methane, with additional heating value derived mostly from hydrogen (fuel gas) and ethane (natural gas). Other process streams in the cracker unit in volatile organic compound (VOC) service contain only insignificant quantities of GHGs as compared to other GHG sources in the cracker unit and therefore are not considered further in this application.

Although there are no established GHG piping fugitive emission factors, Chevron Phillips applied the average Synthetic Organic Chemical Manufacturing Industry (SOCMI) average emissions factors for petrochemical processes to the estimated fuel gas and natural gas piping component types and quantities to estimate fugitive total mass emissions from the fuel gas and natural gas piping in the cracking unit. Because many of these components may be in either natural gas or fuel gas service, and because natural gas is over 90% methane (a GHG), Chevron Phillips conservatively assumed 100% of the mass emissions were methane.

Table 5-1

Emission Point Summary

Date:	12/19/2011	**Permit No.:**	To Be Determined	**Site Name:**	Cedar Bayou Plant
Company Name:	Chevron Phillips Chemical Company, LP			**Project:**	New Ethylene Cracker Unit (Unit 1594)

AIR CONTAMINANT DATA				
1. Emission Point				
(A) EPN	(B) FIN	(C) NAME	2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate (ton/yr)
H-10100	H-10100	Cracking Furnace 1	CO2	206,000
			CH4	1.2
			N2O	0.2
			CO2e	206,000
H-10200	H-10200	Cracking Furnace 2	CO2	206,000
			CH4	1.2
			N2O	0.2
			CO2e	206,000
H-10300	H-10300	Cracking Furnace 3	CO2	206,000
			CH4	1.2
			N2O	0.2
			CO2e	206,000
H-10400	H-10400	Cracking Furnace 4	CO2	206,000
			CH4	1.2
			N2O	0.2
			CO2e	206,000

EPN = Emission Point Number
FIN = Facility Identification Number

Table 5-1

Emission Point Summary

Date:	12/19/2011	**Permit No.:**	To Be Determined	**Site Name:**	Cedar Bayou Plant
Company Name:	Chevron Phillips Chemical Company, LP			**Project:**	New Ethylene Cracker Unit (Unit 1594)

AIR CONTAMINANT DATA				
1. Emission Point				
(A) EPN	**(B) FIN**	**(C) NAME**	**2. Component or Air Contaminant Name**	**3. Air Contaminant Emission Rate (ton/yr)**
H-10500	H-10500	Cracking Furnace 5	CO2	206,000
			CH4	1.2
			N2O	0.2
			CO2e	206,000
H-10600	H-10600	Cracking Furnace 6	CO2	206,000
			CH4	1.2
			N2O	0.2
			CO2e	206,000
H-10700	H-10700	Cracking Furnace 7	CO2	206,000
			CH4	1.2
			N2O	0.2
			CO2e	206,000
H-10800	H-10800	Cracking Furnace 8	CO2	206,000
			CH4	1.2
			N2O	0.2
			CO2e	206,000

EPN = Emission Point Number
FIN = Facility Identification Number

Table 5-1

Emission Point Summary

Date:	12/19/2011	**Permit No.:**	To Be Determined	**Site Name:**	Cedar Bayou Plant
Company Name:	Chevron Phillips Chemical Company, LP			**Project:**	New Ethylene Cracker Unit (Unit 1594)

AIR CONTAMINANT DATA				
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate (ton/yr)
(A) EPN	(B) FIN	(C) NAME		
B-83010	B-83010	VHP Boiler	CO_2	127,000
			CH_4	0.6
			N_2O	0.1
			CO_2e	127,000
		Furnace/Boiler Combustion Cap	CO_2	1,572,000
			CH_4	9
			N_2O	2
			CO_2e	1,572,000
PK-90060	PK-90060	Vapor Destruction Unit	CO_2	1,100
			CH_4	0.002
			N_2O	0.0002
			CO_2e	1,100
PK-90050	PK-90050	Low Profile Flare	CO_2	27,000
			CH_4	0.2
			N_2O	0.04
			CO_2e	27,000

EPN = Emission Point Number
FIN = Facility Identification Number

Table 5-1

Emission Point Summary

Date:	12/19/2011	**Permit No.:**	To Be Determined	**Site Name:**	Cedar Bayou Plant
Company Name:	Chevron Phillips Chemical Company, LP			**Project:**	New Ethylene Cracker Unit (Unit 1594)

AIR CONTAMINANT DATA				
1. Emission Point			**2. Component or Air Contaminant Name**	**3. Air Contaminant Emission Rate (ton/yr)**
(A) EPN	**(B) FIN**	**(C) NAME**		
PK-87010A/B/C	PK-87010A	Emergency Generators A/B/C	CO2	274
			CH4	0.011
			N2O	0.0022
			CO2e	275
F-1594	F-1594	Process Fugitives	CH4	324
			CO2e	6,800

EPN = Emission Point Number
FIN = Facility Identification Number

6.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

As required by 40 CFR §52.21(j),best available control technology (BACT) must be demonstrated for new and modified emissions sources in a PSD permit application for which a significant net emissions increase will occur. In this application, the only applicable pollutants are the GHGs CO_2, CH_4, N_2O, and CO2e. For these pollutants, the following emissions sources propose significant net GHG emissions increases as defined by §52.21(b)(23)(ii) and §52.21(b)(49)(v):

- Cracking furnaces,
- VHP boiler,
- Vapor destruction unit,
- Low profile flare,
- Routine emergency generator testing, and
- Fugitive emissions from piping components in GHG service.

In its October 1990 draft guidance document entitled *New Source Review Workshop Manual (Draft)*, EPA established a five-step process for conducting a top-down BACT review for PSD permitting. In its March 2011 guidance document for GHG *permitting, PSD and Title V Permitting Guidance for Greenhouse Gases* (EPA 457/B-11-001), EPA reaffirmed that this five-step top-down BACT analysis should also be used for GHG PSD permit application BACT demonstrations. Therefore, the five steps used in this BACT analysis are:

1. Identification of available control technologies;
2. Eliminate technically infeasible alternatives from further consideration;
3. Rank remaining technologies according to control effectiveness;
4. Evaluate the most effective controls from the standpoint of cost-effectiveness, energy impacts, and environmental effects, continuing with the next most effective technology if unreasonable adverse impacts are identified for the more effective option(s); and
5. Select BACT.

As shown in Table A-1, over 99.5% of the CO2e emissions proposed for the new cracker unit are CO_2. With the exception of piping fugitives, CH_4 and N_2O contribute insignificantly to the overall GHG emissions potential, and even piping fugitives of CH4 contribute only 0.02% of the GHG mass emissions total and 0.4% of the CO2e total. Therefore, Chevron Phillips searched the EPA RACT/BACT/LAER Clearinghouse (RBLC) database only for applicable CO_2 BACT determinations to assist in identifying potential GHG control technologies relevant to the proposed emissions sources. Appendix B of this application includes the corresponding RBLC search results.

6.1 Steam Cracking Furnaces

6.1.1 Step 1 – Identify Potential Control Technologies

For furnaces and boilers, the RBLC database identified only proper combustion operation and maintenance as BACT controls. Add-on controls and other potential technologies have not been designated in the RBLC database as applicable GHG controls to date. Nonetheless, Chevron Phillips considered the following technologies as potential GHG control measures for the cracking furnaces in the new ethylene Unit 1594:

- Carbon capture and storage (CCS),
- Low-carbon fuel(s),
- Energy efficiencies, and
- Good combustion practices and maintenance.

6.1.1.1 Carbon Capture and Storage

CCS requires separation of CO_2 from flue gases, compression of the isolated CO_2, transportation to a suitable injection/storage location, and long-term storage in appropriate geologic formations. Although several technologies are available for segregating CO_2 from moderate to high- CO_2 purity flue gases, many of these are still being used on a pilot or laboratory scale and are not yet proven for use in large-scale industrial applications except oil and gas production. Once segregated, the CO_2 must be compressed and transported, requiring additional energy to accomplish. Geologic storage must consider the acidic nature of CO_2 gases, especially in formations such as limestone that are susceptible to acidic erosion.

6.1.1.2 Low-Carbon Fuel

Use of fuels containing lower concentrations of carbon generate less CO_2 than other higher-carbon fuels. Typically, gaseous fuels such as natural gas or high-hydrogen plant tail gas contain less carbon, and thus lower CO_2 potential, than liquid or solid fuels such as diesel or coal.

Chevron Phillips proposes to use high-hydrogen plant tail gas as the primary fuel for the cracking furnaces. When this tail gas may be unavailable, the alternate fuel will be natural gas.

6.1.1.3 Energy Efficiency

Energy efficiency considers integration of heat and energy balances throughout a facility, not just for one piece of equipment. Therefore, energy efficiency is an integrated solution to plant-wide energy optimization as compared to production.

Chevron Phillips proposes to use a proprietary furnace and integrated cold system design developed by its vendor to result in a lower carbon footprint than typical ethylene cracking process units. For example, the proprietary design recovers refrigeration capacity from incoming ethane feed to reduce demand for refrigeration compression power downstream of the furnaces, resulting in reduced high-pressure steam demand and thus reducing the required fuel combustion (and related CO_2 generation) for steam generation. Lower pressure separation of ethylene and ethane likewise reduces compression and resulting steam demand and CO_2 generation from combustion. The vendor also incorporates an optimized distillation tower design, resulting in minimization of reboiler and reflux demand, as well as proprietary optimized cooling water system design that that balances heat exchange temperatures with compression and circulation requirements. Further, excess high-pressure steam is anticipated from incorporation of these energy efficiency measures. Thus, Chevron Phillips proposes to export this steam to other existing process units onsite, replacing and/or supplementing steam demand from older, less energy-efficient existing steam generation units.

6.1.1.4 Good Combustion Practice

Good combustion practices include appropriate maintenance of equipment (such as periodic burner tune-ups) and operating within the recommended combustion air and fuel ranges of the equipment as specified by its design, with the assistance of oxygen trim control. Although good combustion practices do not themselves necessarily directly reduce GHG emissions, using good combustion practices results in longer life of the equipment and more efficient operation. Therefore, such practices indirectly reduce GHG emissions by supporting operation as designed and with consideration of other energy optimization practices incorporated into the integrated plant.

Chevron Phillips will incorporate such combustion practices as recommended by its vendor and based on its extensive operating experience with steam cracking furnaces.

6.1.2 Step 2 – Eliminate Technically Infeasible Options

6.1.2.1 Carbon Capture and Storage

As indicated in its March 2011 PSD permitting guidance for GHGs, the EPA notes[1]:

> For the purposes of a BACT analysis for GHGs, EPA classifies CCS as an add-on pollution control technology that is “available” for facilities emitting CO_2 in large amounts, including fossil fuel-fired power plants, and for industrial facilities with high-purity CO_2 streams (e.g., hydrogen production, ammonia production, natural gas processing, ethanol production, ethylene oxide production, cement production, and iron and steel manufacturing). For these types of facilities, CCS should be listed in Step 1 of a top-down BACT analysis for GHGs.

The new ethylene unit does not incorporate hydrogen recovery from the plant fuel gas, although the plant fuel gas is high in hydrogen content. However, rather than purify this

[1] U.S. EPA, Office of Air Quality Planning and Standards, *PSD and Title V Permitting Guidance for Greenhouse Gases,* March 2011, p. 32.

hydrogen stream for sale, Chevron Phillips instead uses the high-hydrogen/lower-carbon tail gas stream as primary fuel for the furnaces, reducing the CO_2 emissions from these large combustion units significantly from that which would be experienced if the hydrogen were recovered and sold and higher-GHG fuels were used as primary furnace fuel year-round.

Further, the furnace exhaust streams are not high-purity streams, as recommended in EPA's guidance. Instead, the furnace exhausts contain approximately 5% or less CO_2 in the stack gas on an average annual basis. Therefore, the recovery and purification of CO_2 from the stack gases would necessitate significant additional processing, including energy, and environmental/air quality penalties, to achieve the necessary CO_2 concentration for effective sequestration.

Finally, even if the CO_2 could be segregated efficiently from the furnace exhausts, the availability of appropriate sites for geologic sequestration in proximity to the facility does not exist. There are salt dome caverns within 10 to 15 miles of the site; however, these limestone formations have not been demonstrated to safely store acid gases such as CO_2, nor is there adequate availability of space. Instead, these domes are used for cyclical storage of liquefied petroleum gases (LPGs) for use in the Gulf Coast as well as for shipment throughout the United States via pipeline. To replace this critical active storage with long-term CO_2 sequestration would necessarily jeopardize energy supplies locally and nationally. Other potential sequestration sites that are presently commercially viable, such as the SACROC enhanced oil recovery unit in the Permian Basin, are more than 400 to 500 miles from the proposed project site.

Further, as stated in the August 2010 *Report of the Interagency Task on Carbon Capture and Storage*[2]:

> Current technologies could be used to capture CO_2 from new and existing fossil energy power plants; however, they are not ready for widespread implementation primarily because they have not been demonstrated at the scale necessary to establish confidence for power plant application. Since the CO_2 capture capacities used in current industrial processes are generally much smaller than the capacity required for the purposes of GHG emissions mitigation at a typical power plant, there is considerable uncertainty associated with capacities at volumes necessary for commercial deployment.

Therefore, because there is not a demonstrated commercial implementation of CCS for non-power plant industrial applications, since the furnace stack gases are not high-purity CO_2 streams, and because there is not a viable geologic sequestration site available in the project area for long-term CO_2 storage, CCS is considered a technically infeasible control option for the

[2] President Obama's Interagency Task Force on Carbon Capture and Storage, *Report of the Interagency Task Force on Carbon Capture and Storage,* August 2010, p. 50.

proposed new cracking unit at Chevron Phillips' Cedar Bayou plant and is not considered further in this analysis.

6.1.2.2 Low-Carbon Fuel

Use of low-carbon fuel is considered technically feasible.

6.1.2.3 Energy Efficiency

Use of certain energy efficiency measures is considered technically feasible.

6.1.2.4 Good Combustion Practice

Use of good combustion practices is considered technically feasible.

6.1.3 Step 3 – Rank According to Effectiveness

Since the remaining control measures identified in Section 6.1.1 – low-carbon fuels, energy efficiency, and good combustion practices – are being proposed for this project, a ranking of the control technologies is not necessary for this application.

6.1.4 Step 4 – Evaluate the Most Effective Controls

Since Chevron Phillips proposes to incorporate the remaining control measures identified in Section 6.1.1, an evaluation of the energy, environmental, and economic impacts of the proposed measures is not necessary for this application.

6.1.5 Step 5 – Select BACT

Chevron Phillips proposes to incorporate low-carbon fuels, energy efficiency, and good combustion practices discussed in Section 6.1.1 as BACT for controlling CO_2 emissions from furnace combustion and its corresponding steam supply/demand as integrated with the process unit's equipment downstream of the furnace.

6.2 Decoking Activities

Ethane cracking furnaces require periodic decoking to remove coke deposits from the furnace tubes. Coke buildup is unavoidable in olefin production in cracking furnaces, and removal of the same at optimal periods maintains the furnace at efficient ethane-to-ethylene conversion rates without increasing energy (fuel) demand. Decoking too early is unnecessary and results in excess shutdown/start-up cycles; decoking too late results in fouled furnace tubes that reduce conversion rates and increases heat demand.

6.2.1 Step 1 – Identify Potential Control Technologies

Decoking is the process of combusting the coke carbon on the tubes through the use of steam and air. Review of the RBLC database identified no specific BACT controls for GHG emissions from decoking operations. Limiting air in the decoking process would tend to drive the conversion of coke to CO rather than CO_2. Additionally, proper design and operation of the furnaces in accordance with manufacturer's recommendations is important in managing the formation of coke in processing.

6.2.2 Step 2 – Eliminate Technically Infeasible Options

Although limiting air in the decoke process could reduce CO_2 emissions, the result would be an increase in the CO emissions from this process. Since CO is likewise a criteria pollutant, controlling one pollutant category, GHGs, to the detriment of another, CO, is considered not beneficial and therefore is eliminated as technically infeasible.

6.2.3 Step 3 – Rank According to Effectiveness

The single option remaining for control of CO_2 from decoking operations is to follow the design and operational parameters integrated into the furnace to limit the need for decoking and thus the corresponding CO_2 emissions generated from the same. Therefore, ranking according to effectiveness is unnecessary.

6.2.4 Step 4 – Evaluate the Most Effective Controls

The single option remaining for control of CO_2 from decoking operations is to follow the design and operational parameters integrated into the furnace to limit the need for decoking and thus the corresponding CO_2 emissions generated from the same. Therefore, further evaluation of this control method is unnecessary.

6.2.5 Step 5 – Select BACT

Chevron Phillips proposes to incorporate a combination of design and recommended operation to limit coke formation in the tubes to the extent practicable considering ethane as a raw material. Managing coke buildup through such methods will result in limited CO_2 formation from annual decoking operations.

6.3 VHP Boiler

The VHP boiler is integrated in the energy balance of the entire new cracker plant and cannot be considered a stand-along device from the standpoint of GHG control methods. This boiler is integral to the overall energy efficiency of the plant as discussed in Section 6.1. Further, the boiler serves not only to generate very high pressure steam, but also as the primary control device for low-pressure process vents, obviating the need for a secondary combustion device such as the vapor destruction unit, which serves only the control function, to operate full-time.

6.3.1 Step 1 – Identify Potential Control Technologies

As with the cracking furnaces, the RBLC database identified only proper combustion operation and maintenance as BACT control for the VHP boiler or similar combustion devices. Add-on controls and other potential technologies have not been designated in the RBLC database as applicable GHG controls to date. Nonetheless, Chevron Phillips considered the following technologies as potential GHG control measures for the VHP boiler in the new ethylene Unit 1594:

- Carbon capture and storage (CCS),
- Low-carbon fuel(s),
- Energy efficiencies, and
- Good combustion practices and maintenance.

Each of these technologies is discussed in detail in Section 6.1.1 and therefore is not repeated here. The boiler will use low-carbon natural gas as the primary fuel, with high-hydrogen plant tail gas available as a second low-carbon fuel, if needed. The energy efficiency measures integrated into the cracking plant as described for the furnaces also applies to the boiler, since it likewise is a contributor to the overall steam balance of the plant and must be considered as integrated in the overall plant energy efficient design. Finally, Chevron Phillips will operate the boiler in accordance with the vendor's recommendations and Chevron Phillips' experience for good combustion and maintenance practices.

6.3.2 Step 2 – Eliminate Technically Infeasible Options

6.3.2.1 Carbon Capture and Storage

For the reasons discussed in Section 6.1.2.1, CCS is likewise not a technically feasible option for GHG emissions control from the VHP boiler and therefore will not be considered further in this analysis.

6.3.2.2 Low-Carbon Fuel

Use of low-carbon fuel is considered technically feasible.

6.3.2.3 Energy Efficiency

Use of certain energy efficiency measures is considered technically feasible.

6.3.2.4 Good Combustion Practice

Use of good combustion practices is considered technically feasible.

6.3.3 Step 3 – Rank According to Effectiveness

Since the remaining control measures identified in Section 6.3.1 – low-carbon fuels, energy efficiency, and good combustion practices – are being proposed for this project, a ranking of the control technologies is not necessary for this application.

6.3.4 Step 4 – Evaluate the Most Effective Controls

Since Chevron Phillips proposes to incorporate the remaining control measures identified in Section 6.3.1, an evaluation of the energy, environmental, and economic impacts of the proposed measures is not necessary for this application.

6.3.5 Step 5 – Select BACT

Chevron Phillips proposes to incorporate low-carbon fuels, energy efficiency, and good combustion practices discussed in Section 6.3.1 as BACT for controlling CO_2 emissions from boiler combustion and its corresponding steam supply/demand as integrated with the process unit's equipment downstream of the boiler.

6.4 Vapor Destruction Unit

The VDU serves as a standby vent control system, which is not anticipated to operate (except in hot stand-by/pilot-only mode) more than four weeks each year, when the primary control device, the VHP boiler, may not be operational due to maintenance or inspection. The VDU is fueled by low-carbon pipeline natural gas.

6.4.1 Step 1 – Identify Potential Control Technologies

The RBLC database did not identify any GHG control technologies for control devices such as the VDU, particularly since the VDU is itself an add-on control unit. Nonetheless, Chevron Phillips considered the following technologies as potential GHG control measures for VDU in the new ethylene Unit 1594:

- Carbon capture and storage (CCS),
- Low-carbon fuel, and
- Good combustion practices and maintenance.

6.4.1.1 Carbon Capture and Storage

As discussed in Section 6.1.1.1, CCS requires separation of CO_2 from flue gases, compression of the isolated CO_2, transportation to a suitable injection/storage location, and long-term storage in appropriate geologic formations.

6.4.1.2 Low-Carbon Fuel

Use of fuels containing lower concentrations of carbon generate less CO_2 than other higher-carbon fuels. Typically, gaseous fuels such as natural gas or high-hydrogen plant tail gas contain less carbon, and thus lower CO_2 potential, than liquid or solid fuels such as diesel or coal.

Chevron Phillips proposes to use natural gas for the pilot gas during hot stand-by mode and as supplemental fuel when the VDU controls low pressure vent streams. Liquid and solid fossil fuels are not proposed for use in the VDU.

6.4.1.3 Good Combustion Practice

Good combustion practices include appropriate maintenance of equipment (such as periodic burner tune-ups) and operating within the recommended combustion air and fuel ranges of the equipment as specified by its design, with the assistance of oxygen trim control. Although good combustion practices do not themselves necessarily directly reduce GHG emissions, using good combustion practices results in longer life of the equipment and more efficient operation. Therefore, such practices indirectly reduce GHG emissions by supporting operation as designed and with consideration of other energy optimization practices incorporated into the integrated plant.

Chevron Phillips will incorporate such combustion practices as recommended by the VDU manufacturer.

6.4.2 Step 2 – Eliminate Technically Infeasible Options

6.4.2.1 Carbon Capture and Storage

As discussed in Section 6.1.2.1, CCS is technically impracticable in situations where stack gases have low concentrations and/or mass flow rates of CO_2. Since the VDU's typical hot stand-by stack gas flow rate is less than 700 scf/hr at a CO_2 concentration of 10% by volume (or less), carbon capture from this stream is technically impracticable. Likewise, there is not a viable geologic sequestration site available in the project area for long-term CO_2 storage. Therefore, CCS is considered a technically infeasible control option for the proposed VDU at Chevron Phillips' Cedar Bayou plant and is not considered further in this analysis.

6.4.2.2 Low-Carbon Fuel

Use of low-carbon fuel is considered technically feasible.

6.4.2.3 Good Combustion Practice

Use of good combustion practices is considered technically feasible.

6.4.3 Step 3 – Rank According to Effectiveness

Since the remaining control measures identified in Section 6.4.1 – low-carbon fuels and good combustion practices – are being proposed for this project, a ranking of the control technologies is not necessary for this application.

6.4.4 Step 4 – Evaluate the Most Effective Controls

Since Chevron Phillips proposes to incorporate the remaining control measures identified in Section 6.4.1, an evaluation of the energy, environmental, and economic impacts of the proposed measures is not necessary for this application.

6.4.5 Step 5 – Select BACT

Chevron Phillips proposes to incorporate low-carbon fuel and good combustion practices discussed in Section 6.4.1 as BACT for controlling CO_2 emissions from the VDU.

6.5 Low Profile Flare

The low profile flare serves as a safety device designed to provide safe control of gases from the ethylene cracker and support units during periods of high pressure discharges during start-up and shutdown, emergency situations, and other large volume maintenance clearing. Additionally, the flare may control some low-pressure vent streams, such as "leak by" from safety relief and pressure control valves, sweep gas, and small volume maintenance activities. Similar to the VDU, the flare's pilots are fueled by low-carbon pipeline natural gas.

6.5.1 Step 1 – Identify Potential Control Technologies

Similar to the VDU, the RBLC database did not identify any GHG control technologies for control devices such as the flare, particularly since the flare is itself an add-on control unit. Nonetheless, Chevron Phillips considered the following technologies as potential GHG control measures for the low profile flare in the new ethylene Unit 1594:

- Carbon capture and storage (CCS),
- Low-carbon fuel, and
- Good combustion practices and maintenance.

6.5.1.1 Carbon Capture and Storage

As discussed in Section 6.1.1.1, CCS requires separation of CO_2 from flue gases, compression of the isolated CO_2, transportation to a suitable injection/storage location, and long-term storage in appropriate geologic formations.

6.5.1.2 Low-Carbon Fuel

Use of fuels containing lower concentrations of carbon generate less CO_2 than other higher-carbon fuels. Typically, gaseous fuels such as natural gas or high-hydrogen plant tail gas contain less carbon, and thus lower CO_2 potential, than liquid or solid fuels such as diesel or coal. Likewise, although flaring carbon-containing vent streams (such as those in the ethylene unit that may contain methane) will necessarily result in CO_2 formation, methane has a global warming potential 21 times higher than that of CO_2. Therefore, control of such streams via flare to reduce methane emissions at the expense of CO_2 generation results in lower overall CO2e emissions than leaving such streams uncontrolled.

Chevron Phillips proposes to use natural gas for the flare's pilot gas and as supplemental fuel, if needed, to maintain appropriate vent stream heating value as required by applicable air quality regulations. Liquid and solid fossil fuels are not proposed for use with the flare.

6.5.1.3 Good Combustion Practice

Good combustion practices for flares include appropriate maintenance of equipment (such as periodic flare tip maintenance) and operating within the recommended heating value and flare tip velocity as specified by its design. Although good combustion practices do not themselves necessarily directly reduce GHG emissions, using good combustion practices results in longer life of the equipment and more efficient operation. Therefore, such practices indirectly reduce GHG emissions by supporting operation as designed and with consideration of other energy optimization practices incorporated into the integrated plant.

Chevron Phillips will incorporate such combustion practices as recommended by the flare manufacturer.

6.5.2 Step 2 – Eliminate Technically Infeasible Options

6.5.2.1 Carbon Capture and Storage

Flare exhaust, by design, cannot be captured for CO_2 separation unless the flare is enclosed, which is a safety hazard for a large capacity flare required in an ethylene unit for safe handling of high pressure vent streams. Likewise, there is not a viable geologic sequestration site available in the project area for long-term CO_2 storage. Therefore, since flare exhaust cannot be captured and because a suitable storage facility is not available, CCS is considered a technically infeasible control option for the proposed low profile flare at Chevron Phillips' Cedar Bayou plant and is not considered further in this analysis.

6.5.2.2 Low-Carbon Fuel

Use of low-carbon fuel is considered technically feasible.

6.5.2.3 Good Combustion Practice

Use of good combustion practices is considered technically feasible.

6.5.3 Step 3 – Rank According to Effectiveness

Since the remaining control measures identified in Section 6.5.1 – low-carbon fuels and good combustion practices – are being proposed for this project, a ranking of the control technologies is not necessary for this application.

6.5.4 Step 4 – Evaluate the Most Effective Controls

Since Chevron Phillips proposes to incorporate the remaining control measures identified in Section 6.5.1, an evaluation of the energy, environmental, and economic impacts of the proposed measures is not necessary for this application.

6.5.5 Step 5 – Select BACT

Chevron Phillips proposes to incorporate low-carbon fuel and good combustion practices discussed in Section 6.5.1 as BACT for controlling CO_2 emissions from the low profile flare.

6.6 Emergency Generators

The three emergency generator engines proposed for use in Unit 1594 normally will operate at a low annual capacity factor – only one hour per week (approximately 52 hrs/yr) – in non-emergency use. The engines are designed to use diesel fuel, stored in onsite tanks, so that emergency power is available for safe shutdown of the facility in the event of a power outage that may also include natural gas supply curtailments.

6.6.1 Step 1 – Identify Potential Control Technologies

Similar to other equipment previously discussed, the RBLC database did not identify any add-on GHG control technologies emergency generator engines; only good combustion practices were identified in the RBLC as BACT for emergency generators. Nonetheless, Chevron Phillips considered the following technologies as potential GHG control measures for the emergency generators in the new ethylene Unit 1594:

- Carbon capture and storage (CCS),
- Low-carbon fuel, and
- Good combustion practices and maintenance.

6.6.1.1 Carbon Capture and Storage

As discussed in Section 6.1.1.1, CCS requires separation of CO_2 from flue gases, compression of the isolated CO_2, transportation to a suitable injection/storage location, and long-term storage in appropriate geologic formations.

6.6.1.2 Low-Carbon Fuel

Use of fuels containing lower concentrations of carbon generate less CO_2 than other higher-carbon fuels. Typically, gaseous fuels such as natural gas or high-hydrogen plant tail gas contain less carbon, and thus lower CO_2 potential, than liquid or solid fuels such as diesel or coal.

Chevron Phillips proposes to use diesel fuel for the emergency generators, since non-volatile fuel must be used for emergency operations.

6.6.1.3 Good Combustion Practice

Good combustion practices for compression ignition engines include appropriate maintenance of equipment (such as periodic testing as will be conducted weekly) and operating within the recommended air to fuel ratio recommended by the manufacturer. Although good combustion practices do not themselves necessarily directly reduce GHG emissions, using good combustion practices results in longer life of the equipment and more efficient operation. Therefore, such practices indirectly reduce GHG emissions by supporting operation as designed and with consideration of other energy optimization practices incorporated into the integrated plant.

Chevron Phillips will incorporate such combustion practices as recommended by the generator manufacturer.

6.6.2 Step 2 – Eliminate Technically Infeasible Options

6.6.2.1 Carbon Capture and Storage

Because the emergency generators will normally operate 52 hours per year or less and because their stack gases are low in volume and CO_2 mass rate, capture and segregation of CO_2 for sequestration has not been demonstrated. Likewise, there is not a viable geologic sequestration site available in the project area for long-term CO_2 storage. Therefore, CCS is considered a technically infeasible control option for the proposed emergency generators at Chevron Phillips' Cedar Bayou plant and is not considered further in this analysis.

6.6.2.2 Low-Carbon Fuel

Because the generators are intended for emergency use, these engines must be designed to use non-volatile fuel such as diesel. Use of volatile (low-carbon) natural gas or plant fuel gas in an emergency situation could exacerbate a potentially volatile environment that may be present under certain conditions, resulting in unsafe operation. Therefore, non-volatile fuel is appropriate and necessary for emergency equipment. As a result, Chevron Phillips proposes diesel fuel for use in the emergency engines. The use of low-carbon fuel is considered technically infeasible for emergency generator operation and is not considered further in this analysis.

6.6.2.3 Good Combustion Practice

Use of good combustion practices is considered technically feasible.

6.6.3 Step 3 – Rank According to Effectiveness

Since the remaining control measure identified in Section 6.6.1 –good combustion practices – is being proposed for this project, a ranking of the control technology is not necessary for this application.

6.6.4 Step 4 – Evaluate the Most Effective Controls

Since Chevron Phillips proposes to incorporate the remaining control measure identified in Section 6.6.1, an evaluation of the energy, environmental, and economic impacts of the proposed measure is not necessary for this application.

6.6.5 Step 5 – Select BACT

Chevron Phillips proposes to incorporate good combustion practices discussed in Section 6.6.1 as BACT for controlling CO_2 emissions from the low profile flare. Further, these new engines will be subject to the federal New Source Performance Standard (NSPS) for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII), such that specific emissions standards for various pollutants must be met during normal operation, such that the engines will meet or exceed BACT.

6.7 Piping Fugitives

GHGs from piping fugitives are generated primarily from plant fuel gas and natural gas lines within the cracker unit. Other process lines in VOC service contain an insignificant quantity of GHGs and therefore are not considered further in this evaluation. Lines containing nitrogen, instrument air, and other non-fuel/non-VOC fluids do not include GHGs and likewise are not evaluated further in this analysis.

6.7.1 Step 1 – Identify Potential Control Technologies

Piping fugitives may be controlled by various techniques, including:

- Use of leakless and/or sealless technology to eliminate fugitive emissions sources;
- Implementation of instrument leak detection and repair (LDAR) programs as prescribed by various federal and state regulations and permit conditions;
- Remote sensing using infrared cameras as an alternative to instrument LDAR programs; and
- Implementation of audio/visual/olfactory (AVO) leak detection methods.

6.7.2 Step 2 – Eliminate Technically Infeasible Options

6.7.2.1 Leakless/Sealless Technology

Leakless technology valves may be incorporated in situations where highly toxic or otherwise hazardous materials are present. Likewise, some technologies, such as bellows valves, cannot be repaired without a unit shutdown. Because plant tail gas and natural gas are not considered highly toxic nor hazardous materials, these fluids do not warrant the risk of unit shutdown for repair and therefore leakless valve technology for fuel lines is considered technically impracticable.

Sealless pumps and compressors, or seal systems venting to a control device such as the VDU or flare, are technically feasible for fuel gas service. However, since the fuel gas-specific piping lines systems in the proposed cracker plant do not include pumps or compressors, this technology is irrelevant and therefore considered technically impracticable.

6.7.2.2 Instrument LDAR Programs

Use of instrument LDAR is considered technically feasible.

6.7.2.3 Remote Sensing

Use of remote sensing measures is considered technically feasible.

6.7.2.4 AVO Monitoring

Use of as-observed AVO monitoring is considered technically feasible. Use of scheduled AVO, such as that used for highly odorous compounds detectable by AVO methods in lower concentrations than would be detected by instrument LDAR and/or remote sensing, such as for high concentration mercaptan streams or those in hydrogen halide and/or halide service (e.g. H_2S, chlorine) are not technically feasible for plant fuel gas or natural gas service.

6.7.3 Step 3 – Rank According to Effectiveness

Instrument LDAR programs and the alternative work practice of remote sensing using an infrared camera have been determined by EPA to be equivalent methods of piping fugitive controls.[3]

As-observed AVO methods are generally somewhat less effective since they are not conducted at specified intervals. However, since pipeline natural gas is odorized with very small quantities of mercaptan, as-observed olfactory observation is a very effective method for identifying and correcting leaks in natural gas systems. Due to the pressure and other physical properties of plant fuel gas, as-observed audio and visual observations of potential fugitive leaks are likewise moderately effective.

6.7.4 Step 4 – Evaluate the Most Effective Controls

Although instrument LDAR and/or remote sensing of piping fugitive emissions in fuel gas and/or natural gas service may be somewhat more effective than as-observed AVO methods, the economic practicability of such programs cannot be verified. Specifically, fugitive emissions are estimates only, based on factors derived for a statistical sample and not specific to any single piping component nor specifically for fuel gas/natural gas service. Therefore, since the total contribution to the site's CO2e PTE from piping fugitives is less than 0.4%, which is less than the statistical accuracy of the development of the factors themselves[4], instrument LDAR programs or their equivalent alternative method, remote sensing, are not economically practicable controlling the piping fugitive GHGs emissions for this project.

As-observed AVO is economically and environmentally practicable for this project.

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[3] 73 *FedReg* 78199-78219, December 22, 2008.
[4] In Appendix B, Table B-2-2, of EPA's *Protocol for Equipment Leak Emissions Estimates* (EPA 453/R-95-017), November 1995, the Agency considered only the upper and lower 95% confidence limits in developing revised SOCMI emission factors.

6.7.5 Step 5 – Select BACT

Chevron Phillips proposes to incorporate as-observed AVO as BACT for the piping components in the new cracker plant in fuel gas and natural gas service.

7.0 OTHER PSD REQUIREMENTS

As identified in EPA's GHG PSD permitting guidance document[5], since there are no NAAQS or PSD increments for GHGs,126 the requirements in 40 CFR §2.21(k) and §51.166(k) of EPA's regulations to demonstrate that a source does not cause or contribute to a violation of the NAAQS is not applicable to GHGs. Thus, EPA does not recommend nor require that PSD applicants model or conduct ambient monitoring for CO_2 or GHGs.

Further, EPA believes it is not necessary for applicants or permitting authorities to assess impacts from GHGs in the context of the additional impacts analysis area provisions of the PSD regulations.

Based on the above guidance from EPA, Chevron Phillips is not required to nor is it including air dispersion modeling, ambient monitoring, or additional impacts analyses of GHGs specific to the new cracker unit on surrounding areas in this permit application.

[5] U.S. EPA, Office of Air Quality Planning and Standards, *PSD and Title V Permitting Guidance for Greenhouse Gases,* March 2011, pp. 47-48.

APPENDIX A

Emissions Estimates

TABLE A-1
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions Summary

FIN	EPN	Description	Annual (ton/yr)			
			CO2	CH4	N2O	CO2e
H-10100	H-10100	Ethylene Steam Cracking Furnace 1	206,000	1.2	0.2	206,000
H-10200	H-10200	Ethylene Steam Cracking Furnace 2	206,000	1.2	0.2	206,000
H-10300	H-10300	Ethylene Steam Cracking Furnace 3	206,000	1.2	0.2	206,000
H-10400	H-10400	Ethylene Steam Cracking Furnace 4	206,000	1.2	0.2	206,000
H-10500	H-10500	Ethylene Steam Cracking Furnace 5	206,000	1.2	0.2	206,000
H-10600	H-10600	Ethylene Steam Cracking Furnace 6	206,000	1.2	0.2	206,000
H-10700	H-10700	Ethylene Steam Cracking Furnace 7	206,000	1.2	0.2	206,000
H-10800	H-10800	Ethylene Steam Cracking Furnace 8	206,000	1.2	0.2	206,000
H-10100	H-10100	Ethylene Steam Cracking Furnace 1 Decoke	362			362
H-10200	H-10200	Ethylene Steam Cracking Furnace 2 Decoke	362			362
H-10300	H-10300	Ethylene Steam Cracking Furnace 3 Decoke	362			362
H-10400	H-10400	Ethylene Steam Cracking Furnace 4 Decoke	362			362
H-10500	H-10500	Ethylene Steam Cracking Furnace 5 Decoke	362			362
H-10600	H-10600	Ethylene Steam Cracking Furnace 6 Decoke	362			362
H-10700	H-10700	Ethylene Steam Cracking Furnace 7 Decoke	362			362
H-10800	H-10800	Ethylene Steam Cracking Furnace 8 Decoke	362			362
B-83010	B-83010	VHP Boiler	127,000	0.6	0.1	127,000
		Furnace/Boiler Cap [1]	***1,572,000***	***9.0***	***1.8***	***1,572,000***
PK-90060	PK-90060	Vapor Destruction Unit	1,100	0.002	0.0002	1,100
PK-90050	PK-90050	Low Profile Flare	27,000	0.2	0.04	27,000
PK-87010A/B/C	PK-87010A/B/C	Emergency Generator Engines	274	0.011	0.002	275
F-1594	F-1594	Process Fugitives		324		6,800
		Totals:	**1,600,000**	**333**	**2**	**1,607,000**

Notes:
1. Furnace/Boiler annual cap assumes an equivalent of 7 furnaces operating continuously at the annual emission rate, plus the average annual boiler emissions, plus all annual decoke (coke conversion) emissions for the 8 furnaces.

TABLE A-2
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Cracking Furnaces, Normal Operation

FIN	EPN	Description	Maximum Firing Rate (HHV) (MMBtu/hr)	72% Conversion Firing Rate (HHV) (MMBtu/hr)	Fuel Type	Fuel HHV[1] (Btu/scf)	Fuel Flow		Fuel Carbon Content[1] (kg C/kg fuel)	Fuel MW[1] (kg/kg-mole)	Emission Factors[4] (kg/MMBtu)		Annual Emissions, ton/yr			
							MMscf/hr[2]	MMscf/yr[3]			CH4	N2O	CO2[5]	CH4[6]	N2O[6]	CO2e[7]
H-10100	H-10100	Ethylene Steam Cracking Furnace 1	500	412	Natural Gas	1,029	0.49	3,508	0.741	16.64	0.0001	0.00001	206,000	0.4	0.04	206,000
					Fuel Gas	470	1.06	7,680	0.512	5.01	0.0003	0.00006	94,000	1.2	0.2	94,000
												Max:	**206,000**	**1.2**	**0.2**	**206,000**
H-10200	H-10200	Ethylene Steam Cracking Furnace 2	500	412	Natural Gas	1,029	0.49	3,508	0.741	16.64	0.0001	0.00001	206,000	0.4	0.04	206,000
					Fuel Gas	470	1.06	7,680	0.512	5.01	0.0003	0.00006	94,000	1.2	0.2	94,000
												Max:	**206,000**	**1.2**	**0.2**	**206,000**
H-10300	H-10300	Ethylene Steam Cracking Furnace 3	500	412	Natural Gas	1,029	0.49	3,508	0.741	16.64	0.0001	0.00001	206,000	0.4	0.04	206,000
					Fuel Gas	470	1.06	7,680	0.512	5.01	0.0003	0.00006	94,000	1.2	0.2	94,000
												Max:	**206,000**	**1.2**	**0.2**	**206,000**
H-10400	H-10400	Ethylene Steam Cracking Furnace 4	500	412	Natural Gas	1,029	0.49	3,508	0.741	16.64	0.0001	0.00001	206,000	0.4	0.04	206,000
					Fuel Gas	470	1.06	7,680	0.512	5.01	0.0003	0.00006	94,000	1.2	0.2	94,000
												Max:	**206,000**	**1.2**	**0.2**	**206,000**
H-10500	H-10500	Ethylene Steam Cracking Furnace 5	500	412	Natural Gas	1,029	0.49	3,508	0.741	16.64	0.0001	0.00001	206,000	0.4	0.04	206,000
					Fuel Gas	470	1.06	7,680	0.512	5.01	0.0003	0.00006	94,000	1.2	0.2	94,000
												Max:	**206,000**	**1.2**	**0.2**	**206,000**
H-10600	H-10600	Ethylene Steam Cracking Furnace 6	500	412	Natural Gas	1,029	0.49	3,508	0.741	16.64	0.0001	0.00001	206,000	0.4	0.04	206,000
					Fuel Gas	470	1.06	7,680	0.512	5.01	0.0003	0.00006	94,000	1.2	0.2	94,000
												Max:	**206,000**	**1.2**	**0.2**	**206,000**
H-10700	H-10700	Ethylene Steam Cracking Furnace 7	500	412	Natural Gas	1,029	0.49	3,508	0.741	16.64	0.0001	0.00001	206,000	0.4	0.04	206,000
					Fuel Gas	470	1.06	7,680	0.512	5.01	0.0003	0.00006	94,000	1.2	0.2	94,000
												Max:	**206,000**	**1.2**	**0.2**	**206,000**
H-10800	H-10800	Ethylene Steam Cracking Furnace 8	500	412	Natural Gas	1,029	0.49	3,508	0.741	16.64	0.0001	0.00001	206,000	0.4	0.04	206,000
					Fuel Gas	470	1.06	7,680	0.512	5.01	0.0003	0.00006	94,000	1.2	0.2	94,000
												Max:	**206,000**	**1.2**	**0.2**	**206,000**

TABLE A-2
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Cracking Furnaces, Normal Operation

Notes:

1. For fuel and natural gas heat, molecular weight, and carbon content data, refer toTable A-9 in this Appendix.

2. Based on maximum hourly firing rate (MMBtu/hr) / Fuel HHV (Btu/scf).
For NG: MMScf/hr = 500 MMBtu/hr / 1,029 Btu/scf = 0.49 MMscf/hr

3. Estimated as: Specified Conversion Firing Rate (MMBtu/hr) / Fuel HHV (Btu/scf) * Annual Operation (hr/yr) * % of Annual Operation with this Fuel
8,760 hr/yr annual operation used for annual emissions estimates.
100% of annual operation using ***natural gas*** (to identify highest average annual PTE)
100% of annual operation using ***fuel gas*** (to identify highest average annual PTE)
For NG: MMScf/yr = 412 MMBtu/hr / 1,029 Btu/scf * 8,760 hr/yr * 100% of Annual Operation = 3,508 MMscf/yr

4. Factors for ethylene production processes designated in Table C-2 to Subpart C of 40 CFR Part 98 and 40 CFR §98.243(d)(3)(i).

5. CO2 emissions calculated in accordance with Equation C-5 of Subpart C of 40 CFR Part 98, adjusted to reflect ton/yr rather than metric tonne/yr:

CO2 = 44/12 * Fuel * CC * MW/MVC * 0.001 * 1.102 Where:

CO2 = Mass emissions of CO2, ton/yr
Fuel = Gaseous fuel volume, scf/yr
CC = Annual average carbon content of the fuel, kg C/kg fuel
MW = Molecular weight of the fuel, kg/kg-mole
MVC = Molar volume conversion at 68°F = 849.5 scf/kg-mole
0.001 = Conversion from kg to metric tonne (0.001 tonne/kg)
1.102 = Conversion from metric tonne to ton (1.102 ton/tonne)

For Furnace 1, Annual CO2 from Natural Gas Firing:
CO2 = 44/12 * 3,507.58 MMscf/yr * 1,000,000 scf/MMscf * 0.741 kg C/kg fuel * 16.6 kg/kg-mole / 849.5 scf/kg-mole * 0.001 tonne/kg * 1.102 ton/tonne = 205,770 ton/yr CO2

6. CH4 and N2O emissions calculated in accordance with Equation C-8 to Subpart C of 40 CFR Part 98, adjusted to reflect ton/yr rather than metric tonne/yr:

CH4/N2O = 0.001 * Fuel * HHV * EF * 1.102

CH4/N2O = Mass emissions of CH4 or N2O, ton/yr
0.001 = Conversion from kg to metric tonne (0.001 tonne/kg)
Fuel = Gaseous fuel volume, scf/hr or scf/yr
HHV = High heat value of fuel, MMBtu/scf
EF = Emission factor, kg/MMBtu
1.102 = Conversion from metric tonne to ton (1.102 ton/tonne)

For Furnace 1, Annual CH4 from Natural Gas Firing:
CH4 = 0.001 tonne/kg * 3,507.58 MMscf/yr * 1,000,000 scf/MMscf * 1,029 Btu/scf * 1 MMBtu/1,000,000 Btu * 0.0001 kg/MMBtu *1.102 ton/tonne= 0.398 ton/yr CH4

7. CO2 equivalents (CO2e) calculated according to the following formula and conversions:

CO2e = Σ ERi * GWPi

CO2e = Aggregate CO2 equivalent emissions for all greenhouse gases for this case
ERi = Mass emission rate of greenhouse gas species "i"
GWPi = Greenhouse warming potential, as provided by Table A-1 to Subpart A of 40 CFR Part 98:
CO2 GWP = 1
CH4 GWP = 21
N2O GWP = 310

For Furnace 1, Annual Natural Gas Combustion:
CO2e = [206,000 ton/yr CO2 * 1 ton CO2e/ton CO2] + [0.40 ton/yr CH4 * 21 ton CO2e/ton CH4] + [0.040 ton/yr N2O * 310 ton CO2e/ton N2O] = 206,021 ton/yr CO2e

TABLE A-3
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Cracking Furnaces, Decoke Mode (Coke Conversion)

FIN	EPN	lb C/decoke[1]	# decoke/yr[2]	Max Conversion to CO_2[3] (%)	Annual Emissions[4] (ton/yr)	
					CO2	CO2e
H-10100	H-10100	16,460	12	100%	362	362
H-10120	H-10120	16,460	12	100%	362	362
H-10130	H-10130	16,460	12	100%	362	362
H-10140	H-10140	16,460	12	100%	362	362
H-10150	H-10150	16,460	12	100%	362	362
H-10160	H-10160	16,460	12	100%	362	362
H-10170	H-10170	16,460	12	100%	362	362
H-10180	H-10180	16,460	12	100%	362	362

Notes:
1. Coke estimates provided by furnce vendor.
2. For conservative emissions estimation purposes only; actual number of decokes for each furnace may vary.
3. Although not all coke carbon will convert to CO2, the majority is anticipated to do so and at times conversion may approach 90-100%. Therefore, for conservatism, 100% conversion to CO2 is assumed for purposes of GHG estimation.
4. CO2 = lb C/decoke * # decokes/yr * 1 lbmol C/12 lb C * 1 lbmol CO2/1 lbmol C * 44 lb CO2/lbmol CO2 * % Conversion * 1 ton/2,000 lb
   For Furnace 1:
   CO2 = 16,460 * 12 decokes/yr * 1 lbmol C/12 lb C * 1 lbmol CO2/1 lbmol C * 44 lb CO2/lbmol CO2 * 100% Conversion * 1 ton/2,000 lb = 362 ton/yr CO2

CO2e = Aggregate CO2 equivalent emissions for all greenhouse gases for this case
ERi = Mass emission rate of greenhouse gas species "i"
GWPi = Greenhouse warming potential, as provided by Table A-1 to Subpart A of 40 CFR Part 98:
CO2 GWP = 1
CH4 GWP = 21
N2O GWP = 310

CO2e = 362 ton/yr CO2 * 1 ton CO2e/1 ton CO2 = 362 ton/yr CO2e

TABLE A-4
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Very High Pressure (VHP) Boiler

FIN	EPN	Description	Maximum Firing Rate (MMBtu/hr)	Startup Firing Rate (MMBtu/hr	Normal Firing Rate (MMBtu/hr)	Fuel Type	Fuel HHV[1] (Btu/scf)	Fuel Flow		Fuel Carbon Content[1]	Fuel MW[1] (kg/kg-mole)	Emission Factors[4] (kg/MMBtu)		Annual Emissions, ton/yr			
								MMscf/hr[2]	MMscf/yr[3]	(kg C/kg fuel)		CH4	N2O	CO2[5]	CH4[6]	N2O[6]	CO2e[7]
B-83010	B-83010	VHP Boiler	500	500	150	Natural Gas	1,029	0.49	1,538.27	0.741	16.64	0.0001	0.00001	90,000	0.17	0.017	90,000
						Fuel Gas	470	1.06	3,368.15	0.512	5.01	0.0003	0.00006	37,000	0.47	0.095	37,000
													Total:	**127,000**	**0.65**	**0.112**	**127,000**

Notes:

1. For fuel and natural gas heat, molecular weight, and carbon content data, refer to Table A-9 in this Appendix.

2. Based on maximum hourly firing rate (MMBtu/hr) / Fuel HHV (Btu/scf).
For NG: MMScf/hr = 500 MMBtu/hr / 1,029 Btu/scf = 0.49 MMscf/hr

3. Estimated as: [Max Rate (MMBtu/hr) / Fuel HHV (Btu/scf) * Annual Hrs at Max Rate (hr/yr) + Startup Rate (MMBtu/hr) / Fuel HHV (Btu/scf) * Annual Hrs at Startup Rate (hr/yr) + Normal Rate (MMBtu/hr) / Fuel HHV (Btu/scf) * Annual Hrs at Normal Rate (hr/yr)] * % of Annual Operation with this Fuel
720 hr/yr in maximum firing rate
48 hr/yr in startup firing rate
7,992 hr/yr in normal firing rate
100% of annual operation using ***natural gas*** (to identify highest average annual PTE)
100% of annual operation using ***fuel gas*** (to identify highest average annual PTE)
For NG: MMScf/yr = [500 MMBtu/hr / 1,029 Btu/scf * 720 hr/yr + 500 MMBtu/hr / 1,029 Btu/scf * 48 hr/yr + 150 MMBtu/hr / 1,029 Btu/scf * 7,992 hr/yr] * 100% of Annual Operation with this Fuel = 1,538.27 MMscf/yr

4. Factors for ethylene production processes designated in Table C-2 to Subpart C of 40 CFR Part 98 and 40 CFR §98.243(d)(3)(i).

5. CO2 emissions calculated in accordance with Equation C-5 of Subpart C of 40 CFR Part 98, adjusted to reflect ton/yr rather than metric tonne/yr:

CO2 = 44/12 * Fuel * CC * MW/MVC * 0.001 * 1.102 Where:

CO2 = Mass emissions of CO2, ton/yr
Fuel = Gaseous fuel volume, scf/yr
CC = Annual average carbon content of the fuel, kg C/kg fuel
MW = Molecular weight of the fuel, kg/kg-mole
MVC = Molar volume conversion at 68°F = 849.5 scf/kg-mole
0.001 = Conversion from kg to metric tonne (0.001 tonne/kg)
1.102 = Conversion from metric tonne to ton (1.102 ton/tonne)

For VHP Boiler, Annual CO2 from Natural Gas Firing:
CO2 = 44/12 * 1,538.27 MMscf/yr * 1,000,000 scf/MMscf * 0.741 kg C/kg fuel * 16.6 kg/kg-mole / 849.5 scf/kg-mole * 0.001 kg/tonne * 1.102 ton/tonne = 90,242 ton/yr CO2

6. CH4 and N2O emissions calculated in accordance with Equation C-8 to Subpart C of 40 CFR Part 98:

CH4/N2O = 0.001 * Fuel * HHV * EF

0.001 = Conversion from kg to metric tonne (0.001 tonne/kg)
CH4/N2O = Mass emissions of CH4 or N2O, metric tons (tonne)/hr or tonne/yr
Fuel = Gaseous fuel volume, scf/hr or scf/yr
HHV = High heat value of fuel, MMBtu/scf
EF = Emission factor, kg/MMBtu
1.102 = Conversion from metric tonne to ton (1.102 ton/tonne)

For VHP Boiler, Annual CH4 from Natural Gas Firing:
CH4 = 0.001 kg/tonne * 1,538.27 MMscf/yr * 1,000,000 scf/MMscf * 1,029 Btu/scf * 1 MMBtu/1,000,000 Btu * 0.0001 kg/MMBtu * 1.102 ton/tonne = 0.17 ton/yr CH4

7. CO2 equivalents (CO2e) calculated according to the following formula and conversions:

CO2e = Σ ERi * GWPi

CO2e = Aggregate CO2 equivalent emissions for all greenhouse gases for this case
ERi = Mass emission rate of greenhouse gas species "i"
GWPi = Greenhouse warming potential, as provided by Table A-1 to Subpart A of 40 CFR Part 98:
CO2 GWP = 1
CH4 GWP = 21
N2O GWP = 310
For VHP Boiler, Annual Natural Gas Combustion:
CO2e = [90,000 ton/yr CO2 * 1 ton CO2e/ton CO2] + [0.17 ton/yr CH4 * 21 ton CO2e/ton CH4] + [0.017 ton/yr N2O * 310 ton CO2e/ton N2O] = 90,009 ton/yr CO2e

TABLE A-5
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Vapor Destruction Unit

FIN	EPN	Description	Maximum Firing Rate (MMBtu/hr)	Hot Standby (Pilot) Firing Rate (MMBtu/hr)	Fuel Type	Fuel HHV[1] (Btu/scf)	Fuel Flow		Fuel Carbon Content[1] (kg C/kg fuel)	Fuel MW[1] (kg/kg-mole)	Emission Factors[4] (kg/MMBtu)		Annual Emissions, ton/yr			
							MMscf/hr[2]	MMscf/yr[3]			CH4	N2O	CO2[5]	CH4[6]	N2O[6]	CO2e[7]
PK-90060	PK-90060	Vapor Destruction Unit	28.8	0.056	Natural Gas	1,029	0.03	19.28	0.741	16.64	0.0001	0.00001	1,100	0.0022	0.00022	1,100
					Fuel Gas	470	0	0	0.512	5.01	0.0003	0.00006	0	0	0	0
												Total:	**1,100**	**0.002**	**0.0002**	**1,100**

Notes:

1. For fuel and natural gas heat, molecular weight, and carbon content data, refer to Table A-9 in this Appendix.

2. Based on maximum hourly firing rate (MMBtu/hr) / Fuel HHV (Btu/scf).
   For NG: MMScf/hr = 29 MMBtu/hr / 1,029 Btu/scf = 0.03 MMscf/hr

3. Estimated as: [Max Rate (MMBtu/hr) / Fuel HHV (Btu/scf) * Annual Hrs at Max Rate (hr/yr) + Pilot Rate (MMBtu/hr) / Fuel HHV (Btu/scf) * Annual Hrs at Pilot Rate (hr/yr)] * % of Annual Operation with this Fuel
   672 hr/yr in maximum firing rate
   8,760 hr/yr in hot standby (pilot) firing rate
   100% of annual operation using ***natural gas***
   0% of annual operation using ***fuel gas***
   For NG: MMScf/yr = [28.8 MMBtu/hr / 1,029 Btu/scf * 672 hr/yr + 0.056 MMBtu/hr / 1,029 Btu/scf * 8,760 hr/yr] * 100% of Annual Operation with this Fuel = 19.28 MMscf/yr

4. Factors for ethylene production processes designated in Table C-2 to Subpart C of 40 CFR Part 98 and 40 CFR §98.243(d)(3)(i).

5. CO2 emissions calculated in accordance with Equation C-5 of Subpart C of 40 CFR Part 98, adjusted to reflect ton/yr rather than metric tonne/yr:

   CO2 = 44/12 * Fuel * CC * MW/MVC * 0.001 * 1.102 Where:

   CO2 = Mass emissions of CO2, ton/yr
   Fuel = Gaseous fuel volume, scf/yr
   CC = Annual average carbon content of the fuel, kg C/kg fuel
   MW = Molecular weight of the fuel, kg/kg-mole
   MVC = Molar volume conversion at 68°F = 849.5 scf/kg-mole
   0.001 = Conversion from kg to metric tonne (0.001 tonne/kg)
   1.102 = Conversion from metric tonne to ton (1.102 ton/tonne)

   For VHP Boiler, Annual CO2 from Natural Gas Firing:
   CO2 = 44/12 * 19.28 MMscf/yr * 1,000,000 scf/MMscf * 0.741 kg C/kg fuel * 16.6 kg/kg-mole / 849.5 scf/kg-mole * 0.001 kg/tonne * 1.102 ton/tonne = 1,131 ton/yr CO2

6. CH4 and N2O emissions calculated in accordance with Equation C-8 to Subpart C of 40 CFR Part 98:

   CH4/N2O = 0.001 * Fuel * HHV * EF

   0.001 = Conversion from kg to metric tonne (0.001 tonne/kg)
   CH4/N2O = Mass emissions of CH4 or N2O, metric tons (tonne)/hr or tonne/yr
   Fuel = Gaseous fuel volume, scf/hr or scf/yr
   HHV = High heat value of fuel, MMBtu/scf
   EF = Emission factor, kg/MMBtu
   1.102 = Conversion from metric tonne to ton (1.102 ton/tonne)

   For VHP Boiler, Annual CH4 from Natural Gas Firing:
   CH4 = 0.001 kg/tonne * 19.28 MMscf/yr * 1,000,000 scf/MMscf * 1,029 Btu/scf * 1 MMBtu/1,000,000 Btu * 0.0001 kg/MMBtu * 1.102 ton/tonne = 0.00 ton/yr CH4

7. CO2 equivalents (CO2e) calculated according to the following formula and conversions:

   CO2e = Σ ERi * GWPi

   CO2e = Aggregate CO2 equivalent emissions for all greenhouse gases for this case
   ERi = Mass emission rate of greenhouse gas species "i"
   GWPi = Greenhouse warming potential, as provided by Table A-1 to Subpart A of 40 CFR Part 98:
   CO2 GWP = 1
   CH4 GWP = 21
   N2O GWP = 310
   For VHP Boiler, Annual Natural Gas Combustion:
   CO2e = [1,100 ton/yr CO2 * 1 ton CO2e/ton CO2] + [0.00 ton/yr CH4 * 21 ton CO2e/ton CH4] + [0.000 ton/yr N2O * 310 ton CO2e/ton N2O] = 1,100 ton/yr CO2e

TABLE A-6
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Low Profile Flare

FIN	EPN	Description	Fuel Type	Fuel HHV[1] (Btu/scf)	Fuel Carbon Content[1] (kg C/kg fuel)	Fuel MW[1] (kg/kg-mole)	Stream Flow[2] (lb/yr)	Stream Flow[3] (MMscf/yr)	Emission Factors[4] (kg/MMBtu)		Annual Emissions, ton/yr			
									CH4	N2O	CO2[5]	CH4[6]	N2O[6]	CO2e[7]
PK-90050	PK-90050	Low Profile Flare	Natural Gas Pilots	1,029	0.741	16.64		22	0.0001	0.00001	1,300	0.003	0.0003	1,300
			Startup Stream 1	1,803	0.799	30.26	755,351	9	0.0003	0.00006	1,100	0.006	0.0011	1,100
			Startup Stream 2	441	0.461	4.40	65,400	6	0.0003	0.00006	100	0.001	0.0002	100
			Startup Stream 3	1,446	0.782	26.03	229,934	3	0.0003	0.00006	300	0.002	0.0003	300
			Startup Stream 4	1,147	0.795	18.30	860,440	18	0.0003	0.00006	1,200	0.007	0.0014	1,200
			Startup Stream 5	1,688	0.834	28.94	378,768	5	0.0003	0.00006	600	0.003	0.0006	600
			Startup Stream 6	1,614	0.856	28.05	477,840	6	0.0003	0.00006	700	0.003	0.0007	700
			Startup Stream 7	2,334	0.856	42.08	84,956	1	0.0003	0.00006	100	0.001	0.0001	100
			Shutdown Stream 1	1,029	0.74	16.64	377,676	9	0.0003	0.00006	500	0.003	0.0006	500
			Shutdown Stream 2	1,803	0.80	30.26	32,700	0	0.0003	0.00006	0	0.0002	0.00005	0
			Shutdown Stream 3	441	0.46	4.40	114,967	10	0.0003	0.00006	100	0.001	0.0003	100
			Shutdown Stream 4	1,446	0.78	26.03	430,220	6	0.0003	0.00006	600	0.003	0.0006	600
			Shutdown Stream 5	1,147	0.79	18.30	189,384	4	0.0003	0.00006	300	0.001	0.0003	300
			Shutdown Stream 6	1,688	0.83	28.94	238,920	3	0.0003	0.00006	400	0.002	0.0003	400
			Shutdown Stream 7	1,614	0.86	28.05	42,478	1	0.0003	0.00006	100	0.000	0.0001	100
			Routine Vents	454	0.301	11.44	33,857,614	1,124	0.0003	0.00006	18,400	0.17	0.034	18,400
			Maintenance Stream 1	748	0.723	10.86	635,654	22	0.0003	0.00006	800	0.005	0.0011	800
			Maintenance Stream 2	1,870	0.829	32.40	26,797	0	0.0003	0.00006	40	0.0002	0.00004	40
			Maintenance Stream 3	2,271	0.841	40.20	9,562	0	0.0003	0.00006	10	0.0001	0.00001	10
			Maintenance Stream 4	2,334	0.851	41.80	6,699	0	0.0003	0.00006	10	0.00005	0.00001	10
			Maintenance Stream 5	1,479	0.836	26.04	19,268	0	0.0003	0.00006	30	0.0001	0.00003	30
										Total:	**27,000**	**0.2**	**0.04**	**27,000**

Molar Volume: **379.5** **scf/lbmol @60 °F**

TABLE A-6
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Low Profile Flare

<u>**Notes:**</u>

1. For natural gas heat value, molecular weight and carbon content data, refer to Table A-9 in this Appendix. For startup, maintenance, and routine vent streams, refer to Table A-10 in this Appendix. Shutdown streams are estimated to have approximately the same composition as startup streams. Speciation and flow rates may vary depending on process conditions, and additional compounds and/or flow rates similar to those represented may be present.

2. Flow rates for startup, routine vents, and maintence streams are based on monitoring data from a similar existing flare. Shutdown stream rates are estimated at one-half that of corresponding startup streams.

3. For natural gas pilots: MMscf/yr = # pilots * flow/pilot (scfh) * 8,760 hr/yr * MMscf/1,000,000 scf
   Pilots (MMscf/yr) = 30 pilots *39:3985 scfh/pilot * 8,760 hr/yr * MMscf/1,000,000 scf = 22 MMscf/yr

   For Vent Streams: MMscf/yr = Mass Rate (lb/yr) / MW (lb/lbmol) * Molar Volume (379.5 scf/lbmol) * MMscf/1,000,000 scf
   For Startup 1 = 755,351 lb/yr / 30.26 lb/lbmol * 379.5 scf/lbmol * MMscf/1,000,000 scf = 9 MMscf/yr

4. Factors for ethylene production processes designated in Table C-2 to Subpart C of 40 CFR Part 98 and 40 CFR §98.243(d)(3)(i).

5. CO2 emissions calculated in accordance with Equation C-5 of Subpart C of 40 CFR Part 98, adjusted to reflect ton/yr rather than metric tonne/yr:

   CO2 = 44/12 * Fuel * CC * MW/MVC * 0.001 * 1.102 Where:

   CO2 = Mass emissions of CO2, ton/yr
   Fuel = Gaseous fuel volume, scf/yr
   CC = Annual average carbon content of the fuel, kg C/kg fuel
   MW = Molecular weight of the fuel, kg/kg-mole
   MVC = Molar volume conversion at 68°F = 849.5 scf/kg-mole
   0.001 = Conversion from kg to metric tonne (0.001 tonne/kg)
   1.102 = Conversion from metric tonne to ton (1.102 ton/tonne)

   For Pilots, Annual CO2 from Natural Gas Firing:
   CO2 = 44/12 * 22 MMscf/yr * 1,000,000 scf/MMscf * 0.741 kg C/kg fuel * 16.6 kg/kg-mole / 849.5 scf/kg-mole * 0.001 kg/tonne * 1.102 ton/tonne = 1,310 ton/yr CO2

6. CH4 and N2O emissions calculated in accordance with Equation C-8 to Subpart C of 40 CFR Part 98:

   CH4/N2O = 0.001 * Fuel * HHV * EF

   0.001 = Conversion from kg to metric tonne (0.001 tonne/kg)
   CH4/N2O = Mass emissions of CH4 or N2O, metric tons (tonne)/hr or tonne/yr
   Fuel = Gaseous fuel volume, scf/hr or scf/yr
   HHV = High heat value of fuel, MMBtu/scf
   EF = Emission factor, kg/MMBtu
   1.102 = Conversion from metric tonne to ton (1.102 ton/tonne)

   For Pilots, Annual CH4 from Natural Gas Firing:
   CH4 = 0.001 kg/tonne * 22 MMscf/yr * 1,000,000 scf/MMscf * 1,029 Btu/scf * 1 MMBtu/1,000,000 Btu * 0.0001 kg/MMBtu * 1.102 ton/tonne = 0.003 ton/yr CH4

7. CO2 equivalents (CO2e) calculated according to the following formula and conversions:

   CO2e = Σ ERi * GWPi

   CO2e = Aggregate CO2 equivalent emissions for all greenhouse gases for this case
   ERi = Mass emission rate of greenhouse gas species "i"
   GWPi = Greenhouse warming potential, as provided by Table A-1 to Subpart A of 40 CFR Part 98:
   CO2 GWP = 1
   CH4 GWP = 21
   N2O GWP = 310
   For VHP Boiler, Annual Natural Gas Combustion:
   CO2e = [1,300 ton/yr CO2 * 1 ton CO2e/ton CO2] + [0.003 ton/yr CH4 * 21 ton CO2e/ton CH4] + [0.0003 ton/yr N2O * 310 ton CO2e/ton N2O] = 1,300 ton/yr CO2e

TABLE A-7
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Emergency Generators

FIN	EPN	Description	Power Output (MW)	Generator Efficiency (%)	Fuel Efficiency (%)	Fuel Type	Operation			Fuel Use	Emission Factors[2] (kg/MMBtu)			Annual Emissions, ton/yr			
							hr/test	test/week	hr/yr	MMBtu/yr[1]	CO2	CH4	N2O	CO2[3]	CH4[3]	N2O[3]	CO2e[4]
PK-87010A	PK-87010A	Emergency Generator 1	1.35	95%	45%	No. 2 Diesel	1.00	1	104	1,122	73.96	0.003	0.0006	91	0.004	0.0007	92
PK-87010B	PK-87010B	Emergency Generator 2	1.35	95%	45%	No. 2 Diesel	1.00	1	104	1,122	73.96	0.003	0.0006	91	0.004	0.0007	92
PK-87010C	PK-87010C	Emergency Generator 3	1.35	95%	45%	No. 2 Diesel	1.00	1	104	1,122	73.96	0.003	0.0006	91	0.004	0.0007	92
													Total:	**274**	**0.011**	**0.0022**	**275**

Notes:

1. Fuel Use = Power Output (MW) / Generator Efficiency (%) / Fuel Efficiency (%) * Conversion Factor (3,415,179 Btu/hr-MW) * Annual Operation (hr/yr) * MMBtu/1,000,000 Btu

   For PK-87010A: MMBtu/yr = 1.35 MW / 95% / 45% * 3,415,179 Btu/hr-MW * 104 hr/yr * MMBtu/1,000,000 Btu = 1,122 MMBtu/yr

2. Factors for general stationary fuel combustion from 40 CFR Part 98, Subpart C, Tables C-1 and C-2.

3. CO2, CH4 and N2O emissions calculated from 40 CFR Part 98, Chapter C emission factors and annual fuel use:

   CO2/CH4/N2O = Fuel (MMBtu/yr) * EF (kg/MMBtu) * 2.2 lb/kg * 1 ton/2,000 lb

   For PK-87010A, Annual CO2 from No. 2 Diesel Firing:
   CO2 = 73.96 kg/MMBtu * 1,122 MMBtu/yr * 2.2 lb/kg *28:281 ton/2,000 lb = 91 ton/yr CO2

4. CO2 equivalents (CO2e) calculated according to the following formula and conversions:

   CO2e = Σ ERi * GWPi

   CO2e = Aggregate CO2 equivalent emissions for all greenhouse gases for this case
   ERi = Mass emission rate of greenhouse gas species "i"
   GWPi = Greenhouse warming potential, as provided by Table A-1 to Subpart A of 40 CFR Part 98:
   CO2 GWP = 1
   CH4 GWP = 21
   N2O GWP = 310

   For PK-87010A, Annual CO2e from No. 2 Diesel Firing:
   CO2e = [91 ton/yr CO2 * 1 ton CO2e/ton CO2] + [0.004 ton/yr CH4 * 21 ton CO2e/ton CH4] + [0.0007 ton/yr N2O * 310 ton CO2e/ton N2O] = 92 ton/yr CO2e

TABLE A-8
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Piping Fugitives

Total Piping Fugitive Emissions:

				Component Counts			Emission Factors[2] (lb/hr/component)			Estimated Emissions[3],
FIN	**EPN**	**Description**	**Service[1]**	**Valves**	**Flanges**	**Connectors**	**Valves**	**Flanges**	**Connectors**	**ton/yr**
F-1594	F-1594	Process Fugitives	FG/NG	2,800	8,700	800	0.0132	0.0039	0.0039	324

Speciated GHG Piping Fugitive Emissions:

FIN	EPN	Description	GHG	Maximum wt%[4]	GHG Mass Emissions[5], ton/yr	CO2e Emissions[6], ton/yr
F-1594	F-1594	Process Fugitives	CH4	100%	324	6,800

Notes:

1. FG = Fuel Gas; NG = Natural Gas.

2. SOCMI Average Factors, based on EPA-453/R-95-017, November 1995, Page 2-12.

3. Total Estimated Emissions:

E_T (ton/yr) = (Σ [Count(i) * Factor (i)]) * 8,760 hr/yr * 1 ton/2,000 lb

E_T (ton/yr) = ([(2,800 * 0.0132) + (8,700 * 0.0039) + (800 * 0.0039)] * 8,760 hr/yr * 1 ton/2,000 lb = 324 ton/yr

4. For purposes of emissions estimation only, conservatively assumes stream could be 100% GHG (methane) in natural gas. Actual speciation may differ in GHG content.

5. Consistuent Emissions:

E_{GHGi} (ton/yr) = E_T (ton/yr) * GHG_i wt%

For CH4, E_{GHGi} (ton/yr) = 324 ton/yr total * 100% = 324 ton/yr CH4

7. CO2 equivalents (CO2e) calculated according to the following formula and conversions:

CO2e = Σ ERi * GWPi

CO2e = Aggregate CO2 equivalent emissions for all greenhouse gases for this case

ERi = Mass emission rate of greenhouse gas species "i"

GWPi = Greenhouse warming potential, as provided by Table A-1 to Subpart A of 40 CFR Part 98:

CO2 GWP = 1

CH4 GWP = 21

N2O GWP = 310

For CH4 E_{CO2e} (ton/yr) = 324 ton/yr CH4 * 21 GWP = 6,807 ton/yr CO2e

TABLE A-9
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Fuel Stream Characteristics

NOTE:
Speciation is based on process design as well as similar operating facilities' typical streams. Speciation may vary depending on process conditions and additional compounds similar to those represented may be present.

Fuel Gas (FG)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg FG						
Constituent	**Formula**	**MW (kg/kgmol)**	**Carbon Content[1] (kg C/kg Constituent)**	**High Heat Value (HHV) (Btu/lbmol)**	**Wt%**	**kg**	**kgmole**	**Mol%[2]**	**MW Contribution[3] (kg/kgmol FG)**	**Carbon Contribution[4] (kg C/kg FG)**	**HHV Contribution[5] (Btu/lbmol FG)**	**HHV Contribution[6] (Btu/scf FG)**
Nitrogen	N2	28.013	0	0	0.11	0.11	0.004	0.02	0.005	0	0	0
Hydrogen	H2	2.016	0	123,364	32.04	32.040	15.89	78.98	1.59	0	97,436	256.7
Methane	CH4	16.043	0.749	384,517	66.90	66.900	4.17	20.72	3.32	0.501	79,686	210.0
Ethylene	C2H4	28.054	0.856	612,645	0.16	0.160	0.006	0.03	0.008	0.001	174	0.5
Ethane	C2H6	30.069	0.799	680,211	0.54	0.540	0.018	0.09	0.027	0.004	607	1.6
Propane	C3H8	44.096	0.817	983,117	0.16	0.160	0.004	0.02	0.008	0.001	177	0.5
Butane	C4H10	58.123	0.827	1,279,191	0.04	0.040	0.001	0.003	0.002	0.000	44	0.1
Butylene	C4H8	56.100	0.856	1,170,631	0.03	0.030	0.001	0.003	0.001	0.000	31	0.1
Pentane	C5H12	72.150	0.832	1,524,401	0.03	0.030	0.000	0.002	0.001	0.000	32	0.1
Hexane	C6H14	86.170	0.836	1,804,940	0.02	0.020	0.000	0.001	0.001	0.000	21	0.1
Carbon Monoxide	CO	28.010	0.429	122,225	0.61	0.610	0.022	0.11	0.030	0.003	132	0.3
Carbon Dioxide	CO2	44.010	0.273	0	0.19	0.190	0.004	0.02	0.009	0.001	0	0
				Totals:	**100.8**	**100.8**	**20.12**	**100.00**	**5.01**	**0.512**	**178,339**	**469.9**

Natural Gas (NG)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg FG						
Constituent	**Formula**	**MW (kg/kgmol)**	**Carbon Content[1] (kg C/kg Constituent)**	**High Heat Value (HHV)[2] (Btu/lbmol)**	**Wt%**	**kg**	**kgmole**	**Mol%[2]**	**MW Contribution[3] (kg/kgmol NG)**	**Carbon Contribution[4] (kg C/kg NG)**	**HHV Contribution[5] (Btu/lbmol NG)**	**HHV Contribution[6] (Btu/scf NG)**
Nitrogen	N2	28.013	0	0	0.67	0.67	0.02	0.40	0.11	0	0	0
Methane	CH4	16.043	0.749	384,517	93.37	93.37	5.82	96.87	15.54	0.699	372,464	981.5
Ethane	C2H6	30.069	0.799	680,211	3.23	3.23	0.11	1.79	0.54	0.026	12,161	32.0
Propane	C3H8	44.096	0.817	983,117	0.93	0.93	0.02	0.35	0.15	0.008	3,451	9.1
Butane	C4H10	58.123	0.827	1,279,191	0.21	0.21	0.004	0.06	0.03	0.002	769	2.0
Butylene	C4H8	56.100	0.856	1,170,631	0.20	0.20	0.004	0.06	0.03	0.002	695	1.8
Pentane	C5H12	72.150	0.832	1,524,401	0.17	0.17	0.002	0.04	0.03	0.001	598	1.6
Hexane	C6H14	86.170	0.836	1,804,940	0.10	0.10	0.001	0.02	0.02	0.001	349	0.9
Carbon Dioxide	CO2	44.010	0.273	0	1.11	1.11	0.03	0.42	0.18	0.003	0	0
				Totals:	**100.0**	**100.0**	**6.01**	**100.0**	**16.64**	**0.741**	**390,486**	**1,028.9**

Molar Volume: **379.5** **scf/lbmol @60 °F**

TABLE A-9
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Fuel Stream Characteristics

NOTE:
Speciation is based on process design as well as similar operating facilities' typical streams. Speciation may vary depending on process conditions and additional compounds similar to those represented may be present.

Notes:

1. Constituent Carbon Content = (No. C molecules * MW C) / MW Constituent
   For methane: C = (1 C molecule * 12.01 kg/kgmol C) / 16.04 kg/kg/mol methane = 0.749 kg C/kg Constituent

2. Mole % calculated on a basis of 100 kg of the constituent:
   $kgmol_i$ = $Wt\%_i$ * 100 / MW_i (kg/kgmol)
   For FG methane: $kgmol_i$ = 66.90% * 100 / 16.043 kg/kgmol methane = 4.17 kgmol
   $Mol\%_i$ = ($kgmol_i$ / Σ $kgmol_i$) * 100
   For FG methane: $Mol\%_i$ = 4.17 kgmol / 20.12 kgmol total * 100 = 20.72 Mol%

3. Molecular Weight Contribution based on Mole % of the Constituent * MW of Constituent
   MW $Contrib_i$ = $Mol\%_i$ * MW_i (kg/kgmol)
   For FG methane: MW $Contrib_i$ = 20.72 Mol% * 16.043 kg/kgmol methane = 3.32 kg/kgmol FG
   MW Stream = Σ MW $Contribution_i$ (kg/kgmol)

4. Carbon Content Contribution based on Wt% of the Consituent * C Content of Constituent:
   C Content $Contrib_i$ = $Wt\%_i$ * C $Content_i$ (kg C/kg Constituent)
   For FG methane: C Content $Contrib_i$ = 66.90 Wt% * 0.749 kg C/kg methane) = 0.501 kg C/kg FG
   C Content Stream = Σ C Content $Contribution_i$ (kg C/kg Stream)

5. HHVContribution based on Mole % of the Consituent * HHV of Constituent:
   HHV $Contribution_i$ = $Mol\%_i$ * HHV_i (Btu/lbmol Constituent)
   For FG methane: HHV $Contribution_i$ = 20.72 Mol% * 384,517 Btu/lbmol methane = 79,686 Btu/lbmol FG
   HHV Stream = Σ HHV $Contribution_i$ (Btu/lbmol Stream)

6. HHV Contribution, Btu/scf:
   HHV $Contribution_i$ = HHV $Contribution_i$ (Btu/lbmol Constituent) / Molar Volume (scf/lbmol)
   For FG methane: HHV $Contribution_i$ = 79,686 Btu/lbmol methane / 379.5 scf/lmol @60F = 210.0 Btu/scf methane
   HHV Stream = Σ HHV $Contribution_i$ (Btu/scf Stream)

TABLE A-10
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Flared Stream Characteristics

NOTE:
Speciation is based on process design as well as similar operating facilities' typical streams. Speciation may vary depending on process conditions and additional compounds similar to those represented may be present.

Startup Stream 1 (SU-1)

Constituent	Formula	MW (kg/kgmol)	Carbon Content[1] (kg C/kg Constituent)	High Heat Value (HHV) (Btu/lbmol)	Wt%	kg	kgmole	Mol%[2]	MW Contribution[3] (kg/kgmol SU-1)	Carbon Contribution[4] (kg C/kg SU-1)	HHV Contribution[5] (Btu/lbmol SU-1)	HHV Contribution[6] (Btu/scf SU-1)
						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg SU-1						
Methane	CH4	16.043	0.749	384,517	0.70	0.70	0.04	1.32	0.21	0.005	5,077	13.4
Ethane	C2H6	30.069	0.799	680,211	95.40	95.40	3.17	96.00	28.87	0.762	653,026	1,720.8
Propane	C3H8	44.096	0.817	983,117	3.90	3.90	0.088	2.68	1.18	0.032	26,310	69.3
Hydrogen Sulfide	H2S	34.070	0.000	241,749	0.00003	0.00003	0.000001	0.00003	0.00001	0	0.1	0.0002
				Totals:	**100.0**	**100.0**	**3.30**	**100.00**	**30.26**	**0.799**	**684,413**	**1,803.5**

Startup Stream 2 (SU-2)

Constituent	Formula	MW (kg/kgmol)	Carbon Content[1] (kg C/kg Constituent)	High Heat Value (HHV) (Btu/lbmol)	Wt%	kg	kgmole	Mol%[2]	MW Contribution[3] (kg/kgmol SU-2)	Carbon Contribution[4] (kg C/kg SU-2)	HHV Contribution[5] (Btu/lbmol SU-2)	HHV Contribution[6] (Btu/scf SU-2)
						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg SU-2						
Hydrogen	H2	2.016	0	123,364	38.10	38.10	18.90	83.13	1.68	0	102,555	270.2
Methane	CH4	16.043	0.749	384,517	61.00	61.00	3.80	16.73	2.68	0.457	64,312	169.5
Ethylene	C2H4	28.054	0.856	612,645	0.19	0.19	0.007	0.03	0.008	0.002	183	0.5
Carbon Monoxide	CO	28.010	0.429	122,225	0.72	0.72	0.026	0.11	0.032	0.003	138	0.364
				Totals:	**100.0**	**100.0**	**22.73**	**100.00**	**4.40**	**0.461**	**167,187**	**440.5**

Startup Stream 3 (SU-3)

Constituent	Formula	MW (kg/kgmol)	Carbon Content[1] (kg C/kg Constituent)	High Heat Value (HHV) (Btu/lbmol)	Wt%	kg	kgmole	Mol%[2]	MW Contribution[3] (kg/kgmol SU-3)	Carbon Contribution[4] (kg C/kg SU-3)	HHV Contribution[5] (Btu/lbmol SU-3)	HHV Contribution[6] (Btu/scf SU-3)
						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg SU-3						
Hydrogen	H2	2.016	0	123,364	1.10	1.10	0.55	14.21	0.29	0	17,529	46.2
Methane	CH4	16.043	0.749	384,517	2.30	2.30	0.14	3.73	0.60	0.017	14,355	37.8
Acetylene	C2H2	26.020	0.923	558,890	0.10	0.10	0.00	0.10	0.03	0.001	559	1.5
Ethylene	C2H4	28.054	0.856	612,645	37.80	37.80	1.35	35.09	9.84	0.324	214,963	566.4
Ethane	C2H6	30.069	0.799	680,211	25.30	25.30	0.84	21.91	6.59	0.202	149,040	392.7
Propylene	C3H6	42.080	0.856	885,601	26.60	26.60	0.63	16.46	6.93	0.228	145,781	384.1
Propane	C3H8	44.096	0.817	983,117	0.20	0.20	0.005	0.12	0.052	0.002	1,161	3.1
Butadienes	C4H6	54.090	0.888	1,093,340	0.40	0.40	0.007	0.19	0.10	0.004	2,106	5.5
Butylene	C4H8	56.100	0.856	1,170,631	0.05	0.050	0.001	0.023	0.013	0.000	272	0.7
Cyclohexane	C6H12	84.160	0.856	1,700,767	0.07	0.070	0.001	0.022	0.018	0.001	368	1.0
Pentane	C5H12	72.150	0.832	1,524,401	0.10	0.10	0.001	0.036	0.026	0.001	550	1.4
Benzene	C6H6	78.112	0.923	1,420,051	0.20	0.20	0.003	0.067	0.052	0.002	947	2.5
Hexane	C6H14	86.170	0.976	1,804,940	0.02	0.020	0.0002	0.006	0.005	0.000	109	0.3
Toluene	C7H8	92.138	0.782	1,698,187	0.04	0.040	0.0004	0.011	0.010	0.000	192	0.5
Xylenes	C8H10	106.165	0.905	1,976,436	0.024	0.024	0.0002	0.006	0.006	0.000	116	0.3
Nonene	C9H18	126.240	0.856	2,397,550	0.10	0.100	0.001	0.021	0.026	0.001	495	1.3
Carbon Monoxide	CO	28.010	0.429	122,225	0.02	0.020	0.001	0.02	0.005	0.000	23	0.1
Carbon Dioxide	CO2	44.010	0.273	0	0.03	0.030	0.001	0.02	0.008	0.000	0	0.0
Hydrogen Sulfide	H2S	34.070	0.000	241,749	0.003	0.003	0.0001	0.00	0.001	0.000	6	0.015
Water	H2O	18.000	0.000	0	5.5	5.50	0.31	7.96	1.432	0.000	0	0.000
				Totals:	**100.0**	**100.0**	**3.84**	**100.00**	**26.03**	**0.782**	**548,572**	**1,445.5**

TABLE A-10
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Flared Stream Characteristics

NOTE:
Speciation is based on process design as well as similar operating facilities' typical streams. Speciation may vary depending on process conditions and additional compounds similar to those represented may be present.

Startup Stream 4 (SU-4)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg SU-4						
Constituent	Formula	MW (kg/kgmol)	Carbon Content[1] (kg C/kg Constituent)	High Heat Value (HHV) (Btu/lbmol)	Wt%	kg	kgmole	Mol%[2]	MW Contribution[3] (kg/kgmol SU-4)	Carbon Contribution[4] (kg C/kg SU-4)	HHV Contribution[5] (Btu/lbmol SU-4)	HHV Contribution[6] (Btu/scf SU-4)
Hydrogen	H2	2.016	0	123,364	3.90	3.90	1.93	35.40	0.71	0	43,672	115.1
Methane	CH4	16.043	0.749	384,517	7.50	7.50	0.47	8.55	1.37	0.056	32,895	86.7
Ethylene	C2H4	28.054	0.856	612,645	53.00	53.00	1.89	34.57	9.70	0.454	211,802	558.1
Ethane	C2H6	30.069	0.799	680,211	34.50	34.50	1.15	21.00	6.31	0.276	142,818	376.3
Propylene	C3H6	42.080	0.856	885,601	1.00	1.00	0.024	0.43	0.18	0.009	3,851	10.1
Propane	C3H8	44.096	0.817	983,117	0.10	0.10	0.002	0.04	0.018	0.001	408	1.1
				Totals:	**100.0**	**100.0**	**5.46**	**100.00**	**18.30**	**0.795**	**435,446**	**1,147.4**

Startup Stream 5 (SU-5)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg SU-5						
Constituent	Formula	MW (kg/kgmol)	Carbon Content[1] (kg C/kg Constituent)	High Heat Value (HHV) (Btu/lbmol)	Wt%	kg	kgmole	Mol%[2]	MW Contribution[3] (kg/kgmol SU-5)	Carbon Contribution[4] (kg C/kg SU-5)	HHV Contribution[5] (Btu/lbmol SU-5)	HHV Contribution[6] (Btu/scf SU-5)
Ethylene	C2H4	28.054	0.856	612,645	59.60	59.60	2.12	61.42	17.23	0.510	376,299	991.6
Ethane	C2H6	30.069	0.799	680,211	39.20	39.20	1.30	37.69	11.33	0.313	256,379	675.6
Propylene	C3H6	42.080	0.856	885,601	1.10	1.10	0.026	0.76	0.32	0.009	6,693	17.6
Propane	C3H8	44.096	0.817	983,117	0.20	0.20	0.005	0.13	0.058	0.002	1,289	3.4
				Totals:	**100.1**	**100.1**	**3.46**	**100.00**	**28.94**	**0.834**	**640,660**	**1,688.2**

Startup Stream 6 (SU-6)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg SU-6						
Constituent	Formula	MW (kg/kgmol)	Carbon Content[1] (kg C/kg Constituent)	High Heat Value (HHV) (Btu/lbmol)	Wt%	kg	kgmole	Mol%[2]	MW Contribution[3] (kg/kgmol SU-6)	Carbon Contribution[4] (kg C/kg SU-6)	HHV Contribution[5] (Btu/lbmol SU-6)	HHV Contribution[6] (Btu/scf SU-6)
Ethylene	C2H4	28.054	0.856	612,645	100.00	100.00	3.56	100.00	28.05	0.856	612,645	1,614.3
				Totals:	**100.0**	**100.0**	**3.56**	**100.00**	**28.05**	**0.856**	**612,645**	**1,614.3**

Startup Stream 7 (SU-7)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg SU-7						
Constituent	Formula	MW (kg/kgmol)	Carbon Content[1] (kg C/kg Constituent)	High Heat Value (HHV) (Btu/lbmol)	Wt%	kg	kgmole	Mol%[2]	MW Contribution[3] (kg/kgmol SU-7)	Carbon Contribution[4] (kg C/kg SU-7)	HHV Contribution[5] (Btu/lbmol SU-7)	HHV Contribution[6] (Btu/scf SU-7)
Propylene	C3H6	42.080	0.856	885,601	100.00	100.00	2.38	100.00	42.08	0.856	885,601	2,333.6
				Totals:	**100.0**	**100.0**	**2.38**	**100.00**	**42.08**	**0.856**	**885,601**	**2,333.6**

TABLE A-10
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Flared Stream Characteristics

NOTE:
Speciation is based on process design as well as similar operating facilities' typical streams. Speciation may vary depending on process conditions and additional compounds similar to those represented may be present.

Routine Vent Stream Average Annual (RV)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
		MW	Carbon Content[1]	High Heat Value		Basis = 100 kg RV			MW Contribution[3]	Carbon Contribution[4]	HHV Contribution[5]	HHV Contribution[6]
Constituent	**Formula**	**(kg/kgmol)**	**(kg C/kg Constituent)**	**(HHV) (Btu/lbmol)**	**Wt%**	**kg**	**kgmole**	**Mol%[2]**	**(kg/kgmol RV)**	**(kg C/kg RV)**	**(Btu/lbmol V)**	**(Btu/scf RV)**
Nitrogen	N2	28.013	0	0	50.92	50.92	1.82	20.785	5.82	0	0	0
Hydrogen	H2	2.016	0	123,364	9.88	9.88	4.90	56.04	1.13	0	69,130	182.2
Methane	CH4	16.043	0.749	384,517	27.84	27.84	1.74	19.84	3.18	0.208	76,298	201.0
Acetylene	C2H2	26.020	0.923	558,890	0.02	0.020	0.00	0.01	0.00	0.000	49	0.1
Ethylene	C2H4	28.054	0.856	612,645	1.48	1.48	0.053	0.60	0.17	0.013	3,696	9.7
Ethane	C2H6	30.069	0.799	680,211	2.62	2.62	0.087	1.00	0.30	0.021	6,777	17.9
Propylene	C3H6	42.080	0.856	885,601	3.24	3.24	0.077	0.88	0.37	0.028	7,797	20.5
Propane	C3H8	44.096	0.817	983,117	1.02	1.02	0.023	0.26	0.12	0.008	2,600	6.9
Butadienes	C4H6	54.090	0.888	1,093,340	0.12	0.12	0.002	0.03	0.014	0.001	277	0.7
Butylene	C4H8	56.100	0.856	1,170,631	0.16	0.16	0.003	0.033	0.018	0.001	382	1.0
Butane	C4H10	58.123	0.827	1,279,191	0.52	0.52	0.009	0.102	0.059	0.004	1,309	3.4
Pentane	C5H12	72.150	0.832	1,524,401	0.05	0.050	0.001	0.008	0.006	0.000	121	0.3
Pentenes	C5H10	70.133	0.856	1,452,233	1.64	1.64	0.023	0.267	0.19	0.014	3,883	10.2
Hexane	C6H14	86.170	0.976	1,804,940	0.03	0.03	0.000	0.004	0.003	0.000	72	0.2
Carbon Monoxide	CO	28.010	0.429	122,225	0.14	0.14	0.005	0.06	0.016	0.001	70	0.2
Carbon Dioxide	CO2	44.010	0.273	0	0.33	0.33	0.007	0.09	0.038	0.001	0	0
				Totals:	**100.0**	**100.0**	**8.75**	**100.00**	**11.44**	**0.301**	**172,460**	**454.4**

Maintenance Stream 1 (M-1)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
		MW	Carbon Content[1]	High Heat Value		Basis = 100 kg M-1			MW Contribution[3]	Carbon Contribution[4]	HHV Contribution[5]	HHV Contribution[6]
Constituent	**Formula**	**(kg/kgmol)**	**(kg C/kg Constituent)**	**(HHV) (Btu/lbmol)**	**Wt%**	**kg**	**kgmole**	**Mol%[2]**	**(kg/kgmol M-1)**	**(kg C/kg M-1)**	**(Btu/lbmol M-1)**	**(Btu/scf M-1)**
Hydrogen	H2	2.016	0	123,364	16.70	16.70	8.28	89.93	1.81	0	110,946	292.3
Methane	CH4	16.043	0.749	384,517	0.74	0.74	0.05	0.50	0.08	0.006	1,926	5.1
Propylene	C3H6	42.080	0.856	885,601	0.61	0.61	0.014	0.16	0.066	0.005	1,394	3.7
Propane	C3H8	44.096	0.817	983,117	0.16	0.16	0.004	0.04	0.017	0.001	387	1.0
Butadienes	C4H6	54.090	0.888	1,093,340	0.30	0.30	0.006	0.06	0.033	0.003	658	1.7
Butylene	C4H8	56.100	0.856	1,170,631	0.05	0.050	0.001	0.010	0.005	0.000	113	0.3
Butane	C4H10	58.123	0.827	1,279,191	0.01	0.010	0.000	0.002	0.001	0.000	24	0.1
Pentane	C5H12	72.150	0.832	1,524,401	4.60	4.60	0.064	0.692	0.50	0.038	10,552	27.8
Pentenes	C5H10	70.133	0.856	1,452,233	6.13	6.13	0.087	0.949	0.67	0.052	13,781	36.3
Isoprene	C5H8	68.117	0.882	1,384,540	4.60	4.60	0.068	0.733	0.50	0.041	10,151	26.7
Hexenes	C6H12	84.160	0.856	1,732,620	0.43	0.43	0.005	0.055	0.047	0.004	961	2.5
Benzene	C6H6	78.112	0.923	1,420,051	12.96	12.96	0.17	1.801	1.41	0.120	25,579	67.4
Hexane	C6H14	86.170	0.976	1,804,940	0.14	0.140	0.002	0.018	0.015	0.001	318	0.8
Toluene	C7H8	92.138	0.782	1,698,187	8.23	8.230	0.089	0.970	0.89	0.064	16,468	43.4
Xylenes	C8H10	106.165	0.905	1,976,436	15.70	15.70	0.15	1.606	1.70	0.142	31,732	83.6
Nonene	C9H18	126.240	0.856	2,397,550	28.62	28.62	0.23	2.461	3.11	0.245	59,012	155.5
Carbon Monoxide	CO	28.010	0.429	122,225	0.03	0.03	0.00	0.01	0.003	0.000	14	0.0
				Totals:	**100.0**	**100.0**	**9.21**	**100.00**	**10.86**	**0.723**	**284,016**	**748.4**

TABLE A-10
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Flared Stream Characteristics

NOTE:
Speciation is based on process design as well as similar operating facilities' typical streams. Speciation may vary depending on process conditions and additional compounds similar to those represented may be present.

Maintenance Stream 2 (M-2)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg M-2						
Constituent	**Formula**	**MW (kg/kgmol)**	**Carbon Content[1] (kg C/kg Constituent)**	**High Heat Value (HHV) (Btu/lbmol)**	**Wt%**	**kg**	**kgmole**	**Mol%[2]**	**MW Contribution[3] (kg/kgmol M-2)**	**Carbon Contribution[4] (kg C/kg M-2)**	**HHV Contribution[5] (Btu/lbmol M-2)**	**HHV Contribution[6] (Btu/scf M-2)**
Methane	CH4	16.043	0.749	384,517	15.13	15.13	0.94	30.56	4.90	0.113	117,491	309.6
Ethylene	C2H4	28.054	0.856	612,645	9.55	9.55	0.34	11.03	3.09	0.082	67,570	178.0
Ethane	C2H6	30.069	0.799	680,211	4.17	4.17	0.14	4.49	1.35	0.033	30,563	80.5
Propylene	C3H6	42.080	0.856	885,601	48.97	48.97	1.16	37.70	15.87	0.419	333,909	879.9
Propane	C3H8	44.096	0.817	983,117	21.99	21.99	0.50	16.16	7.12	0.180	158,842	418.6
Xylenes	C8H10	106.165	0.905	1,976,436	0.20	0.20	0.00	0.061	0.065	0.002	1,206	3.2
				Totals:	**100.0**	**100.0**	**3.09**	**100.00**	**32.40**	**0.829**	**709,581**	**1,869.8**

Maintenance Stream 3 (M-3)

						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg M-3						
Constituent	**Formula**	**MW (kg/kgmol)**	**Carbon Content[1] (kg C/kg Constituent)**	**High Heat Value (HHV) (Btu/lbmol)**	**Wt%**	**kg**	**kgmole**	**Mol%[2]**	**MW Contribution[3] (kg/kgmol M-3)**	**Carbon Contribution[4] (kg C/kg M-3)**	**HHV Contribution[5] (Btu/lbmol M-3)**	**HHV Contribution[6] (Btu/scf M-3)**
Nitrogen	N2	28.013	0	0	0.02	0.02	0.00	0.029	0.008	0.000	0	0.0
Hydrogen	H2	2.016	0	123,364	0.53	0.53	0.26	10.57	0.21	0	13,036	34.4
Methane	CH4	16.043	0.749	384,517	4.16	4.16	0.26	10.42	1.67	0.031	40,078	105.6
Ethylene	C2H4	28.054	0.856	612,645	16.75	16.75	0.60	24.00	6.73	0.143	147,031	387.4
Ethane	C2H6	30.069	0.799	680,211	3.62	3.62	0.12	4.84	1.46	0.029	32,917	86.7
Propylene	C3H6	42.080	0.856	885,601	16.58	16.58	0.39	15.84	6.66	0.142	140,258	369.6
Propane	C3H8	44.096	0.817	983,117	5.43	5.43	0.12	4.95	2.18	0.044	48,662	128.2
Butadienes	C4H6	54.090	0.888	1,093,340	0.63	0.63	0.01	0.47	0.25	0.006	5,119	13.5
Butylene	C4H8	56.100	0.856	1,170,631	0.54	0.54	0.01	0.387	0.22	0.005	4,529	11.9
Butane	C4H10	58.123	0.827	1,279,191	15.96	15.96	0.27	11.037	6.42	0.132	141,189	372.0
Pentane	C5H12	72.150	0.832	1,524,401	4.98	4.98	0.07	2.774	2.00	0.041	42,293	111.4
Pentenes	C5H10	70.133	0.856	1,452,233	6.64	6.64	0.09	3.806	2.67	0.057	55,267	145.6
Isoprene	C5H8	68.117	0.882	1,384,540	4.98	4.98	0.07	2.939	2.00	0.044	40,687	107.2
Hexenes	C6H12	84.160	0.856	1,732,620	5.99	5.99	0.07	2.861	2.41	0.051	49,568	130.6
Benzene	C6H6	78.112	0.923	1,420,051	2.10	2.10	0.03	1.081	0.84	0.019	15,346	40.4
Hexane	C6H14	86.170	0.976	1,804,940	2.00	2.00	0.02	0.933	0.80	0.020	16,839	44.4
Toluene	C7H8	92.138	0.782	1,698,187	1.22	1.22	0.01	0.532	0.49	0.010	9,038	23.8
Xylenes	C8H10	106.165	0.905	1,976,436	0.270	0.27	0.00	0.102	0.11	0.002	2,020	5.3
Nonene	C9H18	126.240	0.856	2,397,550	7.61	7.61	0.06	2.423	3.06	0.065	58,095	153.1
Hydrogen Sulfide	H2S	34.070	0.000	241,749	0.010	0.01	0.00	0.01	0.004	0.000	29	0.075
				Totals:	**100.0**	**100.0**	**2.49**	**100.00**	**40.20**	**0.841**	**862,002**	**2,271.4**

TABLE A-10
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Flared Stream Characteristics

NOTE:
Speciation is based on process design as well as similar operating facilities' typical streams. Speciation may vary depending on process conditions and additional compounds similar to those represented may be present.

Maintenance Stream 4 (M-4)

Constituent	Formula	MW (kg/kgmol)	Carbon Content[1] (kg C/kg Constituent)	High Heat Value (HHV) (Btu/lbmol)	Wt%	kg	kgmole	Mol%[2]	MW Contribution[3] (kg/kgmol M-4)	Carbon Contribution[4] (kg C/kg M-4)	HHV Contribution[5] (Btu/lbmol M-4)	HHV Contribution[6] (Btu/scf M-4)
						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg M-4						
Methane	CH4	16.043	0.749	384,517	0.04	0.04	0.00	0.10	0.02	0.000	401	1.1
Ethylene	C2H4	28.054	0.856	612,645	19.34	19.34	0.69	28.81	8.08	0.166	176,522	465.1
Ethane	C2H6	30.069	0.799	680,211	1.17	1.17	0.04	1.63	0.49	0.009	11,062	29.1
Propylene	C3H6	42.080	0.856	885,601	41.09	41.09	0.98	40.81	17.17	0.352	361,432	952.4
Propane	C3H8	44.096	0.817	983,117	20.27	20.27	0.46	19.21	8.47	0.166	188,881	497.7
Butadienes	C4H6	54.090	0.888	1,093,340	1.21	1.21	0.02	0.93	0.51	0.011	10,222	26.9
Butylene	C4H8	56.100	0.856	1,170,631	1.06	1.06	0.02	0.790	0.44	0.009	9,245	24.4
Butane	C4H10	58.123	0.827	1,279,191	1.25	1.25	0.02	0.899	0.52	0.010	11,498	30.3
Pentane	C5H12	72.150	0.832	1,524,401	1.16	1.16	0.02	0.672	0.48	0.010	10,244	27.0
Pentenes	C5H10	70.133	0.856	1,452,233	1.55	1.55	0.02	0.924	0.65	0.013	13,414	35.3
Isoprene	C5H8	68.117	0.882	1,384,540	1.16	1.16	0.02	0.712	0.48	0.010	9,855	26.0
Hexenes	C6H12	84.160	0.856	1,732,620	0.08	0.08	0.00	0.040	0.033	0.001	688	1.8
Benzene	C6H6	78.112	0.923	1,420,051	2.02	2.02	0.03	1.081	0.84	0.019	15,348	40.4
Hexane	C6H14	86.170	0.976	1,804,940	0.03	0.03	0.00	0.015	0.013	0.000	263	0.7
Toluene	C7H8	92.138	0.782	1,698,187	1.10	1.10	0.01	0.499	0.46	0.009	8,474	22.3
Xylenes	C8H10	106.165	0.905	1,976,436	6.290	6.29	0.06	2.476	2.63	0.057	48,942	129.0
Nonene	C9H18	126.240	0.856	2,397,550	1.18	1.18	0.01	0.391	0.49	0.010	9,367	24.7
				Totals:	**100.0**	**100.0**	**2.39**	**100.00**	**41.80**	**0.851**	**885,856**	**2,334.3**

Maintenance Stream 5 (M-5)

Constituent	Formula	MW (kg/kgmol)	Carbon Content[1] (kg C/kg Constituent)	High Heat Value (HHV) (Btu/lbmol)	Wt%	kg	kgmole	Mol%[2]	MW Contribution[3] (kg/kgmol M-5)	Carbon Contribution[4] (kg C/kg M-5)	HHV Contribution[5] (Btu/lbmol M-5)	HHV Contribution[6] (Btu/scf M-5)
						=Wt%*100	=kg/MW	=kgmol/Σkgmol*100	=Mol% * MW	=wt%*Carbon Content	=Mol% * HHV	=Btu/mol / MolVol
						Basis = 100 kg M-5						
Hydrogen	H2	2.016	0	123,364	0.35	0.35	0.17	4.52	0.09	0	5,577	14.7
Methane	CH4	16.043	0.749	384,517	0.73	0.73	0.05	1.18	0.19	0.005	4,556	12.0
Ethylene	C2H4	28.054	0.856	612,645	1.57	1.57	0.06	1.46	0.41	0.013	8,928	23.5
Ethane	C2H6	30.069	0.799	680,211	17.44	17.44	0.58	15.10	4.54	0.139	102,738	270.7
Propylene	C3H6	42.080	0.856	885,601	24.44	24.44	0.58	15.12	6.36	0.209	133,943	352.9
Propane	C3H8	44.096	0.817	983,117	13.49	13.49	0.31	7.97	3.51	0.110	78,321	206.4
Butadienes	C4H6	54.090	0.888	1,093,340	4.20	4.20	0.08	2.02	1.09	0.037	22,108	58.3
Butylene	C4H8	56.100	0.856	1,170,631	1.91	1.91	0.03	0.887	0.50	0.016	10,379	27.3
Butane	C4H10	58.123	0.827	1,279,191	16.19	16.19	0.28	7.254	4.22	0.134	92,788	244.5
Pentane	C5H12	72.150	0.832	1,524,401	3.18	3.18	0.04	1.148	0.83	0.026	17,496	46.1
Pentenes	C5H10	70.133	0.856	1,452,233	4.24	4.24	0.06	1.574	1.10	0.036	22,863	60.2
Isoprene	C5H8	68.117	0.882	1,384,540	3.21	3.21	0.05	1.227	0.84	0.028	16,991	44.8
Hexenes	C6H12	84.160	0.856	1,732,620	0.63	0.63	0.01	0.195	0.16	0.005	3,378	8.9
Benzene	C6H6	78.112	0.923	1,420,051	3.14	3.14	0.04	1.047	0.82	0.029	14,865	39.2
Hexane	C6H14	86.170	0.976	1,804,940	0.31	0.31	0.00	0.094	0.081	0.003	1,691	4.5
Toluene	C7H8	92.138	0.782	1,698,187	0.37	0.37	0.00	0.105	0.096	0.003	1,776	4.7
Xylenes	C8H10	106.165	0.905	1,976,436	0.130	0.13	0.00	0.032	0.034	0.001	630	1.7
Nonene	C9H18	126.240	0.856	2,397,550	4.48	4.48	0.04	0.924	1.17	0.038	22,157	58.4
				Totals:	**100.0**	**100.0**	**2.38**	**61.87**	**26.04**	**0.836**	**561,185**	**1,478.7**

TABLE A-10
Chevron Phillips Chemical Company LP
Cedar Bayou Plant
Greenhouse Gas Emissions - Flared Stream Characteristics

NOTE:
Speciation is based on process design as well as similar operating facilities' typical streams. Speciation may vary depending on process conditions and additional compounds similar to those represented may be present.

Molar Volume: **379.5** **scf/lbmol @60 °F**

Notes:

1. Constituent Carbon Content = (No. C molecules * MW C) / MW Constituent
   For methane: C = (1 C molecule * 12.01 kg/kgmol C) / 16.04 kg/kg/mol methane = 0.749 kg C/kg Constituent

2. Mole % calculated on a basis of 100 kg of the constituent:
   $kgmol_i$ = $Wt\%_i$ * 100 / MW_i (kg/kgmol)
   For FG methane: $kgmol_i$ = 0.70% * 100 / 16.043 kg/kgmol methane = 0.04 kgmol
   $Mol\%_i$ = ($kgmol_i$ / Σ $kgmol_i$) * 100
   For FG methane: $Mol\%_i$ = 0.04 kgmol / 3.30 kgmol total * 100 = 1.32 Mol%

3. Molecular Weight Contribution based on Mole % of the Constituent * MW of Constituent
   MW $Contrib_i$ = $Mol\%_i$ * MW_i (kg/kgmol)
   For FG methane: MW $Contrib_i$ = 1.32 Mol% * 16.043 kg/kgmol methane = 0.21 kg/kgmol FG
   MW Stream = Σ MW $Contribution_i$ (kg/kgmol)

4. Carbon Content Contribution based on Wt% of the Consituent * C Content of Constituent:
   C Content $Contrib_i$ = $Wt\%_i$ * C $Content_i$ (kg C/kg Constituent)
   For FG methane: C Content $Contrib_i$ = 0.70 Wt% * 0.749 kg C/kg methane) = 0.005 kg C/kg FG
   C Content Stream = Σ C Content $Contribution_i$ (kg C/kg Stream)

5. HHVContribution based on Mole % of the Consituent * HHV of Constituent:
   HHV $Contribution_i$ = $Mol\%_i$ * HHV_i (Btu/lbmol Constituent)
   For FG methane: HHV $Contribution_i$ = 1.32 Mol% * 384,517 Btu/lbmol methane = 5,077 Btu/lbmol FG
   HHV Stream = Σ HHV $Contribution_i$ (Btu/lbmol Stream)

6. HHV Contribution, Btu/scf:
   HHV $Contribution_i$ = HHV $Contribution_i$ (Btu/lbmol Constituent) / Molar Volume (scf/lbmol)
   For FG methane: HHV $Contribution_i$ = 5,077 Btu/lbmol methane / 379.5 scf/lmol @60F = 13.4 Btu/scf methane
   HHV Stream = Σ HHV $Contribution_i$ (Btu/scf Stream)

APPENDIX B

RACT/BACT/LAER Clearinghouse Search Results

COMPREHENSIVE REPORT
Report Date:12/11/2011

Facility Information

RBLC ID:	LA-0254 (draft)	**Date Determination Last Updated:**	11/07/2011
Corporate/Company Name:	ENTERGY LOUISIANA LLC	**Permit Number:**	PSD-LA-752
Facility Name:	NINEMILE POINT ELECTRIC GENERATING PLANT	**Permit Date:**	08/16/2011 (actual)
Facility Contact:	CHRISTEE HERBERT (504) 576-5699 CHERBER@ENTERGY.COM	**FRS Number:**	110002049328
Facility Description:	1827 MW POWER PLANT (PRE-PROJECT). NATURAL GAS IS PRIMARY FUEL; NO. 2 & NO. 4 FUEL OIL ARE SECONDARY FUELS. PROJECT INVOLVES DECOMMISSIONING OF 2 BOILERS AND THE CONSTRUCTION OF 2 COMBINED CYCLE GAS TURBINES WITH DUCT BURNERS, A NATURAL GAS-FIRED AUXILIARY BOILER, A DIESEL GENERATOR, 2 COOLING TOWERS, A FUEL OIL STORAGE TANK, A DIESEL-FIRED FIREWASTER PUMP, AND AN ANHYDROUS AMMONIA TANK. FUELS FOR THE TURBINES INCLUDE NATURAL GAS, NO. 2 FUEL OIL, AND ULTRA LOW SULFUR DIESEL.	**SIC Code:**	4911
Permit Type:	B: Add new process to existing facility	**NAICS Code:**	221112
Permit URL:			
EPA Region:	6	**COUNTRY:**	USA
Facility County:	JEFFERSON		
Facility State:	LA		
Facility ZIP Code:	70094		
Permit Issued By:	LOUISIANA DEPARTMENT OF ENV QUALITY (Agency Name) MR. KEITH JORDAN(Agency Contact) (225)219-3613 KEITH.JORDAN@LA.GOV		
Other Agency Contact Info:	PERMIT WRITER: CHRIS SMITH, (225) 219-3417		
Permit Notes:	APPLICATION ACCEPTED RECEIVED DATE = DATE OF ADMINISTRATIVE COMPLETENESS BACT FOR GREENHOUSE GASES (CO2E) FROM THE COMBINED CYCLE TURBINE GENERATORS (UNITS 6A & 6B) IS OPERATING PROPERLY AND PERFORMING NECESSARY ROUTINE MAINTENANCE, REPAIR, AND REPLACEMENT TO MAINTAIN THE GROSS HEAT RATE AT OR BELOW 7630 BTU/KW-HR (HHV) (ANNUAL AVERAGE).		

Process/Pollutant Information

PROCESS NAME: COMBINED CYCLE TURBINE GENERATORS (UNITS 6A & 6B)

Process Type: 15.200 (Combined Cycle & Cogeneration (>25 MW))

Primary Fuel: NATURAL GAS

Throughput: 7146.00 MM BTU/HR

Process Notes: TURBINES ALSO PERMITTED TO BURN NO. 2 FUEL OIL AND ULTRA LOW SULFUR DIESEL. FUEL OIL USE IS LIMITED TO 1000 HOURS PER YEAR.

POLLUTANT NAME: Particulate matter, total < 2.5 µ (TPM2.5)

CAS Number: PM

Test Method: Other

Other Test Method: METHOD 201A

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 26.2300 LB/HR HOURLY AVERAGE W/O DUCT BURNER

Emission Limit 2: 33.1600 LB/HR HOURLY AVERAGE W/ DUCT BURNER

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: OPERATING PERMIT

Control Method: (P) WHILE FIRING NATURAL GAS: USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES WHILE FIRING FUEL OIL: USE OF ULTRA LOW SULFUR FUEL OIL AND GOOD COMBUSTION PRACTICES

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: WHILE FIRING FUEL OIL, THE BACT LIMIT FOR PM2.5 IS 36.37 LB/HR (HOURLY AVERAGE) BACT FOR GREENHOUSE GASES (CO2E) FROM THE COMBINED CYCLE TURBINE GENERATORS (UNITS 6A & 6B) IS OPERATING PROPERLY AND PERFORMING NECESSARY ROUTINE MAINTENANCE, REPAIR, AND REPLACEMENT TO MAINTAIN THE GROSS HEAT RATE AT OR BELOW 7630 BTU/KW-HR (HHV) (ANNUAL AVERAGE).

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM

Test Method: EPA/OAR Mthd 201A and 202

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 26.2300 LB/HR HOURLY AVERAGE W/O DUCT BURNER

Emission Limit 2: 33.1600 LB/HR HOURLY AVERAGE W/ DUCT BURNER

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis:	BACT-PSD
Other Applicable Requirements:	OPERATING PERMIT
Control Method:	(P) WHILE FIRING NATURAL GAS: USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES WHILE FIRING FUEL OIL: USE OF ULTRA LOW SULFUR FUEL OIL AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:	
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	WHILE FIRING FUEL OIL, THE BACT LIMIT FOR PM10 IS 36.37 LB/HR (HOURLY AVERAGE) BACT FOR GREENHOUSE GASES (CO2E) FROM THE COMBINED CYCLE TURBINE GENERATORS (UNITS 6A & 6B) IS OPERATING PROPERLY AND PERFORMING NECESSARY ROUTINE MAINTENANCE, REPAIR, AND REPLACEMENT TO MAINTAIN THE GROSS HEAT RATE AT OR BELOW 7630 BTU/KW-HR (HHV) (ANNUAL AVERAGE).

POLLUTANT NAME:	Carbon Monoxide
CAS Number:	630-08-0
Test Method:	Unspecified
Pollutant Group(s):	(InOrganic Compounds)
Emission Limit 1:	
Emission Limit 2:	
Standard Emission:	3.0000 PPMVD @ 15% O2 HOURLY AVERAGE

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis:	BACT-PSD
Other Applicable Requirements:	OPERATING PERMIT
Control Method:	(B) OXIDATION CATALYST AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:	
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	CO MONITORED USING CEMS. 3 PPMVD @ 15% O2 LIMIT APPLIES WHEN OPERATING W/ AND W/O THE DUCT BURNER AND WHEN FIRING FUEL OIL. STARTUP/SHUTDOWN: PROGRESS THROUGH THE SU/SD EVENT AS QUICKLY AS POSSIBLE WHILE FOLLOWING THE MANUFACTURER'S RECOMMENDED PROCEDURES. SU/SD OPERATIONS LIMITED TO 1302 HR/YR. BACT FOR GREENHOUSE GASES (CO2E) FROM THE COMBINED CYCLE TURBINE GENERATORS (UNITS 6A & 6B) IS OPERATING PROPERLY AND PERFORMING NECESSARY ROUTINE MAINTENANCE, REPAIR, AND REPLACEMENT TO MAINTAIN THE GROSS HEAT RATE AT OR BELOW 7630 BTU/KW-HR (HHV) (ANNUAL AVERAGE).

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: EPA/OAR Mthd 25A
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 1.4000 PPMVD @ 15% O2 HOURLY AVERAGE W/O DUCT BURNER
Emission Limit 2: 3.8000 PPMVD @ 15% O2 HOURLY AVERAGE W/ DUCT BURNER
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: WHILE FIRING FUEL OIL, THE BACT LIMIT FOR VOC IS 3.1 PPMVD @ 15% O2 (HOURLY AVERAGE) STARTUP/SHUTDOWN: PROGRESS THROUGH THE SU/SD EVENT AS QUICKLY AS POSSIBLE WHILE FOLLOWING THE MANUFACTURER'S RECOMMENDED PROCEDURES. SU/SD OPERATIONS LIMITED TO 1302 HR/YR. BACT FOR GREENHOUSE GASES (CO2E) FROM THE COMBINED CYCLE TURBINE GENERATORS (UNITS 6A & 6B) IS OPERATING PROPERLY AND PERFORMING NECESSARY ROUTINE MAINTENANCE, REPAIR, AND REPLACEMENT TO MAINTAIN THE GROSS HEAT RATE AT OR BELOW 7630 BTU/KW-HR (HHV) (ANNUAL AVERAGE).

Process/Pollutant Information

PROCESS NAME: AUXILIARY BOILER (AUX-1)

Process Type: 11.310 (Natural Gas (includes propane and liquefied petroleum gas))

Primary Fuel: NATURAL GAS

Throughput: 338.00 MM BTU/HR

Process Notes:

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1:
Emission Limit 2:

Standard Emission: 7.6000 LB/MM SCF ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 2.5 µ (TPM2.5)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 7.6000 LB/MM SCF ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1:
Emission Limit 2:
Standard Emission: 84.0000 LB/MM SCF ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT

Control Method: (P) USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 5.5000 LB/MM SCF ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1:
Emission Limit 2:
Standard Emission: 117.0000 LB/MM BTU
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) PROPER OPERATION AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME:	Methane
CAS Number:	74-82-8
Test Method:	Unspecified
Pollutant Group(s):	(Greenhouse Gasses (GHG) , Organic Compounds (all) , Organic Non-HAP Compounds)
Emission Limit 1:	
Emission Limit 2:	
Standard Emission:	0.0022 LB/MM BTU

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis:	BACT-PSD
Other Applicable Requirements:	OPERATING PERMIT
Control Method:	(P) PROPER OPERATION AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:	
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	

POLLUTANT NAME:	Nitrous Oxide (N2O)
CAS Number:	10024-97-2
Test Method:	Unspecified
Pollutant Group(s):	(Greenhouse Gasses (GHG) , InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1:	
Emission Limit 2:	
Standard Emission:	0.0002 LB/MM BTU

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis:	BACT-PSD
Other Applicable Requirements:	OPERATING PERMIT
Control Method:	(P) PROPER OPERATION AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:	
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	

Process/Pollutant Information

PROCESS NAME: CHILLER COOLING TOWER (CHILL CT)

Process Type: 99.009 (Industrial Process Cooling Towers)

Primary Fuel:

Throughput: 12000.00 GALS/MIN

Process Notes:

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1:

Emission Limit 2:

Standard Emission: 0.0010 PERCENT DRIFT ANNUAL AVERAGE

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: OPERATING PERMIT

Control Method: (P) HIGH EFFICIENCY MIST ELIMINATOR

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: MASS EMISSION RATES ARE NOT ESTABLISHED BY THE PSD PERMIT.

POLLUTANT NAME: Particulate matter, total < 2.5 µ (TPM2.5)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1:

Emission Limit 2:

Standard Emission: 0.0010 PERCENT DRIFT ANNUAL AVERAGE

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: OPERATING PERMIT

Control Method: (P) HIGH EFFICIENCY MIST ELIMINATOR

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: MASS EMISSION RATES ARE NOT ESTABLISHED BY THE PSD PERMIT.

Process/Pollutant Information

PROCESS NAME: UNIT 6 COOLING TOWER

Process Type: 99.009 (Industrial Process Cooling Towers)

Primary Fuel:

Throughput: 115847.00 GALS/MIN

Process Notes:

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1:

Emission Limit 2:

Standard Emission: 0.0005 PERCENT DRIFT ANNUAL AVERAGE

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: OPERATING PERMIT

Control Method: (P) HIGH EFFICIENCY MIST ELIMINATOR

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: MASS EMISSION RATES ARE NOT ESTABLISHED BY THE PSD PERMIT.

POLLUTANT NAME: Particulate matter, total < 2.5 µ (TPM2.5)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1:

Emission Limit 2:

Standard Emission: 0.0005 PERCENT DRIFT ANNUAL AVERAGE

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) HIGH EFFICIENCY MIST ELIMINATOR
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: MASS EMISSION RATES ARE NOT ESTABLISHED BY THE PSD PERMIT.

Process/Pollutant Information

PROCESS NAME: EMERGENCY DIESEL GENERATOR
Process Type: 17.110 (Fuel Oil (ASTM # 1,2, includes kerosene, aviation, diesel fuel))
Primary Fuel: DIESEL
Throughput: 1250.00 HP
Process Notes:

POLLUTANT NAME: Particulate matter, total < 2.5 µ (TPM2.5)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 0.1500 G/HP-HR ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1:

Emission Limit 2:
Standard Emission: 0.1500 G/HP-HR ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1:
Emission Limit 2:
Standard Emission: 2.6000 G/HP-HR ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 1.0000 G/HP-HR ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide
CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1:
Emission Limit 2:
Standard Emission: 163.0000 LB/MM BTU
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) PROPER OPERATION AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Methane
CAS Number: 74-82-8
Test Method: Unspecified
Pollutant Group(s): (Greenhouse Gasses (GHG) , Organic Compounds (all) , Organic Non-HAP Compounds)
Emission Limit 1:
Emission Limit 2:
Standard Emission: 0.0061 LB/MM BTU
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) PROPER OPERATION AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrous Oxide (N2O)

CAS Number: 10024-97-2
Test Method: Unspecified
Pollutant Group(s): (Greenhouse Gasses (GHG) , InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 0.0014 LB/MM BTU
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) PROPER OPERATION AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: EMERGENCY FIRE PUMP

Process Type: 17.210 (Fuel Oil (ASTM # 1,2, includes kerosene, aviation, diesel fuel))

Primary Fuel: DIESEL

Throughput: 350.00 HP

Process Notes:

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 0.1500 G/HP-HR ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: NSPS , OPERATING PERMIT
Control Method: (P) ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 2.5 µ (TPM2.5)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 0.1500 G/HP-HR ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: NSPS , OPERATING PERMIT
Control Method: (P) ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1:
Emission Limit 2:
Standard Emission: 2.6000 G/HP-HR ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 1.0000 G/HP-HR ANNUAL AVERAGE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1:
Emission Limit 2:
Standard Emission: 163.0000 LB/MM BTU
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) PROPER OPERATION AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Methane

CAS Number: 74-82-8

Test Method: Unspecified
Pollutant Group(s): (Greenhouse Gasses (GHG) , Organic Compounds (all) , Organic Non-HAP Compounds)
Emission Limit 1:
Emission Limit 2:
Standard Emission: 0.0061 LB/MM BTU
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) PROPER OPERATION AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrous Oxide (N2O)
CAS Number: 10024-97-2
Test Method: Unspecified
Pollutant Group(s): (Greenhouse Gasses (GHG) , InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 0.0014 LB/MM BTU
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: OPERATING PERMIT
Control Method: (P) PROPER OPERATION AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Facility Information

RBLC ID: LA-0248 (draft)

Date Determination Last Updated: 12/08/2011

Corporate/Company Name:	CONSOLIDATED ENVIRONMENTAL MANAGEMENT INC - NUCOR	**Permit Number:**	PSD-LA-751
Facility Name:	DIRECT REDUCTION IRON PLANT	**Permit Date:**	01/27/2011 (actual)
Facility Contact:	STEVE ROWLAN (704) 366-7000	**FRS Number:**	110037583442
Facility Description:	The DRI process reduces the iron oxide content of iron ore pellets into iron metal through direct contact with a reducing gas. The effectiveness of this reduction process is called metallization, and the process equipment will be designed to achieve a metallization rate of at least 92% of the oxides within the ore. The reduction will take place in a countercurrent vertical shaft furnace, where reducing gas passes up through iron oxide pellets, which feed through the furnace by gravity. The major elements of the DRI process include the following: (1) iron oxide preparation; (2) reducing gas preparation; (3) DRI reactor shaft furnace; (4) spent reducing gas preparation for reuse, (5) DRI product handling; and (6) ancillary operations, including a package boiler, two cooling towers, and a flare for emergency situations.	**SIC Code:**	3312
Permit Type:	B: Add new process to existing facility	**NAICS Code:**	331111
Permit URL:			
EPA Region:	6	**COUNTRY:**	USA
Facility County:	ST JAMES PARISH		
Facility State:	LA		
Facility ZIP Code:	70723		
Permit Issued By:	LOUISIANA DEPARTMENT OF ENV QUALITY (Agency Name) MR. KEITH JORDAN(Agency Contact) (225)219-3613 KEITH.JORDAN@LA.GOV		
Other Agency Contact Info:	Kermit Wittenburg kermit.wittenburg@la.gov		
Permit Notes:	This PSD permit also evaluated BACT for Green House Gases		

Process/Pollutant Information

PROCESS NAME: DRI-101 DRI Unit #1 Iron Oxide Day Bins Dust Collection

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 3858090.00 Tons/yr

Process Notes: The DRI process is fed iron oxide in pellet form to provide a consistent size of material in the shaft furnace to reduce the likelihood of fused product. Batches of pellets directed to the DRI facility will be screened prior to storage in the Iron Oxide Day Bins. The Iron Oxide Day Bins provide a continuous feed of pellets to the shaft furnace. The continuous feed is again screened before being transferred by the furnace feed conveyor to the charge hopper at the top of the furnace.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 1.1900 LB/H
Emission Limit 2: 4.3200 T/YR
Standard Emission: 0.0020 GRAINS/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) Fabric filter baghouse achieving at least 99.5% control of PM10/PM2.5. Additionally, hooded conveyors and enclosed transfer stations will be installed to limit emissions from material handling
Est. % Efficiency: 99.500
Compliance Verified: Yes
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-201 DRI Unit #2 Iron Oxide Day Bins Dust Collection

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 3858090.00 tons/yr

Process Notes: The DRI process is fed iron oxide in pellet form to provide a consistent size of material in the shaft furnace to reduce the likelihood of fused product. Batches of pellets directed to the DRI facility will be screened prior to storage in the Iron Oxide Day Bins. The Iron Oxide Day Bins provide a continuous feed of pellets to the shaft furnace. The continuous feed is again screened before being transferred by the furnace feed conveyor to the charge hopper at the top of the furnace.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 1.1900 LB/H
Emission Limit 2: 4.3200 T/YR
Standard Emission: 0.0020 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) Fabric filter baghouse achieving at least 99.5% control of PM10/PM2.5. Additionally, hooded conveyors and enclosed transfer stations will be installed to limit emissions from material handling

Est. % Efficiency: 99.500

Compliance Verified: Yes

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-102 DRI Unit #1 Iron Oxide Screen Dust Collection

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 3858090.00 Tons/yr

Process Notes: The DRI process is fed iron oxide in pellet form to provide a consistent size of material in the shaft furnace to reduce the likelihood of fused product. Batches of pellets directed to the DRI facility will be screened prior to storage in the Iron Oxide Day Bins. The Iron Oxide Day Bins provide a continuous feed of pellets to the shaft furnace. The continuous feed is again screened before being transferred by the furnace feed conveyor to the charge hopper at the top of the furnace.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 1.0900 LB/H

Emission Limit 2: 1.7300 T/YR

Standard Emission: 0.0020 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) Fabric filter baghouse achieving at least 99.5% control of PM10/PM2.5. Additionally, hooded conveyors and enclosed transfer stations will be installed to limit emissions from material handling

Est. % Efficiency: 99.500

Compliance Verified: Yes

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-202 DRI Unit #2 Iron Oxide Screen Dust Collection

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 3858090.00 Tons/yr

Process Notes: The DRI process is fed iron oxide in pellet form to provide a consistent size of material in the shaft furnace to reduce the likelihood of fused product. Batches of pellets directed to the DRI facility will be screened prior to storage in the Iron Oxide Day Bins. The Iron Oxide Day Bins provide a continuous feed of pellets to the shaft furnace. The continuous feed is again screened before being transferred by the furnace feed conveyor to the charge hopper at the top of the furnace.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 1.0900 LB/H

Emission Limit 2: 1.7300 T/YR

Standard Emission: 0.0020 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) Fabric filter baghouse achieving at least 99.5% control of PM10/PM2.5. Additionally, hooded conveyors and enclosed transfer stations will be installed to limit emissions from material handling

Est. % Efficiency: 99.500

Compliance Verified: Yes

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-105 DRI Unit #1 Furnace Feed Conveyor Baghouse

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 3858090.00 Tons/yr

Process Notes: The DRI process is fed iron oxide in pellet form to provide a consistent size of material in the shaft furnace to reduce the likelihood of fused product. Batches of pellets directed to the DRI facility will be screened prior to storage in the Iron Oxide Day Bins. The Iron Oxide Day Bins provide a continuous feed of pellets to the shaft furnace. The continuous feed is again screened before being transferred by the furnace feed conveyor to the charge hopper at the top of the furnace.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.1000 LB/H

Emission Limit 2: 0.3800 T/YR

Standard Emission: 0.0020 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) Fabric filter baghouse achieving at least 99.5% control of PM10/PM2.5. Additionally, hooded conveyors and enclosed transfer stations will be installed to limit emissions from material handling

Est. % Efficiency: 99.500

Compliance Verified: Yes

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-205 DRI Unit #2 Furnace Feed Conveyor Baghouse

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 3858090.00

Process Notes: The DRI process is fed iron oxide in pellet form to provide a consistent size of material in the shaft furnace to reduce the likelihood of fused product. Batches of pellets directed to the DRI facility will be screened prior to storage in the Iron Oxide Day Bins. The Iron Oxide Day Bins provide a continuous feed of pellets to the shaft furnace. The continuous feed is again screened before being transferred by the furnace feed conveyor to the charge hopper at the top of the furnace.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number:	PM
Test Method:	Unspecified
Pollutant Group(s):	(Particulate Matter (PM))
Emission Limit 1:	0.1000 LB/H
Emission Limit 2:	0.3800 T/YR
Standard Emission:	0.0020 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis:	BACT-PSD
Other Applicable Requirements:	
Control Method:	(A) Fabric filter baghouse achieving at least 99.5% control of PM10/PM2.5. Additionally, hooded conveyors and enclosed transfer stations will be installed to limit emissions from material handling
Est. % Efficiency:	99.500
Compliance Verified:	Yes
Pollutant/Compliance Notes:	

Process/Pollutant Information

PROCESS NAME: DRI-103 DRI Unit #1 Coating Bin Filter

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 3858090.00 tons/yr

Process Notes: Iron oxide pellets are given a light coating of pulverized limestone prior to being transferred to the furnace. The limestone coating helps to reduce the tendency of the pellets to fuse together during the reduction process. Water is added to the limestone to make a water-based slurry, which is then applied to the pellets. The pulverized limestone is periodically received by truck and pneumatically conveyed into a storage bin. The act of filling the Iron Oxide Coating Bin may generate dust emissions

POLLUTANT NAME:	Particulate matter, filterable < 10 µ (FPM10)
CAS Number:	PM
Test Method:	Unspecified
Pollutant Group(s):	(Particulate Matter (PM))
Emission Limit 1:	0.1200 LB/H
Emission Limit 2:	0.0200 T/YR
Standard Emission:	0.0200 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) BACT for emissions of PM10 and PM2.5 from Iron Oxide Coating Bin is selected to be local collection and control through a fabric filter employing enhanced filter media

Est. % Efficiency: 99.500

Compliance Verified: Yes

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-203 DRI Unit #2 Coating Bin Filter

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 3858090.00 tons/yr

Process Notes: Iron oxide pellets are given a light coating of pulverized limestone prior to being transferred to the furnace. The limestone coating helps to reduce the tendency of the pellets to fuse together during the reduction process. Water is added to the limestone to make a water-based slurry, which is then applied to the pellets. The pulverized limestone is periodically received by truck and pneumatically conveyed into a storage bin. The act of filling the Iron Oxide Coating Bin may generate dust emissions

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.1200 LB/H

Emission Limit 2: 0.0200 T/YR

Standard Emission: 0.0200 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) BACT for emissions of PM10 and PM2.5 from Iron Oxide Coating Bin is selected to be local collection and control through a fabric filter employing enhanced filter media

Est. % Efficiency: 99.500

Compliance Verified: Yes

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-104 DRI Unit #1 Iron Oxide Fines Handling

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 385039.00 tons/yr

Process Notes: The screening and handling of iron oxide pellets generates a quantity of undersized material referred to as fines. This material is too small to charge to the shaft furnace, where it would clog the flow of reducing gas, and contribute to the problem of pellets fusing together during the reduction reaction, and impeding the flow of pellets out of the furnace. Iron oxide fines are stored at the DRI units temporarily. The fines will be stored in an outdoor pile. Fines will typically be transferred by truck and front end loader.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0700 LB/H

Emission Limit 2: 0.0900 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (B) Nucor will control dust emissions through the application of a chemical surface stabilizer on the iron oxide storage pile. Water sprays will be used locally to control dust generation from activities such as stacking/reclaiming and pile maintenance activity. These activities will be minimized as much as practicable in order to prevent unnecessary dust emissions.

Est. % Efficiency: 95.000

Compliance Verified: No

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-204 DRI Unit #1 Iron Oxide Fines Handling

Process Type: 81.900 (Other Ferrous Metal Industry Processes)

Primary Fuel:

Throughput: 385039.00 tons/yr

Process Notes: The screening and handling of iron oxide pellets generates a quantity of undersized material referred to as fines. This material is too small to charge to the shaft furnace, where it would clog the flow of reducing gas, and contribute to the problem of pellets fusing together during the reduction reaction, and impeding the flow of pellets out of the furnace. Iron oxide fines are stored at the DRI units temporarily. The fines will be stored in an outdoor pile. Fines will typically be transferred by truck and front end loader.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0700 LB/H

Emission Limit 2: 0.0900 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (B) Nucor will control dust emissions through the application of a chemical surface stabilizer on the iron oxide storage pile. Water sprays will be used locally to control dust generation from activities such as stacking/reclaiming and pile maintenance activity. These activities will be minimized as much as practicable in order to prevent unnecessary dust emissions.

Est. % Efficiency: 95.000

Compliance Verified: No

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-113 - DRI Unit #1 Process Water Cooling Tower

Process Type: 99.009 (Industrial Process Cooling Towers)

Primary Fuel:

Throughput: 26857.00 gpm

Process Notes: The cross-flow cooling towers continuously circulate cooling water through heat exchangers and other equipment where the water absorbs heat. That heat is then rejected to the atmosphere by the partial evaporation of the water in cooling towers where up-flowing air is contacted with the circulating down-flow of water. The loss of evaporated water into the air exhausted to the atmosphere is replaced by "make-up" water.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.1100 LB/H

Emission Limit 2: 0.4000 T/YR

Standard Emission: 1000.0000 MG/L TDS

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (B) BACT is a combination of less than or equal to 1,000 milligrams per liter TDS concentration in the cooling water and drift eliminators employing a drift maximum of 0.0005%.

Est. % Efficiency:

Compliance Verified: No

Pollutant/Compliance Notes: The design drift efficiency of 0.0005% and cooling tower circulating water rate shall be verified by vendor certification. Collect a grab sample of the cooling water at least once per day for seven consecutive operating days, analyze each sample in accordance with Standard Method 2540 C or EPA Method 160.1, and record the results. Subsequently, collect a grab sample of the cooling water at least once per week, analyze each sample using one of the aforementioned methods, and record the results. Maintain the assembled cooling tower drift eliminators consistent with the manufacturer's recommendation as described in the operating manual for the cooling tower. Compliance shall be documented by maintaining a log of maintenance activity performed on the cooling tower drift eliminators.

Process/Pollutant Information

PROCESS NAME: DRI-213 - DRI Unit #2 Process Water Cooling Tower

Process Type: 99.009 (Industrial Process Cooling Towers)

Primary Fuel:

Throughput: 26857.00 gpm

Process Notes: The cross-flow cooling towers continuously circulate cooling water through heat exchangers and other equipment where the water absorbs heat. That heat is then rejected to the atmosphere by the partial evaporation of the water in cooling towers where up-flowing air is contacted with the circulating down-flow of water. The loss of evaporated water into the air exhausted to the atmosphere is replaced by "make-up" water.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.1100 LB/H

Emission Limit 2: 0.4000 T/YR

Standard Emission: 1000.0000 MG/L TDS

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (B) BACT is a combination of less than or equal to 1,000 milligrams per liter TDS concentration in the cooling water and drift eliminators employing a drift maximum of 0.0005%.

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: The design drift efficiency of 0.0005% and cooling tower circulating water rate shall be verified by vendor certification. Collect a grab sample of the cooling water at least once per day for seven consecutive operating days, analyze each sample in accordance with Standard Method 2540 C or EPA Method 160.1, and record the results. Subsequently, collect a grab sample of the cooling water at least once per week, analyze each sample using one of the aforementioned methods, and record the results. Maintain the assembled cooling tower drift eliminators consistent with the manufacturer's recommendation as described in the operating manual for the cooling tower. Compliance shall be documented by maintaining a log of maintenance activity performed on the cooling tower drift eliminators.

Process/Pollutant Information

PROCESS NAME: DRI-114 - DRI Unit #1 Clean Water Cooling Tower

Process Type: 99.009 (Industrial Process Cooling Towers)

Primary Fuel:

Throughput: 17611.00 gpm

Process Notes: The cross-flow cooling towers continuously circulate cooling water through heat exchangers and other equipment where the water absorbs heat. That heat is then rejected to the atmosphere by the partial evaporation of the water in cooling towers where up-flowing air is contacted with the circulating down-flow of water. The loss of evaporated water into the air exhausted to the atmosphere is replaced by "make-up" water.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0700 LB/H
Emission Limit 2: 0.2900 T/YR
Standard Emission: 1000.0000 MG/L TDS
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (B) BACT is a combination of less than or equal to 1,000 milligrams per liter TDS concentration in the cooling water and drift eliminators employing a drift maximum of 0.0005%.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: The design drift efficiency of 0.0005% and cooling tower circulating water rate shall be verified by vendor certification. Collect a grab sample of the cooling water at least once per day for seven consecutive operating days, analyze each sample in accordance with Standard Method 2540 C or EPA Method 160.1, and record the results. Subsequently, collect a grab sample of the cooling water at least once per week, analyze each sample using one of the aforementioned methods, and record the results. Maintain the assembled cooling tower drift eliminators consistent with the manufacturer's recommendation as described in the operating manual for the cooling tower. Compliance shall be documented by maintaining a log of maintenance activity performed on the cooling tower drift eliminators.

Process/Pollutant Information

PROCESS NAME: DRI-214 - DRI Unit #1 Clean Water Cooling Tower

Process Type: 99.009 (Industrial Process Cooling Towers)

Primary Fuel:

Throughput: 17611.00 gpm

Process Notes: The cross-flow cooling towers continuously circulate cooling water through heat exchangers and other equipment where the water absorbs heat. That heat is then rejected to the atmosphere by the partial evaporation of the water in cooling towers where up-flowing air is contacted with the circulating down-flow of water. The loss of evaporated water into the air exhausted to the atmosphere is replaced by "make-up" water.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0700 LB/H
Emission Limit 2: 0.2900 T/YR
Standard Emission: 1000.0000 MG/L TDS
Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (B) BACT is a combination of less than or equal to 1,000 milligrams per liter TDS concentration in the cooling water and drift eliminators employing a drift maximum of 0.0005%.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: The design drift efficiency of 0.0005% and cooling tower circulating water rate shall be verified by vendor certification. Collect a grab sample of the cooling water at least once per day for seven consecutive operating days, analyze each sample in accordance with Standard Method 2540 C or EPA Method 160.1, and record the results. Subsequently, collect a grab sample of the cooling water at least once per week, analyze each sample using one of the aforementioned methods, and record the results. Maintain the assembled cooling tower drift eliminators consistent with the manufacturer's recommendation as described in the operating manual for the cooling tower. Compliance shall be documented by maintaining a log of maintenance activity performed on the cooling tower drift eliminators.

Process/Pollutant Information

PROCESS NAME: DRI-117 - Briquetting Mill
Process Type: 81.290 (Other Steel Manufacturing Processes)
Primary Fuel:
Throughput: 551155.70 tons/yr
Process Notes: The screening and handling of DRI pellets results in undersize material, or fines. DRI fines will be recycled and formed into bricks for use in the blast furnace or off-site EAF furnaces. Fines will be mixed with a cement binder, and then pressed in molds to form bricks of uniform size and shape. After curing on racks, the bricks are transported for shipment off-site.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.2900 LB/H
Emission Limit 2: 0.2600 T/YR
Standard Emission: 0.0022 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) High-energy wet scrubber. Additionally, hooded conveyors and enclosed transfer stations will be installed to limit emissions from material handling.

Est. % Efficiency: 99.000

Compliance Verified: No

Pollutant/Compliance Notes: Baghouses often are capable of 99.5% removal efficiencies, and baghouse removal efficiency is relatively level across the particle size range. However, DRI particles are known to react with oxygen in the atmosphere, reoxidizing in an exothermic reaction. This reoxidation process frequently causes fires when the DRI material is improperly handled, particularly when freshly discharged from the furnace before being passivated. The nature of the DRI particulate being captured makes the application of a fabric filter to this source a significant safety hazard, and thus a baghouse is technically infeasible.

Process/Pollutant Information

PROCESS NAME: DRI-118 - DRI Barge Loading Dock

Process Type: 99.190 (Other Fugitive Dust Sources)

Primary Fuel:

Throughput: 5511557.00 tons/yr

Process Notes: DRI pellets will be loaded for shipment to other Nucor facilities by barge. Due to the special handling requirement of the DRI product, the loading dock will be specialized for the loading of DRI product.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.7800 LB/H

Emission Limit 2: 0.6500 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) High-energy wet scrubber. Additionally, hooded conveyors and enclosed transfer stations will be installed to limit emissions from material handling.

Est. % Efficiency: 99.000

Compliance Verified: No

Pollutant/Compliance Notes: A scrubber will be installed on the product storage silos for DRI dust control. Wet suppression of dust generating sources by water sprays will be utilized at each storage pile site. Baghouses often are capable of 99.5% removal efficiencies, and baghouse removal efficiency is relatively level across the particle size range. However, DRI particles are known to react with oxygen in the atmosphere, reoxidizing in an exothermic reaction. This reoxidation process frequently causes fires when the DRI material is improperly handled, particularly when freshly discharged from the furnace before being passivated. The nature of the DRI particulate being captured makes the application of a fabric filter to this source a significant safety hazard, and thus a baghouse is technically infeasible.

Process/Pollutant Information

PROCESS NAME: DRI-115 - Product Screen Dust Collection

Process Type: 81.290 (Other Steel Manufacturing Processes)

Primary Fuel:

Throughput: 5511557.00 tons/yr

Process Notes: The DRI fines collected from the screening operation are transported to the Briquetting Mill. This transportation operation generates particulate matter emissions.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 1.4000 LB/H

Emission Limit 2: 0.9600 T/YR

Standard Emission: 0.0020 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) High-energy wet scrubber

Est. % Efficiency: 99.000

Compliance Verified: No

Pollutant/Compliance Notes: Baghouses often are capable of 99.5% removal efficiencies, and baghouse removal efficiency is relatively level across the particle size range. However, DRI particles are known to react with oxygen in the atmosphere, reoxidizing in an exothermic reaction. This reoxidation process frequently causes fires when the DRI material is improperly handled, particularly when freshly discharged from the furnace before being passivated. The nature of the DRI particulate being captured makes the application of a fabric filter to this source a significant safety hazard, and thus a baghouse is technically infeasible.

Process/Pollutant Information

PROCESS NAME: DRI-116 - Screened Product Transfer Dust Collection

Process Type: 81.290 (Other Steel Manufacturing Processes)

Primary Fuel:

Throughput: 5511557.00 tons/yr

Process Notes: Prior to final shipment, the DRI pellets are screened to remove fines. This screening process generates particulate matter emissions.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.7100 LB/H

Emission Limit 2: 0.4900 T/YR

Standard Emission: 0.0020 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) high-energy wet scrubber

Est. % Efficiency: 99.000

Compliance Verified: No

Pollutant/Compliance Notes: Baghouses often are capable of 99.5% removal efficiencies, and baghouse removal efficiency is relatively level across the particle size range. However, DRI particles are known to react with oxygen in the atmosphere, reoxidizing in an exothermic reaction. This reoxidation process frequently causes fires when the DRI material is improperly handled, particularly when freshly discharged from the furnace before being passivated. The nature of the DRI particulate being captured makes the application of a fabric filter to this source a significant safety hazard, and thus a baghouse is technically infeasible.

Process/Pollutant Information

PROCESS NAME: DRI-107 - DRI Unit No. 1 Furnace Dust Collection

Process Type: 81.290 (Other Steel Manufacturing Processes)

Primary Fuel:

Throughput: 2755778.00 tons/yr

Process Notes: The DRI Product exits the cooling zone of the shaft furnace and falls onto a waiting conveyor for transport to the product silos. This discharge point has a high potential for dust generation, since any fines generated during the action of the pellets passing through the reactor are also discharged.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.9300 LB/H

Emission Limit 2: 2.9200 T/YR

Standard Emission: 0.0020 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) high-energy wet scrubber

Est. % Efficiency: 99.000

Compliance Verified: No

Pollutant/Compliance Notes: Baghouses often are capable of 99.5% removal efficiencies, and baghouse removal efficiency is relatively level across the particle size range. However, DRI particles are known to react with oxygen in the atmosphere, reoxidizing in an exothermic reaction. This reoxidation process frequently causes fires when the DRI material is improperly handled, particularly when freshly discharged from the furnace before being passivated. The nature of the DRI particulate being captured makes the application of a fabric filter to this source a significant safety hazard, and thus a baghouse is technically infeasible.

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 1.2400 LB/H

Emission Limit 2: 4.7400 T/YR

Standard Emission: 0.0700 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N) The seal gas is removed before the flue gas is treated for NOX control.

Est. % Efficiency:

Compliance Verified: No

Pollutant/Compliance Notes: The SCR controlling NOX from the reformer contributes ammonia to the reformer flue gas. Ammonia would react with the lime coating on the iron oxide pellets to form ammonium bicarbonate and ammonium carbamate, which are a sticky white salt. These compounds would tend to promote fusion of the iron ore pellets, which can cause a significant process upset as the clumped product cannot be removed from the shaft furnace. Nitrogen oxides (NOx)

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 0.7100 LB/H

Emission Limit 2: 2.7100 T/YR

Standard Emission: 0.0400 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N) BACT for CO is determined as good combustion practices for the Reformer Flue gas and so no additional control is feasible for the use of a small portion of this flue gas as seal gas.

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: Carbon monoxide (CO)

Process/Pollutant Information

PROCESS NAME: DRI-207 - DRI Unit No. 2 Furnace Dust Collection

Process Type: 81.290 (Other Steel Manufacturing Processes)

Primary Fuel:

Throughput: 2755778.00 tons/yr

Process Notes: Prior to final shipment, the DRI pellets are screened to remove fines. This screening process generates particulate matter emissions.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.9300 LB/H

Emission Limit 2: 2.9200 T/YR

Standard Emission: 0.0020 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) High-energy wet scrubber

Est. % Efficiency: 99.000

Compliance Verified: No

Pollutant/Compliance Notes: Baghouses often are capable of 99.5% removal efficiencies, and baghouse removal efficiency is relatively level across the particle size range. However, DRI particles are known to react with oxygen in the atmosphere, reoxidizing in an exothermic reaction. This reoxidation process frequently causes fires when the DRI material is improperly handled, particularly when freshly discharged from the furnace before being passivated. The nature of the DRI particulate being captured makes the application of a fabric filter to this source a significant safety hazard, and thus a baghouse is technically infeasible.

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 1.2400 LB/H

Emission Limit 2: 4.7400 T/YR

Standard Emission: 0.0700 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N) The seal gas is removed before the flue gas is treated for NOX control.

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: The SCR controlling NOX from the reformer contributes ammonia to the reformer flue gas. Ammonia would react with the lime coating on the iron oxide pellets to form ammonium bicarbonate and ammonium carbamate, which are a sticky white salt. These compounds would tend to promote fusion of the iron ore pellets, which can cause a significant process upset as the clumped product cannot be removed from the shaft furnace. Nitrogen oxides (NOx)

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 0.7100 LB/H

Emission Limit 2: 2.7100 T/YR

Standard Emission: 0.0400 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N) BACT for CO isdetermined as good combustion practices for the Reformer Flue gas and so no additional control is feasible for the use of a small portion of this flue gas as seal gas.

Est. % Efficiency:

Compliance Verified: No

Pollutant/Compliance Notes: Carbon monoxide (CO)

Process/Pollutant Information

PROCESS NAME: DRI-109 - DRI Unit #1 Package Boiler Flue Stack

Process Type: 11.310 (Natural Gas (includes propane and liquefied petroleum gas))

Primary Fuel: Natural Gas

Throughput: 1760.00 Billion Btu/yr

Process Notes: The package boilers provide steam to each DRI unit. The steam is primarily used to heat the reboiler in the acid gas absorption system, as well as for utility purposes.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: EPA/OAR Mthd 201A

Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 2.3800 LB/H
Emission Limit 2: 8.6400 T/YR
Standard Emission: 0.0046 GRAINS/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) good combustion practices
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: EPA/OAR Mthd 10
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 11.4200 LB/H
Emission Limit 2: 41.5400 T/YR
Standard Emission: 0.0390 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) Good Combustion Practices
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0900 LB/H
Emission Limit 2: 0.3300 T/YR
Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) Emissions of SO2 are usually attributable to the sulfur contained within the fuel being combusted. Therefore the use of a low sulfur fuel can drastically reduce emissions of SO2 when compared to other potential fuels.

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: Sulfur dioxide: Purchase natural gas with a sulfur content less than 2000 grains per million standard cubic feet of gas. Sulfur content shall be monitored and recorded monthly and shall be based on either the natural gas analysis provided by the supplier or direct sampling by the facility

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: EPA/OAR Mthd 7E

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 0.9400 LB/H

Emission Limit 2: 3.4100 T/YR

Standard Emission: 0.0032 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: NSPS

Control Method: (B) BACT for the package boiler is selected to be low NOX burners, combined with selective catalytic reduction.

Est. % Efficiency: 90.000

Compliance Verified: No

Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 1.5600 LB/H

Emission Limit 2: 4.7500 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:
Control Method: (P) good combustion practices
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-209 - DRI Unit #2 Package Boiler Flue Stack

Process Type: 11.310 (Natural Gas (includes propane and liquefied petroleum gas))

Primary Fuel: Natural Gas

Throughput: 1760.00 Billion Btu/yr

Process Notes: The package boilers provide steam to each DRI unit. The steam is primarily used to heat the reboiler in the acid gas absorption system, as well as for utility purposes.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: EPA/OAR Mthd 201A
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 2.3800 LB/H
Emission Limit 2: 8.6400 T/YR
Standard Emission: 0.0046 GRAINS/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) good combustion practices
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: EPA/OAR Mthd 10

Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 11.4200 LB/H
Emission Limit 2: 41.5400 T/YR
Standard Emission: 0.0390 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) Good Combustion Practices
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0900 LB/H
Emission Limit 2: 0.3300 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) Emissions of SO2 are usually attributable to the sulfur contained within the fuel being combusted. Therefore the use of a low sulfur fuel can drastically reduce emissions of SO2 when compared to other potential fuels.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: Sulfur dioxide: Purchase natural gas with a sulfur content less than 2000 grains per million standard cubic feet of gas. Sulfur content shall be monitored and recorded monthly and shall be based on either the natural gas analysis provided by the supplier or direct sampling by the facility

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: EPA/OAR Mthd 7E
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.9400 LB/H

Emission Limit 2: 3.4100 T/YR
Standard Emission: 0.0032 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: NSPS
Control Method: (B) BACT for the package boiler is selected to be low NOX burners, combined with selective catalytic reduction.
Est. % Efficiency: 90.000
Compliance Verified: No
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 1.1900 LB/H
Emission Limit 2: 4.7500 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) good combustion practices
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-112 - DRI Unit No. 1 Product storage silo Dust Collection
Process Type: 81.290 (Other Steel Manufacturing Processes)
Primary Fuel:
Throughput: 2755778.00 tons/yr
Process Notes: the DRI Product exits the cooling zone of the shaft furnace and falls onto a waiting conveyor for transport to the product silos. Transfer into and out of the Silo has a high potential for dust generation, since any fines generated during the action of the pellets passing through the reactor are also discharged.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: EPA/OAR Other Test Mthd 27

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.9900 LB/H

Emission Limit 2: 3.3700 T/YR

Standard Emission: 0.0100 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) In order to prevent the reducing gas from escaping the furnace, a higher pressure gas called seal gas is applied at both the charging and discharging opening. The seal gas is allowed to escape the furnace while the reducing gas is retained. This seal gas is merely a small amount of cooled flue gas from the reformer combustion side, and primarily consists of atmospheric nitrogen, carbon dioxide and water vapor.

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: Sulfur dioxide and particulate matter BACT was determined to treat the spent reducing gas being sent to the Reformer as combustion fuel and so no additional control is feasible for the seal gas. Emissions of these two pollutants are expected to be less than five tons per year combined. It should be noted that all of the spent reducing gas has particulate matter emission controlled. Particulate matter (10 microns or less) (PM10)

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: EPA/OAR Mthd 10

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 0.5700 LB/H

Emission Limit 2: 2.1700 T/YR

Standard Emission: 0.0040 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) In order to prevent the reducing gas from escaping the furnace, a higher pressure gas called seal gas is applied at both the charging and discharging opening. The seal gas is allowed to escape the furnace while the reducing gas is retained. This seal gas is merely a small amount of cooled flue gas from the reformer combustion side, and primarily consists of atmospheric nitrogen, carbon dioxide and water vapor. BACT was good combustion practices in the reformer.

Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: EPA/OAR Mthd 7E
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.9900 LB/H
Emission Limit 2: 3.7900 T/YR
Standard Emission: 0.0700 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: Y
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) The seal gas is removed before the flue gas is treated for NOX control. The SCR controlling NOX from the reformer contributes ammonia to the reformer flue gas. Ammonia would react with the lime coating on the iron oxide pellets to form ammonium bicarbonate and ammonium carbamate, which are a sticky white salt. These compounds would tend to promote fusion of the iron ore pellets, which can cause a significant process upset as the clumped product cannot be removed from the shaft furnace
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: Nitrogen oxides (NOx)

Process/Pollutant Information

PROCESS NAME: DRI-212 - DRI Unit No. 2 Product storage silo Dust Collection
Process Type: 81.290 (Other Steel Manufacturing Processes)
Primary Fuel:
Throughput: 2755778.00 tons/yr
Process Notes: the DRI Product exits the cooling zone of the shaft furnace and falls onto a waiting conveyor for transport to the product silos. Transfer into and out of the Silo has a high potential for dust generation, since any fines generated during the action of the pellets passing through the reactor are also discharged.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM

Test Method: EPA/OAR Other Test Mthd 27
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.9900 LB/H
Emission Limit 2: 3.3700 T/YR
Standard Emission: 0.0100 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) In order to prevent the reducing gas from escaping the furnace, a higher pressure gas called seal gas is applied at both the charging and discharging opening. The seal gas is allowed to escape the furnace while the reducing gas is retained. This seal gas is merely a small amount of cooled flue gas from the reformer combustion side, and primarily consists of atmospheric nitrogen, carbon dioxide and water vapor.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: Sulfur dioxide and particulate matter BACT was determined to treat the spent reducing gas being sent to the Reformer as combustion fuel and so no additional control is feasible for the seal gas. Emissions of these two pollutants are expected to be less than five tons per year combined. It should be noted that all of the spent reducing gas has particulate matter emission controlled. Particulate matter (10 microns or less) (PM10)

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: EPA/OAR Mthd 10
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.5700 LB/H
Emission Limit 2: 2.1700 T/YR
Standard Emission: 0.0040 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) In order to prevent the reducing gas from escaping the furnace, a higher pressure gas called seal gas is applied at both the charging and discharging opening. The seal gas is allowed to escape the furnace while the reducing gas is retained. This seal gas is merely a small amount of cooled flue gas from the reformer combustion side, and primarily consists of atmospheric nitrogen, carbon dioxide and water vapor. BACT was good combustion practices in the reformer.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: EPA/OAR Mthd 7E

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 0.9900 LB/H

Emission Limit 2: 3.7900 T/YR

Standard Emission: 0.0700 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) The seal gas is removed before the flue gas is treated for NOX control. The SCR controlling NOX from the reformer contributes ammonia to the reformer flue gas. Ammonia would react with the lime coating on the iron oxide pellets to form ammonium bicarbonate and ammonium carbamate, which are a sticky white salt. These compounds would tend to promote fusion of the iron ore pellets, which can cause a significant process upset as the clumped product cannot be removed from the shaft furnace

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: Nitrogen oxides (NOx)

Process/Pollutant Information

PROCESS NAME: DRI-110 - DRI Unit No. 1 Hot Flare

Process Type: 19.390 (Other Flares)

Primary Fuel: DRI Reducing Gas

Throughput: 1180.00 acfm

Process Notes: The reducing furnace must run as close to steady state operation as possible in order to produce product of acceptable quality. Due to the nature of the reducing gas recycle system periodic shifts in pressure may occur. The pressure of the reducing gas must be maintained below that of the seal gas system or an uncontrolled release of reducing gas will result from the top seal and the bottom seal. To maintain this condition, the reducing gas is occasionally flared to prevent a rise in pressure. The Hot Flare prevents an uncontrolled release of carbon monoxide from the system by combusting the reducing gas.

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.1300 LB/H
Emission Limit 2: 0.2700 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) the best available technology for controlling PM10/PM2.5 from the natural gas pilot is good combustion practice
Est. % Efficiency: 50.000
Compliance Verified: No
Pollutant/Compliance Notes: The reducing gas contains incombustible particulate matter in the gas stream as gas is recycled from the shaft furnace. Therefore, the control of particulate from the hot flare is best addressed by cleaning of the reducing gas prior to its combustion. Particulate matter cleaning of the spent reducing gas has already been addressed, so BACT for PM is venting to the Hot Flare after the spent reducing gas has been cleaned by the wet scrubbers described as BACT for the Reformer Flue Gas. The flare shall be of the continuous pilot variety, fueled by natural gas.

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 1.2700 LB/H
Emission Limit 2: 2.5800 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) A low-NOX fuel is one which results in a lower generation rate of NOX over traditional fossil fuels, on an equal energy basis. DRI reducing gas is a low-NOX fuel, generating less NOX per unit of energy as natural gas. This property is due to the low-BTU value of reducing gas, which burns at a cooler temperature, preventing the formation of much of the NOX seen with hotter natural gas combustion.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 1.4700 LB/H

Emission Limit 2: 2.5800 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) The reducing gas is rich in carbon monoxide and hydrogen. The pilot for the flare is natural gas. Good combustion practices are used to reduce emissions of CO, as well as other pollutants, by optimizing conditions in the combustion zone of a fuel burning source. Good combustion practices typically entail introducing the proper ratio of combustion air to the fuel, maintaining a minimum temperature in the firebox of the combustor, or a minimum residence time of fuel and air in the combustion zone. By employing good combustion practices CO emissions may be greatly reduced.

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: The hot flare will combust reducing gas, which contains a significant portion of carbon monoxide. Nucor will install a flare tip employing good combustion practices to control the generation of CO emissions due to incomplete combustion of reducing gas.

Process/Pollutant Information

PROCESS NAME: DRI-210 - DRI Unit No. 1 Hot Flare

Process Type: 19.390 (Other Flares)

Primary Fuel: DRI Reducing Gas

Throughput: 1180.00 acfm

Process Notes: The reducing furnace must run as close to steady state operation as possible in order to produce product of acceptable quality. Due to the nature of the reducing gas recycle system periodic shifts in pressure may occur. The pressure of the reducing gas must be maintained below that of the seal gas system or an uncontrolled release of reducing gas will result from the top seal and the bottom seal. To maintain this condition, the reducing gas is occasionally flared to prevent a rise in pressure. The Hot Flare prevents an uncontrolled release of carbon monoxide from the system by combusting the reducing gas.

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM

Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.1300 LB/H
Emission Limit 2: 0.2700 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) the best available technology for controlling PM10/PM2.5 from the natural gas pilot is good combustion practices.
Est. % Efficiency: 50.000
Compliance Verified: No
Pollutant/Compliance Notes: The reducing gas contains incombustible particulate matter in the gas stream as gas is recycled from the shaft furnace. Therefore, the control of particulate from the hot flare is best addressed by cleaning of the reducing gas prior to its combustion. Particulate matter cleaning of the spent reducing gas has already been addressed, so BACT for PM is venting to the Hot Flare after the spent reducing gas has been cleaned by the wet scrubbers described as BACT for the Reformer Flue Gas. The flare shall be of the continuous pilot variety, fueled by natural gas.

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 1.2700 LB/H
Emission Limit 2: 2.5800 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) A low-NOX fuel is one which results in a lower generation rate of NOX over traditional fossil fuels, on an equal energy basis. DRI reducing gas is a low-NOX fuel, generating less NOX per unit of energy as natural gas. This property is due to the low-BTU value of reducing gas, which burns at a cooler temperature, preventing the formation of much of the NOX seen with hotter natural gas combustion.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 1.2700 LB/H
Emission Limit 2: 2.5800 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) The reducing gas is rich in carbon monoxide and hydrogen. The pilot for the flare is natural gas. Good combustion practices are used to reduce emissions of CO, as well as other pollutants, by optimizing conditions in the combustion zone of a fuel burning source. Good combustion practices typically entail introducing the proper ratio of combustion air to the fuel, maintaining a minimum temperature in the firebox of the combustor, or a minimum residence time of fuel and air in the combustion zone. By employing good combustion practices CO emissions may be greatly reduced.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: The hot flare will combust reducing gas, which contains a significant portion of carbon monoxide. Nucor will install a flare tip employing good combustion practices to control the generation of CO emissions due to incomplete combustion of reducing gas.

Process/Pollutant Information

PROCESS NAME: DRI-111 - DRI Unit #1 Acid Gas Absorption Vent

Process Type: 81.290 (Other Steel Manufacturing Processes)

Primary Fuel:

Throughput: 30624.00 scfm

Process Notes: Acid gases, primarily hydrogen sulfide and carbon dioxide, are removed from the DRI top gas prior to its use as a fuel in the acid gas absorption unit. This unit is an amine-based absorption scrubber, which selectively dissolves acid gases from the top gas fuel. The amine solution is then regenerated by applying heat in a steam reboiler, which liberates the acid gases from solution. The resulting gas stream is treated for the removal of sulfur compounds prior to being vented.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0800 LB/H
Emission Limit 2: 0.3100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) Emissions of PM10 from the acid gas absorption vent are due to the absorption of PM10/PM2.5 in the amine unit treating the top gas fuel, which is partially released during the amine regeneration step. Due to the low quantity of emissions from the acid gas absorption vent, less than one ton per year from both DRI units combined, No technologies exist which meet the environmental, energy and economic considerations inherent in a BACT review. BACT for emissions of PM10/PM2.5 from the acid gas absorption vent is determined to be no control.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.5800 LB/H
Emission Limit 2: 2.1200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BACT is selected to be treatment of the acid gas stream through the use of a sulfur redox catalyst, such as the SulfaTreat catalyst bed or LO-CAT Redox process, for the removal of H2S. Nucor will install a redox catalyst on each of the acid gas absorption vents at the DRI facility for the control of sulfur compound emissions.
Est. % Efficiency:
Compliance Verified: Unknown

Pollutant/Compliance Notes: The acid gas absorber selectively removes acid gases such as hydrogen sulfide and carbon dioxide from the top gas fuel, prior to combustion at the reformer. The amine-based absorption medium is then regenerated by the application of heat, releasing the absorbed acid gases as a separate gas stream. The efficiency of the DRI process benefits from the removal of these gases, which are no longer heated during combustion. The energy saved from no longer heating inert gases in the top gas fuel is then available for the reforming reaction. An added benefit is the isolation of hydrogen sulfide, which can then be treated more effectively.

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 0.7300 LB/H

Emission Limit 2: 2.6500 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N) Emissions of carbon monoxide from the acid gas absorption vent are due to the slight absorption of CO in the amine unit treating the top gas fuel. Due to the low quantity of emissions from the acid gas absorption vent, no technologies exist which meet the environmental, energy and economic considerations inherent in a BACT review. BACT for emissions of carbon monoxide from the acid gas absorption vent is determined to be no control

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DRI-211 - DRI Unit #1 Acid Gas Absorption Vent

Process Type: 81.290 (Other Steel Manufacturing Processes)

Primary Fuel:

Throughput: 30624.00 scfm

Process Notes: Acid gases, primarily hydrogen sulfide and carbon dioxide, are removed from the DRI top gas prior to its use as a fuel in the acid gas absorption unit. This unit is an amine-based absorption scrubber, which selectively dissolves acid gases from the top gas fuel. The amine solution is then regenerated by applying heat in a steam reboiler, which liberates the acid gases from solution. The resulting gas stream is treated for the removal of sulfur compounds prior to being vented.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0800 LB/H
Emission Limit 2: 0.3100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: Emissions of PM10 from the acid gas absorption vent are due to the absorption of PM10/PM2.5 in the amine unit treating the top gas fuel, which is partially released during the amine regeneration step. Due to the low quantity of emissions from the acid gas absorption vent, less than one ton per year from both DRI units combined, No technologies exist which meet the environmental, energy and economic considerations inherent in a BACT review. BACT for emissions of PM10/PM2.5 from the acid gas absorption vent is determined to be no control.

POLLUTANT NAME: Sulfur Dioxide (SO_2)

CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.5800 LB/H
Emission Limit 2: 2.1200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown

Pollutant/Compliance Notes: The acid gas absorber selectively removes acid gases such as hydrogen sulfide and carbon dioxide from the top gas fuel, prior to combustion at the reformer. The amine-based absorption medium is then regenerated by the application of heat, releasing the absorbed acid gases as a separate gas stream. The efficiency of the DRI process benefits from the removal of these gases, which are no longer heated during combustion. The energy saved from no longer heating inert gases in the top gas fuel is then available for the reforming reaction. An added benefit is the isolation of hydrogen sulfide, which can then be treated more effectively. BACT is selected to be treatment of the acid gas stream through the use of a sulfur redox catalyst, such as the SulfaTreat catalyst bed or LO-CAT Redox process, for the removal of H2S. Nucor will install a redox catalyst on each of the acid gas absorption vents at the DRI facility for the control of sulfur compound emissions.

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 0.7300 LB/H

Emission Limit 2: 2.6500 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: Emissions of carbon monoxide from the acid gas absorption vent are due to the slight absorption of CO in the amine unit treating the top gas fuel. Due to the low quantity of emissions from the acid gas absorption vent, no technologies exist which meet the environmental, energy and economic considerations inherent in a BACT review. BACT for emissions of carbon monoxide from the acid gas absorption vent is determined to be no control

Process/Pollutant Information

PROCESS NAME: DRI-106 - DRI Unit No. 1 Upper Seal Gas Vent

Process Type: 81.290 (Other Steel Manufacturing Processes)

Primary Fuel:

Throughput: 1765.00 acfm

Process Notes: Iron oxide pellets are fed continuously into the shaft furnace from the top, and pass down through the reaction area by gravity. Reducing gas from the Reformer is passed through the iron oxide as it progresses through the furnace, in a countercurrent fashion. The DRI product then continuously exits the bottom of the furnace onto a waiting conveyor. In order to prevent the reducing gas from escaping the furnace, a higher pressure gas called seal gas is applied at both the charging and discharging opening. The seal gas is allowed to escape the furnace while the reducing gas is retained. Due to the higher seal gas pressure, a portion is also entrained into the reactor and combined with the spent reducing gas travels back to the Reformer. This seal gas is merely a small amount of cooled flue gas from the reformer combustion side, and primarily consists of atmospheric nitrogen, carbon dioxide and water vapor.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0700 LB/H

Emission Limit 2: 0.2600 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: particulate matter BACT was determined to treat the spent reducing gas being sent to the Reformer as combustion fuel and so no additional control is feasible for the seal gas. It is already treated before the seal gas is split off.

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))

Emission Limit 1: 0.0200 LB/H

Emission Limit 2: 0.0800 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: Sulfur dioxide BACT was determined to treat the spent reducing gas being sent to the Reformer as combustion fuel. The seal gas is removed before the spent reducing gas is treated for SO2 control, and so no additional control is feasible for the seal gas.

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.5300 LB/H
Emission Limit 2: 2.0300 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: BACT for CO was already determined as good combustion practices for the Reformer Flue gas and so no additional control is feasible for the use of a small portion of this flue gas as seal gas.

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.7500 LB/H
Emission Limit 2: 2.8400 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Y
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: The seal gas is removed before the flue gas is treated for NOX control. The SCR controlling NOX from the reformer contributes ammonia to the reformer flue gas. Ammonia would react with the lime coating on the iron oxide pellets to form ammonium bicarbonate and ammonium carbamate, which are a sticky white salt. These compounds would tend to promote fusion of the iron ore pellets, which can cause a significant process upset as the clumped product cannot be removed from the shaft furnace.

Process/Pollutant Information

PROCESS NAME: DRI-206 - DRI Unit No. 2 Upper Seal Gas Vent

Process Type: 81.290 (Other Steel Manufacturing Processes)

Primary Fuel:

Throughput: 1765.00 acfm

Process Notes: Iron oxide pellets are fed continuously into the shaft furnace from the top, and pass down through the reaction area by gravity. Reducing gas from the Reformer is passed through the iron oxide as it progresses through the furnace, in a countercurrent fashion. The DRI product then continuously exits the bottom of the furnace onto a waiting conveyor. In order to prevent the reducing gas from escaping the furnace, a higher pressure gas called seal gas is applied at both the charging and discharging opening. The seal gas is allowed to escape the furnace while the reducing gas is retained. Due to the higher seal gas pressure, a portion is also entrained into the reactor and combined with the spent reducing gas travels back to the Reformer. This seal gas is merely a small amount of cooled flue gas from the reformer combustion side, and primarily consists of atmospheric nitrogen, carbon dioxide and water vapor.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0700 LB/H

Emission Limit 2: 0.2600 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: particulate matter BACT was determined to treat the spent reducing gas being sent to the Reformer as combustion fuel and so no additional control is feasible for the seal gas. It is already treated before the seal gas is split off.

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))

Emission Limit 1: 0.0200 LB/H

Emission Limit 2: 0.0800 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: Sulfur dioxide BACT was determined to treat the spent reducing gas being sent to the Reformer as combustion fuel. The seal gas is removed before the spent reducing gas is treated for SO2 control, and so no additional control is feasible for the seal gas.

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 0.7500 LB/H

Emission Limit 2: 2.8400 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: The seal gas is removed before the flue gas is treated for NOX control. The SCR controlling NOX from the reformer contributes ammonia to the reformer flue gas. Ammonia would react with the lime coating on the iron oxide pellets to form ammonium bicarbonate and ammonium carbamate, which are a sticky white salt. These compounds would tend to promote fusion of the iron ore pellets, which can cause a significant process upset as the clumped product cannot be removed from the shaft furnace.

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 0.5300 LB/H

Emission Limit 2: 2.0300 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: BACT for CO was already determined as good combustion practices for the Reformer Flue gas and so no additional control is feasible for the use of a small portion of this flue gas as seal gas.

Process/Pollutant Information

PROCESS NAME: DRI-108 - DRI Unit #1 Reformer Main Flue Stack

Process Type: 81.200 (Steel Production (excludes Steel & Iron Foundry Processes))

Primary Fuel: Iron Ore and Natural Gas

Throughput: 12168.00 Billion Btu/yr

Process Notes: The Direct Reduction Iron process consists of two main components, a Reformer and the DRI reactor. Natural gas passes through special catalyst tubes where the natural gas dissociates into a reducing gas rich in carbon monoxide and hydrogen, which are the primary chemicals used to remove the oxygen from the iron ore. The reducing gas is fed in from the bottom of the DRI Reactor. The gas flows countercurrent to the descending iron ore pellets. At the top of the reactor, the partially spent reducing gas exits and is recompressed, enriched with natural gas, preheated, and transported back to the gas reformer. The reformer reforms the mixture back to 95% hydrogen plus carbon monoxide, which is then ready for re-use by the direct reduction furnace.

Some of the reducing gas that has already passed over the iron ore in the DRI reactor (the spent reducing gas is also known as top gas) is mixed with the natural gas that is being combusted in the reformer and is also therefore combusted.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: EPA/OAR Other Test Mthd 27

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 9.9500 LB/H

Emission Limit 2: 37.9000 T/YR

Standard Emission: 0.0027 GRAINS/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) a high-energy wet scrubber can accommodate the large volume of gas that is generated by the DRI process, and is insensitive to variations in dust loading. Additionally, the safety aspects of using a wet system provide the most viable scenario for PM10/PM2.5 emissions control from the DRI process, by cleaning the top gas fuel stream prior to combustion. Nucor will also maintain good combustion practices at the reformer for particulate control of the natural gas combustion, but these actions are not likely to significantly contribute to the control of PM10 emissions due to the inorganic nature of topgas.

Est. % Efficiency: 99.000

Compliance Verified: Yes

Pollutant/Compliance Notes: The top gas contains incombustible particulate matter in the stream as it leaves the shaft furnace. This particulate would pass through the combustion zone and be emitted in the reformer flue gas if left untreated.

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: EPA/OAR Mthd 7E

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 10.8800 LB/H

Emission Limit 2: 41.4500 T/YR

Standard Emission: 0.0070 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (B) The low NOX combustion qualities of top gas fuel are inherent in the DRI reforming process. Additionally, low-NOX burners may be used with the boosted heating value of top gas mixed with natural gas, without unduly penalizing combustion efficiency. Finally, SCR may be applied to the resulting flue gas stream from combustion in the reformer. Therefore, BACT is selected to be low NOX fuel combustion, combined with low NOX burners and selective catalytic reduction.

Est. % Efficiency: 90.000

Compliance Verified: Yes

Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: EPA/OAR Mthd 25A

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 8.3800 LB/H

Emission Limit 2: 12.2100 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) good combustion practices

Est. % Efficiency: 98.000

Compliance Verified: Yes

Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: EPA/OAR Mthd 10

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 62.1800 LB/H

Emission Limit 2: 236.8600 T/YR

Standard Emission: 0.0400 LB/MMBTU

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) good combustion practices

Est. % Efficiency: 98.000
Compliance Verified: Yes
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5
Test Method: Other
Other Test Method: Method 8
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 3.1600 LB/H
Emission Limit 2: 11.5000 T/YR
Standard Emission: 0.0020 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: Y
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BACT is selected to be the removal of hydrogen sulfide from the top gas fuel through acid gas scrubbing. This technology was identified as the most stringent control method of the available technologies, and has the added benefit of slightly reducing energy demand at the reformer. Nucor will install and acid gas scrubbing system for top gas prior to its use as fuel in the reformer. BACT for natural gas is to purchase natural gas containing no more than 2000 grains of Sulfur per MM scf.
Est. % Efficiency: 95.000
Compliance Verified: Yes
Pollutant/Compliance Notes: Method 8 - Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources. Emissions of SO2 are usually attributable to the sulfur contained within the fuel being combusted. Therefore the use of a low sulfur fuel can drastically reduce emissions of SO2 when compared to other potential fuels. Sweet natural gas is often cited as an alternative to other fuels due to the very low sulfur content of this fuel The reformer also burns top gas from the shaft furnace, which contains a small portion of hydrogen sulfide originating from sulfur compounds in the iron ore, as well as any sulfur that was in the natural gas converted into reformer gas. Once combusted, this hydrogen sulfide converts directly to SO2. Because sulfur is rarely introduced into a combustion reaction other than as a component of the fuel, Nucor evaluated both fuel treatment for the removal of hydrogen sulfide and other sulfur compounds, as well as flue gas desulfurization (FGD) for the removal of SO2 from the products of combustion in the flue gas.

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)

Emission Limit 1: 11.7900 MMBTU/TON OF DRI

Emission Limit 2:

Standard Emission: 11.7900 MMBTU/TON OF DRI

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (B) the best available technology for controlling CO2e emissions from the DRI Reformer is good combustion practices, the Acid gas separation system, and Energy integration. BACT shall be good combustion practices, which will be adhered to maintain low levels of fuel consumption by the LNB burners.

Est. % Efficiency:

Compliance Verified: Yes

Pollutant/Compliance Notes: Due to production rate and product quality variability in any production process, production rates should be inclusive of all production at the facility, both of regular and off-spec materials. Additionally, natural gas is consumed in the DRI process as both a raw material (for the formation of reducing gas) and as a fuel (for heating to reaction temperatures). All sources of natural gas consumption at the Reformer should be included in the analysis. BACT is no more than 13 decatherms of natural gas per tonne of DRI (11.79 MM Btu/ton of DRI). Compliance with the BACT limit shall be determined on the basis of total natural gas consumption, divided by total production (including regular and off-spec DRI product) of the facility on a 12-month rolling average.

Process/Pollutant Information

PROCESS NAME: DRI-208 - DRI Unit #2 Reformer Main Flue Stack

Process Type: 81.200 (Steel Production (excludes Steel & Iron Foundry Processes))

Primary Fuel: Iron ore and Natural Gas

Throughput: 12168.00 Billion Btu/yr

Process Notes: The Direct Reduction Iron process consists of two main components, a Reformer and the DRI reactor. Natural gas passes through special catalyst tubes where the natural gas dissociates into a reducing gas rich in carbon monoxide and hydrogen, which are the primary chemicals used to remove the oxygen from the iron ore. The reducing gas is fed in from the bottom of the DRI Reactor. The gas flows countercurrent to the descending iron ore pellets. At the top of the reactor, the partially spent reducing gas exits and is recompressed, enriched with natural gas, preheated, and transported back to the gas reformer. The reformer reforms the mixture back to 95% hydrogen plus carbon monoxide, which is then ready for re-use by the direct reduction furnace. Some of the reducing gas that has already passed over the iron ore in the DRI reactor (the spent reducing gas is also known as top gas) is mixed with the natural gas that is being combusted in the reformer and is also therefore combusted.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: EPA/OAR Other Test Mthd 27
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 9.9500 LB/H
Emission Limit 2: 37.9000 T/YR
Standard Emission: 0.0027 GRAINS/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) a high-energy wet scrubber can accommodate the large volume of gas that is generated by the DRI process, and is insensitive to variations in dust loading. Additionally, the safety aspects of using a wet system provide the most viable scenario for PM10/PM2.5 emissions control from the DRI process, by cleaning the top gas fuel stream prior to combustion. Nucor will also maintain good combustion practices at the reformer for particulate control of the natural gas combustion, but these actions are not likely to significantly contribute to the control of PM10 emissions due to the inorganic nature of topgas.
Est. % Efficiency: 99.000
Compliance Verified: Yes
Pollutant/Compliance Notes: The top gas contains incombustible particulate matter in the stream as it leaves the shaft furnace. This particulate would pass through the combustion zone and be emitted in the reformer flue gas if left untreated.

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: EPA/OAR Mthd 7E
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 10.8800 LB/H
Emission Limit 2: 41.4500 T/YR
Standard Emission: 0.0070 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (B) The low NOX combustion qualities of top gas fuel are inherent in the DRI reforming process. Additionally, low-NOX burners may be used with the boosted heating value of top gas mixed with natural gas, without unduly penalizing combustion efficiency. Finally, SCR may be applied to the resulting flue gas stream from combustion in the reformer. Therefore, BACT is selected to be low NOX fuel combustion, combined with low NOX burners and selective catalytic reduction.
Est. % Efficiency: 90.000
Compliance Verified: Yes
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: EPA/OAR Mthd 25A
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 8.3800 LB/H
Emission Limit 2: 12.2100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) good combustion practices
Est. % Efficiency: 98.000
Compliance Verified: Yes
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: EPA/OAR Mthd 10
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 62.1800 LB/H
Emission Limit 2: 236.8600 T/YR
Standard Emission: 0.0040 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) good combustion practices
Est. % Efficiency: 98.000
Compliance Verified: Yes
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5
Test Method: Other

Other Test Method: Method 8
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 3.1600 LB/H
Emission Limit 2: 11.5000 T/YR
Standard Emission: 0.0020 LB/MMBTU
Did factors, other then air pollution technology considerations influence the BACT decisions: Y
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BACT is selected to be the removal of hydrogen sulfide from the top gas fuel through acid gas scrubbing. This technology was identified as the most stringent control method of the available technologies, and has the added benefit of slightly reducing energy demand at the reformer. Nucor will install and acid gas scrubbing system for top gas prior to its use as fuel in the reformer. BACT for natural gas is to purchase natural gas containing no more than 2000 grains of Sulfur per MM scf.
Est. % Efficiency: 95.000
Compliance Verified: Yes
Pollutant/Compliance Notes: Method 8 - Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources. Emissions of SO2 are usually attributable to the sulfur contained within the fuel being combusted. Therefore the use of a low sulfur fuel can drastically reduce emissions of SO2 when compared to other potential fuels. Sweet natural gas is often cited as an alternative to other fuels due to the very low sulfur content of this fuel The reformer also burns top gas from the shaft furnace, which contains a small portion of hydrogen sulfide originating from sulfur compounds in the iron ore, as well as any sulfur that was in the natural gas converted into reformer gas. Once combusted, this hydrogen sulfide converts directly to SO2. Because sulfur is rarely introduced into a combustion reaction other than as a component of the fuel, Nucor evaluated both fuel treatment for the removal of hydrogen sulfide and other sulfur compounds, as well as flue gas desulfurization (FGD) for the removal of SO2 from the products of combustion in the flue gas.

POLLUTANT NAME: Carbon Dioxide
CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: 11.7900 MMBTU/TON OF DRI
Emission Limit 2:
Standard Emission: 11.7900 MMBTU/TON OF DRI
Did factors, other then air pollution technology considerations influence the BACT decisions: Y
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:

Control Method: (B) the best available technology for controlling CO2e emissions from the DRI Reformer is good combustion practices, the Acid gas separation system, and Energy integration. BACT shall be good combustion practices, which will be adhered to maintain low levels of fuel consumption by the LNB burners.

Est. % Efficiency:

Compliance Verified: Yes

Pollutant/Compliance Notes: Due to production rate and product quality variability in any production process, production rates should be inclusive of all production at the facility, both of regular and off-spec materials. Additionally, natural gas is consumed in the DRI process as both a raw material (for the formation of reducing gas) and as a fuel (for heating to reaction temperatures). All sources of natural gas consumption at the Reformer should be included in the analysis. BACT is no more than 13 decatherms of natural gas per tonne of DRI (11.79 MM Btu/ton of DRI). Compliance with the BACT limit shall be determined on the basis of total natural gas consumption, divided by total production (including regular and off-spec DRI product) of the facility on a 12-month rolling average.

Facility Information

RBLC ID:	TX-0550 (final)	**Date Determination Last Updated:**	05/26/2010
Corporate/Company Name:	BASF FINA PETROCHEMICALS LIMITED PARTNERSHIP	**Permit Number:**	36644
Facility Name:	BASF FINA NAFTA REGION OLEFINS COMPLEX	**Permit Date:**	02/10/2010 (actual)
Facility Contact:	JOHN LYCAN 4099605221 JOHN.LYCAN@BASF.COM	**FRS Number:**	110006134691
Facility Description:	OLEFINS COMPLEX, ETHYLENE CRACKING FACILITY	**SIC Code:**	2869
Permit Type:	A: New/Greenfield Facility	**NAICS Code:**	325131
Permit URL:			
EPA Region:	6	**COUNTRY:**	USA
Facility County:	JEFFERSON		
Facility State:	TX		
Facility ZIP Code:	77643-506		

Permit Issued By: EPA REGION VI (Agency Name)
MR. RICHARD A. BARRETT(Agency Contact) (214) 665-7227 BARRETT.RICHARD@EPA.GOV

Other Agency Contact Info: TCEQ AIR PERMITTING DEPARTMENT (APD)
PROJECT ENGINEER: DANIEL SMOTHERS: DIRECT (512) 239-1664 RECEPTIONIST (512)-239-1250

Permit Notes: NO PROCESSES WERE ADDED OR AMENDED HOWEVER CALCULATIONS FOR VARIOUS EPNS WERE REVIEWED AND REVISED BY THE APPLICANT WHEN THE PERMIT WAS EVALUATED FOR RENEWAL. AN EMISSIONS RECALCULATION RESULTED IN ANNUAL CO EMISSIONS INCREASE AT EPNS N-10, N-11, AND N-18 AND A PSD AMENDMENT. CO DECREASED AT EPN N-13 AND VOC INCREASED AT EPNS N-10, N-11, N-19, F-1, AND F-5 AS WELL AS AN INCREASE IN NH3 EMISSIONS AT EPN N-23 THAT DID NOT QUALIFY AS A MAJOR MODIFICATION.

Process/Pollutant Information

PROCESS NAME: N-10, CATALYST REGENERATION EFFLUENT

Process Type: 50.003 (Petroleum Refining Conversion Processes (cracking, reforming, etc.))

Primary Fuel: METHANE

Throughput: 2100.00 CFS

Process Notes: THE RACT/BACT/LAER (RBLC) DATABASE WAS SEARCHED FOR THIS FACILITY TYPE. A MARATHON PETROLEUM DETROIT REFINERY CATALYST REGENERATION UNIT AND A BP WEST COAST PRODUCTS CATALYST REGENERATION UNIT USED GOOD COMBUSTION PRACTICES TO MEET BACT. THESE WERE THE ONLY FACILITIES LISTED IN THE RBLC DATABASE FOR THIS FACILITY TYPE. GOOD COMBUSTION PRACTICES ARE USED FOR EPN N-10.THE CATALYST FROM THE ACETYLENE CONVERTER MAIN BEDS, ACETYLENE CONVERTER GUARD BED, METHYL ACETYLENE, PROPADIENE CONVERTERS, C4 DIOLEFIN HYDROGENATION REACTOR AND FIRST STAGE DIOLEFINS REACTOR IS HEATED AND ANY COKE PRESENT ON THE CATALYST IS CONVERTED TO CO OR CO2. SINCE GOOD COMBUSTION PRACTICES ARE GOOD BUSINESS PRACTICE, NO ADDITIONAL CONDITIONS OR MONITORING WERE REQUIRED FOR THIS AMENDMENT.

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9

Test Method: Unspecified

Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)

Emission Limit 1: SEE NOTE

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: NO EMISSION LIMITS AVAILABLE

Process/Pollutant Information

PROCESS NAME: N-11, REACTOR REGENERATION EFFLUENT

Process Type: 50.003 (Petroleum Refining Conversion Processes (cracking, reforming, etc.))

Primary Fuel: METHANE

Throughput: 5064.83 CFS

Process Notes: THE RACT/BACT/LAER DATABASE WAS SEARCHED FOR THIS FACILITY TYPE AND NO EXACT PROCESS WAS FOUND. THE MSS PROCESS AT N-11 IS SIMILAR TO N-10, THE CATALYST FROM THE DP REACTOR IS HEATED AND ANY COKE PRESENT ON THE CATALYST IS CONVERTED TO CO OR CO2. UNIT USED GOOD COMBUSTION PRACTICES TO MEET BACT SINCE GOOD COMBUSTION PRACTICES ARE GOOD BUSINESS PRACTICE, NO ADDITIONAL CONDITIONS OR MONITORING WERE REQUIRED FOR THIS AMENDMENT.

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9

Test Method: Unspecified

Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)

Emission Limit 1: SEE NOTE

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: NO EMISSION LIMITS AVAILABLE

Process/Pollutant Information

PROCESS NAME: N-18, DECOKING DRUM

Process Type: 50.003 (Petroleum Refining Conversion Processes (cracking, reforming, etc.))

Primary Fuel: METHANE

Throughput: 26625.00 LB COKE/CYCLE

Process Notes: THE RACT/BACT/LAER DATABASE WAS SEARCHED FOR THIS FACILITY TYPE AND SIMILAR PROCESSES WERE FOUND BUT THERE WERE NO PROJECT NOTES. THE DECOKING DRUM AND FURNACE TUBES ARE HEATED AND ANY COKE PRESENT ON THE CATALYST IS CONVERTED TO CO OR CO2. UNIT USED GOOD COMBUSTION PRACTICES TO MEET BACT. SINCE GOOD COMBUSTION PRACTICES ARE GOOD BUSINESS PRACTICE, NO ADDITIONAL CONDITIONS OR MONITORING WERE REQUIRED FOR THIS AMENDMENT.

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: SEE NOTE
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: NO EMISSION LIMITS AVAILABLE

Facility Information

RBLC ID: OK-0135 (final)

Date Determination Last Updated: 02/18/2010

Corporate/Company Name: PRYOR PLANT CHEMICAL COMPANY
Facility Name: PRYOR PLANT CHEMICAL
Facility Contact:
Facility Description:
Permit Type: C: Modify process at existing facility
Permit URL:
EPA Region: 6
Facility County: MAYES
Facility State: OK
Facility ZIP Code: 73107

Permit Number: 2008-100-C PSD
Permit Date: 02/23/2009 (actual)
FRS Number: 4009700008
SIC Code: 2873
NAICS Code: 325311
COUNTRY: USA

Permit Issued By: OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY (Agency Name)
MR. JERRY GOOCHEY(Agency Contact) (405)702-4189 JERRY.GOOCHEY@DEQ.OK.GOV

Permit Notes: PRYOR PLANT CHEMICAL COMPANY (PPCC) SUBMITTED AN APPLICATION DATED MARCH 27, 2008 TO AIR QUALITY DIVISION (AQD) WITH THE REQUIRED FEE OF $2,000 FOR A CONSTRUCTION PERMIT TO PLACE INTO OPERATION A SYNTHETIC FERTILIZER MANUFACTURING PLANT (SIC 2873) THAT HAS BEEN SHUT DOWN FOR APPROXIMATELY TEN YEARS. RATHER THAN ATTEMPT TO RECONCILE EXISTING PERMITS WITH CHANGES THAT MAY RESULT FROM RE-STARTING A PLANT THAT HAS BEEN INACTIVE FOR TEN YEARS TO EVALUATE WHERE SIGNIFICANT MODIFICATIONS ARE OCCURRING, A DECISION TO SIMPLIFY THE PERMITTING PROCESS WAS MADE BY THE APPLICANT AND ACCEPTED BY AQD. A FULL PSD (PREVENTION OF SIGNIFICANT DETERIORATION) ANALYSIS HAS BEEN COMPLETED FOR THIS PERMIT ISSUANCE. IN ADDITION, EVALUATION OF COMPLIANCE ASSURANCE MONITORING (CAM) IS REQUIRED.

Process/Pollutant Information

PROCESS NAME: PRIMARY REFORMER

Process Type: 61.012 (Fertilizer Production (except 61.009))

Primary Fuel: NATURAL GAS

Throughput: 700.00 Tons per Day

Process Notes: THE PRIMARY REFORMER IS A PROCESS HEATER USED IN CONVERTING RAW NATURAL GAS INTO AMMONIA.

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 18.5000 LB/H 1 HOUR/8 HOUR
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N) NO CONTROLS;GOOD COMBUSTION PRACTICES.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 11.9300 LB/H 3-HOUR/168-H ROLLING CUMMULATIVE
Emission Limit 2: 0.2000 LB/MMBTU STATE LIMIT
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (P) LOW NOX BURNERS/GOOD COMBUSTION PRACTICE.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total (TPM)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 1.6800 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 1.2600 LB/H

Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 1.3500 LB/H
Emission Limit 2: 0.2000 LB/MMBTU
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 1.2100 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: CONDENSATE STEAM FLASH DRUM-AMMONIA PLT 4
Process Type: 61.999 (Other Agricultural Chemical Manufacturing Sources)
Primary Fuel:
Throughput: 80.00 T/H
Process Notes: FLASH DRUM IS A CONTROL DEVICE FOR THE CONDENSATE KNOCKOUT DRUMTO MINIMIZE AMMONIA EMISSIONS.

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 9.2100 LB/H 1-HOUR AV
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) GOOD OPERATION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: PROPER OPERATION AND MONITORING TO MINIMIZE EMISSIONS.

POLLUTANT NAME: Methanol
CAS Number: 67-56-1
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))
Emission Limit 1: 3.4200 LB/H 1-HR AV

Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) GOOD OPERATION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: PROPER OPERATION AND MONITORING TO MINIMIZE EMISSIONS.

POLLUTANT NAME: Ammonia (NH3)

CAS Number: 7664-41-7
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.8000 LB/H 1-HOUR AV
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: NITRIC ACID PLANT #1
Process Type: 62.014 (Nitric Acid Plants)
Primary Fuel:
Throughput: 8.30 LB/H
Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 1.6000 LB/T ANNUAL
Emission Limit 2: 3.0000 LB/T 7-DAY MAX
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) EXTENDED ABSORPTION WITH NSCR.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: NOX LIMIT OF 58.2 T/YR

Process/Pollutant Information

PROCESS NAME: NITRIC ACID PLANT #3
Process Type: 62.014 (Nitric Acid Plants)
Primary Fuel:
Throughput: 6.30 LB/H
Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 1.6000 LB/T ANNUAL
Emission Limit 2: 3.0000 LB/T 7-DAY MAX
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) EXTENDED ABSORPTION WITH NSCR AND GOOD OPERATION PRACTICES.
Est. % Efficiency:

Compliance Verified: Unknown
Pollutant/Compliance Notes: NOX LIMIT OF 44.2 TPY.

Process/Pollutant Information

PROCESS NAME: NITRIC ACID PLANT #4
Process Type: 62.014 (Nitric Acid Plants)
Primary Fuel:
Throughput: 14.60 LB/H
Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 2.5000 LB/T ANNUAL
Emission Limit 2: 3.0000 LB/T 7-DAY MAX
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) SCR AND GOOD OPERATION PRACTICES.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: NOX LIMIT OF 159.9 TPY.

Process/Pollutant Information

PROCESS NAME: NITRIC ACID PREHEATERS #1, #3, AND #4
Process Type: 13.310 (Natural Gas (includes propane and liquefied petroleum gas))
Primary Fuel: NATURAL GAS
Throughput: 20.00 MMBTU/H

Process Notes: THE NITRIC ACID PLANT PREHEATERS ARE USED TO PREHEAT THE PROCESS AIR FROM 300 OF TO 500 OF FOR STARTUP PURPOSES. THE PROCESS AIR FLOWS THROUGH TUBES INSIDE THE PREHEATER.

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.9800 LB/H 168-H ROLLING CUMMULATIVE
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (P) LOW-NOX BURNERS AND GOOD COMBUSTION PRACTICES.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 1.6500 LB/H 1-HOUR/8-HOUR
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N) GOOD COMBUSTION PRACTICES.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total (TPM)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.1500 LB/H 24-H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.1500 LB/H 24-H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.1100 LB/H

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))

Emission Limit 1: 0.0300 LB/H

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: CARBON DIOXIDE VENT

Process Type: 61.999 (Other Agricultural Chemical Manufacturing Sources)

Primary Fuel:

Throughput: 36.50 T/H

Process Notes: 36.5 TONS/H CO2 VENTED LIMIT

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: 3.6500 LB/H 1-HOUR/8-HOUR
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N) GOOD OPERATION PRACTICES.
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: AMMONIUM NITRATE PLANTS #1 AND #2
Process Type: 61.012 (Fertilizer Production (except 61.009))
Primary Fuel:
Throughput: 23.80 T/H
Process Notes: 23.8 TPH AMMONIUM NITRATE PER PLANT LIMIT.

POLLUTANT NAME: Particulate matter, total (TPM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 2.1000 LB/H 24-H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) IN-STACK CONDENSERS AND GOOD OPERATION PRACTICES
Est. % Efficiency: 80.000

Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.1000 LB/H 24-HOURS
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) IN-STACK CONDENSERS AND GOOD OPERATION PRACTICES
Est. % Efficiency: 80.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: GRANULATOR SCRUBBERS #1, #2, AND #3
Process Type: 61.999 (Other Agricultural Chemical Manufacturing Sources)
Primary Fuel:
Throughput: 16.70 T/H
Process Notes: 16.7 TPH DRY AMMONIUM NITRATE PER SCRUBBER LIMIT

POLLUTANT NAME: Particulate matter, total (TPM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.7000 LB/H 24-HOUR
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) GOOD OPERATION PRACTICES
Est. % Efficiency: 80.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.7000 LB/H 24-HOUR
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) GOOD OPERATION PRACTICES
Est. % Efficiency: 80.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: BOILERS #1 AND #2

Process Type: 13.310 (Natural Gas (includes propane and liquefied petroleum gas))

Primary Fuel: NATURAL GAS

Throughput: 80.00 MMBTU/H

Process Notes: THE BOILERS WILL PROVIDE THE STEAM NEEDED TO OPERATE THE VARIOUS PIECES OF EQUIPMENT AT THE FACILITY.

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.5000 LB/H 24-HOUR
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total (TPM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.6000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.2000 LB/H
Emission Limit 2: 0.2000 LB/MMBTU STATE LIMIT
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.5000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Formaldehyde

CAS Number: 50-00-0
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))
Emission Limit 1: 0.1000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:

Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 4.0000 LB/H 3-H/168-H ROLLING CUMMULATIVE
Emission Limit 2: 0.2000 LB/MMBTU STATE LIMIT
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (P) LOW-NOX BURNERS AND GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 6.6000 LB/H 1-HOUR/8-HOUR
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N) GOOD COMBUSTION PRACTICES
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: COOLING TOWER #1

Process Type: 61.999 (Other Agricultural Chemical Manufacturing Sources)

Primary Fuel:

Throughput: 1.47 MMGAL/H

Process Notes: 1,470,000 GALLONS PER HR CIRCULATION RATE LIMIT

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 1.1800 LB/H 24-H

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A

Control Method: (A) MIST ELIMINATORS

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: COOLING TOWER #2

Process Type: 61.999 (Other Agricultural Chemical Manufacturing Sources)

Primary Fuel:

Throughput: 2.40 MMGAL/H

Process Notes: 2,400,000 GALLONS PER HR CIRCULATION RATE LIMIT

POLLUTANT NAME: Particulate matter, total < 10 µ (TPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 1.9200 LB/H 24-HOUR
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) MIST ELIMINATORS
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Facility Information

RBLC ID:	LA-0148 (final)	**Date Determination Last Updated:**	11/03/2008
Corporate/Company Name:	RED RIVER ENVIRONMENTAL PRODUCTS LLC	**Permit Number:**	PSD-LA-727
Facility Name:	ACTIVATED CARBON FACILITY	**Permit Date:**	05/28/2008 (actual)
Facility Contact:	C JEAN BUSTARD 3037341727	**FRS Number:**	110031155853
Facility Description:	THE FACILITY WILL USE COAL AS A FEEDSTOCK TO MANUFACTURE ROUGHLY 350 MILLION POUNDS OF ACTIVATED CARBON (AC) PER YEAR.	**SIC Code:**	2819
Permit Type:	A: New/Greenfield Facility	**NAICS Code:**	325998
Permit URL:			
EPA Region:	6	**COUNTRY:**	USA
Facility County:	RED RIVER		
Facility State:	LA		
Facility ZIP Code:	71019		
Permit Issued By:	LOUISIANA DEPARTMENT OF ENV QUALITY (Agency Name) MR. KEITH JORDAN(Agency Contact) (225)219-3613 KEITH.JORDAN@LA.GOV		
Permit Notes:			

Process/Pollutant Information

PROCESS NAME: MULTIPLE HEARTH FURNACES / AFTERBURNERS

Process Type: 11.110 (Coal (includes bituminous, subbituminous, anthracite, and lignite))

Primary Fuel: COAL

Throughput: 7.78 LB/YR E +08

Process Notes: 4 MULTI-HEARTH FURNACES. PROCESSES LIGNITE COAL. ALSO COMBUSTS 13.2 MM BTU /HR NATURAL GAS TO BALANCE HEAT LOADS.

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 48.3000 LB/H 3-HOUR

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: NSPS , OPERATING PERMIT , OTHER

Control Method: (A) CYCLONE, AFTERBURNER, SDA SYSTEM AND FABRIC FILTER BAGHOUSE

Est. % Efficiency: 99.900

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9

Test Method: Unspecified

Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)

Emission Limit 1: 37.6000 LB/H 3-HOUR

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: NSPS , SIP , OPERATING PERMIT , OTHER

Control Method: (A) AFTERBURNER AND GOOD COMBUSTION PRACTICES

Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 35.9000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: NSPS , SIP , OPERATING PERMIT , OTHER
Control Method: (A) AFTERBURNER AND GOOD COMBUSTION PRACTICES
Est. % Efficiency: 99.900
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 77.3000 LB/H (12-MO. ROLLING)
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: NSPS , SIP , OPERATING PERMIT , OTHER
Control Method: (A) COMBUSTION CONTROLS (INCLUDING LOW-NOX BURNERS) AND SNCR
Est. % Efficiency: 50.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 101.2000 LB/H (30-DAY ROLLING)
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: NSPS , SIP , OPERATING PERMIT , OTHER
Control Method: (A) SPRAY DRYER ABSORBER (SDA) SYSTEM
Est. % Efficiency: 92.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfuric Acid (mist, vapors, etc)

CAS Number: 7664-93-9
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Particulate Matter (PM))
Emission Limit 1: 1.5500 LB/H (3-HR AVG.)
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: NSPS , SIP , OPERATING PERMIT , OTHER
Control Method: (A) SDA SYSTEM AND FABRIC FILTER BAGHOUSE
Est. % Efficiency: 92.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: COOLING TOWERS

Process Type: 99.009 (Industrial Process Cooling Towers)

Primary Fuel:

Throughput: 10750.00 GAL/MIN

Process Notes:

POLLUTANT NAME:	Particulate matter, filterable < 10 µ (FPM10)
CAS Number:	PM
Test Method:	Unspecified
Pollutant Group(s):	(Particulate Matter (PM))
Emission Limit 1:	0.4100 LB/H
Emission Limit 2:	
Standard Emission:	

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis:	BACT-PSD
Other Applicable Requirements:	SIP , OPERATING PERMIT
Control Method:	(P) DRIFT ELIMINATION SYSTEM
Est. % Efficiency:	
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	

Facility Information

RBLC ID:	AL-0231 (final)	**Date Determination Last Updated:**	08/31/2009
Corporate/Company Name:	NUCOR CORPORATION	**Permit Number:**	712-0037
Facility Name:	NUCOR DECATUR LLC	**Permit Date:**	06/12/2007 (actual)
Facility Contact:	JEFF BROWN 2563013508 JBROWN@NSDECATUR.COM	**FRS Number:**	110000589328
Facility Description:	THE FACILITY PRODUCES STEEL COILS PRIMARILY FROM STEEL SCRAP USING THE ELECTRIC ARC FURNACE (EAF) PROCESS.	**SIC Code:**	3312
Permit Type:	D: Both B (Add new process to existing facility) &C (Modify process at existing facility)	**NAICS Code:**	331111
Permit URL:			
EPA Region:	4	**COUNTRY:**	USA
Facility County:	MORGAN		

Facility State: AL

Facility ZIP Code: 35673

Permit Issued By: ALABAMA DEPT OF ENVIRONMENTAL MGMT (Agency Name)
MR. ANTHONY SMILEY(Agency Contact) (334) 271-7714 ASMILEYSR@ADEM.STATE.AL.US

Other Agency Contact Info: PLEASE SEND ANY QUESTIONS TO CHARLES KILLEBREW, ADEM PERMIT ENGINEER, AT 334-270-5675.

Permit Notes: FACILITYWIDE EMISSIONS CONTINUED: PB - 1.5 T/YR

Process/Pollutant Information

PROCESS NAME: TWO (2) ELECTRIC ARC FURNACES AND THREE (3) LADLE METALLURGY FURNACES WITH TWO (2) MELTSHOP BAGHOUSES

Process Type: 81.210 (Electric Arc Furnaces)

Primary Fuel: ELECTRICITY

Throughput: 440.00 T/H

Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 0.4200 LB/T

Emission Limit 2: 184.8000 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.1300 LB/T
Emission Limit 2: 57.2000 LB/H
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 2.3000 LB/T
Emission Limit 2: 1012.0000 LB/H
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Lead (Pb) / Lead Compounds
CAS Number: 7439-92-1
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Heavy Metals , InOrganic Compounds , Particulate Matter (PM))
Emission Limit 1: 0.0020 LB/T
Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) TWO (2) MELTSHOP BAGHOUSES WITH DIRECT EVACUATION CANOPIES
Est. % Efficiency: 99.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0018 GR/DSCF
Emission Limit 2: 43.2200 LB/H
Standard Emission: 0.0018 GR/DSCF

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: NSPS , OPERATING PERMIT
Control Method: (A) TWO MELTSHOP BAGHOUSES WITH DIRECT EVACUATION CANOPIES
Est. % Efficiency: 99.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.6200 LB/T
Emission Limit 2: 220.0000 LB/H
Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:

Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: VACUUM DEGASSER BOILER
Process Type: 13.310 (Natural Gas (includes propane and liquefied petroleum gas))
Primary Fuel: NATURAL GAS
Throughput: 95.00 MMBTU/H
Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.0350 LB/MMBTU
Emission Limit 2: 3.3300 LB/H
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) ULTRA LOW NOX BURNERS
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide
CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: 0.0610 LB/MMBTU
Emission Limit 2: 5.8000 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Y

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))

Emission Limit 1: 0.0006 LB/MMBTU

Emission Limit 2: 0.0570 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 0.0026 LB/MMBTU

Emission Limit 2: 0.2500 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate Matter (PM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0076 LB/MMBTU
Emission Limit 2: 0.7200 LB/H
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: GALVANIZING LINE FURNACE
Process Type: 13.310 (Natural Gas (includes propane and liquefied petroleum gas))
Primary Fuel: NATURAL GAS
Throughput: 98.70 MMBTU/H
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0055 LB/MMBTU
Emission Limit 2: 0.5400 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))

Emission Limit 1: 0.0006 LB/MMBTU

Emission Limit 2: 0.0060 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 0.0840 LB/MMBTU

Emission Limit 2: 8.3000 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate Matter (PM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0076 LB/MMBTU
Emission Limit 2: 0.7500 LB/H
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.0670 LB/MMBTU
Emission Limit 2: 6.6000 LB/H
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) SCRUBBER
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: VACUUM DEGASSER

Process Type: 81.290 (Other Steel Manufacturing Processes)

Primary Fuel:

Throughput: 440.00 T/H

Process Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))

Emission Limit 1: 0.0050 LB/T

Emission Limit 2: 2.2000 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate Matter (PM)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0080 GR/DSCF

Emission Limit 2: 0.9100 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: N

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0050 LB/T
Emission Limit 2: 2.2000 LB/H
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: N
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.0750 LB/T
Emission Limit 2: 33.0000 LB/H
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) FLARE
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 0.0050 LB/T

Emission Limit 2: 2.2000 LB/H

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Facility Information

RBLC ID: TX-0481 (final)

Date Determination Last Updated: 10/01/2007

Corporate/Company Name: AIR PRODUCTS LP

Permit Number: PSD-TX-1044 / 35873

Facility Name: AIR PRODUCTS BAYTOWN I I

Permit Date: 11/02/2004 (actual)

Facility Contact: KATHLEEN BRANDT 2818380202

FRS Number: 110012710423

Facility Description: THIS FACILITY GETS RAW SYNTHESIS GAS FROM EXXON¿S SYNTHESIS GAS MANUFACTURING UNIT. THE RAW SYNGAS STREAM FROM THE EXXON PLANT, CONSISTING OF CO2, CO, H2, H2S, COS, HCN, NH3 AND METHANE, IS PIPED TO THE AIR PRODUCTS PLANT WHERE THE ACID GASES AND AMMONIA WILL BE REMOVED BY AIR PRODUCTS¿ RECTISOL UNIT. THE PRODUCTS PRODUCED INCLUDE CO, AND TWO PURE SYNTHESES GAS PRODUCTS. THESE PRODUCTS ARE DISTRIBUTED TO CUSTOMERS VIA PIPELINES. AN IMPURE SYNGAS IS ALSO PRODUCED AND USED OFFSITE AS FUEL. THE NEW PROCESS WILL CONVERT A PORTION OF THE SYNGAS TO HYDROGEN. THE HYDROGEN WILL BE PURIFIED AND DISTRIBUTED TO CUSTOMERS.

SIC Code: 492

Permit Type: A: New/Greenfield Facility

NAICS Code: 486210

Permit URL:

EPA Region: 6 **COUNTRY:** USA

Facility County: HARRIS

Facility State: TX

Facility ZIP Code: 77520

Permit Issued By: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) (Agency Name)
RANDY HAMILTON(Agency Contact) (512) 239-1512 RHAMILTO@TCEQ.STATE.TX.US

Permit Notes: AIR PRODUCTS REQUESTED AN AMENDMENT TO AUTHORIZE THE ADDITION OF A HYDROGEN PURIFICATION SYSTEM TO THEIR SYN GAS PRODUCTION FACILITY. THE REQUESTED ADDITIONS INCLUDED: 1) A SHIFT REACTOR TO PRODUCE ADDITIONAL HYDROGEN 2) 2 PRESSURE SWING ADSORBERS (PSA¿S) TO PURIFY HYDROGEN 3) A 350 MMBTU/HR BOILER (EPN 7) TO GENERATE STEAM FIRING PSA TAIL GAS . THE BOILER EMITS MORE THAN 100 TPY CO, MAKING THIS PERMIT A PSD PROJECT FOR CO, PSD PERMIT NO. P1044. THE COMPANY ALSO INCLUDED THE FOLLOWING PERMIT BY RULES: AUTHORIZATION TYPE NUMBER DESCRIPTION PBR 43611 A DIESEL FUEL TANK (EPN 8), MEETS BACT, SEE SOURCES AND CONTROLS PBR 43611 A PROCESS STEAM VENT (EPN SVENT1), MEETS BACT, SEE SOURCES AND CONTROLS 106.511 NONE AN EMERGENCY GENERATOR (EPN 9), MEETS BACT, SEE SOURCES AND CONTROLS FINALLY, THE COMPANY AUTHORIZED A START UP PROCESS VENT FOR THE SHIFT REACTOR STEAM DRUM. THERE ARE VIRTUALLY NO VOC EMISSIONS FROM THE VENT. THERE WAS A SMALL INCREASE IN FUGITIVE EMISSIONS DUE TO NEW PIPING FOR THE SHIFT REACTOR SYSTEM.

Process/Pollutant Information

PROCESS NAME: RECTISOL VENT

Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Methanol

CAS Number: 67-56-1

Test Method: Unspecified

Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))

Emission Limit 1: 1.3000 LB/H

Emission Limit 2: 5.7000 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A

Control Method: (N)

Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 11.4000 LB/H
Emission Limit 2: 0.4700 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Hydrogen Sulfide

CAS Number: 7783-06-4
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 1.6500 LB/H
Emission Limit 2: 7.0200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbonyl Sulfide

CAS Number: 463-58-1
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , InOrganic Compounds)
Emission Limit 1: 2.9200 LB/H
Emission Limit 2: 12.4000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: FLARE (NORMAL OPERATION)

Process Type: 19.310 (Chemical Plant Flares)

Primary Fuel: NATURAL GAS

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0400 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)

Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 11.4000 LB/H
Emission Limit 2: 0.4700 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0400 LB/H
Emission Limit 2: 0.0500 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 797.7000 LB/H
Emission Limit 2: 11.0900 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: MSS-NONCONDENSIBLES (PROPYLENE VENTING)

Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 2.5200 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)

Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 21.6400 LB/H
Emission Limit 2: 0.1300 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Propylene
CAS Number: 115-07-1
Test Method: Unspecified
Pollutant Group(s): (Organic Compounds (all) , Organic Non-HAP Compounds)
Emission Limit 1: 20.0000 LB/H
Emission Limit 2: 0.1200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: PARTS WASHER

Process Type: 99.999 (Other Miscellaneous Sources)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 0.0200 LB/H

Emission Limit 2: 0.1000 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: FUGITIVES (4)

Process Type: 50.007 (Petroleum Refining Equipment Leaks/Fugitive Emissions)

Primary Fuel:

Throughput:

Process Notes: THE CO EMISSIONS ARE ELIGIBLE FOR PSD

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.2300 LB/H
Emission Limit 2: 1.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 7.8500 LB/H
Emission Limit 2: 34.4000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Hydrogen Sulfide
CAS Number: 7783-06-4
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.3800 LB/H
Emission Limit 2: 1.6400 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Carbonyl Sulfide

CAS Number: 463-58-1

Test Method: Unspecified

Pollutant Group(s): (Hazardous Air Pollutants (HAP) , InOrganic Compounds)

Emission Limit 1: 0.0200 LB/H

Emission Limit 2: 0.0900 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Hydrogen Cyanide

CAS Number: 74-90-8

Test Method: Unspecified

Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Organic Non-HAP Compounds)

Emission Limit 1: 0.0100 LB/H

Emission Limit 2: 0.0100 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A

Other Applicable Requirements:

Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Propylene
CAS Number: 115-07-1
Test Method: Unspecified
Pollutant Group(s): (Organic Compounds (all) , Organic Non-HAP Compounds)
Emission Limit 1: 0.3900 LB/H
Emission Limit 2: 1.7000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Methanol
CAS Number: 67-56-1
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))
Emission Limit 1: 0.8100 LB/H
Emission Limit 2: 3.5400 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: COOLING TOWER

Process Type: 50.005 (Petroleum Refining Separation Processes (distillation and light ends recovery))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 1.3600 LB/H

Emission Limit 2: 5.9600 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: SUPPLEMENTARY COOLING TOWER

Process Type: 50.005 (Petroleum Refining Separation Processes (distillation and light ends recovery))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.3400 LB/H
Emission Limit 2: 1.4900 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: BOILER STACK
Process Type: 11.390 (Other Gaseous Fuel & Gaseous Fuel Mixtures)
Primary Fuel: NATURAL GAS
Throughput:
Process Notes: CO EMISSIONS ARE ELIGIBLE FOR PSD

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 28.3000 LB/H
Emission Limit 2: 123.8000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:

Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 6.0000 LB/H
Emission Limit 2: 9.2100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 24.2000 LB/H
Emission Limit 2: 9.9400 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Ammonia (NH3)

CAS Number: 7664-41-7
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 2.4500 LB/H
Emission Limit 2: 10.7400 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 33.1800 LB/H
Emission Limit 2: 9.2100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 μ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 2.6100 LB/H

Emission Limit 2: 11.4300 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: BOILER STACK (HIGH BTU FUEL)
Process Type: 11.390 (Other Gaseous Fuel & Gaseous Fuel Mixtures)
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 21.0000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: BOILER STACK (START UP)

Process Type: 13.390 (Other Gaseous Fuel & Gaseous Fuel Mixtures)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 176.7800 LB/H

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DIESEL FUEL TANK

Process Type: 42.005 (Petroleum Liquid Storage in Fixed Roof Tanks)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: EMERGENCY GENERATOR
Process Type: 19.800 (Misc. Internal Combustion Engines)
Primary Fuel:
Throughput:

Process Notes: CO EMISSIONS ARE ELIGIBLE FOR PSD

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: 2.2400 LB/H
Emission Limit 2: 0.9900 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 10.4000 LB/H
Emission Limit 2: 4.5600 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 1.0100 LB/H
Emission Limit 2: 0.4600 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO_2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SO_x))
Emission Limit 1: 4.8000 LB/H
Emission Limit 2: 2.1100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.7400 LB/H
Emission Limit 2: 0.3300 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: EMERGENCY GENERATOR TANK

Process Type: 19.800 (Misc. Internal Combustion Engines)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 0.0100 LB/H

Emission Limit 2: 0.0100 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A

Other Applicable Requirements:

Control Method: (N)

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: PROCESS STEAM VENT

Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))

Primary Fuel:

Throughput:

Process Notes: DS

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0500 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: MSS PROCESS STEAM VENT

Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: N/A
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Facility Information

RBLC ID:	TX-0347 (final)	**Date Determination Last Updated:**	08/14/2006
Corporate/Company Name:	BP AMOCO CHEMICAL COMPANY	**Permit Number:**	PSD-TX-854
Facility Name:	CHOCOLATE BAYOU PLANT	**Permit Date:**	10/16/2001 (actual)
Facility Contact:	JOEL H. ROBINS 7135813498	**FRS Number:**	110000606933
Facility Description:	BP AMOCO PROPOSES TO INCREASE ITS ETHYLENE PRODUCTION FROM THE NO. 1 AND NO. 2 OLEFINS UNITS AT THE CHOCOLATE BAYOU PLANT. TO ACHIEVE THE PRODUCTION INCREASE, BP AMOCO PLANS TO REPLACE THE EXISTING FURNACES AT NO. 1 OLEFINS AND EITHER REPLACE OR RETROFIT THE FURNACES AT THE NO. 2 OLEFINS UNIT. LOW-NOX TECHNOLOGY WILL BE UTILIZED ON THESE FURNACE REPLACEMENTS OR RETROFITS. BP AMOCO IS REQUESTING THIS CONSOLIDATED PERMIT INCLUDE A FLEXIBLE EMISSION CAP FOR ALL CRACKING FURNACES IN NO. 1 AND NO. 2 OLEFINS UNITS AND A FLEXIBLE EMISSION CAP FOR THE EXTERNAL FLOATING ROOF TANKS.	**SIC Code:**	2869
Permit Type:	D: Both B (Add new process to existing facility) &C (Modify process at existing facility)	**NAICS Code:**	325110
Permit URL:			
EPA Region:	6	**COUNTRY:**	USA
Facility County:	BRAZORIA		
Facility State:	TX		
Facility ZIP Code:	775121488		

Permit Issued By: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) (Agency Name)
RANDY HAMILTON(Agency Contact) (512) 239-1512 RHAMILTO@TCEQ.STATE.TX.US

Other Agency Contact Info: ALAN PEGUES
PO BOX 13087
AUSTIN, TX 78711-3087
512-239-1319

Permit Notes: PETROCHEMICAL MANUFACTURING, OLEFINS CRACKING FURNACES

Process/Pollutant Information

PROCESS NAME: NO.1 OLEFINS COOLING TOWER, AT-1210

Process Type: 99.009 (Industrial Process Cooling Towers)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 4.1400 LB/H

Emission Limit 2: 18.1300 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS

Control Method: (P) WEEKLY VOC AND BX MONITORING OF THE CIRCULATION WATER.

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 2.4700 LB/H
Emission Limit 2: 10.8100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: NO. 2 OLEFINS COOLING TOWER, DAT-3201
Process Type: 99.009 (Industrial Process Cooling Towers)
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 5.5200 LB/H
Emission Limit 2: 24.1800 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (P) WEEKLY MONITORING OF VOC AND BZ IN THE CIRCULATION WATER
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 3.2900 LB/H
Emission Limit 2: 14.4100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: NO. 1 OLEFINS UNIT FUGITIVES, FUG-V10F
Process Type: 64.002 (Equipment Leaks (valves, compressors, pumps, etc.))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 21.9900 LB/H
Emission Limit 2: 96.3000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (P) 28VHP LEAK DETECTION AND REPAIR PROGRAM

Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: FUGITIVE RATES ARE AN ESTIMATE ONLY AND SHOULD NOT BE CONSIDERED AS A MAXIMUM ALLOWABLE EMISSION RATE.

Process/Pollutant Information

PROCESS NAME: NO. 2 OLEFINS UNIT FUGITIVES, FUG-V20F

Process Type: 64.002 (Equipment Leaks (valves, compressors, pumps, etc.))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 21.6400 LB/H
Emission Limit 2: 94.7900 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (P) 28VHP LDAR PROGRAM
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: NO. 1&2 OLEFINS ANALYZER VENT FUGITIVES

Process Type: 64.002 (Equipment Leaks (valves, compressors, pumps, etc.))

Primary Fuel:

Throughput:

Process Notes: FUG-A10F & FUG-A20F

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0100 LB/H EACH VENT
Emission Limit 2: 0.0100 T/YR EACH VENT
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (P) 28VHP LDAR PROGRAM
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: FUGITIVE RATES ARE AN ESTIMATE ONLY AND SHOULD NOT CONSIDERED AS A MAXIMUM ALLOWABLE EMISSION RATE.

Process/Pollutant Information

PROCESS NAME: SECOND STAGE HYDROTREATER FUGITIVES, FUGVSSH

Process Type: 64.002 (Equipment Leaks (valves, compressors, pumps, etc.))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 1.0900 LB/H
Emission Limit 2: 4.7700 T/YR
Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (P) 28VHP LDAR PROGRAM
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: FUGITIVE EMISSIONS ARE AN ESTIMATE ONLY AND SHOULD NOT BE CONSIDERED AS A MAXIMUM ALLOWABLE EMISSION RATE

Process/Pollutant Information

PROCESS NAME: TANK FARM FUGITIVES, FUG-FTF
Process Type: 64.002 (Equipment Leaks (valves, compressors, pumps, etc.))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 1.0000 LB/H
Emission Limit 2: 4.3800 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (P) 28VHP LDAR PROGRAM
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: FUGITIVE EMISSIONS ARE AN ESTIMATE ONLY AND SHOULD NOT BE CONSIDERED AS A MAXIMUM ALLOWABLE EMISSION RATE

Process/Pollutant Information

PROCESS NAME: MARINE DOCK FUGITIVES, FUG-VBD

Process Type: 64.002 (Equipment Leaks (valves, compressors, pumps, etc.))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 0.0900 LB/H

Emission Limit 2: 0.4000 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: SIP

Control Method: (P) 28VHP LDAR PROGRAM

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: FUGITIVE EMISSIONS ARE AN ESTIMATE ONLY AND SHOULD NOT BE CONSIDERED AS A MAXIMUM ALLOWABLE EMISSION RATE

Process/Pollutant Information

PROCESS NAME: METERING STATION FUGITIVES, FUG-VCM

Process Type: 64.002 (Equipment Leaks (valves, compressors, pumps, etc.))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.3100 LB/H
Emission Limit 2: 1.3800 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: SIP
Control Method: (P) 28 VHP LDAR PROGRAM
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: FUGITIVE EMISSIONS ARE AN ESTIMATE ONLY AND SHOULD NOT BE CONSIDERED AS A MAXIMUM ALLOWABLE EMISSION RATE

Process/Pollutant Information

PROCESS NAME: RAIL LOADING FUGITIVES, FUG-RAIL
Process Type: 64.005 (Transfer of SOCMI Chemicals (loading/unloading, filling, etc.))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.1000 LB/H
Emission Limit 2: 0.4300 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (P) 28 VHP LDAR PROGRAM
Est. % Efficiency:

Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: NO. 1 OLEFINS TRUCK LOADING, FUELTRK1
Process Type: 64.005 (Transfer of SOCMI Chemicals (loading/unloading, filling, etc.))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 11.0500 LB/H
Emission Limit 2: 1.2300 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: NO. 2 OLEFINS TRUCK LOADING, FUELTRK2
Process Type: 64.005 (Transfer of SOCMI Chemicals (loading/unloading, filling, etc.))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 11.0500 LB/H
Emission Limit 2: 1.5300 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: BLEACH TANK, AF-1215

Process Type: 64.999 (Other SOCMI Processes)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Sodium Hypochlorite

CAS Number: 7681-52-9
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.0400 LB/H
Emission Limit 2: 0.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:

Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: POLLUTANT: NAOCL

Process/Pollutant Information

PROCESS NAME: BLEACH TANK, AF-3215

Process Type: 64.999 (Other SOCMI Processes)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Chlorine / Chlorine Compounds

CAS Number: 7782-50-5
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Hazardous Air Pollutants (HAP))
Emission Limit 1: 0.0300 LB/H CHLORINE GAS
Emission Limit 2: 0.0100 T/YR CHLORINE GAS
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: SLOP TANK, AF-3701

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Acetonitrile

CAS Number: 75-05-8
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all))
Emission Limit 1: 0.6100 LB/H
Emission Limit 2: 0.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: POLLUTANT: ACETONITRILE, C2H3N, CAS 75-05-8

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 5.0700 LB/H
Emission Limit 2: 0.1400 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: (2) ACETONITRILE TANKS, AF-1103&-1104

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes: THE PERMIT DOES NOT SPECIFY WHETHER THE TANKS ARE FLOATING OR FIXED ROOFED. THE SCC CODE WAS CHOSEN FOR PURPOSES OF THIS DATABASE.

POLLUTANT NAME: Acetonitrile

CAS Number: 75-05-8

Test Method: Unspecified

Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all))

Emission Limit 1: 0.0600 LB/H EACH TANK

Emission Limit 2: 0.1100 T/YR EACH TANK

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: MACT

Other Applicable Requirements: MACT

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: POLLUTANT: ACETONITRILE, C2H3N, CAS 75-05-8

Process/Pollutant Information

PROCESS NAME: RERUNS BOTTOMS TANK, AF-1105

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 2.3100 LB/H
Emission Limit 2: 4.4100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Benzene
CAS Number: 71-43-2
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Organic Non-HAP Compounds , Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Toluene
CAS Number: 108-88-3
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))

Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: RERUNS BOTTOMS TANK, AF-1106
Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 2.3100 LB/H
Emission Limit 2: 2.7700 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME:	Benzene
CAS Number:	71-43-2
Test Method:	Unspecified
Pollutant Group(s):	(Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Organic Non-HAP Compounds , Volatile Organic Compounds (VOC))
Emission Limit 1:	0.0100 LB/H
Emission Limit 2:	0.0100 T/YR
Standard Emission:	

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis:	MACT
Other Applicable Requirements:	MACT
Control Method:	(N) NONE INDICATED
Est. % Efficiency:	
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	

POLLUTANT NAME:	Toluene
CAS Number:	108-88-3
Test Method:	Unspecified
Pollutant Group(s):	(Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))
Emission Limit 1:	0.0100 LB/H
Emission Limit 2:	0.0100 T/YR
Standard Emission:	

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis:	MACT
Other Applicable Requirements:	MACT
Control Method:	(N) NONE INDICATED
Est. % Efficiency:	
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	

Process/Pollutant Information

PROCESS NAME: FUEL OIL TANK, AF-1905

Process Type: 42.009 (Volatile Organic Liquid Storage)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.5400 LB/H
Emission Limit 2: 1.8100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: ACETONITRILE TANK, AF-3103

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Acetonitrile

CAS Number: 75-05-8
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all))
Emission Limit 1: 0.0600 LB/H
Emission Limit 2: 10.0000 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: POLLUTANT: ACETONITRILE, C2H3N, CAS 75-05-8

Process/Pollutant Information

PROCESS NAME: FUEL OIL TANK, AF-3905

Process Type: 42.009 (Volatile Organic Liquid Storage)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.5400 LB/H
Emission Limit 2: 2.2500 T/YR
Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: FUEL OIL TANK, DDF-1001

Process Type: 42.009 (Volatile Organic Liquid Storage)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 1.0600 LB/H

Emission Limit 2: 0.2700 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: METHANOL TANK, DDF-1301

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 2.3500 LB/H
Emission Limit 2: 0.0300 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: METHANOL TANK, DDF-202

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 3.9000 LB/H
Emission Limit 2: 0.0600 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: SODIUM NITRITE SOLUTION TANK, DDF-701

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 6.5000 LB/H

Emission Limit 2: 0.0600 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: SODIUM NITRITE SOLUTION TANK, DDF-705

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 6.5000 LB/H
Emission Limit 2: 0.0500 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: FUEL OIL TANK, DF-1001
Process Type: 42.009 (Volatile Organic Liquid Storage)
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 1.7000 LB/H
Emission Limit 2: 4.1500 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: ALCOHOL TANK, DF-1301

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 3.5200 LB/H

Emission Limit 2: 0.0900 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: LUBE OIL STORAGE, DF-502

Process Type: 42.009 (Volatile Organic Liquid Storage)

Primary Fuel:

Throughput:

Process Notes: THE PERMIT DOES NOT SPECIFY WHETHER THE TANKS ARE FIXED OR FLOATING ROOF. THE SCC CODE WAS CHOSEN FOR PURPOSES OF THIS DATABASE.

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.7100 LB/H
Emission Limit 2: 0.2000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: SODIUM NITRITE SOLUTION TANK, DF-701

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 2.6000 LB/H
Emission Limit 2: 0.1100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: SODIUM NITRITE SOLUTION TANK, DF-702
Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.6900 LB/H
Emission Limit 2: 0.0600 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Acetonitrile
CAS Number: 75-05-8
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all))

Emission Limit 1: 0.6900 LB/H
Emission Limit 2: 0.0600 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: ACETONITRILE

Process/Pollutant Information

PROCESS NAME: SODIUM NITRITE SOLUTION TANK, DF-705
Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.6900 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Acetonitrile

CAS Number: 75-05-8
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all))
Emission Limit 1: 0.6900 LB/H
Emission Limit 2: 0.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: ACETONITRILE

Process/Pollutant Information

PROCESS NAME: LUBE OIL STORAGE

Process Type: 42.009 (Volatile Organic Liquid Storage)

Primary Fuel:

Throughput:

Process Notes: THE PERMIT DOES NOT SPECIFY WHETHER THE TANKS ARE FIXED OR FLOATING ROOF, THE SCC CODE WAS CHOSEN FOR PURPOSES OF THIS DATABASE ONLY.

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.6000 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DECOKE STACK, DF-101
Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 61.0000 LB/H
Emission Limit 2: 12.3000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.2900 LB/H

Emission Limit 2: 0.1800 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) CYCLONE SEPARATOR
Est. % Efficiency: 90.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.2000 LB/H
Emission Limit 2: 0.9700 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DECOKE STACK, DF-104
Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 73.0000 LB/H
Emission Limit 2: 3.1800 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.7400 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) CYCLONE SEPARATOR
Est. % Efficiency: 90.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0900 LB/H

Emission Limit 2: 0.4000 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DECOKE STACK, DDF-101

Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9

Test Method: Unspecified

Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)

Emission Limit 1: 36.5000 LB/H

Emission Limit 2: 7.2000 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 6.2000 LB/H
Emission Limit 2: 1.5000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) CYCLONE SEPARATOR
Est. % Efficiency: 90.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DECOKE STACK, DDF-104
Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.8000 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) CYCLONE SEPARATOR
Est. % Efficiency: 90.000

Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 73.0000 LB/H
Emission Limit 2: 3.1800 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: (2) DECOKE STACKS, DF-105 & DDF-105
Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 8.2500 LB/H
Emission Limit 2: 0.8300 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) CYCLONE SEPARATOR
Est. % Efficiency: 90.000
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 38.5000 LB/H
Emission Limit 2: 3.8500 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: DOCK FLARE, AM-1500
Process Type: 19.310 (Chemical Plant Flares)
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 0.0700 LB/H
Emission Limit 2: 0.2900 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: 1, 3-Butadiene
CAS Number: 106-99-0
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0400 LB/H
Emission Limit 2: 0.1600 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (A) THE FLARE IS A CONTROL DEVICE FOR BUTADIENE
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: POLLUTANT: BUTADIENE, C4H6, CAS 106-99-0

POLLUTANT NAME: Propylene
CAS Number: 115-07-1
Test Method: Unspecified
Pollutant Group(s): (Organic Compounds (all) , Organic Non-HAP Compounds)
Emission Limit 1: 0.0300 LB/H
Emission Limit 2: 0.1400 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (A) THE FLARE IS A CONTROL FOR PROPYLENE
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: POLLUTANT: PROPYLENE, C3H6, CAS 115-07-1

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.1900 LB/H
Emission Limit 2: 0.8400 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:

Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: (2) HYDROTREATER REGENERATOR STACKS,DD-606&DDD-606
Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 10.0000 LB/H
Emission Limit 2: 1.4000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 45.8000 LB/H
Emission Limit 2: 3.3000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: NO. 1 OLEFINS FLARE, DM-1101
Process Type: 19.310 (Chemical Plant Flares)
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 151.4000 LB/H
Emission Limit 2: 89.9600 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) THE FLARE IS A VOC CONTROL
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 17.4200 LB/H
Emission Limit 2: 12.6000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 88.7400 LB/H
Emission Limit 2: 64.2000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: NO. 2 OLEFINS FLARE, DDM-3101
Process Type: 19.310 (Chemical Plant Flares)
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 72.2400 LB/H
Emission Limit 2: 88.3900 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 14.1800 LB/H
Emission Limit 2: 17.3500 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 115.5700 LB/H
Emission Limit 2: 124.4600 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) THE FLARE IS A VOC CONTROL
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: LIME SILO FILTER VENT, DDZ-902
Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0100 LB/H
Emission Limit 2: 0.0100 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) THE FILTER CONTROLS PM10 EMISSIONS
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: LIME SILO FILTER VENT

Process Type: 64.003 (Processes Vents (emissions from air oxidation, distillation, and other reaction vessels))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 3.0000 LB/H

Emission Limit 2: 0.0500 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N) THE FILTER CONTROLS PM10 EMISSIONS

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: SEAL OIL VENTS, OF1SOVENT

Process Type: 64.002 (Equipment Leaks (valves, compressors, pumps, etc.))

Primary Fuel:

Throughput:

Process Notes: ASSUMED HEAVY LIQUID STREAM PUMP SEALS

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 0.3000 LB/H

Emission Limit 2: 0.1000 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: RAILROAD LOADING FUGITIVES, RAILLOAD

Process Type: 64.005 (Transfer of SOCMI Chemicals (loading/unloading, filling, etc.))

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 10.5800 LB/H

Emission Limit 2: 1.1500 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: REGENERATION FURNACE, DB-201

Process Type: 19.600 (Misc. Boilers, Furnaces, Heaters)

Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 2.1000 LB/H

Emission Limit 2: 9.2000 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 0.2000 LB/H

Emission Limit 2: 0.7000 T/YR

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 5.9000 LB/H
Emission Limit 2: 25.6000 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.3000 LB/H
Emission Limit 2: 1.2000 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5

Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.5200 LB/H
Emission Limit 2: 0.1100 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: REGENERATION HEATER, DB-601
Process Type: 19.600 (Misc. Boilers, Furnaces, Heaters)
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.2900 LB/H
Emission Limit 2: 1.2800 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0400 LB/H
Emission Limit 2: 0.1600 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.8100 LB/H
Emission Limit 2: 3.5500 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5

Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0700 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0200 LB/H
Emission Limit 2: 0.0900 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: REGENERATION HEATER, DDB-201
Process Type: 19.600 (Misc. Boilers, Furnaces, Heaters)
Primary Fuel:

Throughput:

Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 5.8500 LB/H
Emission Limit 2: 20.5000 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.1500 LB/H
Emission Limit 2: 0.7000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: 2.1000 LB/H
Emission Limit 2: 9.3000 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.3000 LB/H
Emission Limit 2: 1.2000 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.5000 LB/H

Emission Limit 2: 0.1000 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: REGENERATION HEATER, DDB-601
Process Type: 19.600 (Misc. Boilers, Furnaces, Heaters)
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.2800 LB/H
Emission Limit 2: 1.2300 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0400 LB/H
Emission Limit 2: 0.1500 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.8100 LB/H
Emission Limit 2: 2.8400 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0700 LB/H

Emission Limit 2: 0.0200 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0200 LB/H
Emission Limit 2: 0.0900 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: 2ND STAGE HYDROTREATER FEED HEATER, J-1
Process Type: 19.600 (Misc. Boilers, Furnaces, Heaters)
Primary Fuel:
Throughput:
Process Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.5800 LB/H
Emission Limit 2: 2.5300 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0800 LB/H
Emission Limit 2: 0.0200 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.1200 LB/H

Emission Limit 2: 0.5300 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0700 LB/H
Emission Limit 2: 0.3000 T/YR
Standard Emission: NOT AVAILABLE
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0200 LB/H
Emission Limit 2: 0.1000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A

Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: FURNACE EMISSION CAPS FOR 30 EMISSION POINTS

Process Type: 19.600 (Misc. Boilers, Furnaces, Heaters)

Primary Fuel:

Throughput:

Process Notes: INCLUDES OLEFINS FURNACES (EPNS: DB-101A&B, DB-101C&D, DB- 102A-D, DB-103-9, DDB-105, DDB-101A-D AND DDB-102A-D) AND LIQUID FURNACES (EPN'S DDB-104-A&B)

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 25.5400 LB/H CAP PRIOR TO 3/31/04
Emission Limit 2: 111.8600 T/YR CAP PRIOR TO 3/31/04
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: ADDITIONAL CAPS: 28.55 LB/H, 125.04 T/YR FROM 3/31/04 TO 6/30/06, 32.65 LB/H, 143.00 T/YR AFTER 6/30/06

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 18.4800 LB/H CAP PRIOR TO 3/31/04
Emission Limit 2: 80.9500 T/YR CAP PRIOR TO 3/31/04
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: ADDITIONAL CAPS: 20.66 LB/H, 90.49 T/YR FROM 3/31/04 TO 6/30/06, 23.63 LB/H, 103.49 T/YR AFTER 6/30/06

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 164.8000 LB/H CAP PRIOR TO 3/31/04
Emission Limit 2: 721.8200 T/YR CAP PRIOR TO 3/31/04
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: ADDITIONAL CAPS: 184.22 LB/H, 806.90 T/YR FROM 3/31/04 TO 6/30/06, 200.78 LB/H, 879.41 T/YR AFTER 6/30/06

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 48.0000 LB/H CAP PRIOR TO 3/31/04

Emission Limit 2: 10.5100 T/YR CAP PRIOR TO 3/31/04
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: ADDITIONAL CAPS: 53.66 LB/H, 11.75 T/YR FROM 3/31/04 TO 6/30/06, 61.37 LB/H, 13.44 T/YR AFTER 6/30/06

POLLUTANT NAME: Ammonia (NH3)
CAS Number: 7664-41-7
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: LB/H CAP PRIOR TO 3/31/04
Emission Limit 2: T/YR CAP PRIOR TO 3/31/04
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: Other Case-by-Case
Other Applicable Requirements:
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: ADDITIONAL CAPS: 11.93 LB/H, 52.25 T/YR FROM 3/31/04 TO 6/30/06, 27.47 LB/H, 120.33 T/YR AFTER 6/30/06

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 512.1600 LB/H CAP PRIOR TO 3/31/04
Emission Limit 2: 2243.2600 T/YR CAP PRIOR TO 3/31/04
Standard Emission: 0.0500 LB/MMBTU COMBINED

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: Other Case-by-Case

Other Applicable Requirements:

Control Method: (B) SCR, LOW NOX BURNERS

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes: NOX ADDITIONAL CAPS: 401.91 LB/H, 1760.37 T/YR FROM 3/31/04 TO 6/30/06, 284.70 LB/H, 1246.99 T/YR, AFTER 6/30/06

Process/Pollutant Information

PROCESS NAME: TANK EMISSION CAPS FOR 9 EMISSION POINTS

Process Type: 64.004 (Storage Tanks (SOCMI only - also see 42.001-42.999 and 62.020))

Primary Fuel:

Throughput:

Process Notes: SOURCES: AF-1101, AF-1102, AF-1901 THRU AF-1904, AF-3101, AF-3102, AF-3901

POLLUTANT NAME: Ethyl Benzene

CAS Number: 100-41-4

Test Method: Unspecified

Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Organic Non-HAP Compounds , Volatile Organic Compounds (VOC))

Emission Limit 1: 0.0200 LB/H CAP

Emission Limit 2: 0.0300 T/YR CAP

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: MACT

Other Applicable Requirements: MACT

Control Method: (N) NONE INDICATED

Est. % Efficiency:

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Benzene

CAS Number: 71-43-2
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Organic Non-HAP Compounds , Volatile Organic Compounds (VOC))
Emission Limit 1: 0.7400 LB/H CAP
Emission Limit 2: 2.2900 T/YR CAP
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Toluene
CAS Number: 108-88-3
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))
Emission Limit 1: 0.1500 LB/H CAP
Emission Limit 2: 0.3200 T/YR CAP
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Hexane
CAS Number: 110-54-3
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))

Emission Limit 1: 0.4100 LB/H CAP
Emission Limit 2: 1.4700 T/YR CAP
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Styrene
CAS Number: 100-42-5
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0100 LB/H CAP
Emission Limit 2: 0.0200 T/YR CAP
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: o-Xylene
CAS Number: 1330-20-7
Test Method: Unspecified
Pollutant Group(s): (Hazardous Air Pollutants (HAP) , Organic Compounds (all) , Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0800 LB/H
Emission Limit 2: 0.1000 T/YR
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: MACT
Other Applicable Requirements: MACT
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 11.0600 LB/H CAP
Emission Limit 2: 45.1800 T/YR CAP
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: N/A
Other Applicable Requirements: NSPS
Control Method: (N) NONE INDICATED
Est. % Efficiency:
Compliance Verified: Unknown
Pollutant/Compliance Notes: