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COKER ADDITION RESID FEEDSTOCK TANKAGE - SUMMARY

LCRC (Lyondell-Citgo Refining Company)		**- Houston,**	
- Permits:	- November, 1996 - Delayed Coker		
	- April, 1998 - Crude Unit		
- Coker:	- New Delayed Coker	45	
	- New Crude Unit	100	
- Vacuum Resid Storage:	**- No new resid storage included in either new Delayed Coker or new Crude Unit permits.**		
DEER PARK REFINING (Shell / PEMEX Joint Venture)		**- Deer Parl**	
- Permit:	- December, 1992		
- Coker:	- New Delayed Coker	63	
- Vacuum Resid Storage:	**- "...Intermediate tankage is not affected."**		
- Permit:	- March, 1999		
- 2nd Coker Upgrade:	- Increase Coker capacity to 85 MBPD	22	
- Vacuum Resid Storage:	**- "...permit ... will incorporate 47 existing grandfathered storage tanks."**		
PHILLIPS 66 COMPANY		**- Sweeney**	
- Permit:	- March, 2000		
- Coker:	- New Delayed Coker	58	
- Vacuum Resid Storage:	- Revise Existing Tank 418 Throughput	**386**	
	- Days of Resid Storage:	**6.7**	
PACC (Port Arthur Coker Company / Premcor / Clark / Chevron)		**- Port Arth**	
- Permit:	- April, 1999; October, 2000		
- Coker:	- New Delayed Coker	80	
	- *Shut down two existing Coker Units*		
- Vacuum Resid Storage:	- Convert Existing Tank 108 to Coker Feed Service	**175**	
	- *Convert Existing Tank 109 to Coker Feed Service*	**175**	
	- Days of Resid Storage:	**4.4**	
SHELL MARTINEZ		**- Texas Ci**	
- Permit:	- May, 1993		
- Coker:	- New Delayed Coker	24.2	
- Vacuum Resid Storage:	- Delayed Coking Unit Feed Tank	**150**	
	- Days of Resid Storage:	**6.2**	

FEDERAL ENERGY REGULATORY COMMISSION
Docket No. OR89-2-016
Hearing Ex. No. WAP-94
Date Identified 11-7-02
Date Admitted 11-21-02

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COKER ADDITION RESID FEEDSTOCK TANKAGE - SUMMARY

VALERO REFINING COMPANY		- Texas C
- Permit:	- October, 2001	
- Coker:	- New Delayed Coker	45
- Vacuum Resid Storage:	- Convert Existing Tank 496 to Coker Feed Service	100
	- Convert Existing Tank 517 to Coker Feed Service	150
	- Days of Resid Storage:	5.6

Sources:

Texas Commission on Environmental Quality ("TCEQ", formerly Texas Natural Resource Conservation Co "TNRCC"), Contra Costa County, Jenkins, Shell website, Valero website, Premcor website.

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Lyondell, Citgo join for heavy oil upgrade project at Houston refinery

Anne K. Rhodes *Refining/Petrochemical Editor*

Lyondell-Citgo Refining Co. Ltd. is beginning an $800-million upgrade and expansion of its Houston refinery. The project will enable the refinery to produce clean fuels while processing about 80% heavy, high-sulfur Venezuelan crude oil.

Lyondell Petrochemical Co. and Citgo Petroleum Corp., a subsidiary of Venezuela's state-owned company Petroleos de Venezuela S.A., formed the venture to conduct a major upgrade, provide a long-term crude supply for Lyondell-Citgo, and provide a long-term product supply for Citgo. Start-up of the new facilities is scheduled for year-end 1996.

Houston refinery

The 265,000 b/d refinery is a full-conversion plant with facilities for fluid catalytic cracking (FCC), coking, catalytic reforming, sulfur recovery, and hydrotreating. Lyondell Petrochemical contributed these assets to the venture, while Citgo contributed most of the capital to fund the expansion.

Lyondell-Citgo is currently owned 90% by Lyondell and 10% by Citgo. When the heavy-oils project comes on stream, however, Citgo's share will increase to about 35%. Citgo can increase its share to 50% after the expansion, and has expressed its intention to do so, said William E. Haynes, president and chief executive officer of Lyondell-Citgo.

Lyondell-Citgo comprises three business units: refined products, lubricating oils, and aromatics. In addition to transportation fuels, the refinery produces:

- Lubricating base and finished stocks for use in naphthenic and paraffinic industrial and automotive lubes
- Benzene, toluene, and para and ortho-xylene
- Food-grade oils and other specialty products.

Citgo is marketing most refined oducts from the refinery (gasoline, .iesel, and jet/kerosine) in the U.S. The refinery's heavy crude supply contract is with Lagoven S.A., a subsidiary of Petroleos de Venezuela. Since its July 1993 start, the venture company has already seen increased profits from the processing of heavy oil, said Haynes.

The refinery processes about 40,000 b/d of West Texas Intermediate (WTI) or equivalent crude, which is used to produce the lube oil cuts. About 130,000 b/d of 22° API Venezuelan crude, called BCF22, is also processed.

After the expansion, 200,000 b/d of BCF17—a 17° API Venezuelan crude—will be processed.

Because the refinery produces aromatics and is integrated with Lyondell Petrochemical's Channelview, Tex., ethylene plants, which also produce gasoline components, it is in a good position to produce reformulated fuels. Benzene is extracted from the refinery's gasoline stream, so the company is already producing gasoline containing less than 1 vol % benzene. In fact, this past winter, the plant produced about 25,000 b/d of oxygenated gasoline, said Haynes.

The expansion project is expected to enable Lyondell-Citgo to oxygenated about 75% of its gasoline and produce 100% low-sulfur diesel.

Expansion project

The Houston refinery operates three crude distillation units:

- A 6,000 b/d still for processing naphthenic crudes (The front-end and resid from this unit go to fuels production.)
- A 40,000 b/d still for processing paraffinic crudes for lubes production
- An 80,000 b/d still for intermediate-quality crude (This unit produces low-sulfur resid.)
- A 140,000 b/d still which processes BCF22 and fills the coker.

The intermediate still will be replaced with a new crude unit, resembling the existing 140,000 b/d unit.

The accompanying flow diagram of the refinery indicates existing units, units slated fo revamp, and units to be added. The major additions include:

- A 100,000 b/d crude distillation unit, including a vacuum tower and desalter.
- A 45,000 b/d low-pressure, low-recycle, delayed coker to produce ab 2,800 tons/day of shot coke.
- A 45,000 b/d gas oil hydrotreate desulfurize and denitrogenate addi al FCC feed.
- A 235 long tons/day sulfur-reco plant.

John Yoars, vice-president, manu turing for Lyondell-Citgo, says th units will create essentially a seco parallel processing train at the refiner

The catalytic cracker feed hydrotre ing process reduces FCC sulfur em sions, improves unit conversion, an reduces gasoline sulfur content.

Although the refinery currently hy drotreats about 75% of its FCC feed, th additional hydroprocessing capacity will aid efforts to produce about 100,00 b/d of low-sulfur diesel fuel. (The pl now produces about 70,000 b/d of hig er-sulfur diesel.)

The Houston refinery typically ope ates two reformers: A benzene/tol reformer and a "Magnaformer high-end-point reformer that prod xylenes. A third unit is brought on when the other two are down, or low-cost reformer feed is availab

Because these reformers produ lot of hydrogen, and because the ery is integrated with Lyondell's chemical plant across the Housto channel, no major hydrogen de expected.

Currently, incremental, or hydrogen needs are supplied b Products & Chemicals Inc.'s Gulf hydrogen pipeline. Additional gen supply from a third party required after the expansion, acc to Yoars.

No modifications to shipping o age facilities will be required to the new crude. Transportation the refinery is facilitated by the co ny's practice of keeping invento minimum levels, said Yoars.

Technologies

The new units will utilize co industry technologies:

- Hydrotreating—UOP, Des Pl Ill
- Coking—Foster Wheeler, Cli

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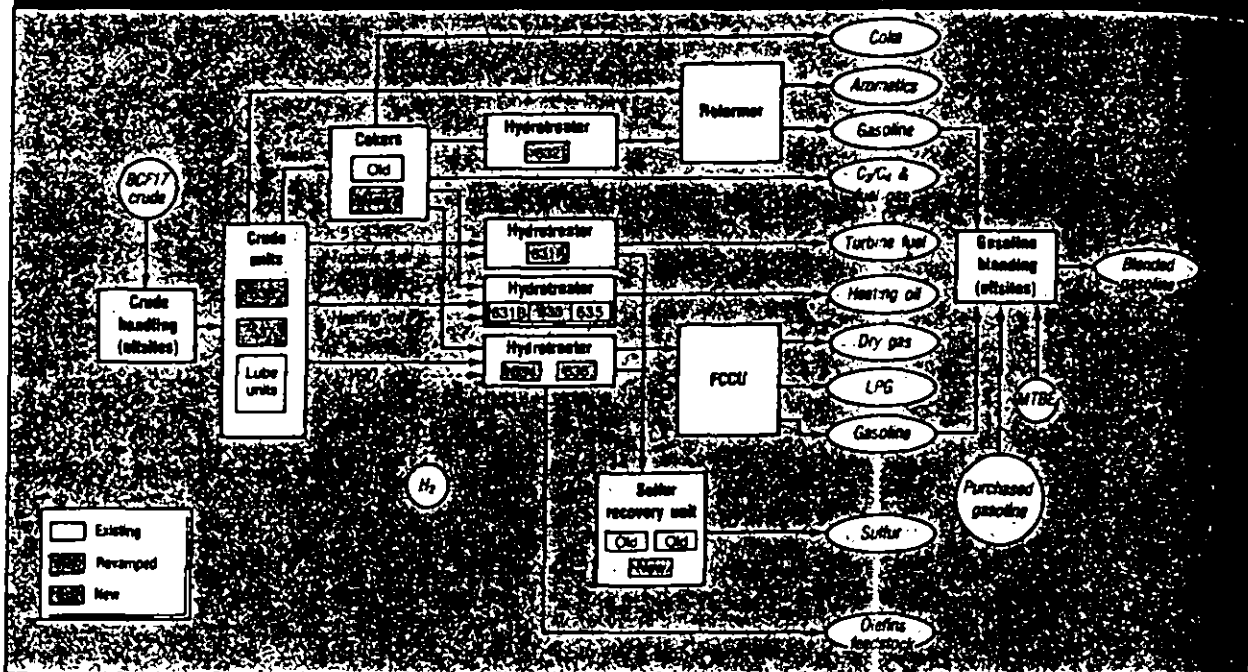
EXPANDED REFINERY PROCESSING SCHEME



N.J.

- Crude distillation—KBC Advanced Technologies Ltd., Weybridge, England.
- Sulfur recovery—Pritchard Corp., Overland Park, Kan.

The sulfur plant will include amine contacting, sour water stripping, and the potential for oxygen enrichment.

Operational changes

One of the project's primary goals is to fully convert 17° API crude without dependence on outside sources for feedstocks to dilute the negative effects of processing the crude, says Lavergne.

Venezuelan BCF17 crude is high in ring-structure species and nitrogen. The crude is also high in metals—especially vanadium—and has poor diesel quality, in terms of gravity and cetane index.

The increased nitrogen content will produce additional ammonia in the wash water, says Lavergne. The combustion chambers in the new Claus units, however, will help mitigate the problem.

BCF17 is also high in naphthenic acid content, which can cause corrosion (OGJ, Feb. 28, p. 31). Metallurgy in parts of the existing still will be upgraded to 317L stainless steel cladding, according to Lavergne. The new crude unit also will contain appropriate corrosion-resistant metallurgy.

The incremental resid production will be pumped off of the still, to unload the column. In addition, according to Lavergne, the tower will be operated in "deep-cut" mode, which will produce more gas oil and less lower-value resid.

The refinery's integration with Lyondell's Channelview petrochemical plant gives it flexibility in its processing options. It now sends about 15-20,000 b/d of low-octane paraffins to Channelview for use as steam cracker feedstock. It also receives streams, including feedstocks for the benzene/toluene reformer and pyrolysis gasoline, from the Channelview plant.

The refinery purchases about 20,000 b/d of gas oil as FCC feed. After the expansion, however, it will no longer need to exercise this option, says Yoars.

The upgrade will cause little change in the refinery's light products slate. Gasoline production will remain about the same, kerosine production will decrease slightly, and diesel output will increase slightly.

Likewise, very little low-sulfur resid will be produced. But because the heavier crude slate will produce more bottoms, coke production will essentially double.

As marketer of the refinery's products, Citgo will market the additional coke. The refinery, however, is looking to cogeneration facilities as a possible market for the coke.

(Lyondell-Citgo is involved in a cogeneration project, separate from the expansion, with AES Deepwater Inc. The refinery sends about half of its coke production to AES, who, in turn, supplies the refinery with additional steam.)

Where the existing coker is drilled [...] a railcar, the new coker will be drill[...] a pit. Coker gas oil production als[...] increase.

Two new cooling towers will be [...]quired for the expansion: one as pa[...] the coker and one as part of the su[...] plant.

The cooling tower for the exist[...] 80,000 b/d crude unit will be la[...] enough to cover the new, larger [...] that will replace it.

The refinery imports methyl ter[...] butyl ether (MTBE) from Lyondell [...]rochemical's Channelview facil[...] Lyondell-Citgo plans to oxygen[...] about 75% of its gasoline after the [...]vamp, says Yoars.

As a testament to the deep-cut [...]version capability of the revamped [...]finery, its gasoline and diesel pro[...]tion will be about 75% on crude, a[...] the same as it is today.

Other projects

Several projects not directly relat[...] the heavy oil upgrade are under [...]

- The preheat section of the la[...] crude still was improved to increa[...] feed capacity.
- Three of the six existing hyd[...]treaters will be revamped to a [...] degree. Of these, the only signif[...] revamp is the upgrade of the disti[...] (diesel) hydrotreater, which will [...] modified to reduce sulfur and [...] cetane and gravity specifications.
- Tank mixing systems are being [...]

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Lyondell-Citgo Refining Co. Ltd. is beginning an $800-million upgrade and expansion of its Houston refinery on the ship channel to enable it to process about 85% heavy (17° API) Venezuelan crude oil.

graded.

- The existing coker has been optimized.
- A reformulated fuel blending experiment will be finished this fall.

Revamps to existing crude and hydrotreating units are being fitted into the plant's turnaround schedule, says Yoars.

The refinery has essentially all of the utilities it will need to operate the new units. Electric motor usage will be optimized and no new boilers or steam-production facilities will be needed. (Incidentally, the refinery, at one time, ran more than 300,000 b/d of crude, indicating that surplus utilities are available.) Two examples of how the steam balance will be affected are:

- The heavier crude will produce less light-ends, which will enable the refinery to reduce steam usage in gas-plant separation columns.
- The heat balance on the FCCU will require the removal of high-level heat from the FCC hydrotreater gas oil product by generating high-pressure steam.

Environment

Lyondell-Citgo has filed environmental permit applications and anticipates receiving the permits in mid-1994. These permits have some general provisions in common: for example, continuous emissions monitoring. But each permit also will have provisions specific to that unit. Until the permitting phase is complete, these specifics will not be known precisely.

To facilitate the permitting process, the refinery is communicating face-to-face with Texas authorities whenever possible (rather than through the mails), says environment manager Janice Hiroms.

The project is covered by the U.S. Environmental Protection Agency's prevention of significant deterioration (PSD) regulations. The PSD regulation is concerned with net changes in emissions of five criteria pollutants. Because the heavy-oils upgrade project has not exceeded those levels, no PSD-type permits will be required. This is called, "netting out," says Faheem Kazimi, health, safety, and environment supervisor, expansion project.

Emissions

Lyondell-Citgo is designing the expansion with existing and anticipated environmental requirements in mind. Best available control technology—including such items as enclosed relief valves and low-NO_x burners—will be employed for all new and modified units, says Hiroms. The specialized burners will be used on all fired units, new and revamped.

All waste waters will be segregated and handled according to four classifications, says Kazimi: Benzene NESHAP, oily water, contaminated storm water, and uncontaminated storm water.

All of the equipment associated with the new units will be tied to a closed flare-header system, thus eliminating atmospheric emissions. Also included in the project will be analyzers on the stack heaters, as required.

All of the waste water from the new units will be hard-piped and pumped to the water treatment area. All streams will have to be separated and sent to the existing benzene stripper to comply with national emissions standards for hazardous air pollutants (Neshap), said Lavergne.

The sulfur plant will be built with 75% redundant capacity, according to Hiroms. The company is upgrading the existing sulfur plant to the same specifications.

Among other sulfur-plant controls will be instrumentation to control the Claus beds and ensure the proper H_2S-to-SO_2 ratio.

The refinery has a waste minimization team that looks for opportunities to eliminate, minimize, or recycle waste. Included in this effort is the effort to recycle as much water as possible within the refinery. For example, coker water is filtered, then recycled for quenching.

The team is looking for similar opportunities for solid wastes, says Hiroms

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1994 OGJ SPEC

yondell-Citgo is evaluating reprocessing sludges in the coker. The company also is continuing to expand its program for collecting and reprocessing used automotive lubricants (OGJ, Feb. 17, 1992, p. 27).

The refinery has an internal program for monitoring fugitive emissions, says Siroms, that exceeds federal and state requirements. Using a 500 ppm leak-detection limit, all benzene point sources are tested for leaks monthly. Leaking components must be repaired within 15 days or placed on a shut-down list.

Sources of volatile organic compounds are checked quarterly. Although a 10,000 ppm limit is allowed, the refinery is instituting a new program with a 500 ppm detection limit.

Existing projects

Several environmental projects, not directly related to the upgrade, are under way at the refinery:

- Compliance with the benzene Neshap regulation was completed on schedule.
- Installation of systems for recovering vapors from dock-loading facilities are under way.
- A wet-gas scrubber is being installed on the FCCU during a scheduled turnaround, and will be complete in late 1994.

Construction

The company has completed the conceptual engineering phase of the upgrade and signed the technology agreements, and is well into the engineering and procurement stage.

The process design phase will be finished in about 1 month. Then all of the project will be in the detail-engineering phase.

A materials-management program is being instituted to maintain the construction schedule, protect the materials from damage and theft, and reduce costs.

The first major construction—revamp of the existing crude unit—is scheduled to begin in October. The remaining revamps will be completed later in 1995, says Youel Baaba, vice-president and project director of the refinery expansion project.

The majority of the construction on the revamp unit will be finished at the end of first quarter 1995. Labor requirements will peak at about 3,000 during construction, says Baaba.

Safety goals for the construction are:

- Less than two OSHA recordable incidents for the entire project
- No loss-of-work days.

The construction project is constrained by space limitations. The refinery is seeking to lease 50-60 acres outside battery limits.

Mechanical completion of the expansion is scheduled for third quarter 1996. The order of construction of major units is:

1. Sulfur plant
2. Crude distillation unit
3. Hydrotreater
4. Coker.

Commissioning, start-up, and 100% operation of all new units should occur by year-end 1996.

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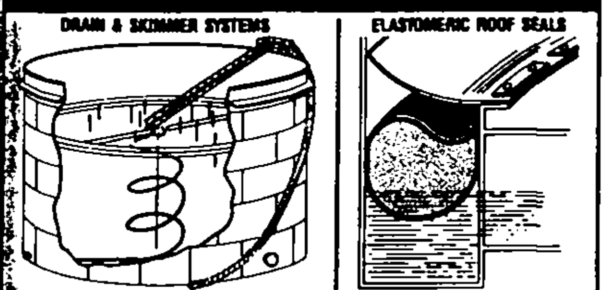

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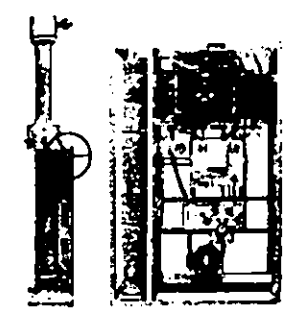

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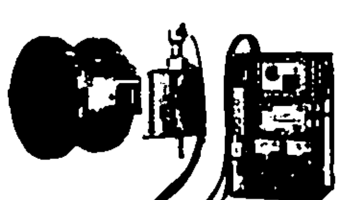

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John M. Baker, *Commissioner*
Dan Pearson, *Executive Director*

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

November 1, 1996

Mr. Barry C. McCormick
Senior Environmental Engineer
Lyondell-Citgo Refining Company Ltd.
P.O. Box 2451
Houston, Texas 77252-2451

Re: Permit Alteration
Permit No. 23551
737 Delayed Coker Unit
Houston, Harris County
Account ID No. HG-0048-L

Dear Mr. McCormick:

This is in response to your letter dated August 30, 1996, requesting alteration of the conditions and maximum allowable emission rates table (MAERT) of the referenced permit. We understand that the two Unit 737 Coker Heaters will utilize a common emission stack and that you are changing the numbers for all the emission points covered under this permit. We also understand that there will be no change to the heater firing rates so there will not be any net increase in emissions from your plant.

Pursuant to the authority conferred under Section 382.0511(b) of the Texas Clean Air Act, Texas Health and Safety Code, Chapter 382, and 30 TAC Section 116.116(c) (Regulation VI), Permit No. 23551 is altered. The altered permit conditions and MAERT are enclosed. Please attach these to your permit.

Your cooperation in this matter is appreciated. If you have further questions, please contact Mr. Patricio L. Griego of our Office of Air Quality, New Source Review Division at (512) 239-1080.

Sincerely,

for Victoria J. Hsu
Dan Pearson
Executive Director

DP/PG/sl

Enclosures

cc: Ms. Karen Atkinson, Air Program Manager, Houston
Mr. Rob Barrett, Director, Harris County Pollution Control Department, Pasadena
Mr. Manuel Aguirre, P.E., Bureau Chief, Bureau of Air Quality Control, Health and Human Services Department, Houston

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit No. 23551

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

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY
737-HEAT	Heater F001 and Heater F002	PM_{10}	5.78	23.00
		VOC	1.17	4.68
		CO	18.98	53.00
		NO_x	25.4	100.80
		SO_2	10.64	21.20
737-CT	Cooling Tower	VOC	0.546	1.99
737-CL	Coke Loading	PM_{10}	0.09	0.37
737-CP	Coke Pit	PM_{10}	0.03	0.15
737-FUG	Fugitives (4)	VOC	3.12	13.67
		H_2S	0.02	0.08

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.
(2) Specific point source name. For fugitive sources use area name or fugitive source name.
(3) VOC - volatile organic compounds as defined in General Rule 101.1
NO_x - total oxides of nitrogen
SO_2 - sulfur dioxide
PM_{10} - particulate matter 10 microns or less in diameter
CO - carbon monoxide
H_2S - hydrogen sulfide
(4) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate.

* Emission rates are based on and the facilities are limited by a maximum operating schedule of 8,760 hours per year.

Dated 11-1-96

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LYONDELL-CITGO REFINING COMPANY LTD
HOUSTON REFINERY

PERMIT AMENDMENT APPLICATION
737 DELAYED COKER UNIT
PERMIT NO. 23551

February 9, 1996

G&M Project No. AT0694.001

Prepared For

LYONDELL-CITGO REFINING COMPANY LTD
Houston, Texas

Prepared By

GERAGHTY & MILLER, INC.
5608 Parkcrest Drive, Suite 300
Austin, Texas 78731
(512) 451-1188

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PERMITS PROGRAM

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3.0 <u>TNRCC TABLE 1(a)</u>

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PERMITS PROGRAM

PERMIT NO. 23651 PERMIT TYPE: CONSTRUCTION ( ) AMENDMENT (X) REVISION ( ) RENEWAL ( )

ACCOUNT ID # HG-0046-L

TABLE 1(a)

EMISSION SOURCES

PAGE 1 OF 1

DATE: 02/06/96

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

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM		AIR CONTAMINANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (6)			SOURCE HEIGHT ABOVE GROUND	SOURCE HEIGHT ABOVE STRUCT.	STACK SOURCES (7) EXIT DATA			FUGITIVE SOURCES (8)	
NUMBER	NAME	COMPONENT OR AIR CONTAMINANT NAME (2)	CONC. (%v) (3)	lb/HR (4)	TONS/YEAR (5)	ZONE	EAST (meters)	NORTH (meters)	(ft.)	(ft.)	DIA. (ft.)	VEL. (fps)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
F77-F001	Heater F001	PM-10		[illegible]	[illegible]	15	283,250	3,288,892	200		11.30	9.9	400		
		VOC		[illegible]	[illegible]	Don't change									
		NOx		12.66	50.42										
		CO		9.49	26.46										
		SO2		5.32	10.59										
F77-F002	Heater F002	PM-10		[illegible]	[illegible]	15	283,250	3,288,892	200		11.30	9.9	400		
		VOC		[illegible]	[illegible]	Don't Change									
		NOx		12.66	50.42										
		CO		9.49	26.48										
		SO2		5.32	10.50										
F77-CT	Cooling Tower 1	Alkanes, Alkenes, Aromatics		0.55	1.99	15	283,224	3,288,877						43	16
F77-CL	Coke Loading	TSP		0.06	0.25	15	283,224	3,288,877						21	21
		PM10		0.03	0.12										
F77-CP	Coke [illegible]	TSP		0.02	0.10	15	283,224	3,288,877						200	100
		PM10		0.01	0.05										
F77-FUG	Fugitives	Alkanes, Alkenes, Aromatics		3.12	13.67	15	283,224	3,288,877						516	456
		H2S		0.02	0.08										
		Benzene		0.01	0.03										

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5.0 PROCESS DESCRIPTION

5.1 GENERAL PROCESS DESCRIPTION

The 737 Coker Unit is designed to convert asphaltic tars to more valuable intermediate products. Products include petroleum coke, heavy gas oil (HGO), light gas oil (LGO), naphtha, mixed C_4's, mixed C_3's, and dry gas.

5.2 PROCESS FLOW DESCRIPTION

The 737 Coker Unit will receive an annualized average of 53,400 barrels per day from the 536 and 537 Crude/Vacuum Units. Coker Unit feed is preheated by exchange before entering the bottom of the fractionator column. The fractionator bottoms stream is heated in two parallel heaters and routed to two of four coke drums. Overhead vapor from the coke drums is routed back to the fractionator column for separation.

Coke will be removed by high pressure water jets using recirculated water. The wet coke and decoking water fall from the bottom of the drum to a coke pit. A bridge crane transports coke from the coke pit to waiting railcars which transport the coke off-site. The loading area wash down system, which consists of three grade mounted monitors with hose connections supplied from the cutting water system, will control any railcar loading particulate emissions which may be generated.

Blowdown system equipment will handle the steam and hydrocarbons leaving the drum during the quench cycle. Vapors enter the blowdown scrubber where water and hydrocarbons are separated. Recovered hydrocarbon bottoms are pumped to the fractionator. Vapors from the blowdown scrubber are cooled and routed to a settling drum. Noncondensibles from the settling drum are sent to the fuel gas system. Water from the settling drum will be recycled,

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and hydrocarbon will be routed back to the fractionator column. Design of the blowdown system results in a completely closed system.

LGO and HGO are drawn as side streams from the fractionator column. Stripped LGO and HGO are routed to the HDS Unit. The overhead vapors from the fractionator column are cooled before entering the overhead accumulator. Liquid hydrocarbon is refluxed to the fractionator column and/or routed to the absorber stripper column. Noncondensed vapors are compressed and processed through the gas concentration system. Sour water from the overhead accumulator is routed to the sour water system.

The gas concentration system consists of an absorber stripper, debutanizer, depropanizer, and two scrubber columns. After compression, the vapors enter the absorber stripper column. The absorber stripper bottoms enters the debutanizer column. The absorber stripper overhead vapors enter the sponge oil absorber.

The absorbent leaves the bottom of the sponge oil absorber and returns to the fractionator. Vapor leaves the top of the sponge oil absorber and enters the tail gas scrubber where diethanolamine (DEA) absorbs H_2S in the gas. Rich amine (DEA with absorbed H_2S) leaves the bottom of the column and is routed to the Amine Treating Units (ATUs) in the Sulfur Complex. Dry gas from the scrubber enters the fuel gas system.

The debutanizer column removes C_4 and lighter hydrocarbons from the absorber stripper bottoms. Overhead vapors are cooled before entering an accumulator. Vapors from the accumulator are routed to the fuel gas system, and the condensate enters the depropanizer column. Naphtha product leaves the bottom of the column and is routed to the HDS Unit.

The depropanizer column separates C_3 and C_4 hydrocarbons. Mixed C_4's are drawn off the bottom of the depropanizer column and sent to the Butane Recovery Unit. The mixed C_3 stream goes overhead and is cooled before flowing into an accumulator. Noncondensibles

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from the accumulator vent to the fuel gas system. The liquid stream from the accumulator enters the C_3 scrubber column for H_2S removal. Same

Lean DEA enters the top of the C_3 scrubber and leaves the bottom with absorbed H_2S. The DEA stream is then routed to the ATUs in the Sulfur Complex. The mixed C_3 product exits the top of the column and is sent to the Butane Recovery Unit.

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FIGURE 5-1

737 COKER UNIT PROCESS FLOW DIAGRAM

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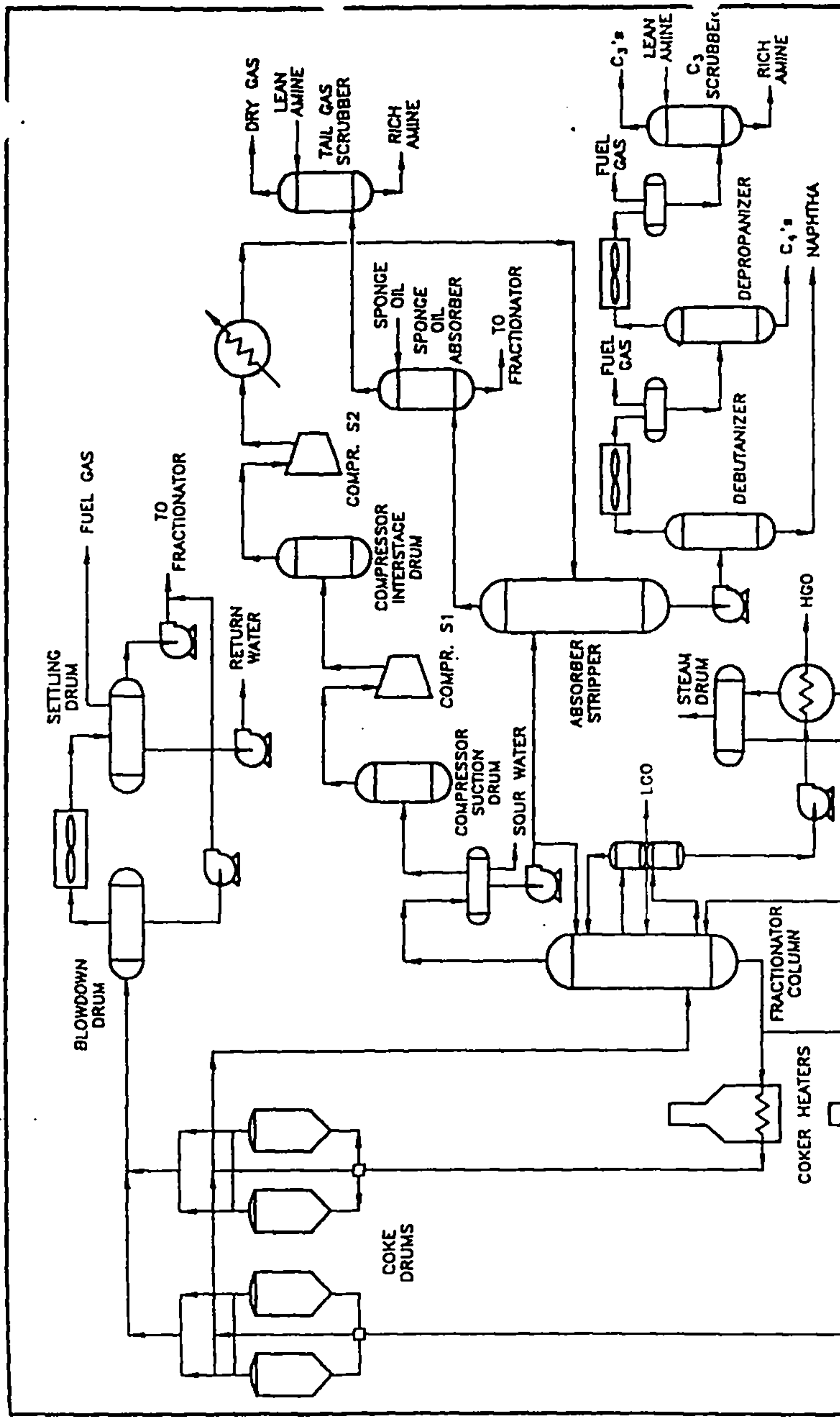

FIGURE 5–1
NEW DELAYED COKER UNIT
PROCESS FLOW DIAGRAM
LYONDELL/CITGO REFINING CO.

JN JONES AND NEUSE, INC.
Environmental and Engineering Services

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6.0 EMISSION BASIS DISCUSSION

Products of combustion are released from two heaters at the Coker Unit. Fugitive VOC emissions are released from the cooling tower.

Emission factors utilized to calculate the heater and, fugitive emission rates are addressed in this section. Emission rates are summarized in Table 1(a) in Section 3.0, while the emission calculations are presented in Appendix B.

6.1 HEATERS

Emission factors from "AP-42 (5th Edition) Tables 1.4-1, 2, and 3" were utilized to calculate emissions of particulates (PM_{10}) and non-methane volatile organic compounds (VOC). Short term CO emissions are based on the burner manufacturer guaranteed maximum concentration of 50 ppmv, and annual CO emissions are based on 70 percent of this guaranteed factor. Nitrogen oxide (NO_x) emissions were calculated from the design specification for low-NO_x burners of 0.06 lb/MMBTU. Annual sulfur dioxide (SO_2) emission calculations are based on a maximum hydrogen sulfide (H_2S) concentration of 80 ppm (volume) in the fuel gas. Short term SO_2 emissions are based on the NSPS Subpart J limit of 160 ppmv. Charge heater and reboiler emission rates are based on firebox maximum absorbed duty design (corrected for absorbed duty efficiency).

6.2 COOLING TOWER

Cooling tower emissions are calculated from the 5th Edition of AP-42 Section 5.1. The cooling water will be monitored; therefore, a controlled emission factor of 0.7 pounds per million gallons of cooling water was used to estimate fugitive VOC emissions from the cooling tower.

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8.0 CONSIDERATIONS FOR GRANTING A PERMIT

As required by Item VIII of the TNRCC PI-1 permit application form, this section addresses the assurance of regulatory compliance by the proposed facility. The requirement contained in TNRCC Rule 116.111(1), Consideration for Granting a Permit to Construct, states:

> "The emissions from the proposed facility will comply with all rules and regulations of the TNRCC and with the intent of the Texas Clean Air Act (TCAA), including protection of the health and physical property of the people."

As outlined in the following evaluation, the emissions from the 737 Coker Unit will comply with all rules and regulations of the TNRCC and with the intent of the Texas Clean Air Act, including the protection of the health and physical property of the people.

General Rules

LCR will comply with all requirements of the TNRCC General Rules while operating the 737 Coker Unit. Some notable compliance procedures are summarized below.

101.3

There will not be any use of devices to conceal or appear to minimize the effects of emissions from sources within the LCR facility.

101.4

All emissions from the 737 Coker Unit will be treated by the Best Available Control Technology, and there will not be any emissions of air contaminants or combined emissions that would injure or adversely affect human health or welfare, or affect plant, animal life, or property.

101.5

There will not be any traffic hazards or interference from emissions from this facility.

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<u>112.31-34</u>

The net ground level concentration for H_2S will not exceed 0.12 parts per million averaged over any 30-minute period.

<u>112.41-59</u>

Not applicable to this application.

Regulation III Control of Air Pollution from Toxic Materials

Regulation III does not apply since inorganic fluoride compounds and beryllium are not emitted from the 737 Coker Unit and facilities in the 737 Coker Unit do not include smelters.

Regulation IV Control of Air Pollution from Motor Vehicles

This facility does not maintain a motor vehicle fleet; therefore, this regulation does not apply.

Regulation V *Control of Air Pollution from Volatile Organic Compounds*

<u>115.112-119</u>

The 737 Coker Unit does not include any dedicated storage tanks containing volatile organic compounds; therefore, this regulation does not apply.

<u>115.121-129</u>

The 737 Coker Unit process heater vents are designed/controlled to maintain atmospheric VOC emissions rates below 100 lb/hr in any 24 hour period; therefore, these regulations do not apply. VOC emission calculations from the process heaters are located in Appendix B.

<u>115.131-139</u>

These regulations do not apply since the 737 Coker Unit does not conduct any VOC water separation with atmospheric vents.

<u>115.140-149</u>

LCR will comply with all requirements under this regulation regarding industrial wastewater control requirements in the 737 Coker Unit.

<u>115.152-159</u>

This unit is not a municipal solid waste landfill.

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Mr. Ramin Ansari
Page 2
April 15, 1998

Re: Permit No. 23555

We have enclosed two operations certification forms (Form PI-3A and Form PI-3B). Section 116.110(b) requires you to certify that operations addressed in this permit are in conformance with representations in the permit application. Please file these certifications with both the Texas Natural Resource Conservation Commission (TNRCC) New Source Review Permits Division in Austin and the appropriate TNRCC Regional Office in a timely manner.

Your cooperation in this matter is appreciated. If you have further questions, please contact Mr. Edward Rapier of our Office of Air Quality, New Source Review Permits Division at (512) 239-1174.

Sincerely,

for Dan Pearson
Executive Director
Texas Natural Resource Conservation Commission

DP/ER/bg

Enclosures

cc: Ms. Orbie Ratcliff, Air Section Manager, Houston
Mr. Manuel Aguirre, P.E., Chief, Bureau of Air Quality Control, Health and Human Services Department, Houston
Mr. Rob Barrett, Director, Harris County Pollution Control Department, Pasadena

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit No. 23555

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

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY
537-HC-1	Crude Heater No. 1	PM_{10}	4.29	10.59
		VOC	0.500	1.99
		NO_x	21.3	84.8
		CO	15.9	44.5
		SO_2	8.94	17.8
537-HV-1	Vacuum Heater No. 1	PM_{10}	1.34	3.74
		VOC	0.389	1.55
		NO_x	16.6	65.9
		CO	12.4	34.6
		SO_2	6.96	13.9
FCT-537O	Cooling Tower	**		
FCT-537N	Cooling Tower	**		
FCT-537X	Cooling Tower	**		
***Total emissions from all three cooling towers or any combination of these towers are as follows:*				
	Cooling Towers	VOC	1.32	5.79
537-FUG	Fugitives (4)	VOC	1.05	4.59
		H_2S	<0.01	0.01

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.
(2) Specific point source name. For fugitive sources use area name or fugitive source name.

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

(3) VOC - volatile organic compounds as defined in General Rule 101.1
NO_x - total oxides of nitrogen
SO_2 - sulfur dioxide
PM_{10} - particulate matter 10 microns or less in diameter
CO - carbon monoxide
H_2S - hydrogen sulfide

(4) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate.

* Emission rates are based on and the facilities are limited by a maximum operating schedule of 8,760 hours per year.

Dated April 15, 1998

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LYONDELL-CITGO REFINING COMPANY LTD
HOUSTON REFINERY

PERMIT AMENDMENT APPLICATION
537 CRUDE UNIT
PERMIT NO. 23555

February 9, 1996

G&M Project No. AT0694.001

Prepared For

LYONDELL-CITGO REFINING COMPANY LTD
Houston, Texas

Prepared By

GERAGHTY & MILLER, INC.
5608 Parkcrest Drive, Suite 300
Austin, Texas 78731
(512) 451-1188

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3.0 TNRCC TABLE 1(a)

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PERMIT NO. 23555

ACCOUNT ID # HG-0048-L

PERMIT TYPE: CONSTRUCTION ( ) AMENDMENT (X) REVISION ( ) RENEWAL ( )

TABLE 1(a)

EMISSION SOURCES

PAGE 1 OF 1

DATE: 02/06/96

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

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM		AIR CONTAMINANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (6)			SOURCE HEIGHT ABOVE GROUND	SOURCE HEIGHT ABOVE STRUCT.	STACK SOURCES (7) EXIT DATA			FUGITIVE SOURCES (8)	
NUMBER	NAME	COMPONENT OR AIR CONTAMINANT NAME (2)	CONC. (%v) (3)	#/HR (4)	TONS/ YEAR (5)	ZONE	EAST (meters)	NORTH (meters)	(ft.)	(ft.)	DIA. (ft.)	VEL. (fps)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
537-HC-1	Crude Heater #1	PM-10		0.89	3.54	15	283,893	3,289,076	190		6.5	45.7	300		
		VOC		0.50	1.99										
		NOx		21.28	84.75										
		CO		15.84	44.47										
		SO2		8.94	17.80										
537-HV-1	Vacuum Heater #1	PM-10		0.69	2.75	15	283,893	3,289,076	190		8.75	15.0	400		
		VOC		0.39	1.55										
		NOx		16.56	65.93										
		CO		12.40	34.59										
		SO2		6.96	13.85										
537-FUG	Fugitives	VOC		1.0491	4.5949	15	283,893	3,289,025						350	200
		H2S		<0.01	0.01										
		Benzene		<0.01	<0.01										
FCT-537C	Cooling Tower	VOC		0.59	2.58	15	284,028	3,288,938						55	[illegible]
FCT-537N	Cooling Tower	VOC		0.27	1.20	15	284,087	3,288,901						100	[illegible]
FCT-537X	Cooling Tower	VOC		0.46	2.02	15	283,990	3,288,926						60	[illegible]

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5.0 PROCESS DESCRIPTION

5.1 GENERAL PROCESS DESCRIPTION

The new 537 Crude Unit processes feed oil from initial storage in the tank farm through Crude Distillation Processes to produce intermediate products which are further processed in the refinery. The intermediate products (distillation "draws") from the Crude Distillation Processes include Gasoline, Kerosene, Diesel, Atmospheric Gas Oil, Crude Tower Overhead Vent Gas, Light, Medium and Heavy Vacuum Gas Oils, Vacuum Residuum, and Vacuum Hotwell Vent Gas.

5.2 PROCESS FLOW DESCRIPTION

Process flow diagrams which correspond to the following process description for the 537 Crude Unit are included as Figures 5-1 and 5-2. The 537 Crude Unit will process an annualized average of 115,435 barrels per stream day of feed oil.

Feed oil is pumped from off-site tank storage. Upon entering the 537 Crude Unit, feed oil is preheated by exchanging heat with hot distillation draws from the Crude and Vacuum Towers. The preheated feed oil then enters the desalting operation.

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The desalting operation removes salts from the feed oil through contact with water. Clean and/or recycled water is used to dissolve the entrained salts, and the salty water (brine) is then separated from the feed oil inside the desalters. The desalters operate under pressure and use an electric field to improve the gravity separation of water and feed oil. Wastewater brine drawn from the bottom of the desalters is closed-piped to the benzene NESHAPS wastewater system.

Feed oil leaving the desalter vessels is further heated by exchanging heat with hotter distillation draws from the Crude and Vacuum Towers. Feed oil is further heated in a gas fired Crude Heater equipped with low NOx burners, prior to entering the Crude Tower. The

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Crude Tower can accommodate up to five liquid product draws plus the Vent Gas stream. Hot circulating sidestream draws from the crude tower are heat exchanged with the feed oil, and then returned to the Crude Tower. The liquid product draws from the top to the bottom of the Crude Tower are: Gasoline, Kerosene, Diesel, Atmospheric Gas Oil, and Atmospheric Residuum. Condensed Gasoline is collected in the Crude Tower Overhead Accumulator system and pumped to the Light Ends Fractionation (LEF) system. The non-condensable gases are routed to the refinery low pressure fuel gas system (Low Line). The Kerosene draw from the Crude Tower is pumped through heat exchange with the feed oil before routing to the HDS Unit(s) or tank storage. The Diesel product leaving the Crude Tower is pumped through heat exchange with the feed oil before routing to the HDS Unit(s) or tank storage. The Atmospheric Gas Oil (AGO) draw is pumped through heat exchange with the feed oil, then to the HDS Unit(s) or tank storage. Atmospheric Residuum from the bottom of the Crude Tower is pumped to the Vacuum Tower for further fractionation.

Prior to entering the Vacuum Tower, the Atmospheric Residuum is heated in a gas fired Vacuum Heater equipped with low NOx burners. The Vacuum Tower can accommodate up to five liquid product draws plus the Vent Gas stream. From top to bottom, the liquid product draws from the Vacuum Tower are Hotwell Hydrocarbon Condensate, Light Vacuum Gas Oil (LVGO), Medium Vacuum Gas Oil (MVGO), Heavy Vacuum Gas Oil (HVGO), and Vacuum Residuum. The Vent Gas from the Vacuum Hotwell is routed to the refinery low pressure fuel gas system. Steam condensate from the Vacuum Hotwell is pumped for reuse in the desalters; hydrocarbon condensate from the Vacuum Hotwell is piped back to the front-end of the crude unit and reprocessed with the feed oil. The Light Vacuum Gas Oil, Medium Vacuum Gas Oil and Heavy Vacuum Gas Oil product draws are each passed through separate heat exchange with the feed oil before routing to the HDS Unit(s) or tank storage. The Vacuum Residuum product is drawn from the bottom of the Vacuum Tower and is pumped through heat exchange with the feed oil before routing to the Coker Unit(s) or tank storage.

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FIGURE 5-1

537 CRUDE UNIT PROCESS FLOW DIAGRAM

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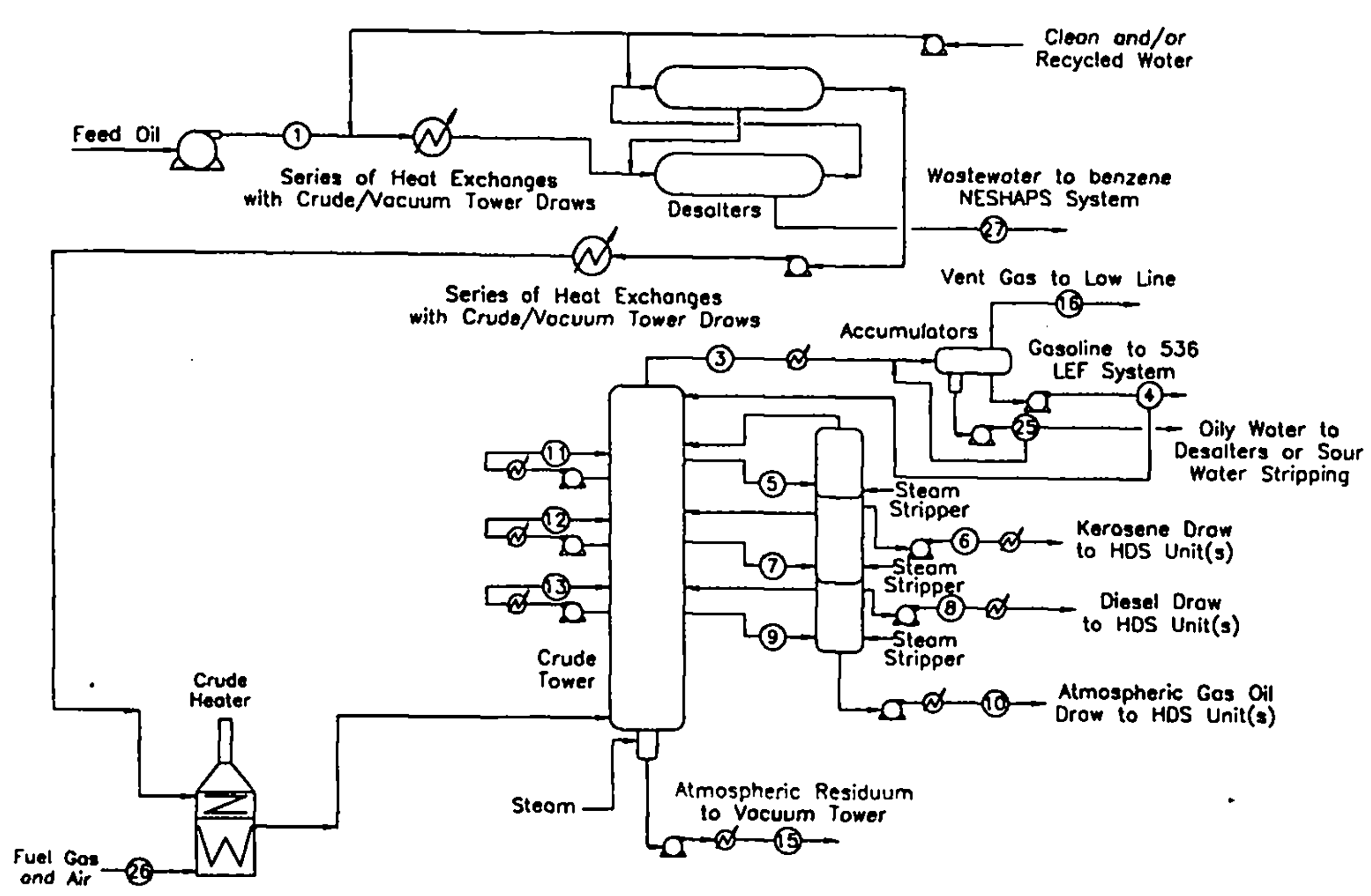

NOTE: The stream numbers correspond to the Fugitive Emission Calculation Summary (Appendix B) and the TNRCC Table 2 – Material Balance (Appendix A).

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PROCESS FLOW DIAGRAM
537 CRUDE UNIT

LYONDELL-CITGO REFINING CO., LTD
HOUSTON, TEXAS

FIGURE
5-1

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FIGURE 5-2

537 CRUDE UNIT PROCESS FLOW DIAGRAM

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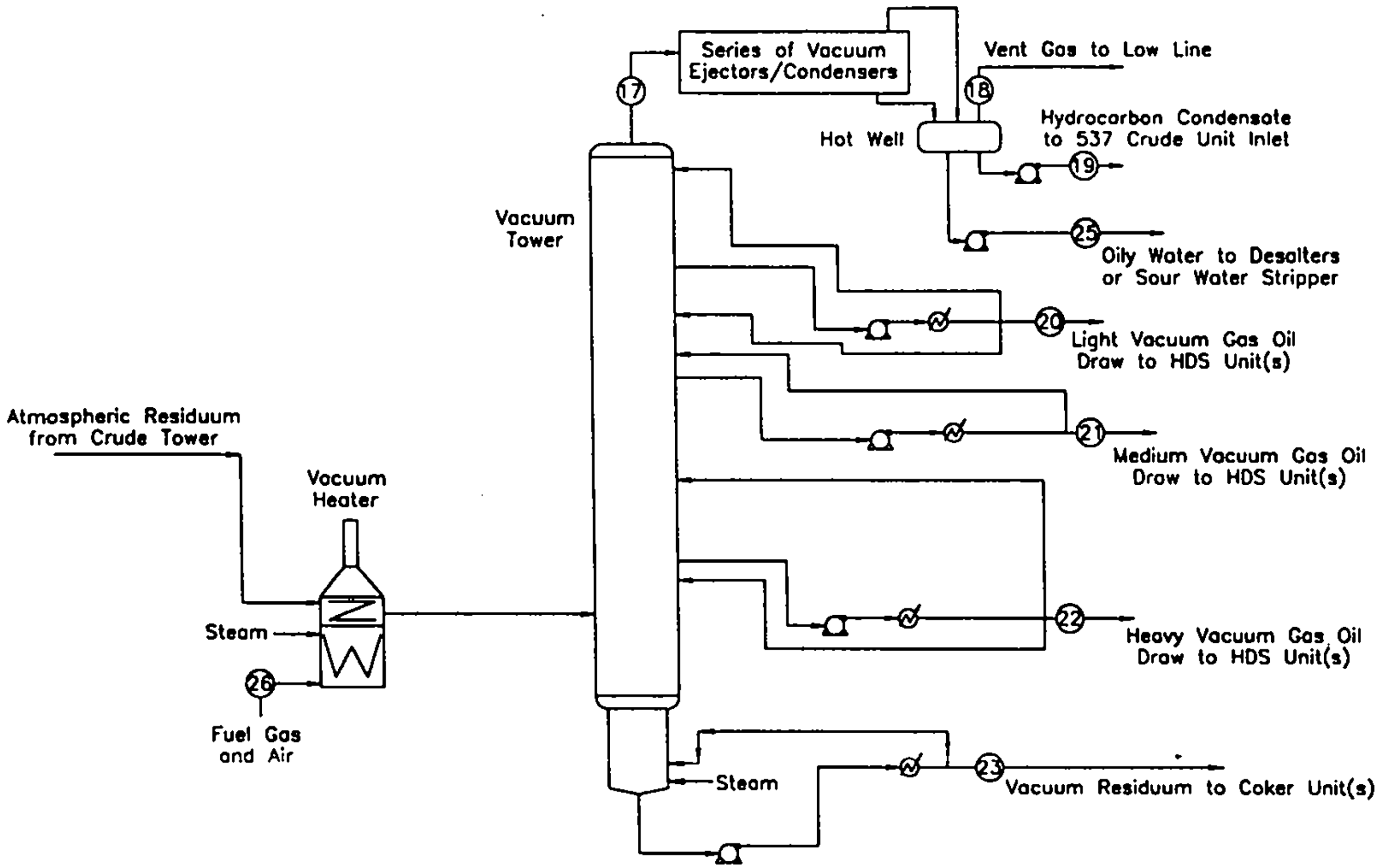

NOTE: The stream numbers correspond to the Fugitive Emission Calculation Summary (Appendix B) and the TNRCC Table 2 - Material Balance (Appendix A).

GERAGHTY & MILLER, INC.
Environmental Services

PROCESS FLOW DIAGRAM
537 CRUDE UNIT

LYONDELL-CITGO REFINING CO., LTD
HOUSTON, TEXAS

FIGURE
5-2

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8.0 CONSIDERATIONS FOR GRANTING A PERMIT

As required by Item VIII of the TNRCC PI-1 permit application form, this section addresses the assurance of regulatory compliance by the proposed facility. The requirement contained in TNRCC Rule 116.111(1), Consideration for Granting a Permit to Construct, states:

> "The emissions from the proposed facility will comply with all rules and regulations of the TNRCC and with the intent of the Texas Clean Air Act (TCAA), including protection of the health and physical property of the people."

As outlined in the following evaluation, the emissions from the 537 Crude Unit will comply with all rules and regulations of the TNRCC and with the intent of the Texas Clean Air Act, including the protection of the health and physical property of the people.

General Rules

LCR will comply with all requirements of the TNRCC General Rules while operating the 537 Crude Unit. Some notable compliance procedures are summarized below.

101.3

There will not be any use of devices to conceal or appear to minimize the effects of emissions from sources within the LCR facility.

101.4

All emissions from the 537 Crude Unit will be treated by the Best Available Control Technology, and there will not be any emissions of air contaminants or combined emissions that would injure or adversely affect human health or welfare, or affect plant, animal life, or property.

101.5

There will not be any traffic hazards or interference from emissions from this facility.

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Regulation IV Control of Air Pollution from Motor Vehicles

This facility does not maintain a motor vehicle fleet; therefore, this regulation does not apply.

Regulation V Control of Air Pollution from Volatile Organic Compounds

115.112-119

The 537 Crude Unit does not include any dedicated storage tanks containing volatile organic compounds; therefore, this regulation does not apply.

115.121-129

The 537 Crude Unit process heater vents are designed/controlled to maintain atmospheric VOC emissions rates below 100 lb/hr in any 24 hour period; therefore, these regulations do not apply. VOC emission calculations from the process heaters are located in Appendix B.

115.131-139

These regulations do not apply since the 537 Crude Unit does not conduct any VOC water separation with atmospheric vents.

115.140-149

LCR will comply with all requirements under this regulation regarding industrial wastewater control requirements in the 537 Crude Unit.

1152-159

This unit is not a municipal solid waste landfill.

115.211

This unit is not a gasoline terminal or a gasoline bulk plant.

115.212-219

There are no loading stations in the 537 Crude Unit.

115.221-229

This facility does not dispense motor vehicle fuel.

115.234-239

This facility does not load or unload gasoline.

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Shell Deer Park

Shell Deer Park

Web Site:www.shelldeerpark.com
Contact:david.mckinney@shell.com

Shell Deer Park Completes Major Refinery Expansion

Park, Texas (May 2, 2001) - The Shell Deer Park refinery recently completed a major expansion project, culminating in the successful April start-up as the fifth largest refinery in the United States with a crude oil capacity of 340,000 barrels a day.

The refinery operates as Deer Park Refining Limited Partnership, a 50-50 joint venture formed in 1993 between Shell Oil Company and Petroleos Mexicanos (Pemex). At that time, the refinery processed approximately 230,000 barrels a day of crude oil.

Over the past eight years, the partnership invested more than $1 billion for refinery upgrades, enabling Shell Deer Park to significantly increase capacity and convert from a refiner of light, low-sulfur "sweet" crude oil to less expensive heavy, high-sulfur "sour" crude oil.

The refinery now is positioned to become the premier heavy sour crude oil refining company in the United States.

Pemex supplies more than 200,000 barrels a day of Maya crude from Mexico to the refinery, where it is processed into refined products and sold throughout North America. The balance of crude oil is domestic, mostly from Texas and Louisiana.

"Shell Deer Park has been on a journey since formation of the partnership...our survival as a viable refinery was in question," said Stacy Methvin, President and CEO of Deer Park Refining Company. "The shared vision of the Shell-Pemex partnership was to combine a reliable supply of heavy sour crude with upgraded refinery assets and world-class people. The vision has become reality."

The scope of work during the latest project phase, known as Maya II, included:

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Expansion of the Delayed Coker to 85,000 barrels a day from 63,000 barrels a day. The coker converts petroleum pitch into petroleum coke and gas oils for processing into higher value diesel fuel and gasoline.

A 70,000 barrels-a-day capacity increase in one of two crude oil Distilling units. This process heats crude oil to the boiling point. Hydrocarbons vaporize at different temperatures and then cool into liquids such as propane, gasoline and home heating oil.

Construction of a 35,000 barrels-a-day Vacuum Flasher. Vacuum flashing is a technique to continue distillation of crude oil at high temperatures.

Construction of a Sulfur Plant with a capacity of 270 tons a day. The plant recovers sulfur from refinery hydrocarbon "streams" as elemental sulfur for sale as end-use products.

Modifications to the Distillate Hydrotreater, which removes sulfur and other contaminants from hydrocarbon streams.

At the peak of Maya II expansion activity, as many as 1,500 contract construction workers amassed 3.5 million hours in the field without incurring a single lost-time injury or environmental incident -- world-class performances.

In addition to safety and environmental achievements, Maya II also was noteworthy for the materials that were used; for example, 3,000 truckloads of concrete, 3,800 tons of structural steel, 250,000 feet of pipe, and 750,000 feet of electrical cable. Two new drums for the Delayed Coker each measure 28 feet in diameter, 122 feet long and weigh 317 tons.

A commemorative event held at Shell Deer Park on April 26 acknowledged the conclusion of Maya II and beginning of what is expected to be a long and profitable future.

Among the dignitaries at the ceremony were Steve Miller, Chairman, President and Chief Executive Officer of Shell Oil Company; Raul Munoz Leos, General Director of Pemex; Eduardo Martinez del Rio, General Director of P.M.I. Comercio Internacional, S.A. de C.V.; Bernardo de la Garza, President of PMI Holdings North America, Inc.; Methvin; Dan Burt, Vice President Major Projects of Deer Park Refining Services; and Wayne Riddle, Mayor of Deer Park, who presented keys to the city to Miller and Munoz Leos.

In his remarks to the Maya II leadership team, Munoz Leos praised the

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people of the Shell-Pemex partnership who worked together in a project that exceeded his expectations. "The challenge for us now," Munoz Leos said, "is to look for more opportunities for success."

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Application for a Texas Air Control Board Permit to Construct Residue Reduction Project Shell Oil Company Deer Park Manufacturing Complex

December 1992

Prepared for:

Shell Oil Company
Deer Park Manufacturing Complex
4900 Highway 225
Deer Park, Texas 77536

Prepared by:

Radian Corporation
8501 North Mopac Blvd.
Austin, Texas 78759

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SECTION 1.0

INTRODUCTION AND GENERAL DESCRIPTION

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1.0 INTRODUCTION AND GENERAL DESCRIPTION

Shell Oil Company plans a program of modifications at its Deer Park Manufacturing Complex (DPMC) in Harris County to enhance global competitiveness, operational efficiency, and long term economic viability. This program consists of two independent projects described in two permit applications:

1. A new cogeneration facility. It will supply lower cost electrical power and steam for the DPMC. The permit application for this facility was filed November 5, 1992 (TACB Permit No. 20238 and PSD Permit No. PSD-TX-815).

   The electrical power replaces power that is currently purchased. The steam increases an existing surplus to enhance supply reliability and reduce dependency on existing high cost steam producers.

2. A Residue Reduction Project (RRP), consisting of a new delayed coker, gas oil hydrotreater, and sulfur recovery facilities. These facilities are the subject of this permit application.

   The Coker converts petroleum pitch into petroleum coke and conversion feed. The project allows Shell to manufacture low-sulfur diesel fuel that meets the 0.05% sulfur level required in the Clean Air Act Amendments of 1990. The conversion feed replaces currently purchased feedstocks.

   The Gas Oil Hydrotreater removes sulfur and nitrogen and saturates aromatics to maintain or enhance conversion capabilities of other process units.

   The Sulfur Recovery facilities convert hydrogen sulfide into elemental sulfur for sale.

   Additional pollution control equipment to increase the sulfur removal efficiency of existing sulfur recovery plants will be installed.

There are no changes planned in crude distilling capacity. A summary of the effects on upstream and downstream facilities is given in Section 14.0.

Collectively the projects in this program will cost over $900 million and result in over 3000 construction jobs in peak construction periods over the 3 to 5 years needed to complete construction and modifications. About 100 new refinery jobs will be created by the program.

This program and other current on-going projects during this period offer substantial environmental improvements. The overall change in emissions is a net decrease of approximately 1500 tons per year. Total emissions of volatile organic compounds (VOC), nitrogen oxides (NO_x), and sulfur dioxide (SO_2) will decrease approximately 2260 tons per year. Emissions of CO and PM_{10} will increase by a total of approximately 760 tons per year.

Shell Oil Company and its contractors assisting Shell in gaining approval of the two permit applications involved in this program stand ready to help in the application review process to facilitate rapid approval of the applications. Construction timing opportunities and contractual obligations target an early summer 1993 construction start-up. Shell appreciates consideration and efforts by the approving authorities to work towards an early summer 1993 start of construction.

The remainder of this application focuses on the information for the permit for the proposed Delayed Coker Unit, Coke Handling Facilities, Gas Oil Hydrotreater and Sulfur Recovery Facilities.

The Delayed Coker Unit receives various residues and internal recycled oil streams as its feed. The coke is formed by thermal cracking and flashing processes in four coke drums. The fractionation section separates the coker gas oil from the overhead product which is routed to the gas recovery section. The coker gas oil feeds the Gas Oil Hydrotreater. The fractionator overhead stream is separated into refinery fuel gas, C_4's, and naphtha. Emission points include two process heaters and fugitive emissions.

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Coke is stored beneath the drums along with the water used to remove the coke from the drums. Coke is transported from the coke pile to the coke crusher to the barge dock. Fugitive particulate emissions are associated with coke handling operations that transport coke from the coke pile to barge loading.

The Gas Oil Hydrotreater (GOHT) upgrades gas oils to commercial quality products. This is accomplished in two major sections: reaction section and products fractionation section. The reaction section consists of two reactors utilizing a catalyst to remove the sulfur and nitrogen compounds from the feed. Emission sources include two process heaters and associated fugitives.

Two new sulfur recovery (SRU) plants will be constructed in association with the Coker and Hydrotreater. The major facilities include two DEA strippers, a sour water stripper, and two Claus plants, each with its own Shell Claus Offgas Treatment (SCOT) unit. In addition, a new SCOT unit will be installed for two existing sulfur recovery units, SR-3 and SR-4. Emission sources include the SRU thermal oxidizers and sulfur storage and loading areas.

Best Available Control Technology

Best Available Control Technology (BACT) for all fired heaters consists of good combustion practices for the control of VOC, CO, and PM and the use of staged combustion burners to control NO_x emissions.

BACT for control of fugitive VOC emissions is the implementation of TACB's 28MID intensive directed maintenance program.

BACT for the coke handling facilities consists of the use of covered conveyors, water sprays, and transfer point partial enclosures for control of fugitive dust emissions.

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SECTION 10.0

PROCESS FLOW DIAGRAMS

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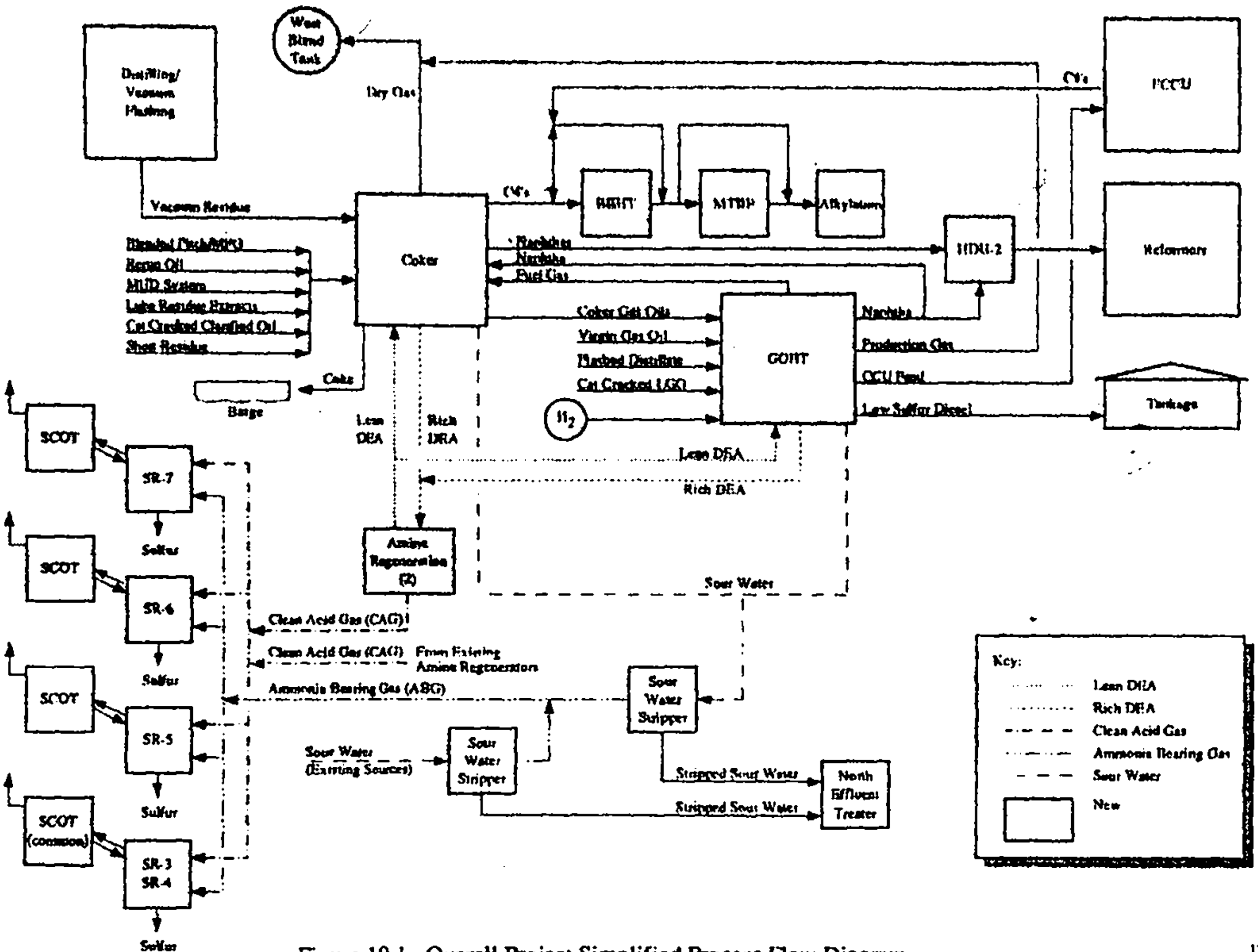

Figure 10-1. Overall Project Simplified Process Flow Diagram

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SECTION 14.0

POTENTIALLY AFFECTED UNITS

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Catalytic Cracking Unit (CCU)

The DPMC CCU is unaffected by the Residue Reduction Project. The CCU is currently operating under TACB Special Exemption X-13678, a copy of which is located in the appendix to this Section. The exemption contains special provisions which limit both the maximum (lb/hr) and annual (tpy) emissions of NO_x, SO_2, and PM. There is also a limit on the feed rate and coke burn rate. The feed rate will not increase as a result of this project; also, the emission rates for NO_x, SO_2, and PM will not increase.

The effect of sulfur and nitrogen content on CCU SO_2 and NO_x emissions and the operating practices used at the DPMC to control these parameters are discussed in more detail in the letter included in the appendix to this section of the permit application.

Associated Tankage

Since the Residue Reduction Project does not increase crude feed to DPMC, crude feed tankage is not affected. Regarding other tankage, this project replaces purchased materials with internally generated feeds and products. Tank throughputs and emissions are not projected to change as a result of this project. Therefore intermediate and finished product tankage is not affected.

Existing Sulfur Recovery Units

The existing sulfur recovery units are unaffected by this project. Increased sulfur load to the Complex is handled by the new SR-6 and SR-7. SR-3 and SR-4, grandfathered sulfur recovery units, and will be equipped with a new SCOT for reduced SO_2 emissions. The addition of the SCOT unit for SR-3 and SR-4 is being done in parallel with the Residue Reduction Project, but is an entirely separate project. No

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other changes will occur at SR-3 and SR-4. SR-5, operating under TACB permit R-1235, is not impacted by this project.

Marine Loading Facilities

This project does not increase emissions from marine loading of light products. Light products leave the DPMC primarily via pipeline. The DPMC will continue to comply with the maximum marine loading of motor gasoline of 9.2 million barrels per calendar year as specified in TACB permit 21427, Special Provision 7.

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Permit No:	21262/P928	Company:	Shell Oil Company
Project Type:	RAMD	Facility Name:	Maya II Project (Coker Expansion)
Record No:	63352/63995	City:	Deer Park
Account No:	HG-0659-W	County:	Harris

AUTHORIZATION CHECKLIST (any "Yes" requires signature by Executive Director):

Will a new policy/precedent be established?	No
Was at least one public hearing request received?	Yes
If yes, was/were all the request(s) withdrawn?	N/A
Is a state or local official opposed to the permit?	N/A
If yes, please provide name and title of official. _	
Is waste or tire derived fuel involved?	No
Are waste management facilities involved?	No

PROJECT OVERVIEW

Shell Oil has applied for an amendment to their existing flexible permit covering their Deer Park Refinery. Shell is proposing to amend the flexible permit to allow construction and operation of the Maya II Project. The project includes the expansion of the existing Coker and Distilling Units. Modifications to the Distillate Hydrotreating Unit. Install a new Post-Fractionator to the existing Selective Hydrocracker and install a new 270 LTD Sulfur Recovery Unit with Shell-Claus Off-gas treating unit. In addition, Shell will be incorporating several grandfathered units into the permit. The project will be PSD for NOx, CO and PM10. The project will not trigger nonattainment review.

30 TAC Chapter 113 RULES

113.100 Compliance with applicable MACT standards expected? . . . . Yes
Subparts A and F, G, H, Y, CC

30 TAC Chapter 116 RULES

PUBLIC NOTICE INFORMATION

116.130-137 Was public notification required? . . . . Yes

If no, give reason:

A. Date application received: 12/23/98 Date application complete: 12/23/98
B. Preliminary determination . . . . Issue
C. Public notice mailed: . . . . March 2, 1999
D. Pollutants: Nox, CO, SO2, PM, H2S, NH3, PM10 and VOC
E. Published: 3/14/99, 3/17/99 , 3/21/99 and 3/24/99 in Deer Park Papers
F. Bilingual public notification required? . . . . No_
Language:
Published: and in
G. Number of public comments? One Technical Issues? . . . .
Meeting requested? No Meeting held? . . . . No
Hearing requested? Yes Hearing held? . . . .
Comments:
H. Certification of sign posting according to 116.133? . . . . _Yes
I. Final action: Letters enclosed? . . . .

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EMISSION CONTROLS

116.111(2)(c) Will the facility utilize BACT? .... Yes
116.111(2)(g) Is the facility expected to perform as represented in the application? .... Yes
116.140 Permit Fee: $ 75,000 Fee certification provided? .... Yes

SAMPLING AND TESTING

116.111(2)(A)(i) Are the emissions expected to comply with all TNRCC air quality rules and regulations, and the intent of the Texas Clean Air Act? .... Yes
116.111(2)(B) Will emissions be measured? .... Yes
Method: stack sampling for four new furnaces HCOKER2, HPREFLASH2, HPREFLASH and HPOSTFRAC. Also stack sampling for SRU incinerator SR8. Several other existing combustion sources have been stack sampled already. CEM monitoring for new sources: HCOKER2, HPREFLASH2 and HPOSTFRAC is being required for this permit. Several other existing furnaces are required to be monitored as well as specified in Special Condition No. 5. Special Condition No. 28 requires that the permit holder demonstrate compliance with all lb/hr and TPY limits in the permit. The emissions must be calculated as required in the document entitled "Flexible Permit Compliance Document" that was submitted with the permit application. Annual summary of emissions is required by this condition as well.

Comments:

FEDERAL PROGRAM APPLICABILITY

116.111(2)(D) Compliance with applicable NSPS expected? .... Yes
Subparts A and J, K, Ka, Kb, VV, GGG, NNN, QQQ and RRR.
116.111(2)(F) Compliance with applicable NESHAPS expected? .... Yes
Subparts A and J, and FF
116.111(2)(H) Is nonattainment review required? .... No
A. Is the facility located in a nonattainment area? .... Yes
If no, skip to 116.111(2)(I). If yes, continue.
B. Federal major source for nonattainment pollutant? .... Yes
C. Federal major modification for nonattainment pollutant? .... No
1. Did project emission increases (proposed allowables minus the two-year average actual emissions, no consideration given to decreases) for the nonattainment pollutant trigger netting? .... Yes
If yes, attach Table 1N & 9N. If no, explain: netting for NOx and VOC are below significance levels over contemporaneous period.
2. Is contemporaneous increase of nonattainment pollutant significant? .... No
If yes, nonattainment review is required.

116.111(8) Is PSD applicable? .... Yes
A. Is facility a federal major source (100/250 tons/yr)? .... Yes
B. Is the project a federal major modification? .... Yes
1. Did project emission increases (proposed allowables minus the two-year average actual emissions, no consideration given to decreases) trigger netting? .... Yes
2. Was contemporaneous increase significant? .... Yes
3. Change excluded by 40 CFR 52.21(b)(2)(iii)? .... No
If yes to B.2 or B.3 above, explain: Project is PSD for PM10, NO_2, CO. SO_2 emissions increases netted out of PSD review.

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30 TAC Chapter 122 RULES

TITLE V APPLICABILITY

122.10(8)(A) Is facility a major source under FCAA Section 112(b)? .... Yes

A. Facility emits 10 tons or more of any single HAP? .... Yes

B. Facility emits 25 tons or more of a combination .... Yes

C. Facility emits 100 tons or more of any air pollutant .... Yes

122.10(8)(c) Is facility a named source under FCAA Section 112? .... Yes

Note: Fugitive emissions are not included in total emissions unless the facility is named in 30 TAC 122.10(8)(C).

REQUEST FOR COMMENTS

REGION:	12	Reviewed by: Carolyn Guillory
COUNTY:	Harris	Reviewed by: No Comment
TARA:	O.K.	Reviewed by: Manny Reyna
COMP:	N.C.A.P.	Reviewed by: Tel Croston

REVIEW SUMMARY

PROCESS DESCRIPTION

Shell is proposing a project that will result in a nominal 50% increase in the capacity of the Delayed Coking Unit. The facility has four coke drums, with this modification, Shell will be adding two more drums and one related process heater. Shell will be installing a new Parallel Vacuum flasher that will fractionate the residue stream that comes from the bottom of the crude column. A new Post Fractionator to the existing Selective Hydrocracker will be installed as well as a new 270 LTD Sulfur Recovery Unit with Shell-Claus Off-gas treating Unit. Following the expansion, the crude capacity will increase up by 80,000 barrels per day. This will include an increase in 50,000 barrels per day of light products, 2,000 tons per day of petroleum coke and 270 long tons per day of sulfur. A more detailed description of the entire refinery can be found in the public file dated 12/23/98.

POLLUTION PREVENTION, SOURCES, CONTROLS AND BACT

Combustion Sources

With this project, Shell will be adding four new furnaces: Coker Island Furnace, two Pre-Flash Furnaces, and a Post fractionator furnace. The sizes are summarized below:

Furnace EPN	Design Max Firing Rate
HCOKER2	200
HPREFLASH2	230
HPREFLASH	70
HPOSTFRAC	230

In addition, 23 additional furnaces and heaters will be modified (either physically or will see additional firin rates) as a result of the Maya II project. Stack testing will be performed for the following furnaces: EPNs: H-5100, H-5101, H-5302, H-5303 and H-5304, HCOKER2, HPREFLASH2, HPREFLASH, HPOSTFRAC, H 613 and SR8STACK (new incinerator stack for new sulfur recovery unit). Special Condition No. 5 specifie pollutants and timeframes for which these units must be sampled. In addition, the following sources ar required to have continuous emissions monitoring performed: EPN's H5402, H5600, H31001, H31002, H510C

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H5101, H5102 and H5103, H5301, H5302, H5303, H5304, HCOKER2, HPREFLASH2 and HPOSTFRAC.

Fugitives

There will be five new fugitive or modified process units that will have additional fugitives. These include the Coker (EPN COKEHCFUG), Pre flash unit (EPN FEFUGDU2), Post Fractionator (EPN FUGPOSTFRAC), DHT EPN (FUGDHT) and SRU 8 (EPN FUGSR8). The following summarizes the fugitive monitoring program that will be implemented:

EPN	Fugitive program
FUGPOSTFRAC	28VHP
FUGSR8	28MID
FEFUGDU2	28VHP
COKEHCFUG	28MID
FUGDHT	28VHP

In an effort to reduce benzene emissions further, Shell will monitor flanges in benzene service quarterly at 500 ppmv. The fugitive areas include the following: DOCKF, FUGCR3, FEFUGDISP and LHT1FE. This will result in a 1.02 TPY reduction in benzene emissions.

Analyzer Vents

Shell will be adding 13 analyzer vents to the flexible permit, 9 in VOC service, 2 in H2S service and 1 in SO2 service. The vents emit less than 1.5 TPY of VOC combined and less than 0.01 TPY of H2S and 0.03 TPY of SO2.

Tanks

The permit amendment will incorporate 47 existing grandfathered storage tanks. 42 of these are fixed roof tanks or internal floaters that store a material with a vapor pressure less than 0.5 psia. Of the five remaining, two are less than 25,000 gallons in size and three are internal floaters each having a capacity of 228,000 gallons. These three floaters have vapor-mounted primary and no secondary seals. The flexible permit requires that these sources go to BACT seals as required by Special Condition No. 15. These seals shall be installed no later than 12/31/2005 as specified in Attachment D. For a complete listing of all of the tanks and their respective EPN's please refer to the application dated 12/22/98.

Coke Handling

By increasing the size of the Coker, Shell will have one new coke pile (EPN COKEPMFUG1A) with resulting PM emissions. Emissions from the pile will be minimized by keeping the moisture to at least 8%.

Flares

Two flares, COKEFLARE and WPFLARE will see emissions increases as a result of this project. Both flares are required to meet specifications in 40 CFR 60.18 (SC # 23).

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Cooling Towers

One new cooling tower will be added as part of the Maya II project (EPN CT18). Special Condition No. 22 requires monthly monitoring for all cooling Towers.

Marine Loading

There will be an increase in products loaded due to the Maya II Project. However, Pumping rates will not change therefore hourly emissions will remain unchanged.

Sulfur Plant

A new sulfur recovery unit (Claus), SRU-8, with a SCOT tail gas treatment and thermal oxidizer (EPN SR8STACK) will be added. The new unit will have a sulfur pit that will be routed to the thermal oxidizer. Molten sulfur will be stored in two sulfur tanks (EPN TSR67) and will be loaded from SR-6 and SR-7 loading rack (EPN LDSULF67). Special Condition No. 20 requires 99.8 % recovery efficiency for all SRU covered under the permit. Special Condition No. 21 limits flaring to no more than 8 hrs and limits SCOT downtime.

Waste Water Emissions

With this project, Shell will be rolling several grandfathered wastewater sources into the permit. The wastewater treatment system has primary, secondary and tertiary treatment. There are two parallel primary treatment systems. One of the systems is used to comply with Benzene Waste Operations NESHAP. This consists of oil/water separator followed by a gas-induced flocculation system. The system is enclosed and the vapors are collected and routed to the West Property Flare. Secondary treatment of the combined wastewater is via biological activated sludge in an aeration basin. Sand Filters are used for tertiary treatment before the water is discharged from the treatment system.

Total emission increases for this project are summarized below:

Compound	Initial Cap(lb/hr)	initial cap(TPY)	Final Cap(lb/hr)	Final Cap(TPY)
VOC	-32.7	-69.5	0	+137.2
Benzene	0	-0.8	0	-0.5
H_2S	+0.27	+6.1	+0.4	+6.7
SO_2	+61.4	-39.67	+9.3	-39.7
CO	+132.9	+576.8	+133	+577
NO_x	+19.0	-42.1	+0.9	+2.6
PM	+5.37	+30.2	+5.4	+30.1
NH_3	+0.82	+3.58	+0.82	+3.59

The project involved re-calculating emissions based on new factors and changes proposed to the facility.

BACT is applied to all newly added facilities.

IMPACTS EVALUATION

1. Was modeling done? Yes Type? Full Dispersion: Modeling
2. Will GLC of any air contaminant cause violation of NAAQS? .... N

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3. Is this a sensitive location with respect to nuisance? .... No
4. Is the site within 3000 feet of any school? .... No
5. Toxics Evaluation: ammonia was modeled plantwide. The impacts from ammonia were approved by toxicology. The project does not result in an increase in short term caps for benzene or VOC total. The following pollutants were modeled for comparison vs NAAQS: PM (Reg I standard), SO_2 (NAAQS and Reg II), CO, PM_{10}, NOx, and H_2S (reg II standards). These pollutants modeled below their respective NAAQS and reg standards.

COMPLIANCE HISTORY

1. Was a NOV issued for construction without a permit? .... No
2. Was the NOV resolved by issuance of permit? .... N/A
   Comments:

MISCELLANEOUS

1. Is applicant in agreement with special conditions? .... Yes
   Company representative? Glenn Gibler
   Contacted via? Phone
   Date of contact? 2/23/99
2. Did the franchise tax verify the applicant to be in good standing? .... N/A
3. Emission reductions from source reduction or pollution prevention .... TPY
4. Emissions reductions resulting from the application of BACT required by state rules, avoidance of potential impacts problems, and voluntary reductions .... 2.8 TPY
   Voluntary flange monitoring will reduce benzene emissions by 1 TPY and total VOC by 2.8 TPY.
5. Other permit(s) affected by this action? -
   If YES, list permit number(s) and actions required or taken

Note: **If there is an increase of 10 tons of a single HAP, 25 tons of aggregated HAPs, 25 tons of VOC or NOX in Harris/Galveston and surrounding counties, or 50 tons of anything else anywhere else, be sure to notify Paul Henry (PHENRY) of the Technical Services Section of the increases via eMail.**

John Benny [signature]	3/1/99	[signature]	3.1.99
Permit Engineer	Date	Team Leader/Section Manager/Backup	Date

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3006 Bee Cave Rd., Suite B200
Austin, Texas 78746
512-347-7588
fax - 512-347-8243

TNRCC Permit Renewal Application
Permit 5682A and PSD-TX-103M2
Sour Crude Processing Units
Phillips 66 Company
Sweeny, Texas

March 2000

RECEIVED
MAR 31 2000
PAR SECTION

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Chapter I
Common Items

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1 Introduction

Phillips 66 Company, a division of Phillips Petroleum Company (Phillips 66), was issued TNRCC Permit No. 5682A for the Sour Crude Unit on April 4, 1985. This is an application to renew this permit including the amendments and standard exemptions approved since 1985.

1.1 Permit History

TNRCC Permit No.5682A, originally issued on April 4, 1985, was first amended on September 10, 1990. Permits 5682A and PSD-TX-103M2 were issued authorizing new and modified units associated with the Merey-Sweeny Expansion Project on December 31, 1998. This amendment also administratively consolidated the various existing separate permits listed below into a single permit:

SOUR CRUDE UNIT 25.1 - Permit 5682A as revised on 09/10/90
DISTILLATE HYDROSULFURIZATION UNIT 25.2 - Permit 5683A as issued on 9/12/90
ATMOSPHERIC DESULFURIZATION UNIT 26.1 - Permit 5684 as issued on 04/22/85
HEAVY OIL CRACKING UNIT 27 - Permit 5686 as issued on 04/08/85, Standard Permit No. 40944 dated 04/21/99
SULFUR RECOVERY COMPLEX UNIT 28 - Permit 5687A as revised on 11/3/93. Standard Permit No. 41806 dated 07/22/99
LETTER (03/27/92) - Suffix "A" assigned to various permits due to name/ownership change
STORAGE TANKS:

- Tank 61 (EPN: 68-95-61) - Grandfathered, Standard Exemption No. 106 (03/29/93), Permit 5688 as continued on 03/26/97
- Tank 62 (EPN: 68-95-62) - Grandfathered, Standard Exemption No. 106 (03/29/93), Permit 5688 as continued on 03/26/97
- Tank 98 (EPN: 68-95-98) - Permit 5688 as continued on 03/26/97
- Tank 99A (EPN: 68-95-99A) - Permit 5688 as continued on 03/26/97
- Tank 99B (EPN: 68-95-99B) - Permit 5688 as continued on 03/26/97
- Tank 99C (EPN: 68-95-99C) - Permit 5688 as continued on 03/26/97
- Tank 213 (EPN: 68-95-213) - Standard Exemption Registration No 25434 issued 12/22/94
- Tank 418 (EPN: 68-95-418) - Standard Exemption No. 102 (05/12/81 Exemption List)
- Tank 419 (EPN: 68-95-419) - Standard Exemption No. 102 (05/12/81Exemption List)

On March 19, 1999, a standard permit registration was submitted in accordance with §116.617 (Standard Permits for Pollution Control Projects) allowing the voluntary implementation of control techniques. In the standard permit, Phillips 66 proposed the use of a sulfur oxide reduction additive at Unit 27 to comply with the permitted allowable sulfur dioxide (SO_2) emission rate during periods of increased sulfur load. Phillips 66 would like this standard permit incorporated into the TNRCC Permit No. 5682A renewal.

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In August of 1999, a permit alteration of Permits 5682A and PSD-TX-103M2 was approved to add a Special Condition. This condition stated that during the construction of the new and modified facilities authorized by the December 31, 1998 permit amendment, operation of existing facilities shall continue consistent with previous new source review authorizations including permits, associated permit application representations, associated permit alterations, and permit exemptions.

On December 8, 1999, Phillips 66 registered a standard exemption for changes to the petroleum coke handling facility under the requirements of Standard Exemption 106.261 (formerly Standard Exemption No. 106). Phillips 66 is including these changes in the renewal application.

An amendment to TNRCC Permit No. 5682A and PSD-TX-103M2 approved on March 1, 2000 authorized the construction of a new Sulfur Recovery Unit (SRU) and Tail Gas Treating Unit (TGTU) to increase the redundancy and turndown capability of its sulfur recovery complex. This amendment also consolidated the rest of the sulfur complex into TNRCC Permit No. 5682A and PSD-TX-103M2.

1.2 Process Units to be Included In Permit Renewal Application

The refinery units included in this permit renewal application are the Sour Crude Unit, Vacuum Unit, Delayed Coker Unit, Atmospheric Residuum Desulfurization (ARDS) Unit, Heavy Oil Cracking (HOC) Unit, Unsaturates Gas Plant, Storage Tanks, Distillate Hydrodesulfurization (DHDS) Unit, and the Sulfur Recovery Complex. The relationships of each of these units as well as material outputs to other refinery process units are shown on the block flow diagram in Figure 1-1. Brief descriptions of each process unit are provided below. Production rates listed are nominal or average rates provided for illustration purposes and are not intended as specific permit limitations.

<u>Sour Crude Unit (Unit 25.1)</u>

The Sour Crude Unit, the first major processing unit at the refinery, was authorized to process 161,150 barrels per stream day (BPSD). Until recently, the processed crudes consisted predominantly of light and medium Arabian, Mesa, and Olmeca crudes (API specific gravity of approximately 33.4). After completion of the Merey-Sweeny Expansion Project, the Sour Crude Unit will have the ability to process heavy crude (API specific gravity of approximately 16) at a rate of 165,000 BPSD.

<u>Vacuum Unit (Unit 29.1)</u>

The Vacuum Unit is designed to process 110,000 BPSD and will be located next to the existing Sour Crude Unit. A new cooling tower and a new flare providing emergency relief service to the Vacuum Unit and the Delayed Coker Unit are also considered with this unit.

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Delayed Coker (Unit 29.2) and Coke Handling Facilities

The Delayed Coker Unit is designed to process 58,000 BPSD and will be located south of the existing ARDS Unit. The coke produced will be conveyed to on-site storage where it will be loaded into railcars or trucks for off-site shipment.

Atmospheric Residuum Desulfurization (ARDS) (Unit 26.1)

The ARDS Unit formerly operated under TNRCC Permit No. 5684 and PSD Permit No. PSD-TX-103M2. The ARDS Unit, designed to remove sulfur, nitrogen, and metals from sweet and sour crude residuals, processes 83,000 BPSD of residuum. Previously, the residuum was derived predominantly from light and medium Arabian, Mesa, and Olmeca crudes (API specific gravity of approximately 33.4). After the expansion is complete, the ARDS Unit will be able to process various gas oil and lighter streams produced from processing heavy crude at a rate of 104,000 BPSD.

Heavy Oil Cracking (HOC) Unit (Unit 27.1) and Unsaturates Gas Plant (Unit 27.2)

The HOC Unit, which includes the Unsaturates Gas Plant, previously operated under TNRCC Permit No. 5686 and PSD Permit No. PSD-TX-103M2. The HOC Unit was authorized to process 67,000 BPSD of desulfurized residue from the ARDS Unit. After the expansion is complete, the HOC Unit will typically process hydrotreated gas oils from both the Sour Crude Unit and the ARDS Unit.

Storage Tanks

As a result of the refinery expansion, tank throughputs for several tanks will increase above their prior potential rate. By amendment (December 1998), new service and increased throughputs were authorized for Tanks 99A, 99B, and 99C, previously permitted under TNRCC Permit No. 5688. In addition to the changes for storage tanks included in Permit No. 5688 (including Tanks 61, 62, 98, 99A, 99B, and 99C), Phillips 66 added three other tanks (213, 418, and 419) previously authorized under standard exemption.

Distillate Hydrodesulfurization (DHDS) Unit

The DHDS Unit, designed to remove sulfur from distillate streams, was stack tested at a distillate charge rate of approximately 44,500 barrels per stream day (BPSD) and has a capacity of approximately 51,000 BPSD. No physical or operational changes in the DHDS Unit are necessary to enable the processing of heavier crude oil by the refinery. While 51,000 BPSD represents the nominal capacity of the DHDS unit, throughput during actual operations may exceed this level as long as such operations can be achieved within the permitted emissions for the unit and the permit and grandfathered limitations of downstream units.

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<u>Sulfur Recovery Complex</u>

The two existing Claus sulfur recovery units have a capacity of 471 LTPD of sulfur. The new SRU will have a nominal capacity of 30 LTPD, providing additional processing capacity and reliable operation during low load conditions. The new 100 LTPD TGTU will provide adequate turndown capability during major refinery turnarounds as well as redundancy to minimize curtailment of refinery operations during planned maintenance on the existing TGTU. At the conclusion of these redundancy and turndown capability improvements, the nominal capacity of the sulfur recovery complex will be 475 LTPD based on the combined capacity of the existing 375 LTPD TGTU and the new 100 LTPD TGTU. This nominal capacity will be sufficient to meet the currently projected sulfur load of the refinery.

1.3 Renewal Application Content Description

For clarity, this renewal application has been divided into separate chapters for each process unit. Section 2 of Chapter I contains the TNRCC Administration Forms - PI-1R and Core Checklist. A list of acronyms used throughout the renewal application is shown in Table 1-1. The area map and overall refinery plot plan are found in Section 3. Appendix A contains a copy of the existing TNRCC permits. The subsequent chapters discuss each process unit as follows:

Chapter	Process Unit
II	Sour Crude Unit
III	Vacuum Unit
IV	Delayed Coker
V	Atmospheric Residuum Desulfurization (ARDS)
VI	Heavy Oil Cracking (HOC) Unit
VII	Storage Tanks
VIII	Distillate Hydrodesulfurization Unit
IX	Sulfur Recovery Complex

Each chapter contains the same sections. Section 1 is an introduction describing the process unit. Section 2 contains detailed lists of the input and output streams of each unit. A separate Table 1(a) for each unit is located in Section 3. The unit plot plans are provided in Section 4. Section 5 provides a non-confidential process description for the process unit. A discussion of the basis of the emissions calculations is provided in Section 6. Section 7 describes air pollution abatement equipment for the emission sources in each unit covered by this application. Considerations for granting renewal are included in Section 8.

Confidential chapters for each unit are contained in a separate volume. This second volume contains the Section 5, confidential process descriptions; TNRCC forms and tables included in Appendix A, and emission calculations incorporated as Appendix B.

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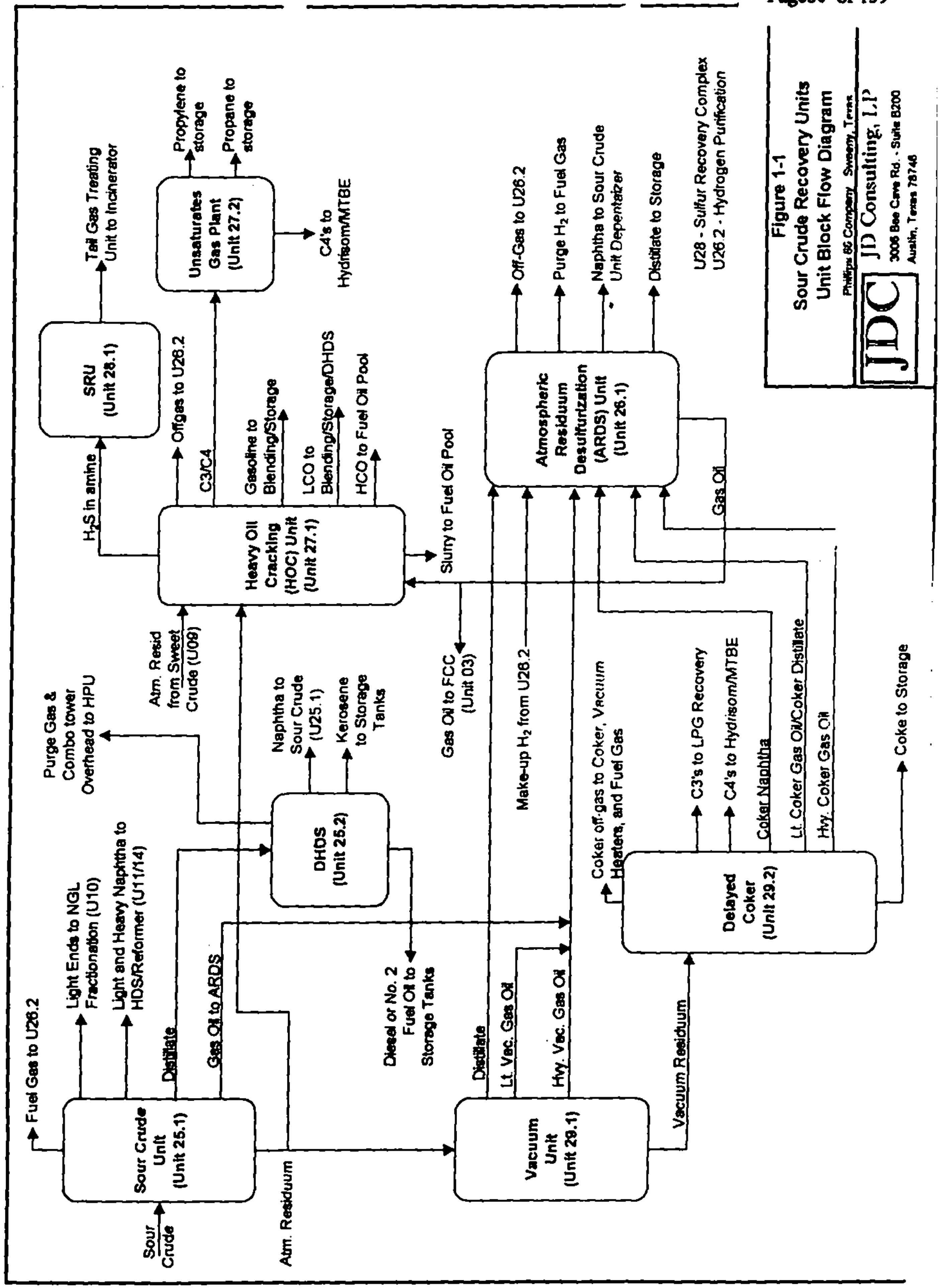

Figure 1-1
Sour Crude Recovery Units
Unit Block Flow Diagram

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Chapter VII
Storage Tanks

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All Appendices are located in Confidential Application

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1 Introduction

Phillips 66 Company, a Division of Phillips Petroleum Company (Phillips 66), and Petroleos de Venezuela S.A. (PDVSA) are building a Delayed Coker Unit (Unit 29.2) and Vacuum Unit (Unit 29.1) at Phillips 66 Sweeny Refinery and Petrochemical Complex. The new units are part of a major reconfiguration of the refinery's sour crude processing facilities that will enable the processing of heavy crude. As a result of constructing the new units and modifying several existing units, tank throughputs for several tanks at the refinery will increase above their current permitted basis. The amendment to permits 5682A and PSD-TX-103M2 issued on December 31, 1998 authorized these increases. The amendment also administratively consolidated tanks previously in Permit 5688 and others previously authorized under standard exemptions into Permit 5682A.

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3 Table 1(a)

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PERMIT NO. R-6682A PERMIT TYPE: CONSTRUCTION [ ] AA ML... [ ] ALTERATION [ ] RENEWAL [X]

ACCOUNT ID NO. BL-0042-G

TABLE 1(a)
EMISSION SOURCES

PAGE 1 OF 1
DATE 3/30/00

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

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS												
EMISSION POINT [1]			COMPONENT OR AIR CONTAMINANT NAME [2]	AIR CONTAMINANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. [5]			SOURCE									
									HEIGHT ABOVE GROUND (ft.)	HEIGHT ABOVE STRUCTURE (ft.) [6(A)]	STACK EXIT DATA			FUGITIVES				
	NUMBER	NAME		#/HR [3]	TONS/YR [4]	ZONE	EAST (meters)	NORTH (meters)			DIA. (ft.) [6(B)]	VEL. (fps) [6(C)]	TEMP. (°F) [6(D)]	LENGTH (ft.) [7(A)]	WIDTH (ft.) [7(B)]	AXIS DEG. [7(C)]	E/W OF NORTH [7(D)]
EPN	68-95-61	Alkylate/Aviation Gasoline Storage	VOC	1.36	3.59	16	231,906	3,219,029	40		3	0.003	Ambient				
FIN	68-95-61																
EPN	68-95-62	Alkylate Storage Tank	VOC	1.36	3.59	15	231,874	3,218,996	50		3	0.003	Ambient				
FIN	68-95-62																
EPN	68-95-88	Cat Gasoline Storage Tank	VOC	1.30	7.50	15	231,702	3,219,180	42		3	0.003	Ambient				
FIN	68-95-88																
EPN	68-95-99A	Sweet Gas Oil Storage Tank	VOC	1.69	7.40	15	232,007	3,217,960	40		3	0.003	Ambient				
FIN	68-95-99A																
EPN	68-95-99B	Sweet Gas Oil Storage Tank	VOC	1.69	7.40	15	232,094	3,217,873	40		3	0.003	Ambient				
FIN	68-95-99B																
EPN	68-95-99C	Sour Gas Oil Storage Tank	VOC	1.70	7.43	15	232,204	3,217,927	40		3	0.003	Ambient				
FIN	68-95-99C																
EPN	68-95-418	Vacuum Resid Storage Tank	VOC	4.31	18.90	15	232,306	3,219,629	40		3	0.003	Ambient				
FIN	68-95-418																
EPN	68-95-419	Sweet Gas Oil Storage Tank	VOC	3.20	14.03	15	232,414	3,217,958	40		3	0.003	Ambient				
FIN	68-95-419																
EPN	68-95-213	Alkylate Storage Tank	VOC	3.36	10.48	15	233,425	3,219,386	42		3	0.003	Ambient				
FIN	68-95-213																
EPN																	
FIN																	
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EPN = EMISSION POINT NUMBER
FIN = FACILITY IDENTIFICATION NUMBER

GROUND ELEVATION OF FACILITY ABOVE MEAN SEA LEVEL 35 feet
TNRCC STANDARD CONDITIONS ARE 68°F AND 14.7 PSIA (GENERAL RULE 101.1).

See instructions on reverse side

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5 Process Description

5.1 General Process Description

The Merey-Sweeny Expansion Project will result in the production of a new intermediate material, vacuum resid and increases in the intermediate production of alkylate and gas oil. A flow diagram showing the units associated with the subject tanks is shown in Figure 5-1.

The majority of the process materials flow from one process unit to the downstream unit. Tanks 99A, 99B, 99C, 418, and 419 are primarily used to control the amount of material going to the downstream unit. As such they operate as constant-level tanks.

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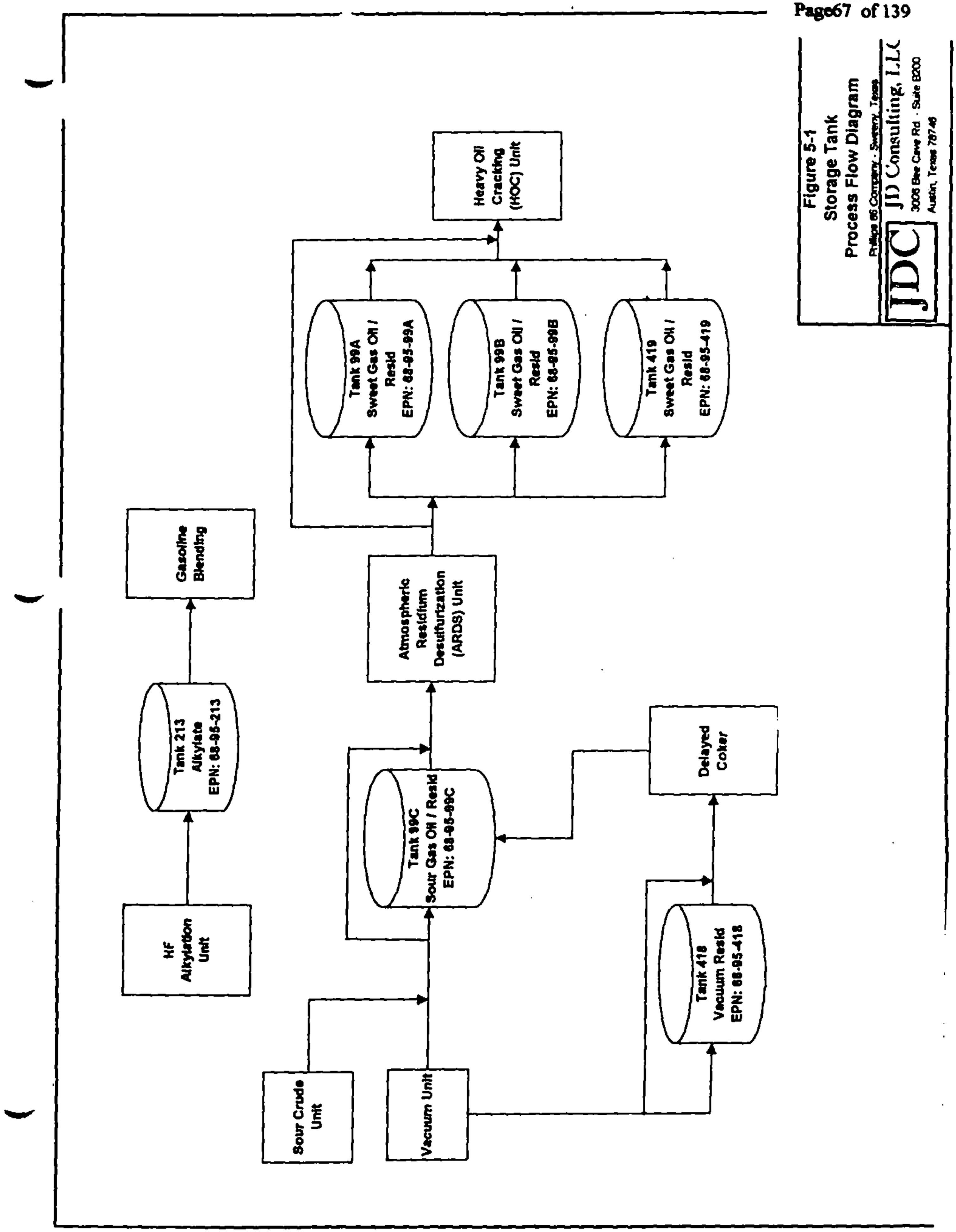

Figure 5-1
Storage Tank
Process Flow Diagram
Phillips 66 Company - Sweeny, Texas

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7 Air Pollution Abatement Equipment

This section discusses controls used for the storage tanks. A listing of the storage tanks, service, and proposed seal configuration is provided in Table 7-1.

The four (4) gas oil and vacuum resid storage tanks are vertical fixed roof tanks storing materials with vapor pressures at operating conditions less than 0.5 psia.

Tanks 61,62, 98, and 213 store alkylate and cat gasoline with vapor pressures of greater than 0.5 psia. These are external floating roof (EFR) tanks with mechanical shoe primary seals and rim-mounted secondary seals.

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Table 7-1
Control Summary for Storage Tanks

Tank No.	EPN	Type of Tank	Material Handled	Volume (gal)	Vapor Pressure (psia)	Vapor Pressure Temperature (°F)	Primary Seal	Secondary Seal
Tk 61	68-95-61	EFR	Alkylate	2,055,690	8.40	90.00	Mechanical Shoe	Rim-mounted
Tk 62	68-95-62	EFR	Alkylate	2,144,100	8.40	90.00	Mechanical Shoe	Rim-mounted
Tk 98	68-95-98	EFR	Cat. Gasoline	4,125,534	6.30	86.00	Mechanical Shoe	Rim-mounted
Tk 99A	68-95-99A	FXD	Sweet Gas Oil/Resid	8,601,432	0.13	250.00	NA	NA
Tk 99B	68-95-99B	FXD	Sweet Gas Oil/Resid	8,600,382	0.13	250.00	NA	NA
Tk 99C	68-95-99C	FXD	Sour Gas Oil/Resid	8,617,476	0.13	250.00	NA	NA
Tk 213	68-95-213	EFR	Alkylate	5,564,076	3.84	77.55	Mechanical Shoe	Rim-mounted
Tk 418	68-95-418	FXD	Vacuum Resid	16,218,720	0.12	400.00	NA	NA
Tk 419	68-95-419	FXD	Sweet Gas Oil/Resid	16,218,972	0.13	250.00	NA	NA

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8 Considerations for Granting Permit Renewal

Pursuant to TNRCC 30 TAC §116.311(a), Phillips 66 proposes to meet all rules and regulations of the TNRCC and the intent of the Texas Clean Air Act (TCAA) for the conditions addressed in this permit renewal application as follows:

Rule 116.311(a)(1) Permit operated according to current permit conditions
The amendment to permits 5682A and PSD-TX-103M2 issued on December 31, 1998 authorized new and modified units associated with the Merey-Sweeny Expansion Project. The amendment also administratively consolidated various existing separate permits into a single permit. In the permit amendment application submitted in July 1998, Phillips indicated that refinery operations will be consistent with the existing permits until the construction associated with the Merey-Sweeny Expansion Project is complete and operations begin as contemplated by the consolidated permit. Permits 5682A and PSD-TX-103M2 have the following Special Condition to minimize the potential for confusion regarding applicable requirements during the construction period of the Merey-Sweeny Expansion Project:

22. During the construction of the new and modified facilities authorized in the permit amendment dated December 31, 1998 operation of existing facilities shall continue according to their previous authorization, i.e., grandfathered, permitted, or exempted status.

The construction of the Merey-Sweeny Expansion Project is not yet complete. Therefore, this discussion of compliance with current permit conditions will focus on the conditions in place prior to the December 31, 1998 amendment and consolidation. Tanks 61, 62, 98, 99A, 99B, and 99C were part of Permit 5688 as continued on 3/26/97. Tank 213 was covered by Standard Exemption Registration No. 25434. Tanks 418 and 419 were previously covered by standard exemption 102 (5/12/81).

A copy of the permit is included in Appendix A. A discussion of how Phillips 66 is complying with each provision is provided below:

Permit 5688:

General Provision (GP) 1. The tanks operate as specified by the permit.

GP 2. Construction started within 18 months of date of issuance.

GP 3. Construction notifications were made.

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GP 4. *Start-up notification* was made.

GP 5. No sampling has been required to date.

GP-6. Written approval will be requested for all proposed alternative methods.

GP-7. Phillips 66 maintains records on tank throughput and operating hours.

GP-8. Allowable emission rates have not been exceeded.

GP-9. The facility has not operated without controls.

GP-10. See discussion of TNRCC rules below.

GP-11. No appeal was requested.

GP-12. Permit has not been transferred.

GP-13. NA

GP-14. See special condition discuss.

GP-15. Facility meets requirement.

Special Condition (SC) 1. The tanks have not exceeded allowable emission rates.

SC 2. Tank 98 is subject to and meets the requirements of NSPS Ka.

SC 3. Tanks 61 and 62 are equipped with mechanical shoe primary seals and rim mounted wiper secondary seals.

SC 4. Tanks 99A and 99B are used to store HOC charge. Tank 99C stores ARDS charge. These materials all have maximum vapor pressures less than 0.5 psia. Therefore, this provision does not apply.

Tanks 61, 62, and 98 meet the requirements with the following controls: external floating roof (EFR) tanks with mechanical shoe primary seals and rim-mounted secondary seals. The exterior surfaces are painted white. Seals are inspected semi-annually as required by TNRCC Regulation V. Tank 98 has and annual physical gap measurements required by NSPS Ka.

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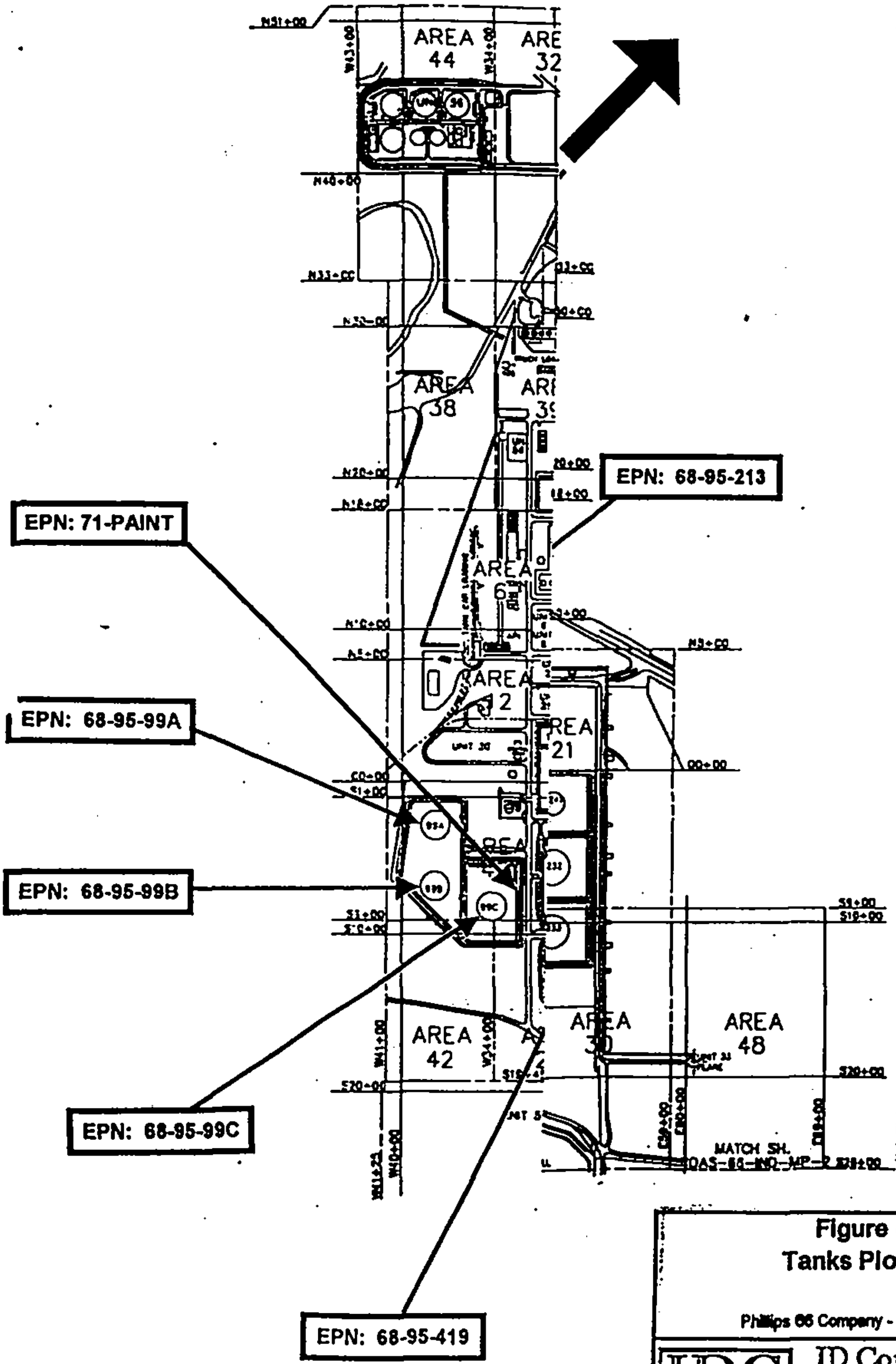

Figure 4-1
Tanks Plot Plan

Phillips 66 Company - Sweeny, Texas

JDC JD Consulting, LLC
3006 Bee Cave Rd. - Suite B200
Austin, Texas 78746

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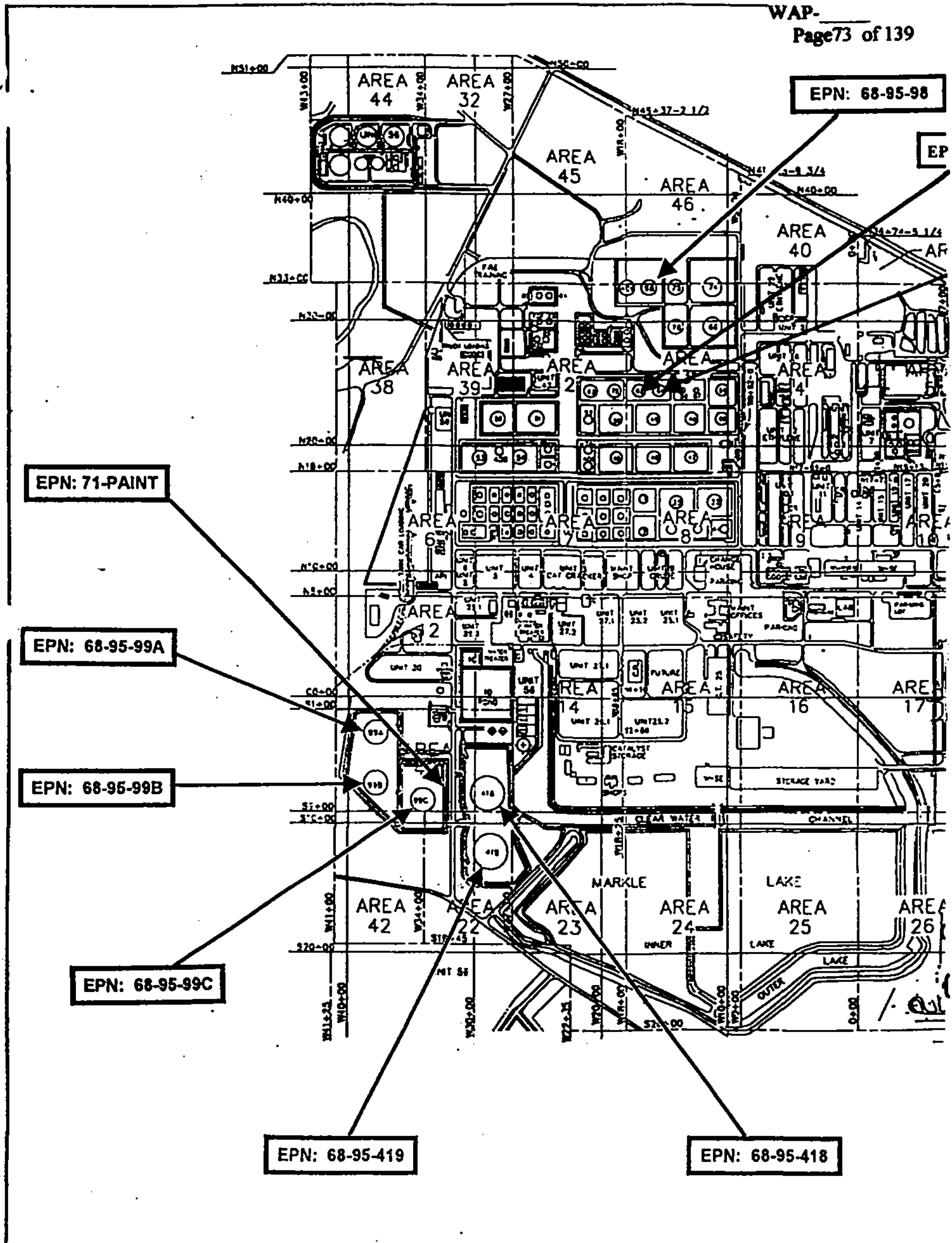

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Appendix A

Existing TNRCC Permits

SPECIAL CONDITIONS

Permit Nos. 5682A and PSD-TX-103M2

EMISSION STANDARDS AND FUEL GAS SPECIFICATIONS

1. This permit covers only those sources of emissions listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," and those sources are limited to the emission limits and other conditions specified in that attached table.

2. There shall be no visible emissions from the Tail Gas Incinerator (TGI) stack (Emission Point Number [EPN] 28.2-36-2), and the in-stack concentration of the following pollutants from the TGI stack shall not exceed the following:

Pollutant	Emission Limitation (hourly average)	Basis
Sulfur dioxide (SO_2)	250 parts per million by volume (ppmv)	Dry and zero excess air
Hydrogen sulfide (H_2S)	10 ppmv	Dry and zero excess air
Carbon monoxide (CO)	100 ppmv	Dry and zero excess air
Nitrogen oxides (NO_x)	0.06 lb per million BTU	Higher heating value

(2/2000)

3. Fuel gas combusted at the facilities governed by this permit shall contain no more than 160 ppmv of H_2S, or the fuel gas shall consist of sweet natural gas containing no more than five grains of total sulfur per 100 dry standard cubic feet. Fuel gas H_2S content shall be monitored and recorded in accordance with New Source Performance Standards (NSPS) Subpart J.

FEDERAL APPLICABILITY

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

   A. Petroleum Refineries, Subparts A and J.

   B. Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced After May 18, 1978 and prior to July 23, 1984 - Subparts A and Ka.

   C. Equipment Leaks of volatile organic compounds (VOC) in Petroleum Refineries, Subparts A and GGG.

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PERMIT REQUIREMENTS DURING CONSTRUCTION OF MEREY-SWEENY EXPANSION

22. During the construction of the new and modified facilities authorized in the permit amendment dated December 31, 1998 operation of existing facilities shall continue according to their previous authorization, i.e., grandfathered, permitted, or exempted status as follows:

Unit or Source	Authorization
Unit 25.1	Permit No. 5682A dated September 10, 1990
Unit 25.2	Permit No. 5683A dated September 12, 1990
Unit 26.1	Permit No. 5684 dated April 22, 1985
Unit 27	Permit No. 5686 dated April 8, 1985, Standard Permit No. 40944 dated April 21, 1999
Unit 28	Permit No. 5687A dated November 3, 1993, Standard Permit No. 41806 dated July 22, 1999
Tank 61	Grandfathered, Standard Exemption No. 106 (3/29/93). Permit 5688 dated March 26, 1997
Tank 62	Grandfathered, Standard Exemption No. 106 (3/29/93), Permit No. 5688 dated March 26, 1997
Tank 98	Permit No. 5688 dated March 26, 1997
Tank 99A	Permit No. 5688 dated March 26, 1997
Tank 99B	Permit No. 5688 dated March 26, 1997
Tank 99C	Permit No. 5688 dated March 26, 1997
Tank 213	Exemption Registration No. 25434 dated December 22, 1994
Tank 418	Standard Exemption No. 102 (May 12, 1981 Exemption List)
Tank 419	Standard Exemption No. 102 (May 12, 1981 Exemption List)

(8/99)

Dated March 1, 2000

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit Nos. 5682A and PSD-TX-103M2

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

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY
		SOUR CRUDE UNIT 25.1		
25.1-0-0	Sour Crude Unit Fugitives (4)	VOC	3.07	13.46
		H_2S	0.001	0.004
25.1-36-1	Crude Charge Heater	NO_x (8)	93.40	409.09
		TSP/PM_{10} (8)	2.34	10.23
		VOC (8)	0.16	0.71
		CO	18.68	81.82
		SO_2 (8)	15.25	66.81
54-22-14	Cooling Tower	VOC	3.36	14.72
56-61-17	Expansion HP Flare (Emergency Only)	NO_x	0.11	0.49
		CO	0.96	4.20
		SO_2	0.07	0.33
		DISTILLATE HYDRODESULFURIZATION UNIT 25.2		
25.2-0-0	DHDS Unit Fugitives (4)	VOC	2.24	9.81
		H_2S	<0.01	0.03
		NH_3	<0.01	<0.01
25.2-CS	DHDS Reactor Charge Heater	NO_x (8)	10.14	41.53
		TSP/PM_{10} (8)	0.87	3.60
		VOC (8)	0.07	0.31
		CO	2.17	8.91
		SO_2 (8)	2.07	8.50

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY
29.2-36-CS	Coker Heater B	NO_x	14.77	51.74
		TSP/PM_{10}	0.74	2.59
		VOC	0.04	0.14
		CO	9.84	34.49
		SO_2	5.85	20.49
	STORAGE TANKS			
68-95-61	Storage Tank	VOC	1.35	3.59
68-95-62	Storage Tank	VOC	1.35	3.59
68-95-98	Cat. Gasoline Storage Tank	VOC	1.30	7.50
68-95-99A (6)	Sweet Gas Oil Storage Tank	VOC	1.69	7.40
68-95-99B (6)	Sweet Gas Oil Storage Tank	VOC	1.69	7.40
68-95-99C (6)	Sour Gas Oil Storage Tank	VOC	1.70	7.43
68-95-213	Alkylate Storage Tank	VOC	3.36	10.46
68-95-418 (6)	Vacuum Resid Storage Tank	VOC	4.31	18.90
68-95-419 (6)	Sweet Gas Oil Storage Tank	VOC	3.20	14.03

(1) Emission point identification - either specific equipment designation or emission point number from plot plan
(2) Specific point source name. For fugitive sources use area name or fugitive source name.

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

(3) NO_x - total oxides of nitrogen
TSP - total suspended particles, not including PM_{10}.
PM - particulate matter, suspended in the atmosphere, including PM_{10}
PM_{10} - particulate matter, equal to or less than 10 microns in diameter. Where PM is not listed, it shal be assumed that no particulate matter greater than 10 microns is emitted.
VOC - volatile organic compounds as defined in 30 Texas Administrative Code Section 101.1
CO - carbon monoxide
SO_2 - sulfur dioxide
H_2S - hydrogen sulfide
NH_3 - ammonia
H_2SO_4 - sulfuric acid mist
Benzene - hazardous air pollutant
R-SH - mercaptan

(4) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate
(5) New unit incorporated into Permit 5682A.
(6) Heated for processing heavy liquids.
(7) Test method shall be method 201/201A, excluding sulfates.
(8) Emissions of NO_x, TSP/PM_{10}, VOC, and CO from the Crude Charge Heater (EPN 25.1-36-1), Distillate Hydrodesulfurization Unit Heaters (EPN 25.2-CS), Atmospheric Residuum Desulfurization Uni Charge Heaters and Recycle Heaters (EPN 26-CS), HOC Regenerator Exhaust (EPN 27.1-36-RE), and TGI (EPN 28.2-36-2) are covered under PSD-TX-103M2.

* Emission rates are based on and the facilities are limited by the following maximum operating schedule:

____Hrs/day ____Days/week ____Weeks/year or 8,760 Hrs/year

Dated March 1, 2000

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Premcor Inc.—News Release

- Company Overview
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FOR IMMEDIATE RELEASE

PREMCOR STARTS NEW COKER UNIT AT PORT ARTHUR REFINERY

St. Louis, December 12, 2000 . . . Premcor Inc. announced today that it is currently i the start-up process for its newly constructed 80,000 barrel per day coker unit at its Port Arthur, Texas refinery. The coker unit was started on November 30 and is currently averaging approximately 50,000 barrels per day of throughput. The compar anticipates the coker will achieve full operations by the end of December. The start-u of the coker unit is the latest achievement for the company as it enters the final construction phase of an $835 million heavy oil upgrade project at the refinery.

The heavy oil upgrade project will allow the refinery to process heavy, sour crude oil c up to approximately 80% of its 250,000 barrel per day capacity. It consists of an 80,000 barrel per day coker unit (one of the largest in the United States), a 35,000 barrel per day hydrocracker and a 417 long tons per day sulfur complex. The sulfur complex began operations in early November and the hydrocracker is scheduled to begin operations within the next few weeks. The project is currently on schedule and within budget. The company anticipates significant earnings contribution once the project becomes fully operational in early 2001.

"We are excited that the second phase of operation of the heavy oil upgrade project hа begun and we look forward to its completion within the next few weeks," said William (Rusnack, President and Chief Executive Officer of Premcor.

Premcor Inc. is a Fortune 500 company based in St. Louis, Missouri that operates in the central United States. Through its principal operating subsidiaries, The Premcor Refining Group and Port Arthur Coker Company, it owns four petroleum refineries witl 565,000 barrels per day of total crude oil throughput capacity. Premcor's principal shareholders are affiliates of The Blackstone Group (80%) and Occidental Petroleum (19%).

This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, including Premcor Inc.'s current expectations with respect to the start-up, operation and projected earnings contributions of the upgrade to the Port Arthur refinery. Words such as "expects," "intends," "plans," "projects," "believes," "estimates," and similar expressions typically identify such forward-looking statements. Even though Premcor Inc. believes the expectations reflected in such forward-looking statements are based on reasonable assumptions, it can give no assurance that its expectations will be attained. Factors that could cause actual results to differ materially from expectations include, but are not limited to, operational difficulties, varying market conditions, government

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regulations and other factors contained from time to time in the reports filed with th Securities and Exchange Commission by Sabine River Holding Corp. (the general partner of Port Arthur Coker Company L.P.), Premcor USA Inc. and its subsidiary, Tl Premcor Refining Group Inc., including quarterly reports on Form 10-Q, reports on Form 8-K, and annual reports on Form 10-K.

For further information, please visit us on the world-wide web at www.premcorinc.co or contact:

INVESTORS:
Jim Carter
(314) 854-1424
james.carter@premcorinc.com

MEDIA:
Jim Joyce
(314) 854-1511
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webma

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PACC
Port Arthur Coker Company

Port Arthur Coker Company L.P.
1801 S. Gulfway-Office 36
P.O. Box 908
Port Arthur, TX 77641-0908

November 1, 2000

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

Mr. Jeff Saitas
Executive Director
Texas Natural Resource Conservation Commission
P. O. Box 13087
Austin, Texas 78711-3087

RECEIVED
NOV 03 2000
TNRCC Region 10
BEAUMONT

SUBJECT: Notification of Startup
TNRCC Permit No. 2303A
Heavy Oil Upgrade Project (HOUP)
Port Arthur Coker Company, L.P. (PACC)
Account No. JE-0042-B
Port Arthur, Jefferson County

Dear Mr. Saitas:

Please refer to my subject letter dated September 25, 2000, which notified your office of preliminary startup dates for the facilities in TNRCC Permit No. 2303A. In accordance with General Condition No. 4 of Permit No. 2303A, 30 TAC 116.115(b)(2)(C) and 40 CFR 60, Subpart 60.7(3), please be advised that Coker Feed Tank Nos. 108 and 109 (EPN: T-108 & T-109) began operation on October 31, 2000.

PACC will advise your office of the actual date of startup of the other facilities outlined in my September 25, 2000 letter within 15 days of such an occurrence. If you have any questions or require additional information, please contact me at (409) 985-1358.

Sincerely,

Morris Carter, Jr.
Manager – Environmental, Health & Safety

AJG:lv

Certified Mail # P 297 623 364

cc: Vic Fair, TNRCC - Beaumont

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→KLW
CI- 2303A

October 4, 2000

PAI Port Arthur Coker Company

PORT ARTHUR COKER COMPANY L.P.
1801 S. GULFWAY-OFFICE 36
P.O. Box 908
PORT ARTHUR, TX 77641-0908

Certified Mail – Return Receipt Requested

Dr. Kurt Kind, PhD
New Source Review Program (MC-162)
Chemical and Coatings Section
Air Permits Division
Texas Natural Resource Conservation Commission
P. O. Box 13087
Austin, Texas 78753

RECEIVED
OCT - 6 2000
TNRCC - Region 10

Re: Permit Amendment
Permit No. 2303A
Heavy Oil Upgrade Project (HOUP)
Port Arthur Coker Company, L.P. (PACC)
Port Arthur, Jefferson County
Account ID No. JE-0042-B

Dear Dr. Kind:

Please refer to your Fax dated September 26, 2000, which requested additional information to continue review of our proposed permit amendment.

We are providing the information requested on an item-by-item basis to facilitate your review and in an effort to expedite the amendment process.

1. PACC agrees that it is appropriate to calculate NOx emissions as noted in your FAX. Therefore, emissions for the HOUP facilities have been calculated as follows:

   0.08 lbs NOx / MMBTU limit on an hourly basis

   0.06 lbs NOx / MMBTU on an annual basis

   Updated emissions calculation sheets and Tables 1(a) for DCU 843 and HCU 942 have been provided in Attachment 1.

2. Tank Nos. 108 & 109 are blanketed and pressurized with Nitrogen. The level in the tanks will remain static and serve as surge tanks in the event that DCU 843 is shut down. When this occurs, the charge to DCU 843 will be diverted to Tanks 108 & 109. As indicated in your FAX, emissions from these tanks will occur only during an upset situation. Updated emissions calculation sheets and Tables 1(a) for the tanks have been provided in Attachment 1. The following are the design criteria for the pressure relief valves installed at each tank:

Tank No.	Safety No.	Pressure Setting
108	PRV 1850L	+ 2" W.C.
	EVR 1850L	+ 3" H2O
	VRV 1850L	-0.869 W.C.
109	PRV 1867L	+ 2" W.C.
	EVR 1867L	+ 3" H2O
	VRV 1867L	-0.869 W.C.

INFORMATION COPY

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PACC
Port Arthur Coker Company

PORT ARTHUR COKER COMPANY L.P.
1801 S. GULFWAY-OFFICE 36
P.O. BOX 908
PORT ARTHUR, TX 77641-0908

PRV = Pressure Relief Valve; EVR = Emergency Relief Valves; VRV = Vacuum Relief Valve.

3. The updated Sulfur Loading Calculation Sheet is in Attachment 1. The hourly emissions rate was calculated by the ratio of *417 LTPD / 400 LTPD*. The annual rate was calculated from the hourly rate by taking into account the number of loads per day. The following equation was used to calculate the annual rate:

PRODUCTION RATE	417 LT/D
TANK TRUCK CAPACITY	19 - 20 LT/LOAD
NUMBER OF LOADS / DAY	21 - 22

(0.16 lbs/Hr) X (22 loads / 24 Hrs) X (4.38) = 0.64 T/Yr

4. *Tables 1N, 2N, 3N and 9N are in Attachment 2.*

We appreciate your help and the guidance you have provided to assure an early issuance of our permit amendment request. If you have any questions or require additional information, please contact Art Gracia at (409) 985-1572.

Sincerely,

Morris Carter, Jr.

Morris Carter, Jr., P.E.
Manager – Environmental, Health & Safety

AJG:lv

Att

CERTIFIED MAIL # P 297 623 343

ccw/att: Vic Fair, TNRCC - Beaumont

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ATTACHMENT 1

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ERMIT NO. 2303A PERMIT TYPE: CONSTRUCTION [ ] AMENDMENT [X] ALTERATION [ ] RENEWAL [ ]

CCOUNT ID NO. JE-0042-B

TABLE 1(a)
EMISSION SOURCES

PAGE 3 OF 5
DATE 4-30-98

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

AIR CONTAMINANT DATA: EMISSION POINT [1] NUMBER	NAME	COMPONENT OR AIR CONTAMINANT NAME (2)	AIR CONTAMINANT EMISSION RATE #/HR [3]	TONS/YR [4]	EMISSION POINT DISCHARGE PARAMETERS: UTM COORDINATES OF EMISSION PT. [5] ZONE	EAST (meters)	NORTH (meters)	SOURCE: HEIGHT	HEIGHT	STACK EXIT DATA: DIA. (ft.) [6(B)]	VEL. (fps) [6(C)]	TEMP. (°F) [6(D)]	FUGITIVES: LENGTH (ft.) [7(A)]	WIDTH (ft.) [7(B)]	AXIS DEG. [7(C)]	E/W OF NORTH [7(D)]
EPN E-06-843 FIN DCU 843	2 TANK HEATERS TOTAL EMISSIONS	PM	0.052	0.228	15	407175	3303100		25	1.5	23	1100	1000		15°	W
EPN FIN		SO_2	0.008	0.035												
EPN FIN		NO_x	1.476	6.465												
EPN FIN		CO	0.278	1.218												
EPN FIN		VOC	0.038	0.166												
EPN F-843 FIN DCU 843	FUGITIVES	FUGITIVES VOC	6.16	26.97	15	406900	3302900						800	500	15°	W
EPN 108 FIN T-108	CHARGE TANK No. 1	VOC	0.0	~~4.55~~ 0.0	15	407375	3303104		42	160	N/A	Ambi				
EPN 109 FIN T-109	CHARGE TANK No. 2	VOC	0.0	~~4.55~~ 0.0	15	407278	3303184		42	160	N/A	Ambi				
EPN FIN																
EPN FIN																
EPN FIN																

EPN = EMISSION POINT NUMBER
FIN = FACILITY IDENTIFICATION NUMBER

See instructions on reverse side.

GROUND ELEVATION OF FACILITY ABOVE MEAN SEA LEVEL 0-5
TNRCC STANDARD CONDITIONS ARE 68°F AND 14.7 PSIA (GENERAL RULE 10

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September 25, 2000

PACC
Port Arthur Coker Company

Port Arthur Coker Company L.P.
1801 S. Gulfway-Office 36
P.O. Box 908
Port Arthur, TX 7764:-0908

CERTIFIED MAIL – RETURN RECEIPT REQUSTED

Mr. Jeff Saitas
Executive Director
Texas Natural Resource Conservation Commission
P. O. Box 13087
Austin, Texas 78753

RECEIVED
SEP 26 2000
TNRCC Region 10

SUBJECT: **Notification of Startup**
TNRCC Permit No. 2303A
Heavy Oil Upgrade Project (HOUP)
Port Arthur Coker Company, L.P.
Account No. JE-0042-B
Port Arthur, Jefferson County

Dear Mr. Saitas:

Please refer to my subject letter dated July 25, 2000, which notified your office of preliminary startup dates for t facilities in TNRCC Permit No. 2303A. Due to construction delays, the facilities did not commence operations previously indicated. We now project the facilities to commence operations as indicated below:

FACILITY	EPN	PRELIMINARY STARTUP DATE	REVISED STARTUP DATE
Flare No. 23	E-23-FLARE	September 6, 2000	October 18, 2000
Coker Feed Tank 108	TK-108	September 18, 2000	October 17, 2000
Coker Feed Tank 109	TK-109	September 18, 2000	October 17, 2000
Sulfur Recovery Unit 545	F-545	September 22, 2000	October 20, 2000
SCOT Offgas Treating Unit	E-03-SCOT	September 22, 2000	October 20, 2000

PACC will advise your office of the actual date of startup of these facilities within 15 days of such an occurrenc as required by 40 CFR 60, subpart 60.7(a)(3). Additional notification on the startup of the remaining facilities will follow at a later date. If you have any questions or require additional information, please contact me at (40 985-1358.

Sincerely,

Morris Carter, Jr.
Mgr EH&S

INFORMATION COPY

AJG:bmk

Cc: Vic Fair
CERTIFIED MAIL P-297-623-337

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RECEIVED

Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Jeffrey A. Saitas, *Executive Director*

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

April 29, 1999

Mr. Morris Carter, Jr.
Manager, Environment, Health, and Safety
Clark Refining & Marketing, Inc.
1801 South Gulfway Drive
Port Arthur, Texas 77641

CLARK P.A. REFINERY ENVIRONMENTAL	DATE:		
HANDLE__ INFO__	BKB__	MCH__	OTHER:
N/R__ DISCUSS__	JPC__	CRP__	
COPY TO:______	CMD__	TEAM__	
CHECK	FILE No:		

Re: Permit Amendment
Permit No. 2303A
Port Arthur Refinery
Port Arthur, Jefferson County
Account ID No. JE-0042-B

Dear Mr. Carter:

This is in response to your letter dated March 18, 1999 and permit application, Form PI-1, concerning the proposed amendment to Permit No. 2303A. We understand that you propose to move the new emission points associated with your heavy oil upgrade project from flexible Permit No. 6825A to this permit. Also, this will acknowledge that your application for the above-referenced permit is technically complete as of April 27, 1999.

Pursuant to 30 Texas Administrative Code Chapter 116, Section 116.116(b), Permit No. 2303A is hereby amended. This information will be incorporated into the existing permit file. Enclosed are revised special conditions pages and a maximum allowable emission rates table (MAERT) to replace those currently attached to your permit. Please replace those conditions and the MAERT currently attached to your permit with those enclosed.

This amendment will be automatically void upon the occurrence of any of the following, as per §116.115(b)(1):

1. Failure to begin construction of the changes authorized by this amendment within 18 months from the date of this authorization.

2. Discontinuance of construction of the changes authorized by this amendment for a period of 18 consecutive months or more.

3. Not completing the changes authorized by this amendment within a reasonable time.

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Re: Permit No. 2303A

Your cooperation in this matter is appreciated. If you have any questions, please call Mr. Kurt Kind of our Office of Air Quality, New Source Review Permits Division at (512) 239-1337 or write him at Texas Natural Resource Conservation Commission, Office of Air Quality, New Source Review Permits Division (MC-162), P.O. Box 13087, Austin, Texas 78711-3087.

Sincerely,

for Jeffrey A. Saitas, P.E.
Executive Director

JS/KK/ds

Enclosures

cc: Mr. Marion Everhart, Air Program Manager, Beaumont

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SPECIAL CONDITIONS

Permit No. 2303A

EMISSION LIMITATIONS

1. This permit covers only the emission sources listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," and those sources are limited to the emission limits specified in that table.

FEDERAL APPLICABILITY

2. New Stationary Sources Standards of Performance.

   A. These facilities shall comply with all applicable requirements of Environmental Protection Agency (EPA) Regulations on Standards of Performance for New Stationary Sources promulgated for the following:

      (1) Petroleum Refineries in Title 40 Code of Federal Regulations Part 60 (40 CFR 60), Subparts A and J.

      (2) Storage Vessels for Petroleum Liquids in 40 CFR 60, Subparts A and K.

      (3) Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984 in 40 CFR 60, Subparts A and Kb.

      (4) Equipment Leaks of Volatile Organic Compounds (VOC) in Petroleum Refineries in 40 CFR 60, Subparts A and GGG.

      (5) The VOC Emissions From Petroleum Refinery Wastewater Systems in 40 CFR 60, Subparts A and QQQ. (4/99)

3. These facilities shall comply with all applicable requirements of EPA Regulations on National Emission Standards for Hazardous Air Pollutants (NESHAPS) promulgated for Benzene Transfer Operations and Benzene Waste Operations in 40 CFR 61, Subparts A, BB, and FF. (4/99)

4. These facilities shall comply with all applicable requirements of 30 Texas Administrative Code (TAC) Section 113.340 promulgated for Petroleum Refineries, including the referenced requirements contained in 40 CFR 63, Subpart CC. (4/99)

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27. A continuous monitor shall be installed at the fuel gas mix drum in the fuel feed line header for all fired units to continuously monitor and record the gas for H_2S content of the fuel. The instrument shall be installed according to the specifications set out in 40 CFR 60.105. These gases shall have a maximum H_2S hourly average concentration of 80 ppmv. Process fuel gases that are not routed to the fuel gas mix drum shall be monitored for H_2S content and heating value prior to being used as fuel. (4/99)

CONTEMPORANEOUS REDUCTIONS

28. This permit is conditioned on the completion of all emission reduction projects represented in the permit amendment applications for Permit No. 6825A dated October 3, 1994 and April 30, 1998 and listed below. The holder of this permit shall apply for registration and certification of the emissions reductions associated with the activities described below in accordance with 30 TAC §101.29, "Emissions Credit Banking and Trading."

    A. Shutdown of a refinery production train. This train includes Units AVU 144, CRU 1342, DEPROP 6142, LVU 147, IU 341, SEU 1843, DEPENT 6442-6444, DEBUT 6242, SDU 1943, CDU 1944, GFU 2141-2142, CONC 6941, FCCU 1242, ATU 7845, and ATU 7847.

    B. Installation of the new Sour Water Stripping Facility (SWS 8746) and shutdown the old sour water stripping unit.

    C. Shutdown of BH-18 Boilers 4 and 5.

    D. Shutdown of SRUs 541 and 542.

    E. Retrofit sleeves on existing slotted guide poles on the previously grandfathered Floating Roof Storage Tank Nos. 2113, 2118, 2132, 2145, and 2148.

    F. After start-up of the Delayed Coking Unit DCU-843, shutdown of the Delayed Coking Units DCU-841 and DCU-842.

The holder of this permit shall maintain records of these emission reductions and provide access and/or copies upon request to the TNRCC Executive Director, his representatives, or any local air pollution control program having jurisdiction. Construction of these facilities must commence as defined in 40 CFR 52.21(b)(9) (prevention of significant deterioration) or 40 CFR 51.165(a)(1)(xvi) (nonattainment) no later than five years after the

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit No. 2303A

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

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	Emission Rates * TPY
E-01-843	H-101 Charge Heater	PM	0.85	3.72
		SO_2	2.29	10.04
		NO_x	13.60	59.57
		CO	6.80	29.78
		VOC	0.24	1.04
E-02-843	H-102 Charge Heater	PM	0.85	3.72
		SO_2	2.29	10.04
		NO_x	13.60	59.57
		CO	6.80	29.78
		VOC	0.24	1.04
E-03-843	H-103 Charge Heater	PM	0.85	3.72
		SO_2	2.29	10.04
		NO_x	13.60	59.57
		CO	6.80	29.78
		VOC	0.24	1.04
E-06-843	8 Tank Heaters for Charge Tanks	PM	0.14	0.63
		SO_2	0.16	0.71
		NO_x	2.40	10.51
		CO	0.24	1.05
		VOC	0.07	0.31
E-01-942	H-1, H-2, and H-3 Heaters	PM	2.04	8.95
		SO_2	1.97	8.63
		NO_x	11.68	51.16
		CO	8.91	39.01
		VOC	1.53	1.17

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY
E-03-SCOT	SCOT III Incinerator SRU 545	PM	0.15	0.66
		SO_2	88.41	387.21
		NO_x	2.40	10.51
		CO	6.70	29.35
		VOC	0.08	0.37
		H_2S	0.05	0.22
F-843	DCU 843 VOC Fugitives (4)	VOC	6.16	26.97
F-843-PM	DCU 843 PM Fugitives (4)	PM	2.41	10.56
F-942	HCU 942 Fugitives (4)	VOC	7.17	31.39
F-545	SRU 545 VOC Fugitives (4)	VOC	1.13	5.00
F-LOADING	Sulfur Loading Fugitives (4)	H_2S	0.15	0.16
F-545-H2S	SRU 545 H2S Fugitives (4)	H_2S	<0.01	0.02
T-8431	Charge Tank 1	VOC	0.46	2.06
T-8432	Charge Tank 2	VOC	0.46	2.06
E-23-FLARE	Flare 23	SO_2	0.01	0.04
		NO_x	0.06	0.26
		CO	2.10	9.21
		VOC	0.03	0.14
E-191CT	Cooling Tower 191	VOC	0.30	1.50
F-PIPING	Piping Fugitives (4)	VOC	3.55	15.56
5023	Tank 106	Crude Oil	7.30	12.8
5024	Tank 107	Crude Oil	7.30	12.8

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EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY
5025	Tank 108	Crude Oil	7.30	12.8
5026	Tank 109	Crude Oil	7.30	12.8
Fugitive	Fugitives (4)	Crude Oil	0.70	3.1

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.
(2) *Specific point source name. For fugitive sources use area name or fugitive source name.*
(3) VOC - volatile organic compounds as defined in General Rule 101.1
NO_x - total oxides of nitrogen
SO_2 - sulfur dioxide
PM - particulate matter, suspended in the atmosphere, including PM_{10}
PM_{10} - particulate matter equal to or less than 10 microns in diameter. Where PM is not listed, it shall be assumed that no particulate matter greater than 10 microns is emitted.
CO - carbon monoxide
H_2S - hydrogen sulfide
Crude Oil - crude oils with a vapor pressure less than 11 psia
(4) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate.

* Emission rates are based on and the facilities are limited by the following maximum operating schedule:

_Hrs/day __Days/week __Weeks/year or 8,760 Hrs/year

Dated April 29, 1999

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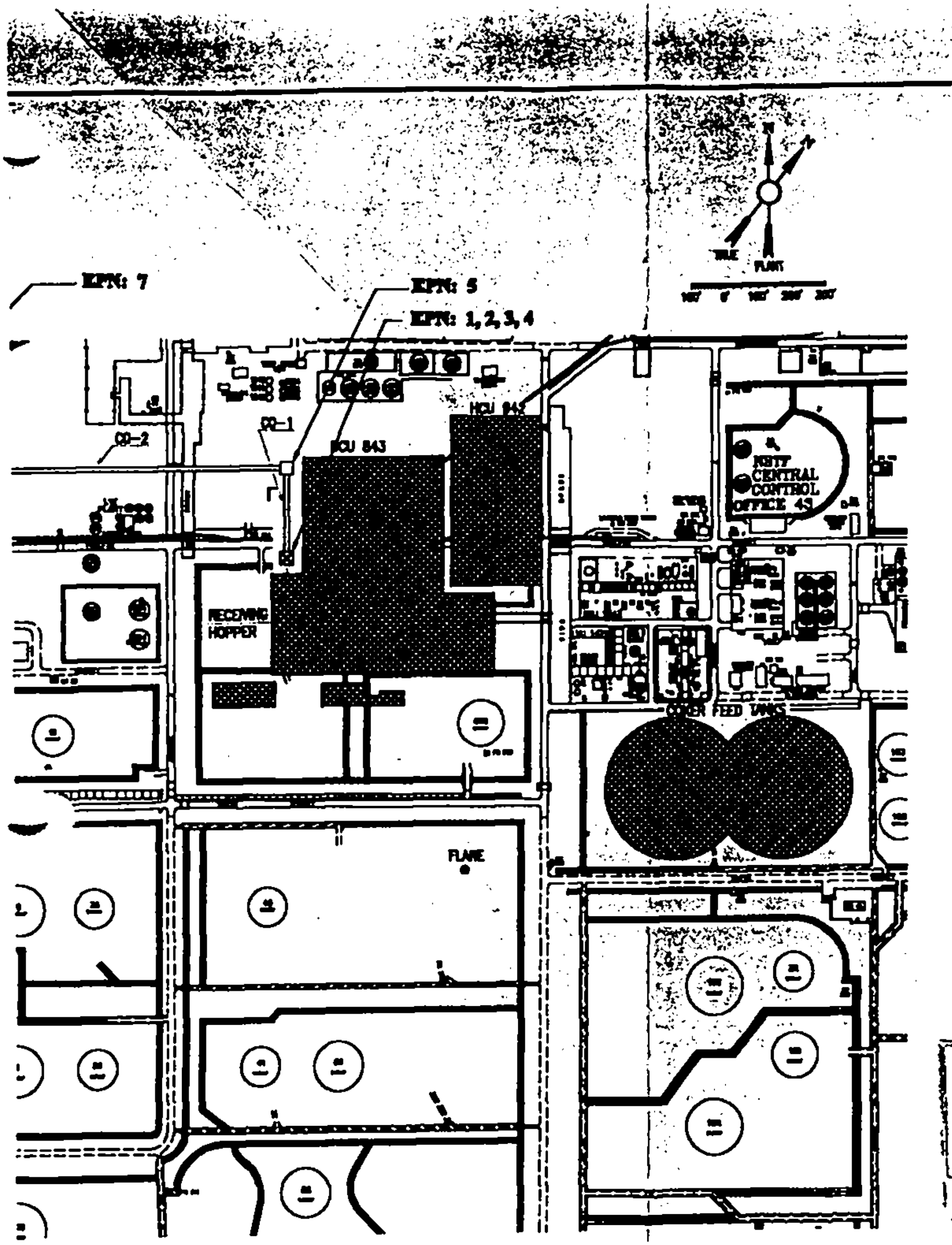

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AUG 3 1 1999
PERMITS PROGRAM

Coke Handling Facility
Clark Port Arthur Refinery

Figure 4-2
Plot Plan

JDC JD Consulting, LLC

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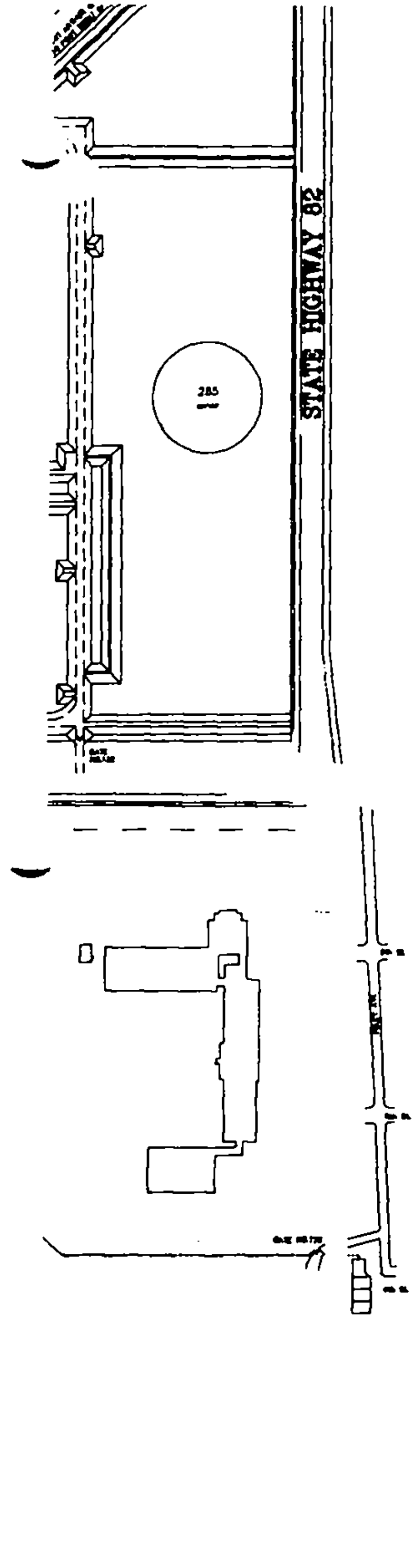


WWTU 8742, SWS 8746, 8744A & B, WWU 7545, DEFLUORINATOR, KOH TREATOR, THE NEW PART OF WTP-2 AND THE SOIL MANAGEMENT AREA BATTERY LIMITS WERE DETERMINED BY THE BEST INFORMATION AVAILABLE. WE DO NOT HAVE THE PLOT PLANS FOR THESE UNITS.

THE 100 FOOT LIMIT PAST PROCESS UNIT BATTERY LIMITS HAS BEEN MODIFIED IN WWU 7545, CRU 1344 & WTP-2, AS NECESSARY TO STOP AT THE REFINERY FENCE LINE.

THIS MAP IS INTENDED FOR GENERAL INFORMATIONAL PURPOSES ONLY. IT MAY NOT ACCURATELY REFLECT EXISTING REFINERY UNITS OR THEIR CURRENT OPERATIONAL STATUSES. CHEVRON U.S.A., INC. EXPRESSLY DISCLAIMS ANY REPRESENTATIONS OR WARRANTIES REGARDING THE REFINERY FACILITIES BASED ON THIS MAP.

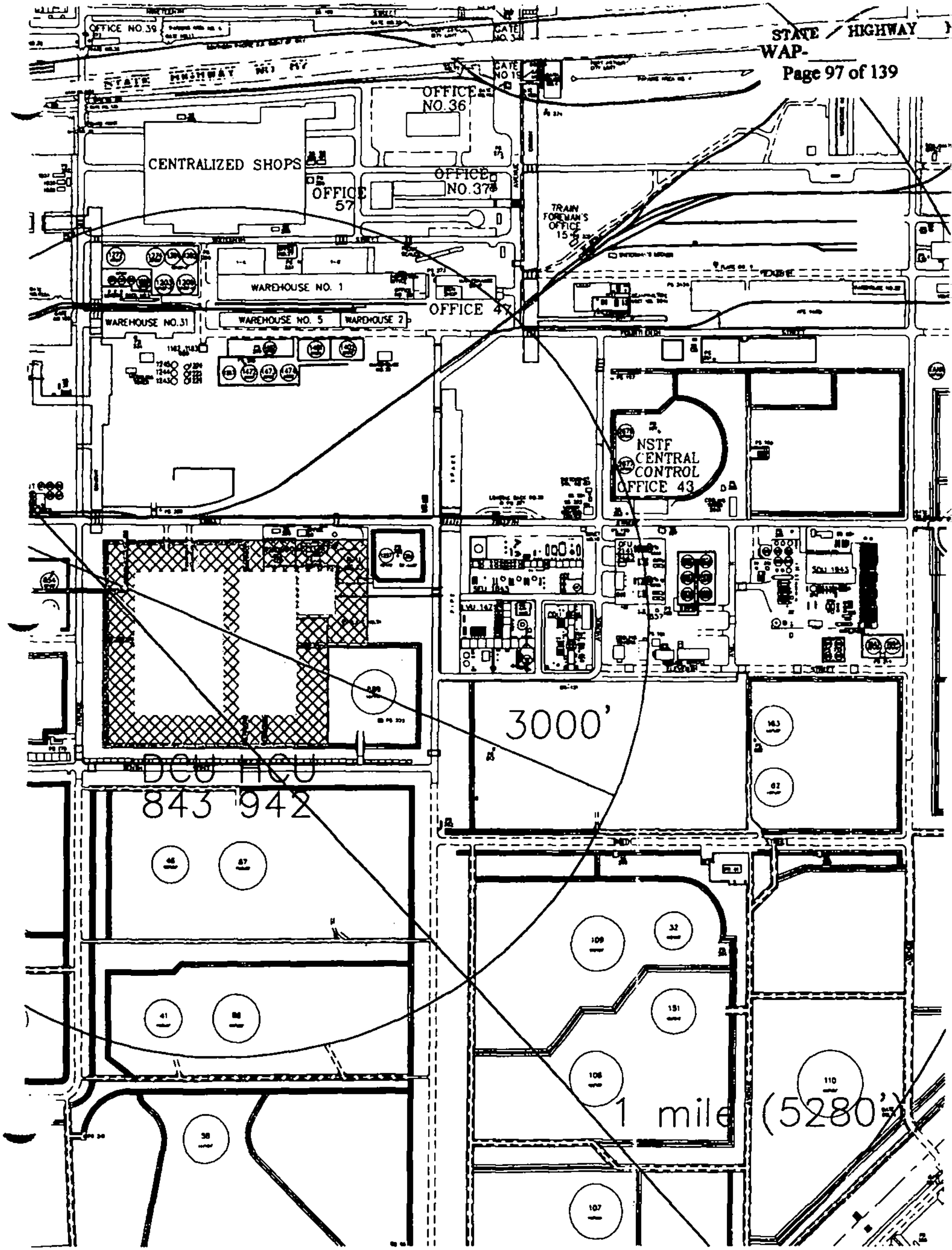
HEAVY OIL
EXPANSION PROJECT
MAP

Clark Refining & Marketing, Inc.
Port Arthur Refinery

PORT ARTHUR, TEXAS

RECEIVED
APR 30 1998
PERMITS PROGRAM

April 24, 1998


STATE HIGHWAY
OFFICE NO.39
GATE NO.3
GATE NO.19
OFFICE NO.36
CENTRALIZED SHOPS
OFFICE 57
OFFICE NO.37
TRAIN FOREMAN'S OFFICE 15
WAREHOUSE NO. 1
WAREHOUSE NO.31
WAREHOUSE NO. 5
WAREHOUSE 2
OFFICE 47
NSTF CENTRAL CONTROL OFFICE 43
3000'
DCU HCU
843 942
1 mile (5280')

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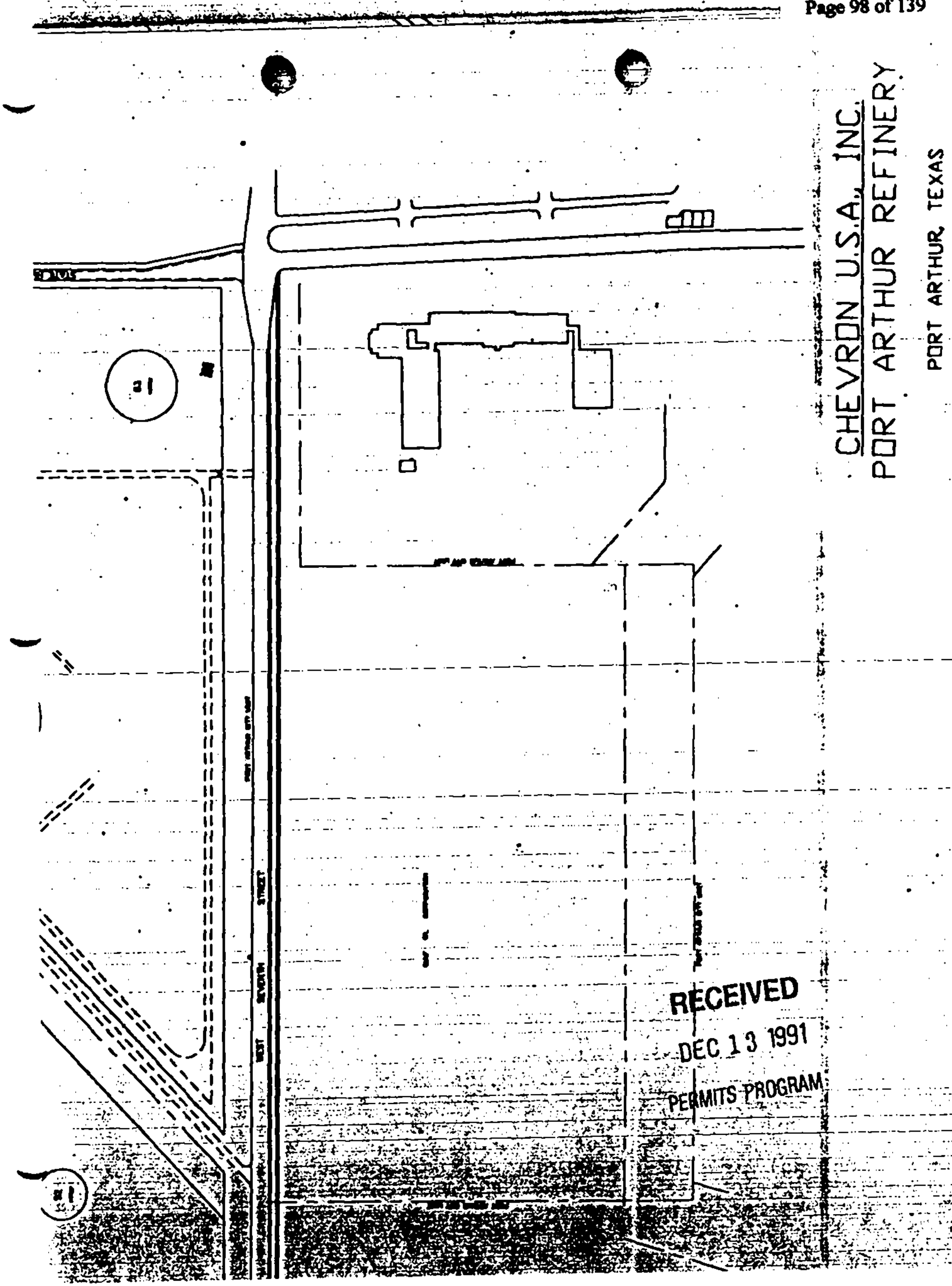

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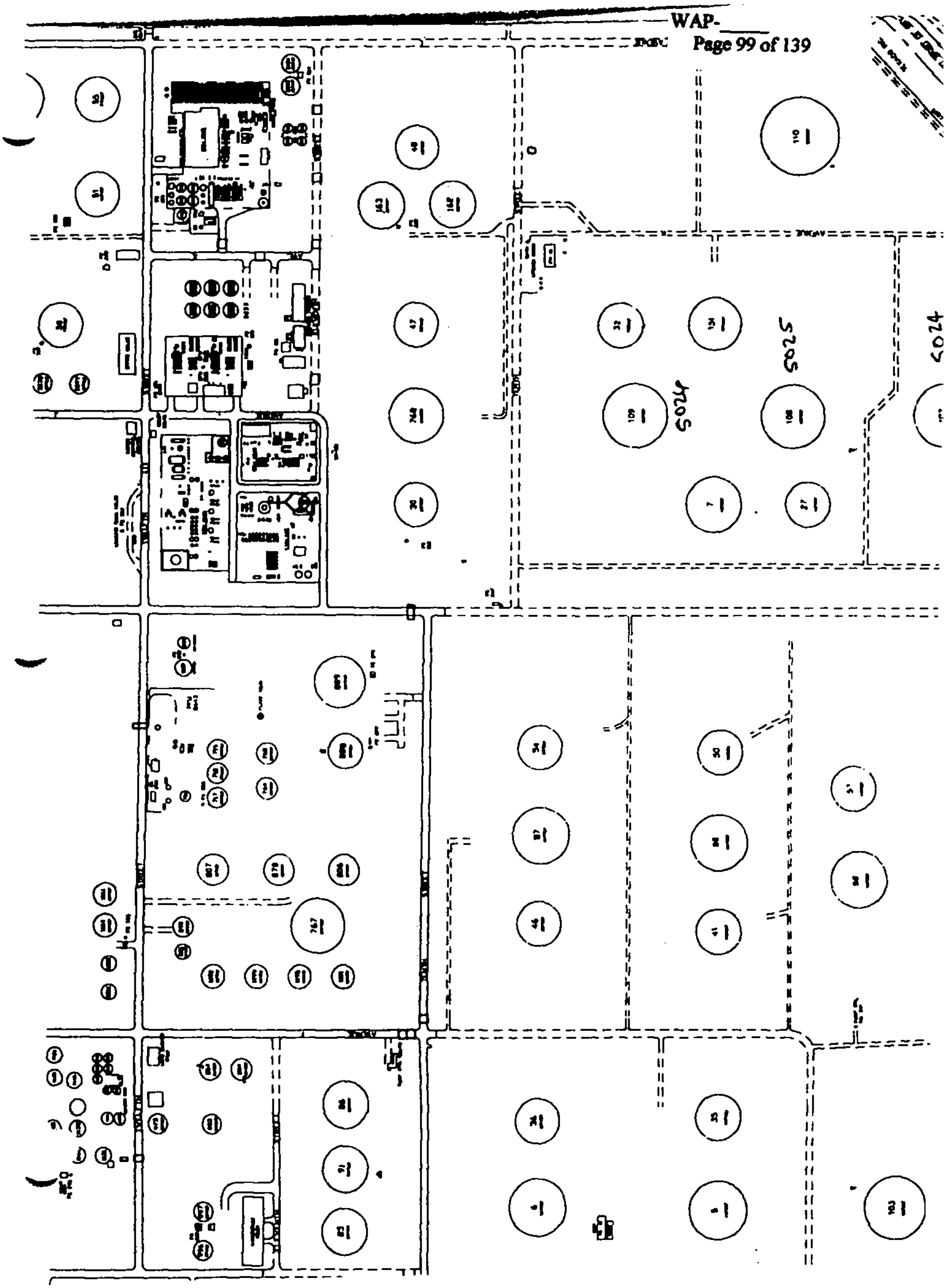

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Gulf Oil Company - U.S.

PORT ARTHUR REFINERY

M. P. Zanotti
REFINERY MANAGER
T. D. Higginbotham
MANAGER - ENGINEERING
B. J. Stout
MANAGER - HUMAN RESOURCES
C. R. Tuckey
MANAGER - MAINTENANCE & CONSTRUCTION
J. E. Walizer
MANAGER - OPERATIONS
W. F. Dee
MANAGER - SERVICES

P. O. Box 701
Port Arthur, TX 77

January 10, 1977

RECEIVED
JAN 11 1977
REGION 10
TEXAS AIR CONTROL BOARD

Mr. Charles R. Barden
Executive Director
Texas Air Control Board
8520 Shoal Creek Boulevard
Austin, Texas 78758

Dear Mr. Barden:

Re: Permit No. C-203, Crude Oil Tanks
Port Arthur, Jefferson County

In accordance with the provisions of the above referenced permit authorizing construction of Crude Oil Tanks Nos. 106, 107, 108, and 109 at the Port Arthur Refinery and confirming telephone notification of the Permits Sectic Staff on January 7, 1977, we advise that construction is nearing completion on Tank No. 109 and we plan to put it in service within a week to ten days. We anticipate that Tanks Nos. 108, 107, and 106 will be completed and put in servi in the sequence listed at three to four week intervals.

As requested by the Permits Section, we will submit our application f an operating permit for these tanks soon after putting Tank No. 109 in service.

Please advise if further information is required.

Yours very truly,

Original Signed by
M. P. Zanotti

M. P. Zanotti

OLF:mdh

cc: H. T. Baker, Regional Supervisor
Texas Air Control Board, Beaumont
V. Bateman, Acting Director
Jefferson County Environmental Control Dept., Nederland
Director, Enforcement Division,
U.S. Environmental Protection Agency, Dallas

Gulf

A DIVISION OF GULF OIL CORPORATION

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TEXAS AIR CONTROL BOA...

PHONE 512/451-5711
8520 SHOAL CREEK BOULEVARD
AUSTIN, TEXAS - 78758

CHARLES R. BARDEN, P. E.
EXECUTIVE DIRECTOR

JOHN L. BLAIR
Chairman

HERBERT W. WHITNEY, P.E.
Vice-Chairman

ALBERT W. HARTMAN,
E.W. ROBIN
CHARLES R
JAMES D. ABR
FRED H
WILLIE L. ULICH, P
JOE C. BRIDGEFARM

JUN 10 1974

Re: Permit No. C-

Dear Mr.

A construction permit for your new facility is enclosed. We appreciate your cooperation in sending us the necessary information to evaluate your proposed facility.

We have also enclosed an application(s) for a permit to operate (Form PI-3). Within sixty (60) days after operation of the facility begins, please return each application <u>in triplicate</u>.

Yours very truly,

Charles R. Barden, P.E.
Executive Director
Texas Air Control Board

Enclosure

cc:

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TEXAS AIR CONTROL BOARD
FORM PI-1, GENERAL APPLICATION
(Read Instructions Before Completing)

I. PERMIT TO BE ISSUED TO: Gulf Oil Company - U.S.
(Corporation, Company, Government Agency, Firm, etc.)

Mailing address: P. O. Box 701, Port Arthur, Texas 77640

Individual authorized to act for applicant: Name: O. L. Fouse Title: Supervisor, Utilitie Environmental Engine

Address: P. O. Box 701, Port Arthur, Texas 77640 Telephone: 713/983-3301 Extension 460

II. LOCATION OF PERMIT UNITS (Latitude and Longitude must be to the nearest 15 seconds):

Name of plant or site: Gulf Oil Refinery Street address (if available): West Seventh Stre

Nearest city: Port Arthur County: Jefferson Latitude: 29-51-15 Longitude: 93-57-4

III. TYPE OF OPERATION OR PROCESS OF PERMIT UNIT:

A. Name of operation or process of permit unit: Floating Roof Tanks for Crude Oil Storage
B. Permit unit identification number: Tank Nos. 106, 107, 108 and 109 (Source No. 50)
C. Type (Check one): XXX Permanent ☐ Portable
D. Operating schedule: Hours/day 24 Days/week 7 Weeks/year 52

IV. PERMIT UNIT CLASSIFICATION (Check applicable blocks):

A. XXX New Permit Unit: Proposed start of construction 11-74 (Date) Start of operation 4-77 (Date)
B. ☐ Modification of Permit Unit
C. ☐ Change in Location
D. ☐ Change in Ownership
E. ☐ Permit Unit Now Operating Under Permit Number ________

V. If Items IV. A, B, or C were checked, submit the following information under either A or B:

A. Data requested in B1, B2 and B3 has been previously submitted under Permit No. C-802
B.1 Submit three copies of an area map to approximate scale showing the location of the property, the land use designations fo adjacent and nearby lands which may be affected by the emissions, geographical features such as highways, roads, streams or significant landmarks, distance to the center of nearest city or town if located outside an incorporated municipality. If th property is located within a town or city, a city map may be used to present this information, and if outside a town or city, a coun highway map may be used. County highway maps may be ordered either through the Texas Highway Department, Austin, Texa or through the State District Highway Engineer for the county.
B.2 Give a legal description of the tract of land upon which the plant or facility is located. The term "legal description" mea either a metes and bounds description, or the block and lot number of a platted subdivision which would be suitable to effectu the transfer of title to real property.
B.3 Submit a plot plan of the property, to scale, showing the boundaries, the location of all sources of any air contaminant the property, the distance from each source to the nearest boundary line, prevailing wind direction, true north directior scale and any other information deemed relevant by the applicant. Identify the sources by numbers; use the same num for those sources in this permit that will be assigned in the flow diagram.

VI. If Item IV.E is not checked, submit the following information:

A. Process Flow Diagram. Prepare and attach a flow diagram identifying significant individual processes and/or operations. Id (by number) points where raw materials, chemicals, and fuels are introduced, where gaseous emissions and/or airborne partic may be discharged including intermediate releases where finished products are obtained, and location of pollution control de
B. Description of Process. Prepare and attach a written description of each process and of the function of the equipment process. (Identify items of equipment by numbers corresponding to flow diagram numbers.) The description must be in suff detail to determine the general operation of the process. Particular attention must be given to explaining all stages in the p where there is or may be a discharge of any solid, liquid, or gaseous material(s) into the atmosphere. Estimate number ar of air pollution abatement devices to be used such as 1 electrostatic precipitator, 2 cyclones, 1 incinerator, 2 baghous

VII. Has local Air Pollution Control Program been contacted? XXX Yes ☐ No ☐ No active local program in the city or c

VIII. I, B. F. Short (Name) Refinery Manager (Title)

state that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate vision of the Texas Clean Air Act, Article 4477-5, Vernon's Texas Civil Statutes, as amended, or any of the rules and regulatic Texas Air Control Board or any local governmental ordinance or resolution enacted pursuant to the Texas Clean Air Act.

DATE April 18, 1974 SIGNATURE Original Signed By: B. F. Short

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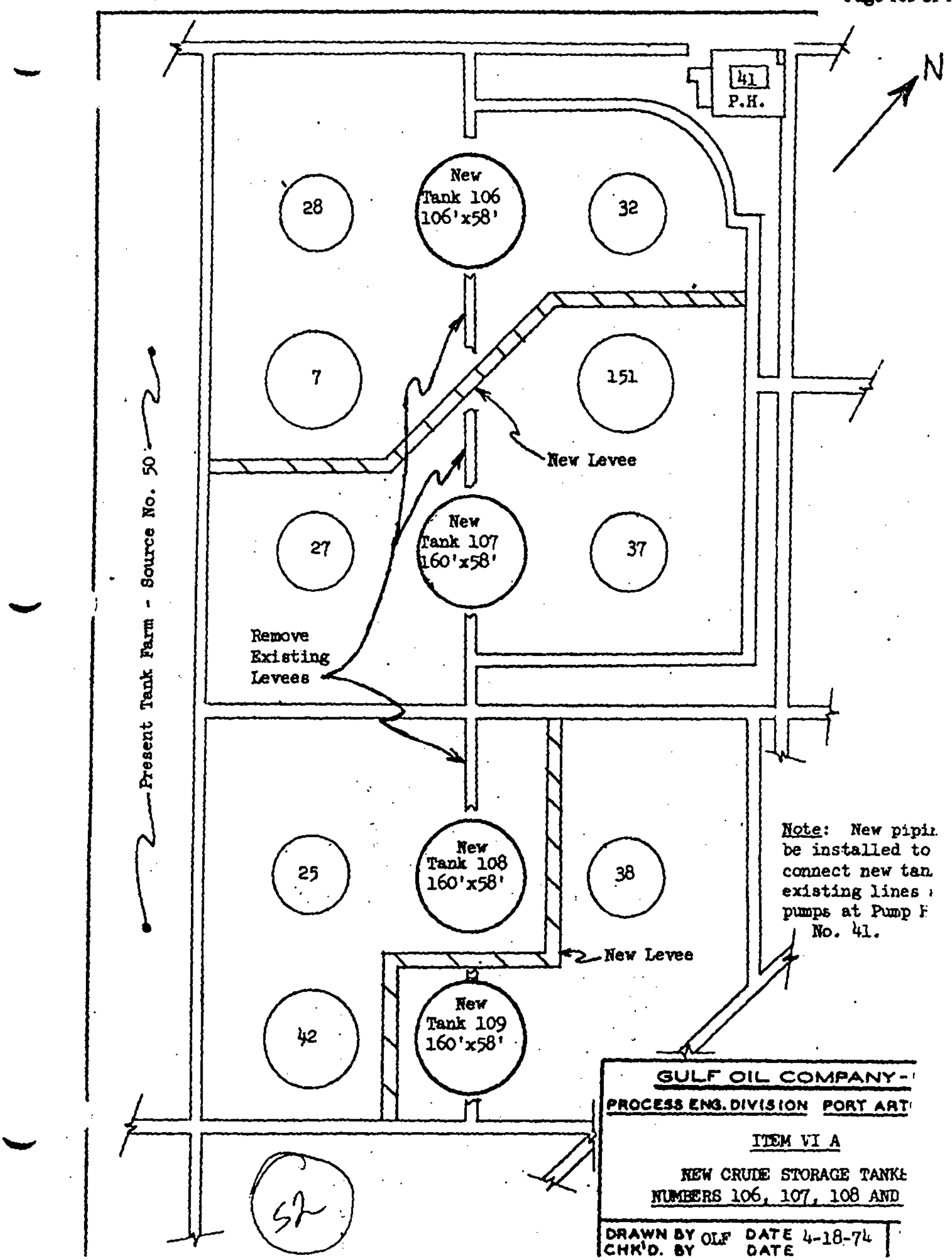

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ITEM VI B

DESCRIPTION OF PROCESS

The proposed permit units are four 160 Ft. diameter x 58 Ft. high crude oil storage tanks. These tanks are necessary to improve the capability to receive and charge various crude oils. The tanks will have a working capacity of 175,000 barrels each and will be equipped with a single deck annular pontoon type floating roof. The tanks will be located in an existing tank farm which is designated as Source No. 50 on our annual Emissions Inventory Report. Therefore, it is proposed that these new tanks be considered as additional contributors to Source No. 50.

Jenkins Ex-5

REDACTED

Coker Project Cost Announcements

ect	Location	Source	Cost $MM	$/BPD	Size BPD	Details
fnia	Brazil	OGJ 10/97	$ 235	$ 7,472	31,450	New coker
tershall	Germany	OGJ 10/97	$ 77	$ 14,259	5,400	Expansion
eney	Texas	OGJ 10/97	$ 450	$ 7,759	58,000	New, with vac tower -- cost may be low
-	Hungary	OGJ 04/98	$ 170	$ 8,500	20,000	New coker
SA	Romania	OGJ 10/98	$ 12	$ 8,989	1,335	Expansion
Deer Park	Texas	OGJ 04/99	$ 300	$ 8,571	35,000	Expansion
que De Canlas	Brazil	OGJ 04/00	$ 181	$ 5,755	31,450	New, 2004
rojam	Jamaica	OGJ 04/00	$ 350	$ 23,333	15,000	Coker/cogen; planning
rox	Chile	FW	$ 236	$ 19,667	12,000	Coker with 67 MW cogen
ddrift	Texas	FW	$ 22	$ 12,222	1,800	Expansion 130,000 MT to 170,000 MT, est 1800 B
cor	Venezuela	FW	$ 350	$ 5,000	70,000	6 drum, includes SRU, gascon, handling -, est size
ropower	Pennsylvania	FW	$ 350		.	coker, 100 MW cogen - project shelved
joven	Amuay	OGJ 94	$ 320	$ 9,412	34,000	new coker
RC	Texas	OGJ 94	$ 800	$ 17,778	45,000	100,000 BPD crude; 45,000 gasoil hydrotreater, 235 st/d SRU
Toledo	Ohio	BP '98	$ 235	$ 7,833	30,000	Under Construction
ell Martinez	California		$ 250	$ 10,331	24,200	internal per [A]. not public includes handling
venas	St. Croix		$ 430	$ 7,414	58,000	$430 From JEG/Bechtel, $535 per S&P
venas	St. Croix		$ 535	$ 9,224	58,000	$430 From JEG/Bechtel, $535 per S&P
ell	Deer Park	Internal	$ 950	$ 19,000	50,000	Includes crude expansion, various mods
ark Oil	Port Arthur	Moody's	$ 655	$ 8,188	80,000	There is 655 of debt ?
ark Oil			$ 750	$ 9,375	80,000	RS — Ray Stancil
rien			$ 145	$ 3,625	40,000	
andi			$ 406	$ 10,150	40,000	

Coker $ 3,000 Per [A;] no handling, no gas plant {Jenkins says on USGC}
3 to 4,000 Per Foster Wheeler
[A] says coker alone at Shell, Martinez about $6,000.

A- Art Stephani

Post-it® Fax Note 7671	Date 7/15/03 # of pages ▸
To Mike Sarna	From Bill Sanderson
Co./Dept.	Co.
Phone #	Phone # H3989
Fax #	Fax #

EMT 03557

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DRAFT ENVIRONMENTAL IMPACT REPORT

for the

SHELL OIL COMPANY CLEAN FUELS PROJECT

(Land Use Permit 2009-92; State Clearinghouse # 92093028)

CONTRA COSTA COUNTY

MAY, 1993

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TABLE 3-4

PROPOSED NEW TANK DIMENSIONS

New Tanks	Number of Tanks	Diameter	Maximum Height
Lube Crude Tanks	2	150'	48'
Dimate Tank	1	134'	30'
Isomerization Feed Tank	1	144'	34.5'
Heavy Naphtha Tank	1	87'	47'
Sour Water Tank	1	110'	60'
Declayed Coking Unit Recycle Oil Tank	1	120'	48'
Delayed Coking Unit Feed Tank	1	150'	48'
C_5 Tanks	3	90'	60'
Lt. Crude Tank (#1)	1	110'	60'
Lt. Crude Tank (#2)	1	230'	48'
Olefin Sphere	1	50'	—
Liquified Petroleum Gases Sphere	1	42'	—
Alkylate Tank	1	123'	48'
Butane Sphere	1	50'	—
Effluent Holding Tank	1	50'	48'
Sludge Thickener Tank	1	60'	40'

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VALERO ENERGY CORPORATION

Valero to Upgrade Texas City Refinery

Return to News Releases

San Antonio - January 10, 2002

Valero Energy Corporation (NYSE: VLO) today announced a major upgrading project at its Texas City refinery. The company intends to construct a new 45,000 barrel-per-day (BPD) delayed coker facility that will greatly improve the refinery's overall profitability and allow the refinery to process a heavier, more sour crude oil feedstock slate. Completion of the project is expected by January of 2004 at a cost of approximately $300 million. Company officials also announced that they have entered into a long-term supply contract with P.M.I. Comercio Internacional, S.A. de C.V. (PMI) for 90,000 BPD of Maya crude commencing upon completion of the coker project.

"Once we complete this project, the Texas City refinery will be a world-class facility with more than 260,000 BPD of throughput capacity," said Bill Greehey, chairman of the board and chief executive officer. "When we bought the Texas City refinery from Basis Petroleum, we paid less than ten cents on the dollar of replacement cost. One of the biggest reasons for the very low purchase price was its limited ability to upgrade bottom-of-the-barrel refined products. The coker project will resolve this limitation by allowing us to upgrade residual fuel oils rather than selling them at discounted prices in the market or transporting them to our Corpus Christi facility. The other big benefit is that we'll be able to process a heavier, more sour feedstock slate which should lower the refinery's feedstock costs by as much as $1 per barrel."

"Our contract with PMI is also very significant since it secures a reliable source of heavy, sour crude and reduces our dependency on long-haul crudes such as those out of the Middle East. This new contract also expands our relationship with PMI by increasing our total crude commitment to more than 170,000 BPD," said Greehey.

Valero Energy Corporation is a Fortune 100 company based in San Antonio, with more than 20,000 employees and annual revenues of more than $30 billion. The company currently owns and operates 12 refineries in the United States and Canada with a combined throughput capacity of approximately 2 million BPD, making it one of the nation's top three refiners of petroleum products. Valero is also one of the nation's largest retailers of petroleum products with nearly 5,000 retail outlets in the United States and Canada under various brand names including Diamond Shamrock, Ultramar, Valero, Beacon and Total.

-30-

For more information about Valero, visit the company's web site at www.valero.com.

Statements contained in this press release that state the Company's or management's expectations or predictions of the future are forward-looking statements intended to be covered by the safe harbor provisions of the Securities Act of 1933 and the Securities Exchange Act of 1934. It is important to note that the Company's actual results could differ materially from those projected in such forward-looking statements. Factors that could affect those results include those mentioned in the documents that the Company has filed with the Securities and Exchange Commission.

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AiR/GB00073P/391421RA

VALERO REFINING COMPANY-TEXAS

INFORMATION COPY

TEXAS CITY REFINERY

TNRCC AIR ACCOUNT NO. : GB-0073-P

FLEXIBLE PERMIT AMENDMENT APPLICATION

LOW SULFUR GASOLINE PROJECT /
EXPANSION PROJECTS /
PROPOSED AMENDMENTS TO SPECIAL CONDITION No. 51

OCTOBER 2001

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1.0 INTRODUCTION

1.1 Purpose

Valero Refining Company - Texas (Valero) owns and operates a petroleum refinery in Texas City, Galveston County, Texas. The facility is designed to process crude oil into a variety of gasolines and hydrocarbon products and derivatives. The Valero Texas City facility is currently permitted to operate under Texas Natural Resource Conservation Commission (TNRCC) Flexible Permit Nos. 39142 and PSD-TX-822M2, as amended June 4, 2001.

In accordance with the provisions of 30 Texas Administrative Code (TAC) §116.710 and §116.721, Valero is submitting this application for an amendment to the Flexible Permit to accomplish the following objectives:

1) Authorize the construction of a Gasoline Hydrotreater Unit (aka Low Sulfur Gasoline Unit) to permit hydrotreating desulfurization of gasoline to meet more stringent federal fuel standards.

2) Authorize an expansion in sulfur recovery (sulfur production) rates.

3) Authorize the construction of a new Maya crude oil storage tank.

4) Authorize the construction of a new naphtha feed tank.

5) Authorize new piping components within the facility's Tank Farm Area to allow 13 product tanks to be interconnected to a Marathon pipeline header.

6) Authorize new piping components within the facility's Tank Farm Area to allow the installation of a new gasoline blender system.

7) Allow the conversion of two existing storage tanks into heated coker feed storage tanks and authorize the construction of a coker feed tank heater (fuel-fired heater rated at 7.5 MMBtu/hour).

8) Authorize a change in the permitted maximum filling rate for Sourwater Tank T-549 from 1,000 bbl/hour to 2,143 bbl/hour to provide additional retention time capacity to the refinery.

9) Establish sub-caps for ammonia and hydrogen sulfide emissions from the facility's four existing flares.

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10) Request an alteration to the flexible permit's Attachment 1 Listing of Emission Sources to include two previously permitted LPG bullet tanks (T-538 and T-539).

11) Request a change in the language of Special Condition No. 51 of the flexible permit.

12) Amend the representations of the facility's Wastewater Treatment Unit to include a second, parallel, lift station at the front end of the wastewater system.

13) Roll in all outstanding Permit-By-Rules (PBRs).

1.2 Background Discussion

1.2.1 Authorization of New Gasoline Hydrotreater Unit:

To be able to meet more stringent federal fuel standards which regulate the amount of sulfur permissible in gasoline, Valero must install additional process equipment to accomplish a greater level of desulfurization of its gasoline product. The Gasoline Hydrotreater Unit will accomplish desulfurization using catalytic hydrotreating technology. A detailed discussion of the process and equipment involved is provided in Section 2.1.

1.2.2 Authorization of Sulfur Recovery Expansion:

To accommodate the increased needs for sulfur removal at the facility, Valero is requesting authorization to expand the capacities of its existing sulfur recovery units (SRUs). High-level oxygen enrichment technology will be applied to the existing SRUs (implemented over 3 phases) to allow a total sulfur processing rate increase from 595 LTPD to 907 LTPD (final phase). A detailed discussion of the SRU units and proposed technologies are provided in Section 2.1.

1.2.3 Authorization of New Maya Crude Tank

The facility is requesting authorization to construct a new Maya Crude Tank to allow the segregated storage of Maya crude oil from other imported crude oils. Maya crude oil contains high levels of metals which could poison the catalysts in several of the facility's downstream hydroprocessing units. Segregation of the Maya crude will allow better inventory control at the facility and minimize the possibility of any adverse downstream effects.

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1.2.4 Authorization of New Naphtha Feed Tank

The facility is requesting authorization to construct a new Naphtha Feed Tank to provide additional storage capacity for naphtha intermediate product. Two older existing facility tanks (T-429 and T-430) will be decommissioned and demolished.

1.2.5 Authorization of Marathon Pipeline Header Tie-Ins:

Valero is requesting authorization to install additional piping and fugitive equipment components in the tank farm area to allow the interconnection of 13 product storage tanks to an off-site pipeline header (Marathon pipeline). This project will allow the facility to export greater quantities of products via pipeline.

1.2.6 Authorization of Gasoline Blender Upgrade:

Valero is requesting authorization to install additional piping and fugitive equipment components (e.g., pumps, valves) in the tank farm area to allow an expansion of the facility's gasoline blending capabilities. A description of the new gasoline blender system and associated components is provided in Section 2.1.

1.2.7 Conversion of Two Tanks and Authorization of Coker Feed Tank Heater:

The facility will be converting two existing storage tanks (T-496 and T-517) into coker feed storage tanks. Due to the high viscosity of coker feed, the facility will need to install a recirculatory heater to maintain the material in a liquid (pumpable) state. The facility is proposing the installation of a small (7.5 MMBtu/hr) gas-fired heater adjacent to Tank T-517 to accomplish the necessary heating for that tank. For Tank T-496, the facility is intending to use steam heating (with no emissions source) to accomplish the heating.

1.2.8 Authorize an Increase in the Maximum Filling Rate for Sourwater Tank T-549

Valero is requesting that the maximum filling rate for Sourwater Tank T-549 be increased from its permitted level of 1,000 bbls/hr to 2,143 bbls/hr. The primary function of Sourwater Tank T-549 will be to store sourwater generated by the Delayed Coker Unit (up to 300 gpm). However, to provide the facility greater sourwater storage capabilities and to increase the facility-wide sourwater storage retention time, Valero intends to tie-in the existing sourwater tanks to the new Tank T-549 so that flow which normally goes to the existing tanks could be diverted to the new Tank T-549 whenever necessary. Consequently, Valero is requesting that the maximum allowable fill rate for T-549 be increased to 2,143 bbls/hr to accommodate total flow from the facility.

The total capacity of the three tank system (T-335, T-16-1902, and T-549) will be 7,564,200 gallons. The maximum sour water generation rate of the entire facility,

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including the Delayed Coker Unit, will be 1,500 gallons/minute (2,143 bbls/hr). The sourwater retention time for the system will be 3.5 days.

Valero is also requesting authorization to increase the design capacity of the new tank from 4,700,000 gallons to 5,250,000 gallons. In the application to the June 4, 2001 amendments, Valero characterized the tank as having a capacity of 4,700,000 gallons. To provide the additional sourwater storage capabilities described above, Valero is proposing that the tank be 5,250,000 gallons. In Section 5 of this application, Valero has recalculated emissions from the new tank on the basis of the larger dimensions and the proposed increased short-term filling rate.

1.2.9 Establishment of NH3 and H2S Sub-cap Limitations for Flares 1 –4:
Valero is requesting that an ammonia emission limit sub-cap and a hydrogen sulfide emission limit sub-cap be established in the Flexible Permit for Flares 1 –4. Currently, the flexible permit has individual ammonia and hydrogen sulfide emission limits for each flare. However, because the four flares are interconnected and have the capability to serve as backup to one another, Valero believes that a single sub-cap limit for each pollutant, based on the aggregate of the existing authorized individual limits, is warranted.

1.2.10 Alteration to the Flexible Permit's Attachment 1 Listing of Emission Sources
Valero is requesting that LPG bullet tanks T-538 and T-539 be added to the Attachment 1 listing of emission sources contained at the end of Flexible Permit No. 39142. As indicated in our June 29, 2001 letter to your office, Tanks T-538 and T-539 were authorized under the most recent amendment to the flexible permit, but did not make their way into the Attachment 1 listing of emission sources. Valero is requesting that these tanks be included in the Attachment 1 listing under the category of "Storage Tanks."

1.2.11 Proposed Amendments to Special Condition No. 51:
Valero is proposing amendments to Special Condition No. 51 so that the provisions of this condition reflect current Best Available Control Technology (BACT) emission levels, rather than planned voluntary emission levels which are subject to change. The proposed amendments are also being requested to allow the facility greater discretion in its choice of specific NO_x reduction control technologies to be applied to new heaters and boilers. The current provisions of Special Condition No. 51 restrict the facility to the use of selective catalytic reduction (SCR) technology on its new heaters. This restriction prohibits the use of other effective NO_x reduction control technologies, such as ultra low-

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NO_x burners, which are capable of achieving current BACT levels. Valero is proposing that Special Condition No. 51. B be modified to read:

> *"All proposed new heaters, including Heaters EH-34N, EH-42, EH-43, EH-47, EH-48, EH-53, EH-54, EH-55, EH-56, EH-59, and EH-60, shall be equipped with NO_x control technology capable of meeting a NO_x emission value of 0.035 lb/MMBtu for each individual unit (upon initial start-up)."*

Related to this proposal, Valero is also proposing that the language of Special Condition No. 51. C be modified to exclude the phrase "*(as required by Special Condition No. 51B above).*"

To provide background on the basis of the current language contained in Special Condition No. 51.B, Valero represented in its July 2000 amendment application that the new heaters associated with the Coker Unit, the No. 3 Reformer Unit, and the No. 3 Crude Unit would be designed to meet 0.015 lb/MMBtu of NO_x. This representation was aligned with the Houston/Galveston Area (HGA) NO_x SIP Rule, which was finalized in December 2000 and requires a NO_x control level of 0.01 lb/MMBtu for process heaters. The level of over-control which was represented in the amendment application was not intended to be a reflection of current BACT, which is 0.035 lb/MMBtu of NO_x for process heaters.

The provisions of 30 TAC §116.711(3) address BACT for flexible permits and state that the "*existing level of control may not be lessened for any facility.*" Regarding new facilities, §116.711(3) states that "*the use of BACT shall be demonstrated for the individual facility.*" Valero believes that Special Condition No. 51.B should only reflect the application of current BACT for new process heaters (i.e., 0.035 lb/MMBtu) and not Valero's voluntary and changeable plan regarding individual process heater NO_x control levels. For this reason, Valero is requesting the changes indicated above to Special Condition No. 51.B. Under no circumstances will Valero lessen the existing level of control for any emission source.

1.2.12 Amendment of Wastewater Treatment Unit Representation:

Valero is submitting an amendment to its representation of the facility's wastewater treatment unit to include a second, parallel, lift station at the front end of the system. The current representation characterizes the system as having a single process water lift station (G-173) upstream of the API separator. However, because the facility's stormwater lift station (G-172) can, on occasion, divert flow to the wastewater treatment unit (parallel with the process water lift station and upstream of the API), Valero is

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amending the system's characterization to include G-172. The total water flow rate through the system is not changing as a result of this addition and consequently there are no emission rate changes associated with this action. See Section 2.1 for a more detailed discussion of the proposed wastewater system amendments/re-characterizations.

1.2.13 Incorporation of TNRCC Permit-By-Rules:

Valero is requesting that TNRCC Permit-By-Rule (PBR) No. 48330, issued August 17, 2001, be incorporated into (rolled into) the Flexible Permit. PRB No. 48330 authorized the construction of the BHT Unit (EPN F-60), two new spherical tanks (T-547 and T-548), a new LPG truck rack (F-59), and changes to the annual throughputs associated with Tanks T-489, T-490, and T-491. Valero is requesting that the new emission sources associated with this PBR (F-59, F-60, T-547, and T-548) be added to the listing of authorized emission sources contained in Attachment 1 of the Flexible Permit. Please note that the location of the new LPG truck has been changed (see Figure 2-4a) to a location approximately 100 feet north of the old, decommissioned truck rack.

1.3 Approach (Emissions Offsetting)

This amendment application is not proposing any increases to the refinery-wide criteria pollutant emission cap limitations which are currently authorized in the Flexible Permit. To provide offsets for the new emissions which are associated with this application, Valero has reduced authorized emissions from a number of existing sources (e.g., fugitives, Tanks 429 and 430, and the FCCU). As a result of the proposed amendments, the flexible permit's emission cap limitations for VOC, benzene, and NO_x will actually be incurring small reductions, while the emission cap limitations for CO, SO_2 and PM_{10} will remain the same.

Valero is proposing slight increases in the individual H_2S emission limits for the Tail Gas Incinerators as a result of this amendment. These increases will be the result of the increased sulfur removal loads on the SRUs. The net increase for both tail gas incinerators combined will be +0.7 lb/hour and +3.1 tons/year.

1.4 Application Structure

This flexible permit amendment application has been prepared in accordance with the provisions of 30 TAC §116.711 and §116.721 and has been structured to address each of the applicable requirements of TNRCC's "Air Quality Permit Application Instructions,

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PI-1 Form." This application consists of seven narrative sections (complete with summary technical data tables, figures, and maps) followed by a series of appendices containing:

- Appendix A – General TNRCC Forms / Tables (PI-1, Core Checklist, Table 1(a), Table 2, Table 30)
- Appendix B – Combustion Source Calculations and Tables
- Appendix C – Storage Vessel Calculations and Tables
- Appendix D – SRU/TGI and Process Vent Calculations and Tables
- Appendix E – Fugitive Emission Calculations and Tables
- Appendix F – Process Drains / Wastewater Treatment Unit Water8 Calculations
- Appendix G – TNRCC Equipment Tables (Tables 6 and 7)
- Appendix H – Comptroller's Letter of Good Standing

1.5 Listing of New and Modified Emission Sources

Presented in Table 1-1 is a listing of the new and modified emission sources which will be associated with the proposed projects and which Valero is requesting be included in the facility's amended flexible permit.

In addition to the sources listed in Table 1-1, Valero is also requesting that the following previously-authorized sources be included in Attachment 1 of the Flexible Permit:

Source:	Authorization:
T-538	June 4, 2001 Amendment (see Clarifying Letter sent to TNRCC June 29, 2001)
T-539	June 4, 2001 Amendment (see Clarifying Letter sent to TNRCC June 29, 2001)
T-549	June 4, 2001 Amendment (previously identified as "Sourwater Tank")
T-547	PBR No. 48330 (identified in the PBR as "iC4 Spherical Tank")
T-548	PBR No. 48330 (identified in the PBR as "iC5 Spherical Tank")
F-59	PBR No. 48330
F-60	PBR No. 48330

1.6 Summary of Emission Changes

Presented in Table 1-2 is a summary of the emission changes associated with the proposed permit amendments. More detailed summaries of the emission changes can be found in Sections 5 and 6 of this application.

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TABLE 1-1
Listing of New and Modified Emission Sources*
Valero Refining - Texas City Refinery

October 2001

FIN	EPN	Emission Source Description	Source Category	New or Modified Source
H-59	EH-59	Coker Feed Tank Heater	Combustion Sources	New
H-60	EH-60	L.S. Gasoline Column Reboiler Heater	Combustion Sources	New
Maya Crude Tank	Maya Crude Tank	Maya Crude Tank	Storage Tank	New
Naphtha Feed Tank	Naphtha Feed Tank	Naphtha Feed Tank	Storage Tank	New
T-496	496	Tank 496	Storage Tank	Change of Service
T-517	517	Tank 517	Storage Tank	Change of Service
T-549	549	Sourwater Tank 549	Storage Tank	Modified
T-429	429	Tank 429	Storage Tank	To be Removed From Permit
T-430	430	Tank 430	Storage Tank	To be Removed From Permit
P-33	F-33	Tank Farm Unit Fugitives	Fugitives	Modified
P-61	F-61	Low Sulfur Gasoline Unit Fugitives	Fugitives	New
G-193	EG-193	No. 3 TGU Incinerator	Process Vent	Modified
G-18-1403	EG-18-1403	Residfiner TGU Incinerator	Process Vent	Modified
WWTU-A	WWTU-A	Wastewater System (addt'l process drns)	Wastewater Source	Modified

* Does not include the new sources authorized under PBR No. 48330 (8/17/2001), which are being rolled into the permit via this amendment.

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2.0 PROCESS DESCRIPTION, PROCESS FLOW DIAGRAM, PLOT PLAN, AND AREA MAP

2.1 Process Descriptions

This section presents a brief description of the Gasoline Hydrotreater process and the other projects which are being proposed in this amendment application.

Gasoline Hydrotreater Unit (Phase I – Gasoline to ~40 ppm sulfur):
The Gasoline Hydrotreater Unit will produce up to 55,000 barrels per day of low sulfur gasoline using a catalyst distillation technology. The process will desulfurize naphtha from the Fluid Catalytic Cracking (FCC) Unit using a proprietary hydro-desulfurization catalyst packed in a distillation/hydrodesulfurization column tower. The operating conditions in the column will form a selective hydrodesulfurization environment in which sulfur compounds will react with added hydrogen to form hydrogen sulfide (H_2S), which can then be effectively removed.

Heavy naphtha from the FCCU will first enter a conventional gasoline splitter column where light gasoline will be separated from heavier, sulfur-laden gasoline. The splitter's reboiler will obtain heat from a shell-and-tube heat recovery exchanger and by supplemental high pressure steam. The overhead gases from the top of the splitter will be routed to the facility's fuel gas recovery system. To minimize octane loss in the column, the facility may utilize an optional hydro-isomerization technology in the column, which would involve the use of additional catalyst in the splitter column (extending the height of the column by approximately 22 feet).

The heavy gasoline exiting the bottom of the splitter will be routed to the hydro-desulfurization column. The hydrodesulfurization column will be equipped with a fuel gas fired reboiler heater (H-60) and the overhead vapors from the top of the column (containing the greater portion of desulfurized naphtha) will be partially condensed and sent to an accumulator that operates at moderate temperature. A portion of the liquid from the accumulator drum will be pumped back into the column as reflux, while the remainder of the liquid will be routed to a stabilizer/H_2S stripper column. Hydrogen sulfide-laden vapor off the accumulator drum will be routed to an amine contactor, where H_2S will be removed by contact with lean amine. The rich amine from the bottom of the contactor (rich in sulfur compounds) will be sent to the facility's Amine and Sulfur Recovery Units for further processing. The vapor leaving the amine contactor will be recycled back into the

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desulfurization process by a recycle compressor on flow control. Makeup hydrogen will be added to the process, as needed. A purge of the vapor exiting the amine contactor will be drawn off and routed to the fuel gas system to control non-condensables buildup in the process.

The function of the stabilizer/H_2S stripper column will be to remove hydrogen, H_2S, and light hydrocarbons from the desulfurized naphtha. The vent off the stabilizer column will be returned to the FCC Unit for reprocessing. The bottoms stream off the stabilizer column will be the hydrotreated naphtha product; this product will be routed to the facility's existing on-site blending operations.

A simplified process flow diagram of the hydrodesulfurization process is presented at the end of this section as Figure 2-5. Under normal operating conditions, the process will not have emissions to the atmosphere (purged gases from the gasoline splitter and amine contactor will be routed to the facility's fuel gas system and off-gases from the stabilizer column will be routed to the FCCU for reprocessing). Safety and process relief valves associated with the unit will be routed to a flare or other control device.

<u>Gasoline Hydrotreater Unit (Phase II – Gasoline to ~10 ppm sulfur)</u>:
The process description provided in the preceding section represented Phase I technology, which will be capable of reducing sulfur levels to approximately 40 ppmw. Valero intends to design the Phase I process unit in a manner that will allow the future addition/integration of Phase II sulfur removal equipment (capable of reducing sulfur levels to approximately 10 ppmw). The Phase II modifications are expected to involve the installation of two additional columns (one will be a dedicated H_2S stripper column, the other will be a polishing reactor column), one compressor, several heat exchangers, several drums, and approximately 4 additional pumps. The two new Phase II columns will be added to the tail end of the Phase I equipment and will remove H_2S from the bottom streams of the Phase I CDHDS Column and Stabilizer/H_2S Stripper. The Phase II equipment is expected to be added sometime after 2004. Like the Phase I equipment, the Phase II equipment will not have emissions to the atmosphere during normal operations (all purged gases will be reprocessed or routed to the fuel gas system). The fugitive emission estimates quantified in Section 5 of this application include emissions from the entire Phase I + Phase II unit equipment.

<u>Expanded Sulfur Recovery Unit (SRU) Trains</u>:
The capacities of the facility's existing sulfur recovery trains will be expanded to accommodate the increased needs for sulfur removal at the facility. The existing Train 1 and Train 2 SRUs which are associated with the Residfiner Unit are each designed to process up

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to 330 long tons per day (LTPD) of sulfur using medium-level oxygen enrichment technology (COPE™ Phase I technology). Under the proposed expansions, high-level oxygen enrichment technology (COPE™ Phase II technology) will be applied to allow processing rates of up to 450 LTPD, per train. The existing SRU No. 3 train at the facility is designed to process up to 115 LTPD of sulfur. Under the proposed expansion, high-level oxygen enrichment (COPE™ Phase II technology) will be applied to allow processing rates of up to 230 LTPD.

The proposed expansions to the facility's SRU trains will result in increased emissions from the Scot Tail Gas Unit incinerators (TGI's) and increased sulfur production capabilities. The facility anticipates that the SRU train expansions will occur in phases (e.g., SRU #3 may be expanded in Year X, Residfiner Train 1 in Year Y, and Residfiner Train 2 in Year Z). The table below presents the anticipated implementation phases of the COPE technologies and the corresponding total facility sulfur production rates (maximum operating rates based on a minimum redundancy of 75%).

Implementation Phase	[illegible] Level of Expansion [illegible] Train Capacity [illegible]	Total Facility Prod. Rate Limit (based on 75% Redundancy) (LTPD)
1	***SRU #3 Train = 230 LTPD*** Resid Train 1 = 330 LTPD Resid Train 2 = 330 LTPD	747 LTPD [based on (230+330)/0.75]
2	***SRU #3 Train = 230 LTPD*** ***Resid Train 1 = 450 LTPD*** Resid Train 2 = 330 LTPD	747 LTPD [based on (230+330)/0.75]
3	***SRU #3 Train = 230 LTPD*** ***Resid Train 1 = 450 LTPD*** ***Resid Train 2 = 450 LTPD***	907 LTPD [based on (230+450)/0/75]

<u>No. 3 SRU Train Expansion</u>:
The No. 3 SRU Train will be modified from having no oxygen enrichment to having Phase II technology. The Phase II technology will require the installation of oxygen enrichment supply equipment (e.g., piping, controls, etc.) to the existing unit. In addition, the following changes will be made to the unit to accommodate the Phase II technology:

- Installation of larger acid gas piping, larger meter run, and larger control valve.
- Installation of a bypass around the existing acid gas preheater to control pressure drop.

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- Modification of existing main burner internals to allow the handling of oxygen and a higher acid gas rate.
- Increased boiler feed water and steam line sizes, if necessary.
- Modifications to the internals of the Scot quench tower.
- Modifications to the quench tower water pumps.
- Installation of a new, parallel, quench water air cooler.
- Replacement of trays in the Scot Amine Absorber with structured packing.

Residfiner SRU's Expansions:
The Residfiner SRU's (Trains 1 and 2) will be modified from Phase I technology to Phase II technology by the addition of a recycle loop which will cool the reaction furnace temperature such that higher levels of oxygen may be used without exceeding the temperature limits of the furnace refractory. The Phase II technology will use a steam ejector to accomplish the recycle. To accommodate the Phase II technology, the following changes will be made to the existing SRUs:

- Installation of larger acid gas piping, larger meter run, and larger control valve.
- Installation of larger acid gas knockout drum, or the addition of a new parallel drum.
- Installation of larger oxygen piping, larger control valve, and larger ESD valves.
- Modifications to the existing main burner internals to allow more acid gas and oxygen handling.
- Repiping of acid gas and air lines to main burner so that acid gas is fed to the existing air nozzle and air is fed to the existing acid gas nozzle.
- Installation of a recycle line from the outlet of Sulfur Condenser No. 1 to the acid gas feed line to the main burner.
- Installation of a larger Sulfur Condenser No. 1 to handle the increased duty.
- Installation of a larger sulfur seal for Condenser No. 1.

In addition, the following changes will be necessary in the Scot Tail Gas Unit to accommodate the SRU Phase II technology:

- Modifications to the internals of the quench tower, or possible replacement of entire tower.
- Modifications (or replacement) of the quench tower water circulation pumps; with increases in associated line sizes, if necessary.
- Addition of cooling capacity to quench water air cooler (or add trim cooler).
- Increased quench water line sizes, where necessary.

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__Marathon Pipeline Connection Project__:
The facility will be installing piping and modifying various pump configurations to allow the connection of product tanks T-313, T-314, T-316, T-440, T-443, T-444, T-445, T-446, T-447, T-448, T-450, T-452, and T-478 to the neighboring Marathon pipeline header. In addition to new piping and modified pump configurations, this project will also involve the installation of several new valves and flanges. It is estimated that the number of new components will be 6 pumps, 69 valves, 2 PSVs, and 207 flanges. Emission changes which will be associated with this project will be occurring under the existing Tank Farm Unit fugitives emission source (EPN F-33).

As a result of this project, the facility will be able to export gasoline and distillate products off-site via pipeline instead of marine transportation.

__Gasoline Blender Upgrade Project:__
The facility will be supplementing its existing gasoline blending system with a new and larger blending system. The existing blender is antiquated and will be unable, by itself, to meet the gasoline blending needs of the facility after the expansions authorized under the existing flexible permit are completed and operational.

A gasoline blending system is essentially a collection of component pipelines which are brought together and feed into a single gasoline product header. A computerized controller system determines and controls the exact blending rate of each component which is added to the blend. The blending system consists primarily of the computerized controller, pipelines, pumps, valves, and product quality analyzers. The gasoline product header then carries the blended gasoline product to the gasoline product storage tanks.

The only emission sources associated with the new blender will be fugitive equipment components. It is estimated that the new blender will consist of approximately 10 pumps, 100 valves, and 300 flanges. Emission changes which will be associated with this project will be occurring under the existing Tank Farm Unit fugitives emission source (EPN F-33).

__New Maya Crude Tank and New Naphtha Feed Tank:__
The facility will be installing an additional crude oil storage tank to allow for the storage of imported Maya crude. The tank will have a capacity of 350K barrels and will have an annual throughput of 36,500,000 barrels per year. The tank will be designed with an external floating roof equipped with a mechanical shoe primary seal and a rim-mounted secondary seal.

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The facility will also be installing an additional naphtha storage tank. The tank will have a capacity of 80K barrels and will have an annual throughput of 9,125,000 barrels per year. The tank will be designed with an internal floating roof equipped with a mechanical shoe primary seal.

As of this time, facility identification numbers are not available for these new tanks. Valero is requesting that these tanks be referred to as "Maya Crude Tank" and "Naphtha Feed Tank." When equipment identification numbers have been assigned to these tanks, Valero will inform the TNRCC of the assigned numbers.

Associated with the two new tanks will be new fugitive equipment components. It is estimated that an additional 8 pumps, 36 valves, 4 PSVs, and 108 flanges will be associated with the new tanks. Emissions from these new fugitive components will be occurring under the existing Tank Farm Unit Fugitives emission source (F-33).

<u>Conversion of T-496 and T-517 to Coker Feed Tanks:</u>
Existing Tanks T-496 and T-517 will be converted to coker feed service. The coker feed material is comprised of heavy vacuum tower bottoms. Due to the heavy nature of this material, the facility will be required to keep these tanks heated to approximately 450°F to maintain material fluidity (pumpability). To accomplish the heating, a small gas-fired heater (H-59) will be installed. Heater H-59 will have a maximum heat input duty of 7.5 MMBtu/hr. On an annualized basis, the heater is expected to run at approximately 5.0 MMBtu/hour. The heater will be refinery fuel gas or sweet, pipeline-quality natural gas.

<u>Updated Representation of Wastewater Treatment Component Configuration</u>:
Under the existing flexible permit, the wastewater treatment unit is characterized as being composed of one process lift station (G-173) followed by the API Separator, DAF, and the remainder of the wastewater handling and treatment components. Under this amendment application, Valero is seeking to change the characterization of the front-end of the wastewater treatment system to contain two lift stations, operating in parallel. Process Lift Station G-173 and Stormwater Lift Station G-172 are being considered by the facility as operating in parallel because the stormwater lift station can, on occasion, divert flow to the wastewater treatment unit whenever the water is determined unsuitable for discharge as stormwater.

The water flow rate through the two parallel lift stations will be the same as the existing permitted water flow rate through the single lift station (i.e., 2,800 gallons/minute). As

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shown in the Water 8 emission calculations contained in Appendix F and as discussed further in Section 5 of this application, there are no emission changes associated with the proposed addition of a parallel lift station.

2.2 Process Flow Diagram

Presented in Figure 2-1 is a simplified process flow diagram which shows the integration of the proposed new and modified process units to the total refinery. Also included on Figure 2-1 is the Butadiene Hydrotreater Unit (BHT Unit) which was recently authorized under PBR. No. 48330 (August 17, 2001).

2.3 Area Map and Facility Plot Plan

Presented in Figures 2-2 and 2-3 are area maps depicting the location of the Valero Texas City facility. The area map presented in Figure 2-2 is a 1:250,000 scaled map which was prepared from the United States Geological Survey (U.S.G.S.) Topographic-Bathymetric Map for Houston, Texas. The Valero Texas City Refinery is clearly indicated on Figure 2-2.

The area map presented in Figure 2-3 is a 1:24,000 scaled map which was prepared from the Texas City and Virginia Point, Texas U.S.G.S. 7.5-minute Quadrangle topographical maps. Identified on this map are the Valero Texas City facility's property, an outline of all areas within 3,000 feet of the facility's property boundaries, and indications of the nearest residence, church, and community center.

The Valero Texas City facility is bounded to the north by Marathon Oil, to the east by the Texas City Ship Channel, immediately to the south by Amoco Chemical Company's storage tank farm and by Union Carbide Corporation's marine facility, further to the south by the Texas City Ship Channel Turning Basin, and to the west by Amoco Oil Company.

Presented in Figures 2-4a and 2-4b are scaled plot plans of the Valero Texas City refinery, complete with UTM coordinate references. Figure 2-4a depicts the facility's process units and Figure 2-4b depicts the facility's tank farm area and marine docks. Each emission point number (EPN) at the Valero facility is clearly shown on the plot plans. Please note that for some of the new equipment for which detailed design information is still unavailable, the UTM coordinates provided on the Plot Plans and on TNRCC Table 1(a) reflect current best available information and may be subject to change.

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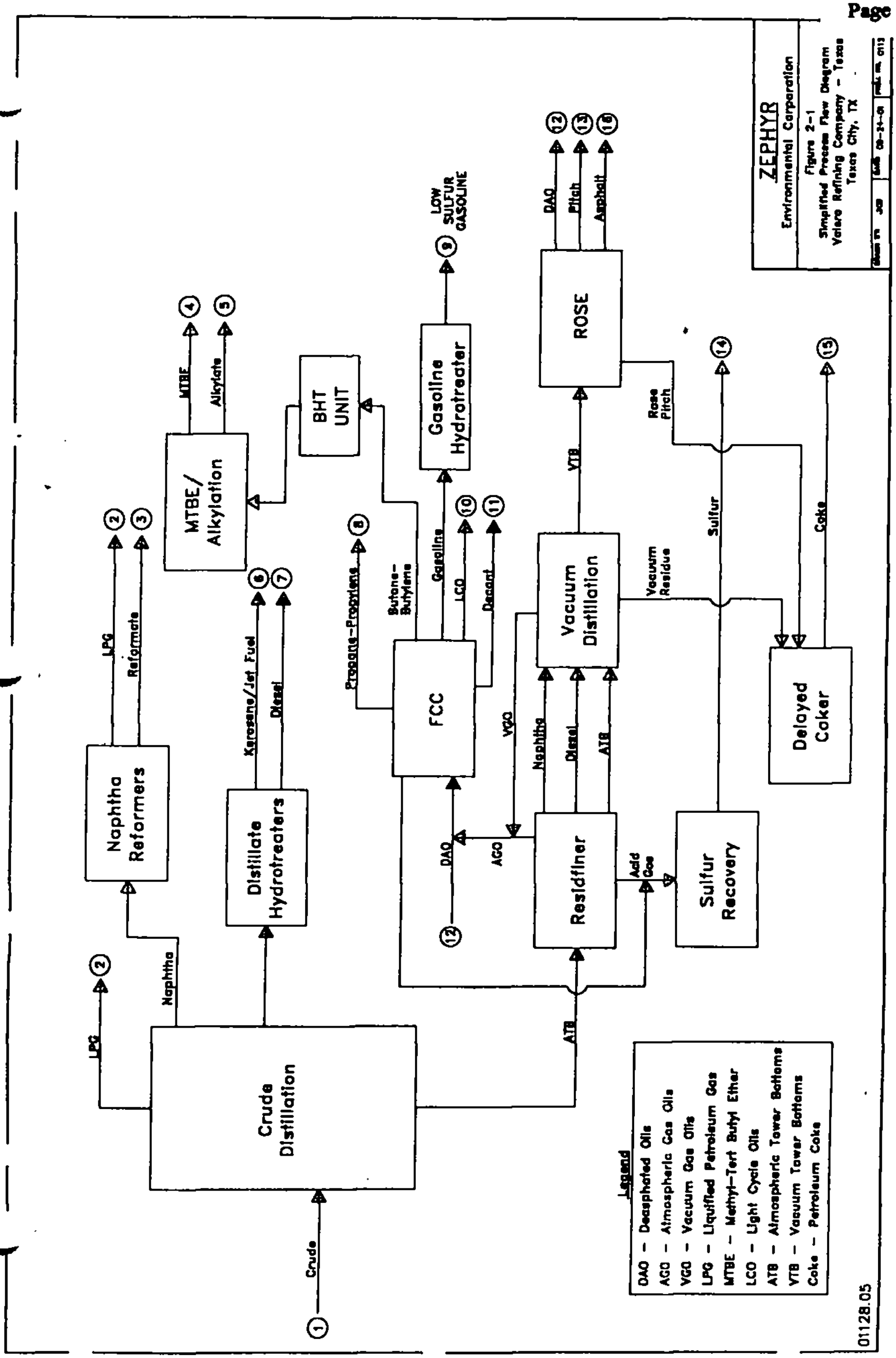

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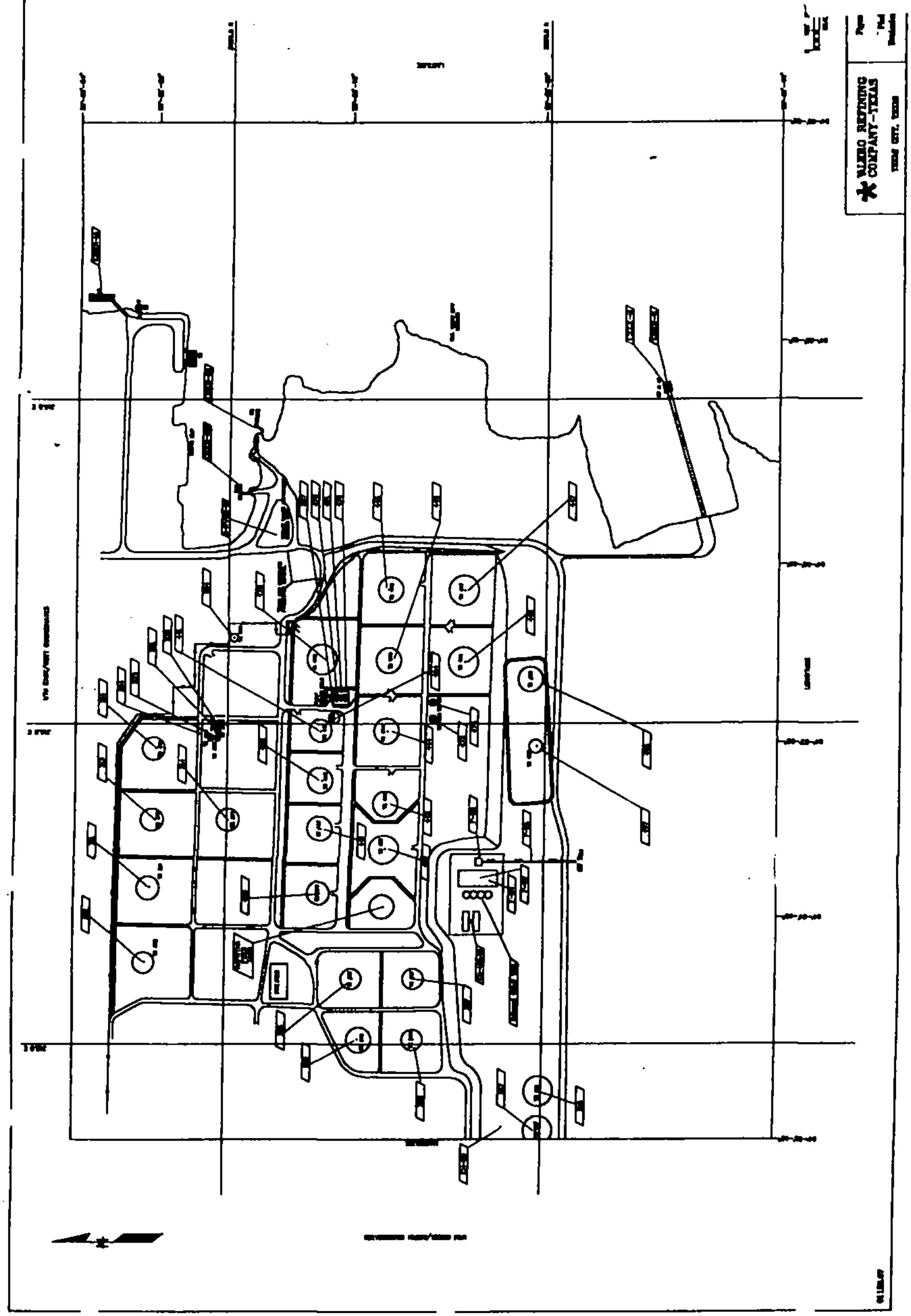

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3.0 PROPOSED FACILITY PROJECTS AND SCHEDULE

Valero's flexible permit granted on February 16, 2000, and amended June 4, 2001, authorized the construction and operation of the expansion projects listed in Table 3-1 of the original flexible permit application and the projects listed in Section 3 of the July 2000 amendment application. As indicated in the July 2000 application (which was approved June 4, 2001), the estimated start-of-construction and start-of-operation for some of those authorized projects has been delayed. It is estimated that the start-of-construction of the authorized projects will be phased in over the next few years, but will be completed before December 31, 2005. Valero's flexible permit emission controls implementation period also ends on December 31, 2005.

Additional facility projects were authorized under PBR No. 48330 (August 17, 2001) and those projects are being rolled into the Flexible Permit as a part of this current permit amendment application. The projects authorized under PBR No. 48330 included a new LPG Truck Rack, a Butadiene Hydrotreater (BHT) Unit, two new spherical tanks, and operational changes to Tanks T-489, T-490, and T-491.

With this permit amendment application, Valero seeks the additional authorization of the following new refinery projects:

- New 55,000 BPD Gasoline Hydrotreater Unit (Phase I and Phase II)
- Phased SRU Expansion up to 907 LTPD
- New 350,000 bbl Maya Crude Tank
- New 80,000 bbl Naphtha Feed Tank
- Conversion of two tanks to Coker Feed Tanks and Installation of Tank Heater
- Additional piping in Tank Farm Area to interconnect to Marathon Pipeline.
- Additional piping in Tank Farm Area for new gasoline blender.

It is estimated that the start-of-construction of these new projects will be phased in over the next few years, with some project being initiated as early as July 2002. It is estimated that all projects, with the exception of the Phase II Gasoline Hydrotreater add-ons, will have construction initiated by December 31, 2005. The date for installation of the Phase II Gasoline Hydrotreater add-on equipment will be contingent on the final compliance dates of the new federal fuel standards.

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5.0 EMISSIONS CALCULATIONS AND METHODOLOGY

This section presents summaries of the estimated emissions associated with the proposed projects and provides a discussion of the methodologies that were used to determine these emission estimates. Detailed calculations supporting all of the emission calculations are provided in Appendices B - F.

The emission sources addressed in this permit amendment application include the following source types:

- Combustion Units
- Storage Tanks
- Piping Fugitives
- Process Vents
- Process Drains/Wastewater System

The project will include the following new or modified emission sources:

- Two New Heaters (one coker feed tank heater; one Gasoline Hydrotreater Unit heater)
- Two New Storage Tanks (Maya Crude Tank and Naphtha Feed Tank)
- Three Modified Storage Tanks (T-496, T-517, and Sourwater Tank T-549)
- Modified Tail Gas Incinerator emissions (due to expanded SRUs and increased Sourwater Tank pumping rates)
- New Piping Fugitives (Phase I/II Gasoline Hydrotreater Unit and Tank Farm Area additions)
- Modified Piping Fugitives (future expansion buffer reduced from +12% to +3.5%)
- Modified FCCU emissions (offsetting reductions applied)
- Modified Wastewater Treatment Unit representations (no emission changes)
- Establishment of NH_3 and H_2S Sub-caps for Flare 1-4 Emissions.

5.1 Combustion Source Emissions

Changes in the Combustion Source category include the installation of two new process heaters (H-59 Coker Feed Tank Heater and H-60 Gasoline Hydrotreater Unit Heater) and a re-calculation of NO_x emissions from previously-permitted "new" heaters using a NO_x emission factor of 0.035 lb/MMBtu instead of 0.015 lb/MMBtu.

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NO_x emissions from the two new heaters have been calculated using a BACT level emission factor of 0.035 lb/MMBtu. This level of control will be achieved by using Ultra $LoNO_x$ burners, selective catalytic reduction (SCR) technology, or some other comparable emissions control technology. NOx emissions from previously-permitted "new" process heaters (EH-34N, EH-42, EH-43, EH-47, EH-48, EH-53, EH-54, EH-55, and EH-56) have been re-calculated using a BACT level of 0.035 lb/MMBtu. In the previous permit amendment, NOx emissions from these sources were calculated using 0.015 lb/MMBtu (based on SCR technology). To offset these emission changes and to offset the new emissions occurring from the two new heaters, NO_x emissions from the FCCU have been discretionarily reduced. Annual FCCU NO_x emissions have been reduced from 658 tpy to 519 tpy. Short-term (hourly) FCCU NO_x emissions have been reduced from 390 lb/hr to 350 lb/hr.

Emissions of CO for all new heaters (except H-59, due to its size) and all existing heaters which are equipped with a CO Continuous Emission Monitoring System (CEMS) have been based on a stack exit concentration of 90 ppmv CO, at 3% oxygen. As shown in supporting calculations in Appendix B, 90 ppmv CO is equivalent to 80.3 lbs CO/MMscf fuel gas fired (using stoichiometric combustion at 20% excess air). For all existing heaters without CO CEMS, the existing BACT CO level of 100 ppmv (89.3 lb/MMscf) was maintained. For the new Heater H-59, a CO CEMS will not be installed because the rating of the heater is only 7.5 MMBtu/hr. For this heater, the BACT CO level of 100 ppmv has been applied as the emission factor.

The approach used for calculating emissions of PM10, VOC, and Benzene from the two new heaters has remained the same as the approach used in the 1998 Flexible Permit application (i.e., AP-42 factors were applied). For SO_2 and H_2S emissions, annual emissions were based on an emission factor of 3.8 lbSO_2/MMscf of RFG burned (which is the maximum expected annual RFG sulfur content) and short-term emissions were based on an emission factor of 26.9 lb SO_2/MMscf of RFG burned, (which is equivalent to the requirements of NSPS Subpart J).

Detailed calculation spreadsheets showing the changes discussed in the preceding paragraphs are provided in Appendix B. A tabular summary of the emission changes occurring within the combustion source category as a result of the proposed amendments is provided in Table 5-1.

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5.2 Storage Tank Emissions

TANKS 3.1 algorithms (based on AP-42, Fifth Edition, Sept. 1997 methodologies) were used to calculate all new and modified storage tank emissions. Short-term tank emission calculations were based on the methodologies described in TNRCC's "Technical Guidance Package for Chemical Sources - Storage Tanks", February, 1995.

As discussed in Section 1, in addition to the construction of two new tanks, this project will also involve a change of service for two existing tanks (T-496 and T-517) and modified dimensions and pumping rates for Sourwater Tank T-549. In addition, this project will also involve the decommissioning of two tanks (T-429 and T-430). The two new tanks will be the Maya Crude Tank (350,000 bbls) and the Naphtha Feed Tank (80,000 bbls). The Maya Crude Tank will be an external floating roof tank equipped with a mechanical shoe primary seal and a rim-mounted secondary seal. The Naphtha Feed Tank will be an internal floating roof tank equipped with a mechancial shoe primary seal. Both tanks will meet BACT. Emissions from both new tanks have been calculated using the AP-42 methodologies discussed above.

Existing Tanks T-496 and T-517 will be converted to heated coker feed tanks. Both tanks will be maintained in a heated state at 450°F so that the heavy coker feed material remains in a pumpable liquid state. Tank T-496 will be heated by steam (with no emission source) and Tank T-517 will be heated by a new fuel-fired heater (H-59, as discussed in the preceding section). The revised emissions for Tanks 496 and 517 have been determined using a bulk liquid temperature and surface temperature of 450°F. The product code of L005A, established in the previous permit amendment, has been assigned to characterize the coker feed (which is essentially vacuum tower bottoms). Existing Tanks T-429 and T-430 will be removed from service and decommissioned.

Sourwater Tank T-549 is being modified from a permitted maximum short-term filling rate of 1,000 bbls/hour to a rate of 2,143 bbls/hour. In addition, the dimensions of the vessel are being modified to reflect a capacity of 5,250,000 gallons instead of the 4,700,000 gallon value which was represented in the June 4, 2001 permit amendment application. As a result of the proposed short-term maximum filling rate changes, short-term emissions of VOC, H_2S, and NH_3 are increasing. As a result of the corrected tank dimensions, annual emissions of VOC and H_2S will be increasing (increases in annual emissions of NH_3 are negligible – see Appendix C). As described in the application to the June 4, 2001 amendment, emissions of VOC, H_2S, and NH_3 from T-549 will be controlled to 99.9% in Tail Gas Incinerator G-18-1403. Because H_2S emissions to the

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incinerator will be increasing, SO_2 emissions emitted from the incinerator will also be increasing. Appendix D contains detailed calculations which quantify the increases in H_2S and SO_2 emissions from the tail gas incinerator.

Detailed supporting calculations for the emissions from the new and modified tanks are provided in Appendix C. Included in Appendix C is a summary table which shows the individual emission increases and decreases for the six affected tanks. A summary of the emission changes occurring within the storage tanks category as a result of this project is provided in Table 5-2. As discussed in Footnote 1 to Table 5-2, although the proposed changes show net reductions in short-term VOC emissions and short-term and annual benzene emissions within the Tanks Category, Valero is not proposing that these reductions be applied to the flexible permit caps. Instead, Valero is requesting that the existing emission levels for these categories be maintained as they are. With regard to the increased annual VOC emissions in the Tanks Category, Valero has proposed reductions in the Fugitives Category (as discussed in the following sections) to offset these increases.

5.3 *Sulfur Recovery Units / Tail Gas Incinerators (Process Vent Category)*

As a result of the expanded SRU capabilities (SRU #3 train and both Residfiner SRU trains), emissions from the two tail gas incinerators (TGIs G-193 and G-18-1403) will be increasing. The increased emissions from the TGIs have been estimated by factoring up the existing permitted TGI emission rates proportionally with the increased sulfur recovery loads. The increases in SRU capacity will be phased in over time and it is anticipated that the SRU #3 will be the first to undergo modification (Phase 1), followed by each of the Residfiner SRU trains (Phases 2 and 3). As a result of the anticipated phased implementation of the expansion technologies, TGI emission increases have been calculated separately for each phase (see spreadsheets in Appendix D). In addition to these increases, Incinerator G-18-1403 will also be experiencing increases in H_2S and SO_2 emissions from the modified sourwater tank (as described in Section 5.2 above).

A summary of the emission changes occurring within the process vent category as a result of the increased TGI emissions (Phase 3 emissions, with all SRUs expanded to maximum capacity plus the sourwater tank emissions) is provided in Table 5-3. As can be seen in this table, TGI emissions from all pollutants are increasing relative to the previously-permitted levels. However, under the aggregate summary of Process Vent Category emissions, CO, SO_2, and PM_{10} emissions are actually decreasing (as a result of the offsetting reductions being made from the FCCU – see Tables D-1 through D-4 in

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Appendix D for details). The reduced levels of emissions of CO, SO_2, and PM_{10} under the aggregate Process Vent Category were established in such a manner to provide offsets for the increases occurring in the Combustion Source Category (see Tables 6-1 and 6-2 for further clarification).

5.4 Piping Fugitive Emissions

Fugitive emissions from all new piping-related components (i.e., new Gasoline Hydrotreater Unit fugitives and additional Tank Farm Unit fugitives) were calculated using emission factors and control reduction efficiency credits obtained from the TNRCC technical guidance document entitled, "*Technical Guidance Package for Chemical Sources – Equipment Leak Fugitives (July 1998).*" Refinery factors and control efficiencies associated with the 28MID LDAR program were applied to all new components. In addition to the use of the 28MID program, all light-liquid and gas/vapor flanges associated with the new units will undergo monitoring at 500 ppm, in accordance with the valve standards of 28MID.

To offset the emission increases associated with these new fugitives, as well as the VOC emission increases occurring in other categories and the VOC emissions associated with the PBR being rolled into this amendment, Valero has reduced the facility's fugitive expansion factor down from 12% to 3.5%. Detailed supporting calculations and summary spreadsheets are provided in Appendix E.

A summary of the emission changes occurring within the fugitive emissions category as a result of these amendments is provided in Table 5-4. As can be seen in this table, emissions of VOC from the Fugitives Category are being reduced by –10.6 tpy and –2.4 lb/hr to provide the offsets needed in other categories.

5.5 Process Drain Emissions and Wastewater Treatment Unit Emissions

It is estimated that the new Gasoline Hydrotreater Unit (Phases I & II) will contain 10 – 12 process drains. VOC emissions from these process drains were estimated using the uncontrolled drain factor of 0.07 lbs/hr/drain (obtained from the "TNRCC Technical Guidance Document for Chemical Sources – Equipment Leak Fugitive – July 1998") and a control efficiency of 75% for sealed (covered) drains. See Appendix F for a presentation of the calculations.

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APPENDIX C

Storage Vessel Calculations and Tables

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Summary Table of Tank Emission Changes

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Comparison of Pre- and Post Storage Tank Emissions
Valero Refining - Texas City Refinery

VOC and Benzene Emission Changes Occurring within the Storage Tanks Category:

Tank ID	Existing Emission Values (Pre-Amendment) VOC (tpy)	VOC (lb/hr)	Benzene (tpy)	Benzene (lb/hr)
T-429	0.28	28.93	<0.01	4.677
T-430	4.49	2.50	0.18	0.044
T-496	0.17	1.52	<0.01	0.274
T-517	0.41	2.08	<0.01	<0.01
Sourwater Tank*	0.179	0.237	0.0010	0.0008
Maya Crude Tank	0	0	0	0
Naphtha Feed Tank	0	0	0	0

* Controlled emissions at TGI (@99.9% DRE)

Tank ID	Future Emission Values (Post-Amendment) VOC (tpy)	VOC (lb/hr)	Benzene (tpy)	Benzene (lb/hr)
T-429	0	0	0	0
T-430	0	0	0	0
T-496	0.37	0.81	<0.01	0.11
T-517	0.49	0.48	<0.01	0.06
Sourwater Tank*	0.181	0.50	0.0011	0.0016
Maya Crude Tank	5.99	8.54	0.04	0.23
Naphtha Feed Tank	3.01	1.40	0.06	0.19

Net Emission Changes (Between Pre-Amendment and Post-Amendment Scenarios):

Tank ID	Net Change in Emissions (Post Amendment) - (Pre Amendment) VOC (tpy)	VOC (lb/hr)	Benzene (tpy)	Benzene (lb/hr)
T-429	-0.28	-28.93	-0.01	-4.68
T-430	-4.49	-2.50	-0.18	-0.04
T-496	0.20	-0.71	0.00	-0.16
T-517	0.08	-1.60	0.00	0.05
Sourwater Tank*	0.002	0.26	0.0001	0.0008
Maya Crude Tank	5.99	8.54	0.04	0.23
Naphtha Feed Tank	3.01	1.40	0.06	0.19
Net Changes:	+ 4.52	-23.54	-0.09	-4.41

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Annual Tank Emissions

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V/ ˃ .RO REFINING COMPANY - TEXAS CI. TX
Vertical or Horizontal Fixed Roof Tank Report

INPUT INFORMATION:

Maximum Annual Thruput Calculations

Emissions calculated for the time period : Annual (yr)
(Enter Specific Month or Annual)

Identification

Tank ID# :	496
Location :	Texas City
Tank Type :	Vertical Fixed Roof

Tank Info

		Units		
Shell Height :	40	(ft)		
Diameter :	134.0	(ft)		
Max. Liquid Height :	40	(ft)		
Ave. Liquid Height :	20	(ft)		
Nominal Capacity :	4,200,000	(gals)	100,000	(bbls)
Turnovers :	90.9	(# / yr)		
Net Throughput :	383,250,000	(gal/ yr)	9,125,000	(bbls/ yr)
Maximum Filling Rate :	210,000	(gal/hr)	5,000	(bbls/hr)
Heated Tank? (Yes or No) :	Yes			
Shell Color :	Red/Primer			
Shell Color Condition :	Good			
Roof Color :	Red/Primer			
Roof Color Condition :	Good			
Roof Type :	Cone			
Roof Height (ft) :	4.19	(ft)		
Vacuum Setting (psig) :	-0.03	(psig)		
Pressure Setting (psig) :	0.03	(psig)		

Product Information

Product Code :	L005A		RVP :	NA	(psia
Product Name :	Vacuum Tower Bottoms	(Coker Feed)	S-Value :	NA	
Chemical Category :	Petroleum Distillate		Antoine's Coefficient (A) :	0.0	
Mol. Vapor Weight (M_V) :	190	(lb/lb-mole)	Antoine's Coefficient (B) :	0.0	
Liquid Density (W_L) :	8.20	(lb/gal)	Antoine's Coefficient (C) :	0.0	

OUTPUT INFORMATION:

Yearly/Monthly Calculations

Vapor Pressure Information

Ave. Liquid Surface Temp. (T_{LA}) :	450.00	(°F)
Vapor Pressure @ T_{LA} :	8.50E-04	(psia)
Liquid Bulk Temperature (T_B) :	450.00	(°F)

Emission Calculations

Standing Losses :	0.0000	(ton / yr)
Working Losses :	0.3661	(ton / yr)
Total Emissions :	**0.3661**	(ton / yr)
Control Device :	None	
Control Efficiency :	0.00	(%)
Controlled Total Emissions :	**0.3661**	(ton / yr)

Speciation Information

Percent Benzene :	0.001	(%)
Percent Non-Benzene :	100.00	(%)
Yearly/Monthly Benzene emissions :	0.00000	(ton / yr)

Notes:

1) Parameter information that is in bold and italic type indicates user input.
2) Entries that are in bold type indicate that default values are assumed.

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INPUT INFORMATION:

Maximum Annual Thruput Calculations

Emissions calculated for the time period : (Enter Specific Month or Annual)	Annual	(yr)		

Identification

Tank ID# :	517			
Location :	Texas City			
Tank Type :	Vertical Fixed Roof			

Tank Info

		Units		
Shell Height :	48	(ft)		
Diameter :	150.0	(ft)		
Max. Liquid Height :	48	(ft)		
Ave. Liquid Height :	24	(ft)		
Nominal Capacity :	6,300,000	(gals)	150,000	(bbls)
Turnovers :	60.4	(# / yr)		
Net Throughput :	383,250,000	(gal/ yr)	9,125,000	(bbls/ yr)
Maximum Filling Rate :	126,000	(gal/hr)	3,000	(bbls/hr)
Heated Tank? (Yes or No) :	**Yes**			
Shell Color :	Red/Primer			
Shell Color Condition :	Good			
Roof Color :	Red/Primer			
Roof Color Condition :	Good			
Roof Type :	Cone			
Roof Height (ft) :	4.69	(ft)		
Vacuum Setting (psig) :	-0.03	(psig)		
Pressure Setting (psig) :	0.03	(psig)		

Product Information

Product Code :	L005A		RVP :	NA (ps
Product Name :	Vacuum Tower Bottoms (Coker Feed)		S-Value :	NA
Chemical Category :	*Petroleum Distillate*		*Antoine's Coefficient (A) :*	0.0
Mol. Vapor Weight (M_V) :	190	(lb/lb-mole)	Antoine's Coefficient (B) :	0.0
Liquid Density (W_L) :	8.20	(lb/gal)	Antoine's Coefficient (C) :	0.0

OUTPUT INFORMATION:

Yearly/Monthly Calculations

Vapor Pressure Information

Ave. Liquid Surface Temp. (T_{LA}) :	450.00	(°F)
Vapor Pressure @ T_{LA} :	8.50E-04	(psia)
Liquid Bulk Temperature (T_B) :	450.00	(°F)

Emission Calculations

Standing Losses :	0.0000	(ton / yr)
Working Losses :	0.4886	(ton / yr)
Total Emissions :	**0.4886**	(ton / yr)
Control Device :	None	
Control Efficiency :	0.00	(%)
Controlled Total Emissions :	**0.4886**	(ton / yr)

Speciation Information

Percent Benzene :	0.001	(%)
Percent Non-Benzene :	100.00	(%)
Yearly/Monthly Benzene emissions :	0.00000	(ton / yr)

Notes:

1) Parameter information that is in bold and italic type indicates user input.
2) Entries that are in bold type indicate that default values are assumed.