GW-25

REPORTS

YEAR(S):

1990

WARREN PETROLEUM COMPANY

A DIVISION OF CHEVRON U.S.A. INC.

DISCHARGE PLAN GW-25

FOR

MONUMENT GAS PROCESSING PLANT

1639/09209/LLJ/MONUMT DISG PLN
(kln)

OCT 21 1985

50 YEARS

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

1935 - 1985

TONEY ANAYA
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-5800

October 18, 1985

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Warren Petroleum Co.
P.O. Box 1589
Tulsa, OK 74102

Attention: Ms. L. T. Reed

Re: Dicharge Plans for Monument (GW-25), Saunders (GW-26) and Vada (GW-27) Gas Processing Plants - Lea County, NM

Dear Ms. Reed:

The information that was stipulated for approval of the subject discharge plans has been reviewed and accepted by OCD. The above-listed discharge plans are hereby approved for a period of five years. This approval will expire July 31, 1990, and you should submit an application for new approval in ample time before that date.

Hydrostatic tests on the Saunders underground wastewater piping will be required for discharge plan renewal in 1990. Hydrostatic tests of underground wastewater piping at the Vada plant will not be required until 1995.

On behalf of the staff of the Oil Conservation Division, I wish to thank you for your cooperation during this discharge plan review.

Sincerely,

R. L. STAMETS
Director

RLS/JB/dp

cc: Oil Conservation Division - Hobbs

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-5800

May 17, 1985

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Warren Petroleum Co.
P.O. Box 1589
Tulsa, OKlahoma 74102

Attention: Ms. L. T. Reed

Dear Ms. Reed:

Enclosed is a copy of the public notice pertaining to your proposed discharge which was issued by this agency pursuant to New Mexico Water Quality Control Commission Regulations 3-108.A.

If you have any questions, please do not hesitate to contact me at the address and telephone number given above.

Sincerely,

DAVID G. BOYER
Environmental Bureau
Chief

DGB/PLB/dp

Enc.

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
SANTA FE, NEW MEXICO

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission regulations, Warren Petroleum Co., L. T. Reed, Authorized Agent, P.O. Box 1589, Tulsa, Oklahoma 74102, has submitted for approval the following discharge plans to the Director of the Oil Conservation Division, P. O. Box 2088, State Land Office Building, Santa Fe, New Mexico 87501 (505) 827-5800.

Warren Petroleum Co., Monument Gas Processing Plant (SW/4 Section 36, Township 19 South, Range 36 East, NW/4 Section 1, Township 20 South, Range 36 East, NMPM, Lea County, New Mexico) proposes to continue disposing of approximately 50,000 gallons per day of industrial wastewater into a commercial Class II injection well currently operating near the plant. The wastewater is transported to the injection well via pipeline. In the event of an emergency shutdown at the injection well, a lined pond with a leak detection system and a capacity of approximately one million gallons will be used to contain the wastewater temporarily. The wastewater is composed of effluents from cooling towers and process vessels. The wastewater has a total dissolved solids concentration of approximately 2800 mg/l. The ground water most likely to be affected by any non-injection discharges is at depths of 35 to 60 feet with total dissolved solids concentrations ranging from 500 to 3000 mg/l.

Warren Petroleum Co., Saunders Gas Processing Plant (SW/4 Section 34, Township 14 South, Range 33 East, NMPM, Lea County, New Mexico) proposes to continue disposing of approximately 25,000 gallons per day of industrial wastewater into a commercial Class II injection well currently operating near the plant. The wastewater is transported to the injection well via pipeline. In the event of an emergency shutdown at the injection well, the wastewater will be stored in four tanks with a total combined capacity of approximately 100,000 gallons until the wastewater can be transported by truck to an approved disposal site. The wastewater is composed of effluents from cooling towers and process vessels. The wastewater has a total dissolved solids concentration range of 3,800 to 10,000 mg/l. The ground water most likely to be affected by any non-injection discharges is at a depth of approximately 100 feet with a total dissolved solids concentration of approximately 600 mg/l.

Warren Petroleum Co., Vada Gas Processing Plant (NW/4 Section 23, Township 10 South, Range 33 East, NMPM, Lea County, New Mexico), proposes to continue disposing of approximately 630 gallons per day of industrial wastewater into two storage tanks with a total combined capacity of approximately 12,000 gallons. From the tanks, the wastewater is transported via truck to an approved disposal site. The wastewater has a total dissolved solids concentration of approximately

15,000 mg/l. The ground water most likely to be affected is at a depth of approximately 35 feet with an estimated total dissolved solids concentration of 1000 mg/l.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. Prior to ruling on any proposed discharge plan or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and a public hearing may be requested by an interested person. Requests for public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan based on information available. If a public hearing is held, the Director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN Under the Seal of the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 17th day of May, 1985.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

R. L. STAMETS
Director

S E A L

ENERGY and MINERALS DEPARTMENT
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501

50 YEARS OIL CONSERVATION 1935 - 1985

ALBUQUERQUE NM 871 PM 17 MAY 1985

DEFEAT MUSCULAR DYSTROPHY SUPPORT MDAA

CERTIFIED P 505 906 073 MAIL

Warren Petroleum Co.
P.O. Box 1589
Tulsa, OK 74102

Attention: L. T. Reed

CERTIFIED MAIL RETURN
RECEIPT REQUESTED

TABLE OF CONTENTS

SECTION I

GENERAL INFORMATION

DISCHARGE PLAN
MONUMENT PLANT
SECTION I - GENERAL INFORMATION

INTRODUCTION

The following is presented as the Monument Plant Discharge Plan and is in accordance with Part 3-100 of the State of New Mexico Water Quality Control Commission Regulations.

This Plan provides information regarding any potential discharges onto or below the surface of the ground.

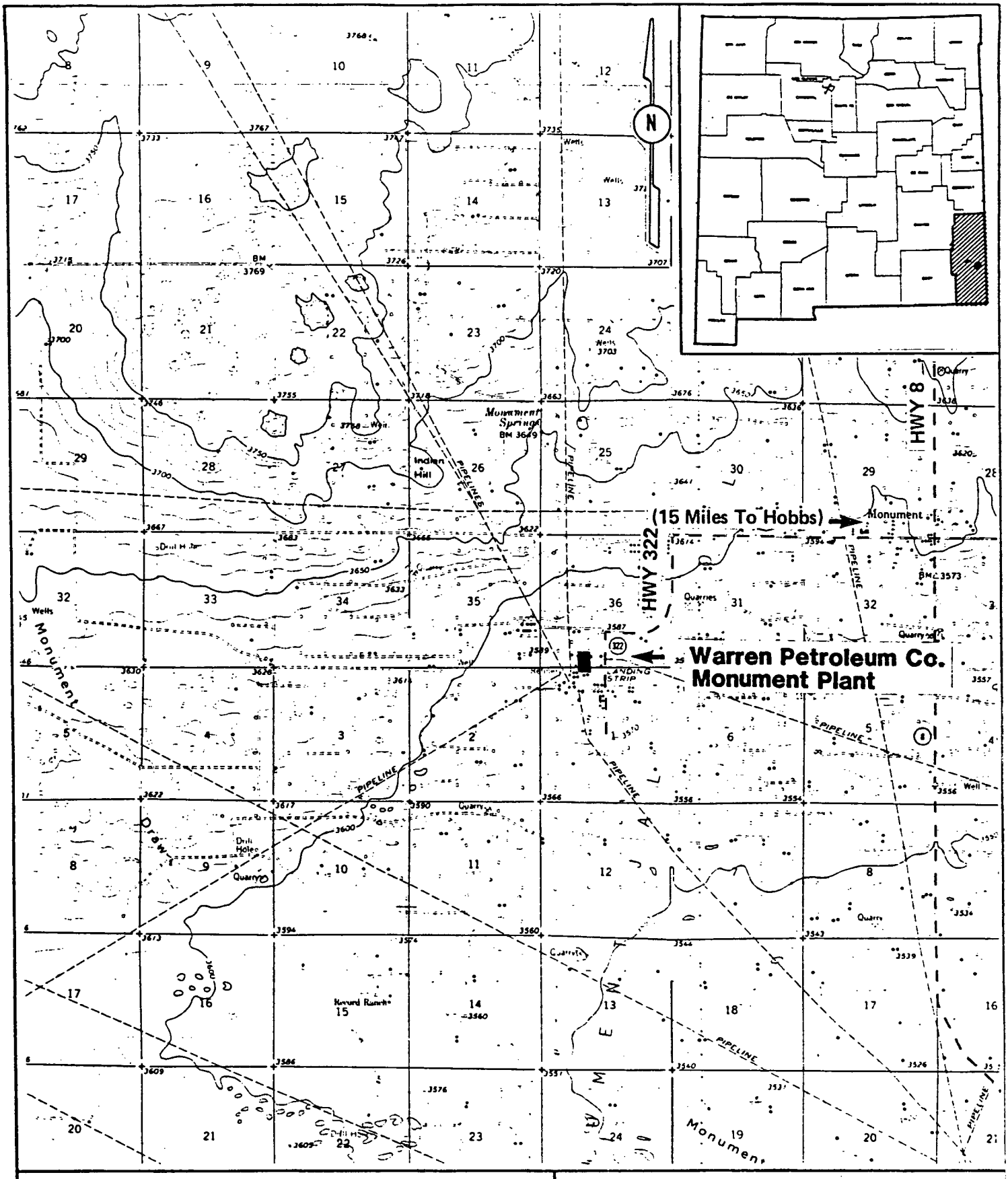
SUMMARY OF WASTEWATER DISPOSAL METHODS

MONUMENT GAS PROCESSING PLANT

Location	Wastewater Disposal Methods*
36-T19S, R36E and 1-T20S, R36E Lea County, NM	(1) Evaporation Pond (Approved 9/13/77 by the New Mexico Oil Conservation Commission)
	(2) Rice Engineering Injection Well (By Continuing Contract)**
	(3) Brine Pond (Approved by NMOCD-Final Construction Modification Specifications of 9/2/83).
	(4) Evaporation Area for Reverse Osmosis Reject Water. (1989 Project)

*Section XIII of this Plan further describes the disposal of waste materials generated at the Monument Plant.

**In the event of any shutdown of the Rice Engineering injection well, the evaporation pond would be used. The evaporation pond is lined and has a reserve time of approximately thirty days. Nearing the end of the thirty-day period, should the Rice well still be shut down, the effluent would be hauled to another approved disposal well. The location of an alternate well will take place in advance of the actual need for the disposal site. All information involved in a shutdown for the Rice well will be used to determine an alternate disposal site.



PLANT LOCATIONS

SEC. 36, T-19-S, R-36-E and
SEC. 1, T-20-S, R-36-E

APPROX. EL. 3585'

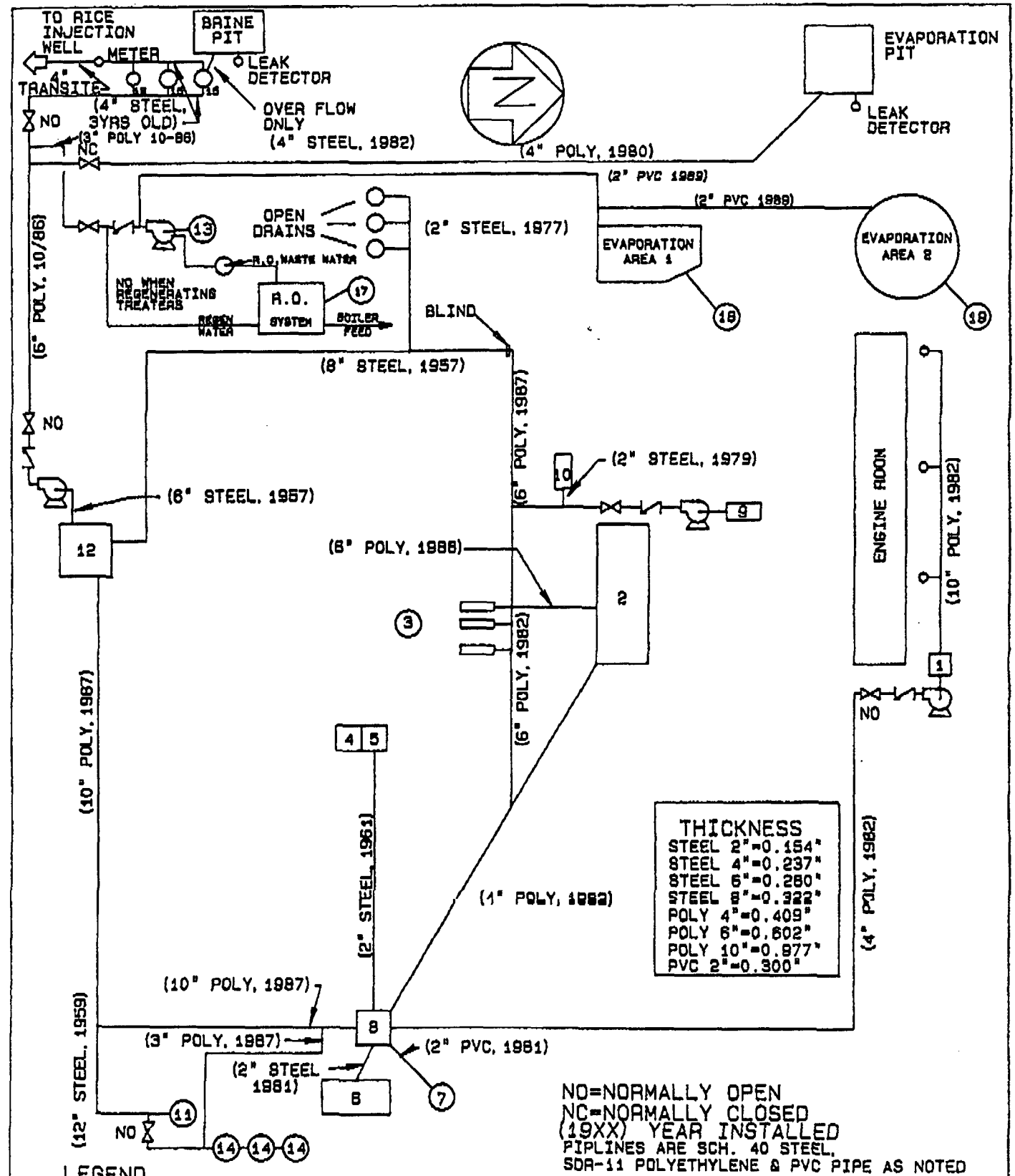
APPROX. LAT. 32°35' 40" N

APPROX. LONG 103°15' 44"W

SCALE	DATE
1"=1 MI.	7-16-82

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.

MONUMENT
PLANT NO. 118
LEA CO. N.M.

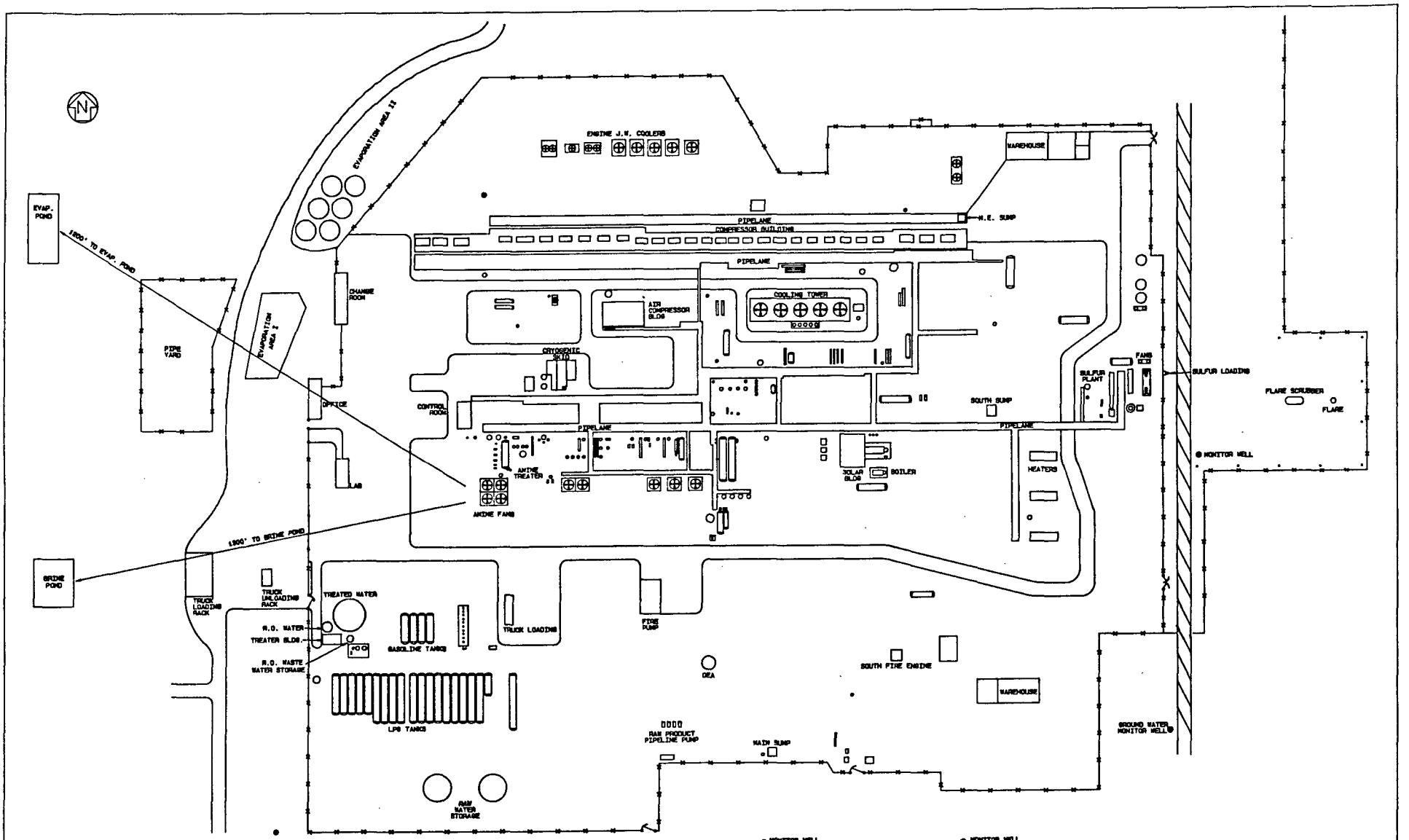


LEGEND

1-NORTH ENGINE ROOM SUMP
2-COOLING TOWER
3-CONDENSORS
4-BOILER
5-BOILER
6-BOILER
7-H_2S SCRUBBER
8-EAST SUMP
9-SOUTH ENGINE ROOM SUMP
10-CONDENSORS
11-CONDENSATE TANK
12-SOUTH MAIN SUMP
13-ZEOLITE H_2O TREATER
14-SHELL TANKS (3)
15-WASTE WATER STORAGE (2)
16-WASTE WATER OIL SKIMMER
17-REVERSE OSMOSIS SYSTEM
18-EVAPORATION 1
19-EVAPORATION 2

Revised Per Field 7/89
Revised Per Field 4/88

NO. OF UNITS REQUIRED THUS			WO-AFE NO.
WARREN PETROLEUM COMPANY A DIVISION OF CHEVRON U.S.A.			
WASTE WATER SYSTEM LAYOUT PLANT 118 MONUMENT			LEA, COUNTY, NM.
DRAWN	HPK	DATE 10/11/85	SCALE NONE
CHECKED	LLJ	DATE 10/11/85	DRAWING NO.
APPR.	PDA	DATE 10/11/85	11B-1001-1



GENERAL NOTES	GENERAL NOTES	DWG. NO.	REFERENCE DRAWINGS

NO.	REVISION	BY	DATE	CHK.	APPR
1	REDRAWN	LP	7-88		

APE OR MO	ISSUE		
	DATE	PRELIM.	CONST.

WARREN PETROLEUM COMPANY
A DIVISION OF CHEVRON U.S.A. INC.

PLOT PLAN

PLT. 118 MONUMENT		MONUMENT NO.
DRAWN LP	DATE 7-20-88	SCALE 1"=80' 8-4-8
CHECKED	DATE	118-1000-1
APPR.	DATE	

SECTION II

ORIGINAL DISCHARGE PLAN FOR MONUMENT GAS PROCESSING PLANT

JULY 28, 1981

Warren Petroleum Company

MANUFACTURING DEPARTMENT

July 28, 1981

P. O. Box 1589
Tulsa, Oklahoma 74102

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P. O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Joe D. Ramey,
Division Director

Re: Discharge Plans
Monument Plant

Dear Mr. Ramey:

Warren Petroleum Company, a division of Gulf Oil Corporation, is submitting the following formal waste water discharge plan for the Monument Gas Processing Plant, located in Section 1, Township 20S, Range 31E and Section 36, Township 19S, Range 36E, in Lea County, New Mexico.

The liquid waste from the plant includes general plant run-off, cooling tower blowdown, brine from the zeolite softener, boiler blowdown, inlet scrubber water, compressor (interstage scrubbers) condensate water, and water from the H_2S scrubber are disposed of by using a lined evaporation pond, located in the Northwest Corner of the plant.

The evaporation pond was previously approved by the New Mexico Oil Conservation Commission on September 13, 1977 with the condition that it comply with the NMOCC "Specifications for the Design and Construction of lined Evaporation Pits" with the following exceptions:

1. There would be less than 600 square feet of evaporative surface per barrel per day of water placed in the pit.

2. The excavation would be more than six inches deep in some places.

The evaporation pond has a leak detection drainage system which is spaced such that no point in the pond would be more than 20 ft. from the drainage grid.

The amount of waste water generated at the plant is approximately 30,000 barrels per month. Due to the lack of the evaporative surface needed to dispose of this quantity of water, we maintain a disposal contract with an injection well firm to get rid of all excess waste water. The injection well, designated Rice EMEI 1, is located in Section 1, Township 20S, Range 36E in Lea County, New Mexico.

NM Energy and Minerals Department

July 28, 1981

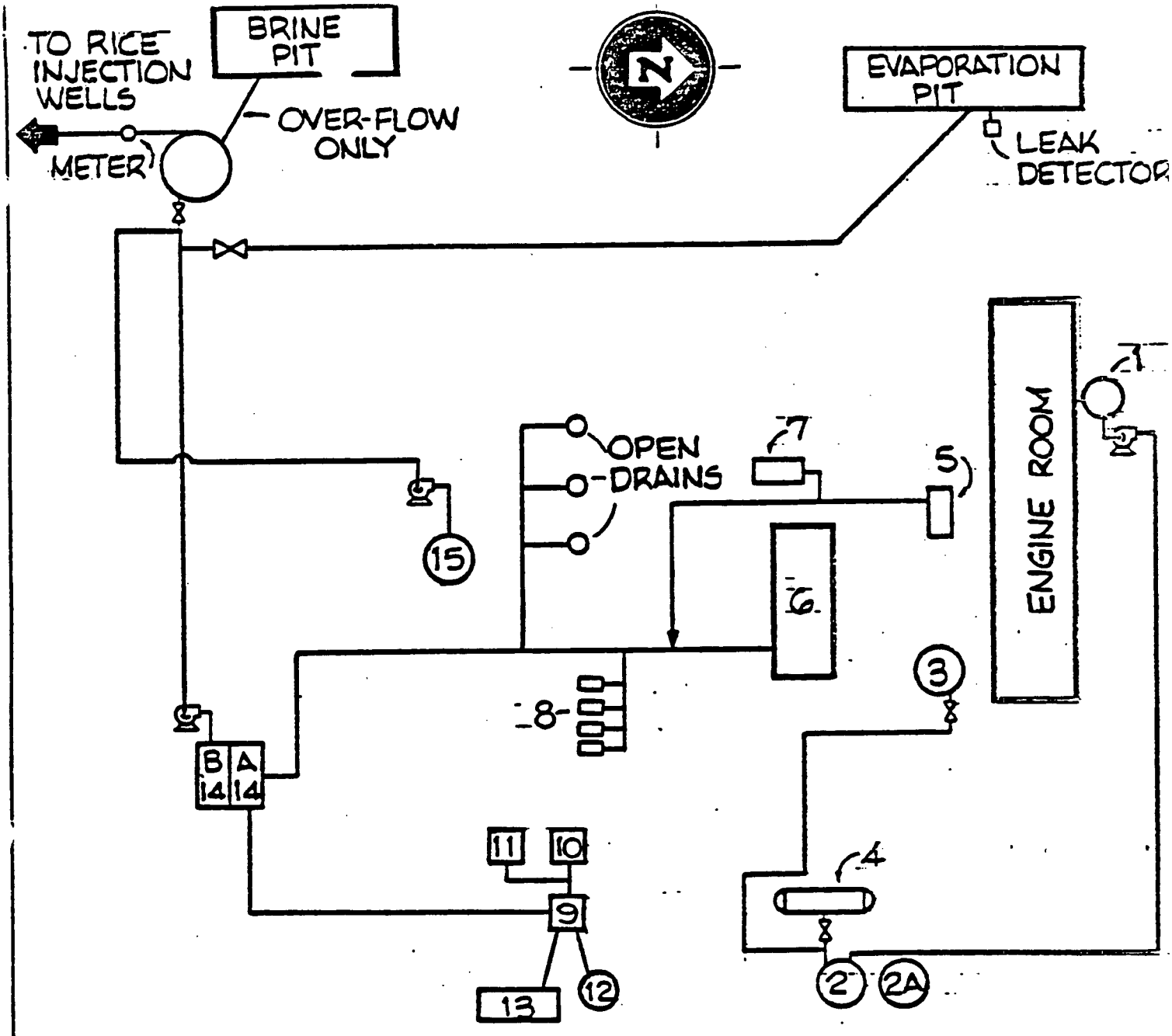
Attached is a map of the waste water system and one of the evaporation pond construction. Should you have any questions or need additional information, please call either Lynn Reed or me at (918) 560-4117.

Very truly yours,

Debra J. Johnson

for J. E. Moody, Manager
Environmental and Services

JEM:DFJ:de
Attachments



LEGEND

1. NORTH ENG. ROOM SUMP
2. SKIMMER TANK
2-A. BLACK OIL TANK
3. 2ND STAGE SCRUBBER
4. 1ST STAEE SCRUBBER
5. SOUTH ENGINE ROOM SUMP
6. COOLING TOWER
7. CONDENSORS
8. CONDENSORS
9. EAST SUMP
10. BOILER
11. BOILER
12 H_2S SCRUBBER
13. BOILER
14-A SKIMMER
14-B. SOUTH SUMP
15. ZEOLITE H_2O TREATERS
16. 3RD STAGE SCRUBBER

NO.	REVISIONS	BY	DATE	CHK.	APPR.	ISSUED CONST. DATE	ISSUED CONST. BY

NO. OF UNITS REQUIRED, THUS | WO-AFE NO.

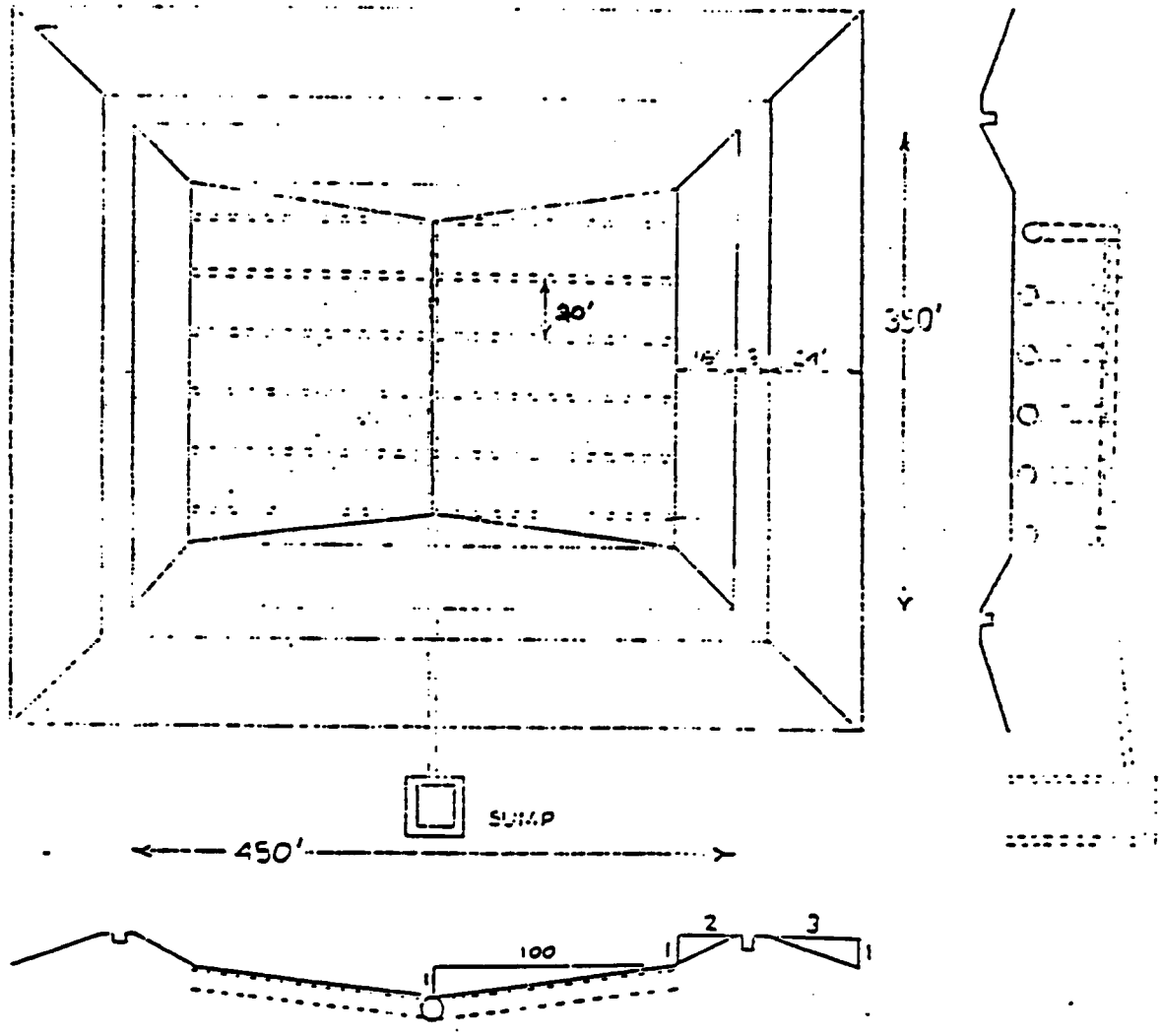
WARREN PETROLEUM CORPORATION
TULSA, OKLAHOMA

WASTE WATER SYSTEM

MONUMENT PLT. MONUMENT, N.M.

DRAWN	DATE	SCALE
WKC	7-28-81	
CHECKED	DATE	DRAWING NO.

JUNE 15, 1977 EVAPORATION PIT



SECTION III

UPDATE OF ORIGINAL DISCHARGE PLAN FOR MONUMENT GAS PROCESSING PLANT

SEPTEMBER 30, 1984

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 1589
Tulsa, Oklahoma 74102

September 30, 1984

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
Box 2088
Santa Fe, New Mexico 87501

Attn: Joe D. Ramey

Re: Update to Discharge Plans for Monument, Saunders, and Vada Gas Processing Plants

Dear Mr. Ramey:

The subject material is presented according to your request of February 23 and 24, 1984. As you will recall, your subsequent correspondence of June 7, 1984 provided a September 30, 1984 submittal date for this information.

If you have any questions or need further information, please contact Linda Johnson or me at (918) 560-4119.

Very truly yours,

L. T. Reed, Director
Environmental Affairs

LTR/LLJ:cm

Attachments

WARREN PETROLEUM COMPANY
A DIVISION OF CHEVRON U.S.A. INC.
UPDATE OF ORIGINAL WASTE WATER DISCHARGE PLAN
MONUMENT GAS PROCESSING PLANT
SEPTEMBER 30, 1984

Plant Location

Section 1, Township 20 South, Range 36 East, and Section 36, Township 19 South, Range 36 East, Lea County, New Mexico.

Liquid Waste

The liquid waste from the facility includes general plant runoff, dehydration water, cooling tower blowdown, engine washwater, brine from the zeolite softener, boiler blowdown, inlet scrubber water, compressor (interstage scrubbers) condensate water, and water from the H_2S scrubber. These sources are disposed of by way of the plant sump system and from there to the Rice Engineering disposal well. The amount of waste water generated is approximately 30,000 barrels per month.

Evaporation Pond

The pond is no longer used as an evaporation pond, as described in our original discharge plan submitted to the New Mexico Oil Conservation Division (NMOCD) on July 28, 1981.

Brine Pond

The Brine Pond was upgraded in 1983, in accordance with the NMOCD letter of August 6, 1982. The pond stores brine from the storage well. Warren's initial correspondence describing plans and specifications for the storage of approximately 2,000,000 gallons* of ten pound brine was submitted to the NMOCD on August 16, 1982. These specifications were updated, with a copy sent to the NMOCD on March 30, 1983. The sieve analysis for the sand and gravel to be used was submitted on May 3, 1983. A letter describing the final modification specifications was sent to the NMOCD on September 2, 1983. Each stage of the construction was inspected and approved by the NMOCD. Copies of Warren's correspondence appears as Section VII of this plan.

*Final capacity is 2,283,000 gallons.

1639/09209/LLJ/MONUMT DISG PLN
(kln)

UPDATE OF WASTEWATER DISCHARGE PLAN
OF SEPTEMBER 30, 1984
SEPTEMBER 20, 1989

Liquid Waste

In addition to the aforementioned sources, Reverse Osmosis Reject Water is to be disposed to an agricultural evaporation area.

Brine Pond

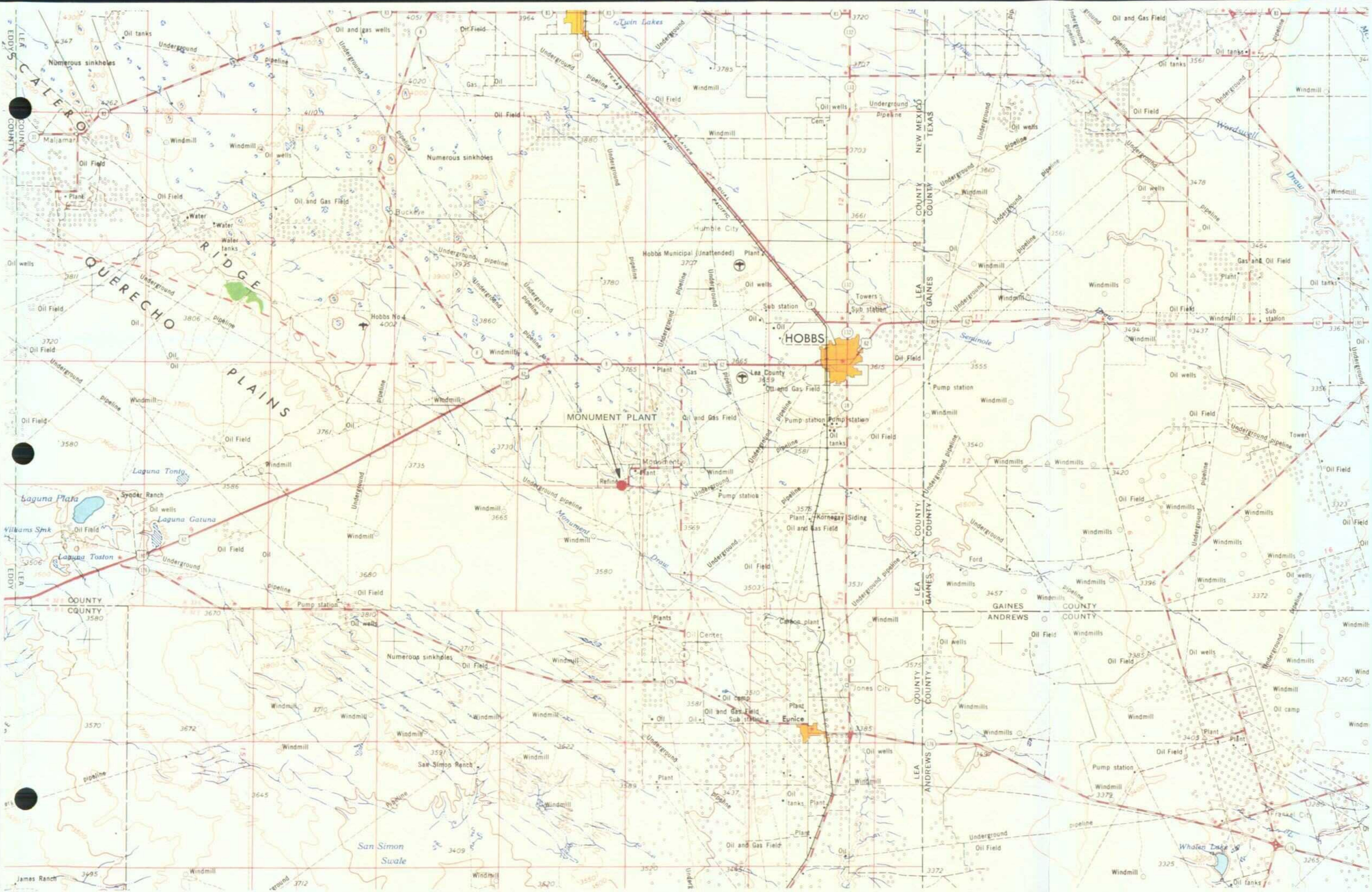
The brine pond was upgraded again in 1989 with a polyethylene liner, replacing the fiberglass liner which had deteriorated beyond use.

Proposed Agricultural Evaporation Area

A Reverse Osmosis Unit was installed in 1989, from which waste water is evapotranspirated from two evaporation areas planted with Bermuda grass. The design of the area has been done with help from an agronomist with the Agricultural Science Center of New Mexico State University of Artesia.

SECTION IV

TOPOGRAPHIC MAP



HOBBS
MONUMENT PLANT
QUERECHO PLAINS
CALERO RIDGE
Maljamar
Buckeye
Humble City
Hobbs Municipal (Unattended)
Hobbs No 4
Lea County
Monument
Refinery
Kornegay Siding
Oil Center
Eunice
Jones City
San Simon Ranch
San Simon Swale
James Ranch
Laguna Plata
Laguna Gatuna
Laguna Tonto
Laguna Toston
Williams Sink
Snyder Ranch
Twin Lakes
Monument Draw
Seminole Draw
Wardswell Draw
Whalen Lake
Frankel City
NEW MEXICO
TEXAS
LEA COUNTY
EDDY COUNTY
GAINES COUNTY
ANDREWS COUNTY
Numerous sinkholes
Oil and Gas Field

SECTION V

GENERAL DESCRIPTION -

GAS PROCESSING INDUSTRY AND SPECIFIC REFERENCES

FOR

THE MONUMENT PLANT

SECTION V
GENERAL DESCRIPTION
GAS PROCESSING INDUSTRY

Natural Gas Processing Plants extract liquid hydrocarbons from raw natural gas. Please refer to the block flow diagram which directly follows.

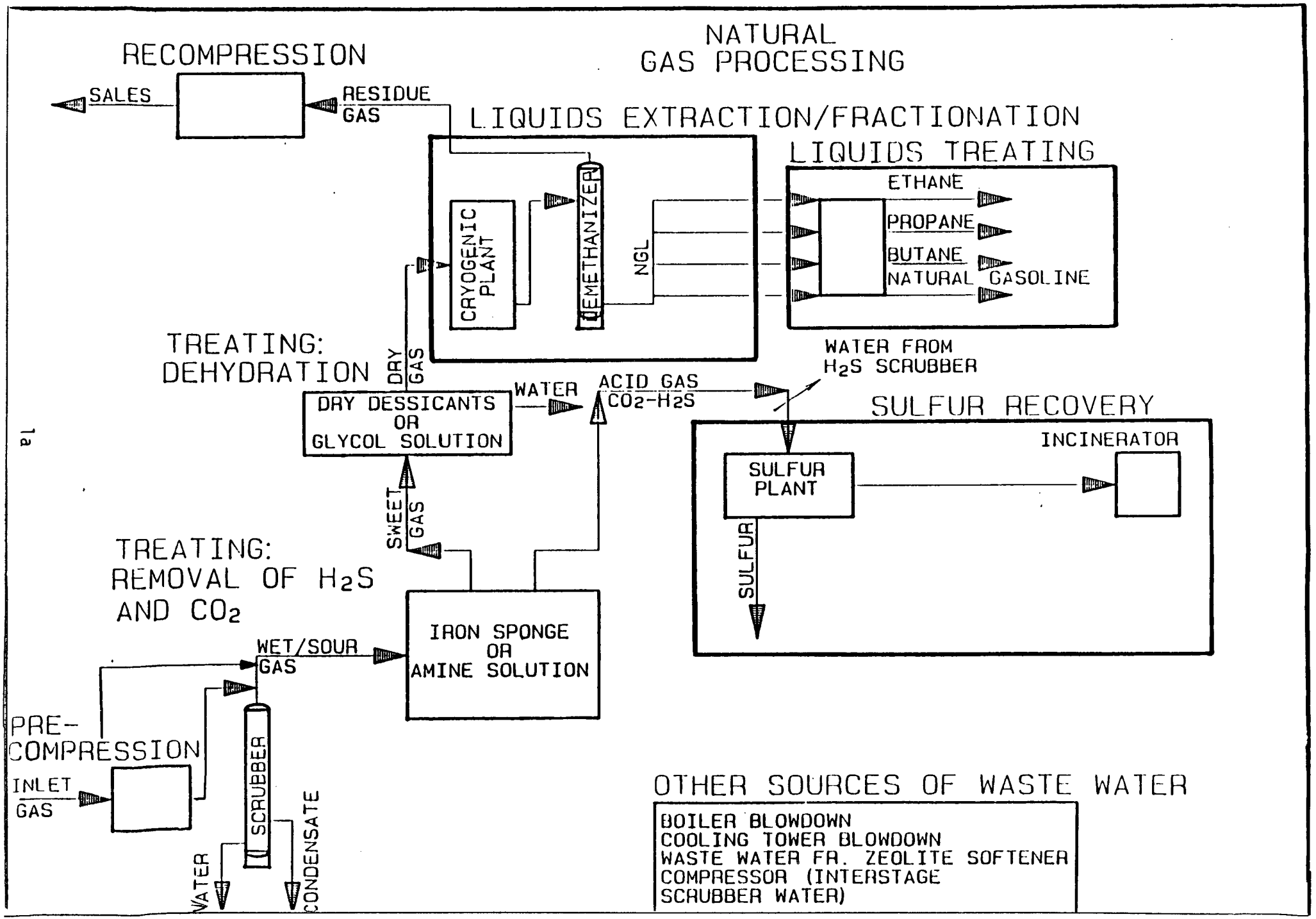
The liquid hydrocarbon components of natural gas are ethane (C_2), propane (C_3), butane (C_4), and natural gasoline (C_5+). The remaining gas, from which the liquids are extracted, is almost entirely methane (C_1).

Treating for the Removal of Hydrogen Sulfide and Carbon Dioxide

The raw natural gas, termed inlet gas, may contain varying amounts of impurities. The most common contaminants are water (H_2O), hydrogen sulfide (H_2S), and carbon dioxide (CO_2). The gas is compressed and then enters the first phase of natural gas processing, which is treatment to remove the impurities.

The term acid gas refers to the presence of H_2S and CO_2 in the raw natural gas. Sour gas has a high concentration of sulfur components. Sweet gas has small quantities of sulfur compounds, usually less than 0.25 grain of H_2S per 100 standard cubic feet of gas, and as such, bypasses iron sponge or amine treating.

The acid gas may be removed from the inlet gas stream by an absorption process where the incoming stream contacts a liquid that selectively reacts with and removes the acid gas. This liquid, mono- or diethanolamine is regenerated by heat, thereby driving off the gases. The resultant amine liquid then reacts with more acid gas in a continuing cycle of reaction, then regeneration. The gases released from the amine may then be combusted to SO_2 in a flare stack, or incinerator. If the acid gas exists in a large concentration, it will not be combusted, but will enter a sulfur recovery plant, which removes elemental sulfur from the stream. Any unoxidized H_2S, which occurs in small amounts, is


NATURAL
GAS PROCESSING
RECOMPRESSION
SALES
RESIDUE
GAS
LIQUIDS EXTRACTION/FRACTIONATION
LIQUIDS TREATING
CRYOGENIC
PLANT
DEMETHANIZER
NGL
ETHANE
PROPANE
BUTANE
NATURAL GASOLINE
TREATING:
DEHYDRATION
DRY
GAS
WATER FROM
H2S SCRUBBER
WATER
ACID GAS
CO2-H2S
DRY DESSICANTS
OR
GLYCOL SOLUTION
SULFUR RECOVERY
INCINERATOR
SULFUR
PLANT
SULFUR
SWEET
GAS
TREATING:
REMOVAL OF H2S
AND CO2
IRON SPONGE
OR
AMINE SOLUTION
WET/SOUR
GAS
PRE-
COMPRESSION
INLET
GAS
SCRUBBER
WATER
CONDENSATE
OTHER SOURCES OF WASTE WATER
BOILER BLOWDOWN
COOLING TOWER BLOWDOWN
WASTE WATER FR. ZEOLITE SOFTENER
COMPRESSOR (INTERSTAGE
SCRUBBER WATER)

Treating for the Removal of Hydrogen Sulfide and Carbon Dioxide

oxidized to SO_2 by the sulfur plant incinerator. This incinerator is located after the last sulfur plant catalytic bed. Also note that an H_2S scrubber may exist prior to the entry of the gas stream into the sulfur plant. This scrubber removes water from the gas.

Treating for the Removal of Water

The inlet gas, now minus the acid gas components, enters the next phase of gas processing. This is the removal of water from the gas.

The water may be removed by an absorption, or an adsorption process. Both processes may be used in tandem.

Triethylene glycol removes water from the gas by absorption. The glycol is then reconcentrated by removal of the water with heat. This is a continuous cycle. Either alone, or in conjunction with the glycol system, a molecular sieve dehydraytion system may exists. The molecular sieve is a dessicant which absorbs water from the gas is regenerated by heat to restore its absorptive capability.

Whether removed by glycol or molecular sieve, the water driven off during regeneration exists in the steam phase, then condenses through exchangers and leaves the process as a liquid.

Natural Gas Processing - Removal of Gas Liquids

The extraction of the gas liquids from the gas stream, which is now sweet and dry, is accomplished in several ways. Warren's New Mexico plants use the cryogenic method. Basically, the gas stream is cooled and the non-methane hydrocarbons are then condensed and recovered. In some instances, the liquids are also treated to remove water and/or acid gas components.

Natural Gas Processing - Fractionation of Natural Gas Liquids

The natural gas liquids that have been separated out of the inlet stream are fractionated into their individual components. Many of Warren's plants do not fractionate the liquids. These plants remove the gas liquids by pipeline.

Separation of the hydrocarbon components is possible because of the difference in their physical properties, specifically, their boiling points. The distinct gas liquids, along with the purified natural gas, are sold commercially.

The following document, "The Gas Processing Industry: Its Function and Role in Energy Supplies", published by the Gas Processors Association, will provide further details about the industry.

The Gas Processing Industry:

Its Function and Role
in
Energy Supplies

Gas Processors Association
1812 First Place
Tulsa, OK 74103

INTRODUCTION

The gas processing industry is a major segment of the oil and gas industry, distinct from either crude oil or natural gas production, separate from oil refining or gas distribution, yet indispensable to all. As a separate and identifiable function, it is probably the least known and least understood part of the petroleum industry.

In simple terms, the gas processing industry refines raw natural gas from the earth into saleable, useful energy forms for use in a wide variety of applications. Through the gas processing industry's plants flows approximately 60% of the nation's petroleum energy production, which emerges in the form of merchantable natural gas, liquefied petroleum gases, motor fuel components, and raw materials for a myriad of basic petrochemicals.

Natural gas occurs deep below the surface of the earth in two principal forms: associated gas and non-associated gas.

Associated gas is found in crude oil reservoirs, either dissolved in the crude oil, or in conjunction with crude oil deposits. It is produced from oil wells along with the crude. It separates, or is separated from, the oil at the casinghead of the well, which leads to the synonymous term "casinghead gas." It may also be called "oil-well gas" or "dissolved gas." In the industry's beginning, virtually all processed gas was from oil wells.

Non-associated gas occurs in reservoirs separate from crude oil. Its production is not incidental to the production of crude oil. It is commonly called "gas-well gas" or "dry gas." Today about 75% of all natural gas produced is non-associated gas.

In addition, the reservoirs of many oil fields found since 1935 produce neither true gases nor true liquids. The material might properly be called a "two-phase fluid." It is neither a gas because of its high density, nor a liquid because no surface boundary exists between gas and liquid. These reservoirs, called "gas condensate" reservoirs, are usually deeper with higher pressures, which pose special problems in production and processing.

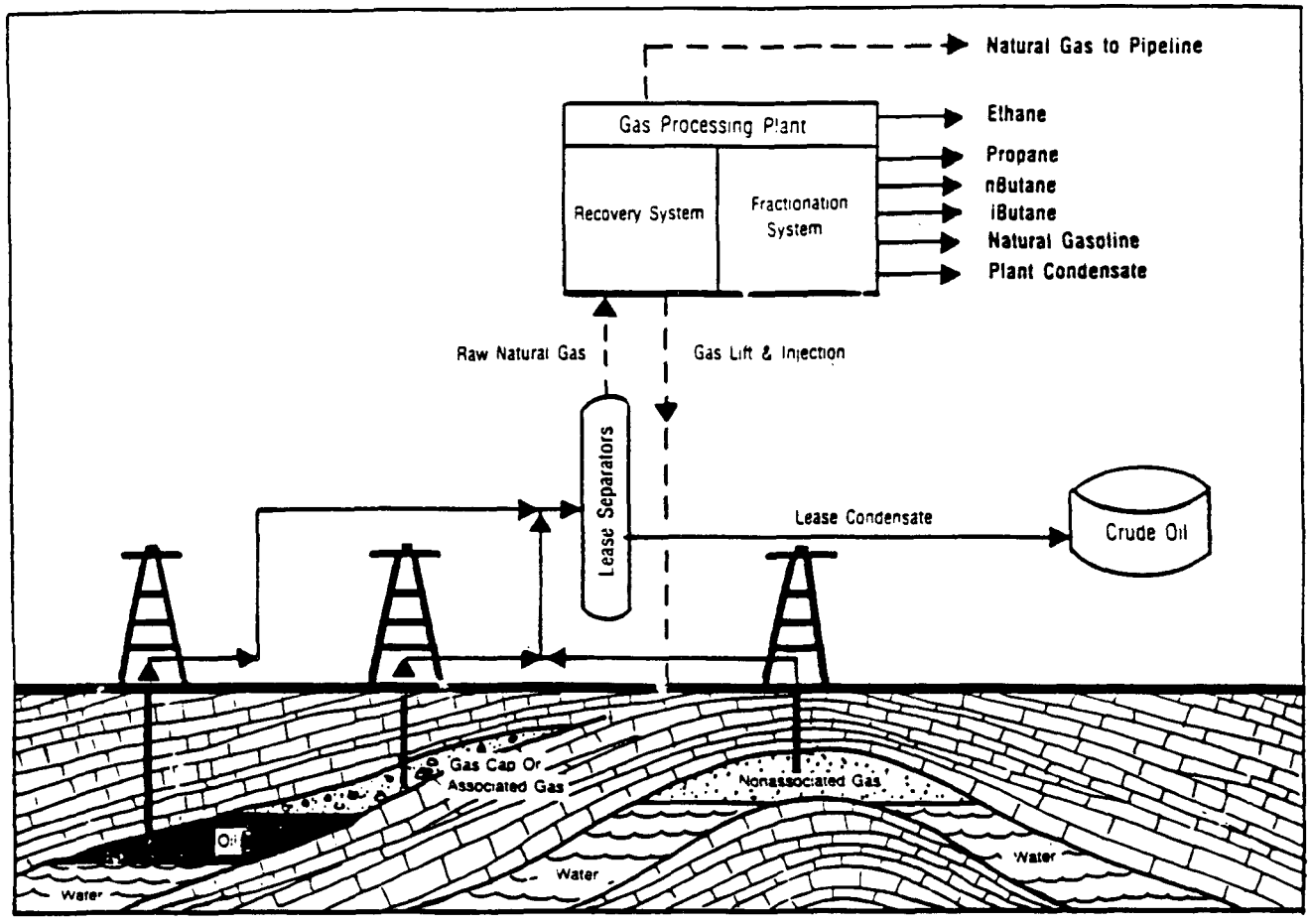
From whatever reservoir, natural gas as produced from the earth has widely varying composition, depending on the field, the formation, or the reservoir from which it is produced. The principal constituents of natural gas are methane and ethane, but most gases contain varying amounts of heavier components, such as propane, butane, pentane, and heavier hydrocarbons that may be removed by any of a number of processing methods.

The removal of individual hydrocarbons by processing is possible because of the differences in physical properties. Each component has a distinctive weight, boiling point, and other physical characteristics, making its separation from other components a relatively simple physical operation.

Gas processors describe gas as "rich" (wet), or "lean" (dry) depending on its content of heavy components. These are relative terms, but as used in the industry, a rich gas may contain five or six gallons or more of recoverable hydrocarbons per thousand cubic feet; a lean gas usually contains less than one gallon of recoverable liquids per thousand cubic feet.

Natural gas may also contain water, hydrogen sulfide, carbon dioxide, nitrogen, helium, or other components that may be diluents and/or contaminants. In any case, natural gas as produced rarely is suitable for pipe line transportation or commercial use. Natural gas in commercial distribution systems is composed almost entirely of methane and ethane, with moisture and other contaminants removed to very low concentrations.

Therefore, all natural gas is processed in some manner to remove unwanted



water vapor, solids and/or other contaminants that would interfere with pipe line transportation or marketing of the gas. In addition, and equally important, most natural gas is processed to separate from the gas those hydrocarbon liquids that have higher value as separate products.

These natural gas liquids (NGL's) are part of a family of saturated hydrocarbons called paraffins. Each compound has a chemical formula C_nH_{2n-2}. The principal natural gas liquids include:

Ethane: Exists as a liquid only under very high pressures (800 psi) or at extremely low temperatures (−135°F). It is recovered and transported in either the liquid or gaseous state principally for use as feedstock for ethylene, the most important basic petrochemical produced today.

Propane: Recovered and handled as a liquid at pressures over 200 pounds, or at temperatures below −44°F. Its principal uses are as feedstock for production of ethylene and propylene, and as LP-gas for heating fuel, engine fuel, and industrial fuel.

Butane: Recovered and handled as a liquid under moderate pressure. Its principal uses are to provide needed volatility to gasoline motor fuel; as domestic LP-gas fuel, either alone or in mixtures with propane; and as a feedstock for the manufacture of butadiene, a key ingredient of synthetic rubber.

Iso-butane: The chemical isomer of butane, it is fractionated and produced as a separate product principally for the manufacture of alkylate, a vital ingredient of high-octane motor gasoline.

Natural Gasoline: A mixture of pentanes and heavier hydrocarbons, with small amounts of butane and iso-butane. Industry specifications define its physical

properties in terms of vapor pressure at 100°F (10 to 34 psi), and percentage evaporated at 140°F (25 to 85%). It is recovered as a liquid, principally for use as a motor fuel component.

If the gas contains hydrogen sulfide, a poisonous gas, it is removed and further processed for recovery of elemental sulfur. Most carbon dioxide is removed to prevent destructive corrosion and to inject into crude oil reservoirs for enhanced oil recovery (EOR). Some helium is extracted for its unique properties as an inert gas.

In addition, gas processing performs vital functions, both economically and technically, in the recovery of crude oil through reservoir pressure maintenance, miscible floods, and other secondary recovery methods. Many of these projects would not be economically possible except for the revenues generated by extraction and sale of natural gas liquids.

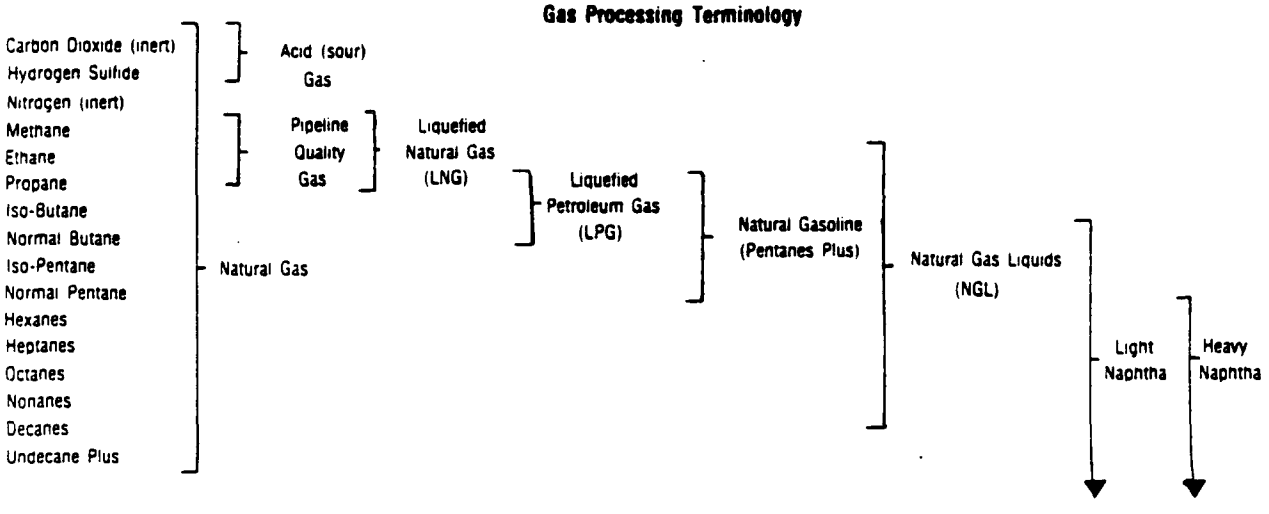
PROCESSING AND MANUFACTURE

Natural gas processing involves two basic operations: (1) extraction of the natural gas liquids from the gas stream; and (2) fractionation of the natural gas liquids into their separate components. Additional processing is usually required to treat and condition both the natural gas and the gas liquids.

Natural gas processing may be as simple as drying the gas by passing it through a fixed bed of a desiccant material, or it may be as complex as complete liquefaction of the total gas stream by cooling to extremely low temperatures. Extraction of heavier gas liquids (pentane and heavier) can be achieved by simple compression and moderate cooling of the natural gas stream.

However, the modern gas processing industry uses a variety of sophisticated processes to treat natural gas and extract natural gas liquids from the gas stream. The two most important extraction processes are the absorption and cryogenic expander processes. Together, these processes account for an estimated 90% of total natural gas liquids production.

Gas Processing Terminology



ABSORPTION PROCESS

The basic step in the absorption process is removal of NGL components from the natural gas by contact with an absorbing oil. Liquid recovery is enhanced by refrigerating the absorption oil. Recovery levels may also be increased by lowering the molecular weight of the absorption oil. Depending on operating conditions, approximately 85% of the propane and essentially all of the heavier natural gas liquids are absorbed in the oil. The lighter fractions – methane, ethane, and some of the propane – are not recovered in the absorbing oil and pass through the absorber tower as merchantable pipeline quality natural gas.

The bottoms effluent from the absorption tower consists of rich absorption oil mixed with absorbed propane, butanes, pentanes, and other heavier natural gas liquids. This stream is then fed to lean oil stills where the absorbed liquids are distilled from the absorber oil by heating the mixture to a temperature above the boiling point of the natural gas liquids, but below that of the absorber oil. The stripped absorber oil is then recirculated to the absorption tower, and the mixed stream of natural gas liquids is piped to the fractionation system for further separation into individual NGL components.

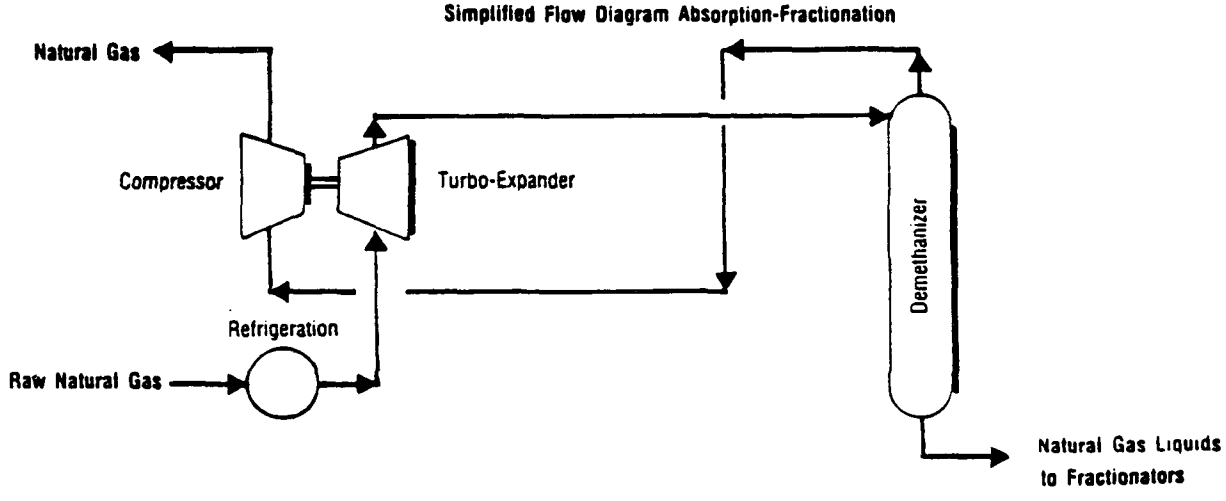
The fractionation system may be an integral part of the gas processing plant, or it may be a "central fractionator" many miles from the primary production. A central fractionator may receive mixed streams of natural gas liquids from many plants.

TURBO EXPANDER PROCESS

In recent years, ethane has become increasingly desirable as a petrochemical feedstock. This has resulted in the construction of many plants that recover ethane and heavier hydrocarbons from natural gas at temperatures ranging down to minus 150°F.

Combinations of external refrigeration and liquid flash-expansion refrigeration with gas turbo expansion cycles are employed to attain the low temperatures desired for high ethane recovery.

In the turbo-expander process, the absorber and still facilities are replaced by an expansion turbine, which accomplishes the separation of gas liquids from the natural gas stream by auto-refrigeration to extremely low temperatures.



Recoveries of 90-95% ethane and all of the heavier hydrocarbons have been achieved with the expander process. The mixed liquid product from the expander plant is then fractionated or may be delivered by pipeline to a central fractionation facility for fractionation into separate NGL components.

FRACTIONATION

Fractionation of a mixed NGL stream into separate components is accomplished by controlling the temperature of the stream in a fractionator to take advantage of the difference in boiling points of separate products. Fractionators are usually named for the overhead or top product. Therefore, a deethanizer implies that the top product is ethane; a depropanizer indicates that the top product is propane, etc. Natural gas liquids are normally fractionated by boiling the lighter products from the heavier products in the following order:

Deethanizer: The first step in the fractionating sequence is to separate the ethane and propane, with the ethane going overhead and the propane and heavier components passing from the bottom of the fractionator.

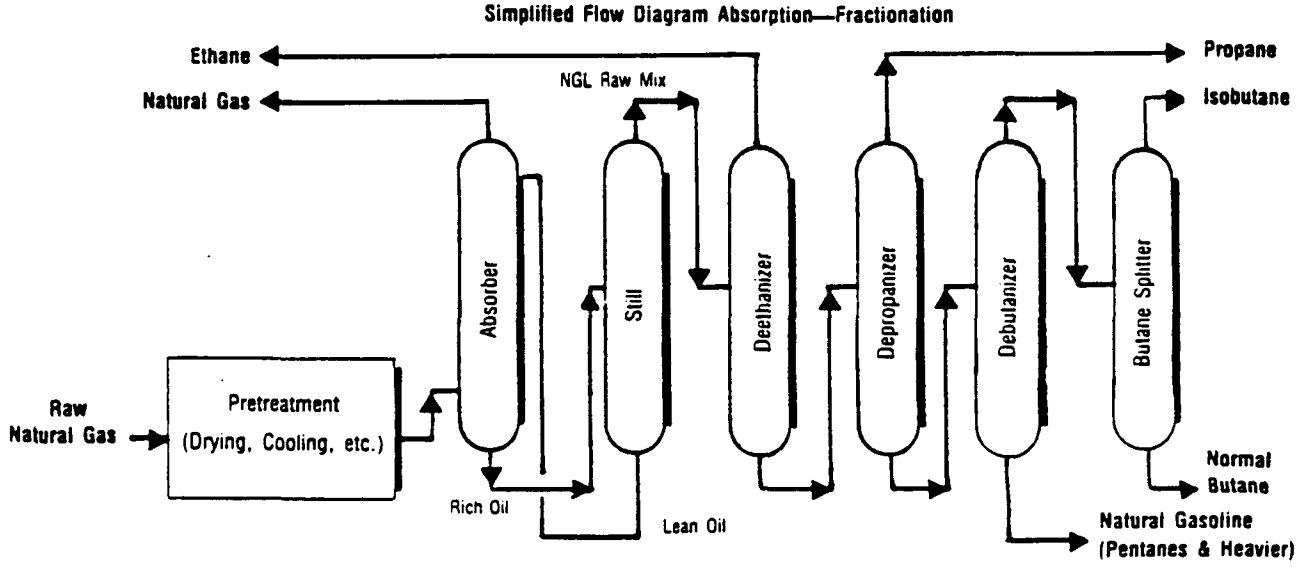
Depropanizer: The next step in the processing sequence is to separate the propane and the isobutane, with the propane going overhead and the isobutane and heavier components passing from the bottom of the depropanizer.

Debutanizer: The next fractionation step is separation of the butanes from the pentanes plus stream. The butanes (both iso and normal) pass overhead and the pentanes plus pass from the bottom of the fractionator.

Butane Splitter or Deisobutanizer: When it is desirable to do so, the butanes which pass overhead from the debutanizer may be separated into iso and normal butanes. The isobutane goes overhead and the normal butane is drawn from the bottom of the tower.

OTHER ROUTINE GAS PROCESSING

As noted earlier, both natural gas and natural gas liquids may require additional treating or processing, either before or after extraction of liquids.



The most common treatment of natural gas is removal of excess water vapor, which is necessary to prevent formation of hydrates and freezing in pipeline transmission systems. Techniques for dehydrating natural gas include:

-Absorption using liquid desiccants, usually a glycol compound

-Adsorption, using solid desiccants such as silica gel, activated alumina, or molecular sieves

-Dew point depression by injection of anti-freeze compounds such as glycols or alcohols

-Expansion refrigeration which cools the gas stream below the dew point of entrained water vapor.

Removal of excess moisture from some natural gas liquids, principally propane, is also necessary and is accomplished most often with solid desiccants or molecular sieves.

Additional treatment of both natural gas and natural gas liquids is usually required to remove hydrogen sulfide and carbon dioxide. This process in the industry is called "sweetening." Many process methods are used, most of which rely on either chemical reactions, physical solution, or adsorption. Each process has unique advantages, depending on the concentration of hydrogen sulfide, carbon dioxide, and other conditions.

The most common chemical processes are based on contact with amine solutions. These solutions react with unwanted acid gas constituents to form other compounds which can then be removed.

Physical solvent processes include a number of patented chemicals and processing schemes which function much the same as the oil absorption process for removal of liquids from gas.

Adsorption processes involve the removal of unwanted components by passing the gas or liquid through a bed of solid material that has been designed or treated to selectively extract carbon dioxide, hydrogen sulfide, or other contaminants.

SULFUR RECOVERY

The sour gas effluent from a sweetening unit must be further treated, either for disposal or for recovery of sulfur contained in the gas. At plants where hydrogen sulfide concentrations are very low, it is not economical to install sulfur recovery facilities. In these cases, the sour gas is disposed of by incineration.

At higher concentrations, the sour gas is usually processed in a sulfur recovery facility to recover elemental sulfur. The Claus process is the most widely used process for converting hydrogen sulfide into elemental sulfur. The process utilizes thermal and catalytic reactions to achieve conversion of up to 97% of hydrogen sulfide to elemental sulfur. "Tail gas clean up" processes reduce sulfur emissions significantly and boost overall efficiency of sulfur recovery to 98+%.

OTHER SPECIALIZED GAS PROCESSING

Depending on gas composition and other factors, the gas processing function may also include additional processing such as:

- Carbon dioxide removal and transport for enhanced oil recovery
- Helium recovery for commercial sale
- Nitrogen removal to increase heating value of the gas
- Liquefaction of the total gas stream to produce liquefied natural gas.

All of these process functions require specialized processes and additional investment.

PROFILE OF THE U.S. GAS PROCESSING INDUSTRY

PROCESSING PLANTS

There are approximately 859 gas processing plants in the United States, most of which are located in five states: Texas, Louisiana, Oklahoma, Kansas, and New Mexico. These five states account for about 86% of total U.S. gas processing capacity, gas processed, and natural gas liquids production.

Plant sizes range from less than 1 million cubic feet per day up to more than 2.5 billion cubic feet per day. The 200 smallest plants (about 25% of total) are less than 10 million cubic feet per day capacity, and account for only about 1% of total industry capacity.

The 200 largest plants (25% of total) have capacities greater than 80 million cubic feet per day and account for nearly 80% of total industry capacity. Approximately 92% of total gas capacity is in 375 plants (44% of total) with capacities greater than 35 million cubic feet per day. Production of natural gas liquids averages less than 2,000 barrels per day per plant, with maximum production ranging up to 25,000 barrels per day in the largest plants.

Approximately 100 of the 859 U.S. gas processing plants include sulfur recovery facilities, with a total capacity of about 4,500 tons per day of elemental sulfur. Sulfur production from gas plants accounts for about 13% of total U.S. sulfur production.

In addition, there are approximately 20 central fractionating plants operating in the United States. These fractionators may handle the mixed natural gas liquids production of a single separation facility, or may process mixed streams from many plants, some of which may be located hundreds of miles away. These fractionators separate these raw mixed NGL streams from recovery facilities into saleable products such as ethane, propane, butane, or specified mixtures, according to the user's needs.

COMPANIES

The U.S. gas processing industry is composed of an estimated 300 companies, ranging in size from the largest integrated oil companies to the single plant owner-operator.

The 20 largest gas processing companies produce about 70% of total U.S. production of natural gas liquids.

U.S. GAS PROCESSING PLANTS

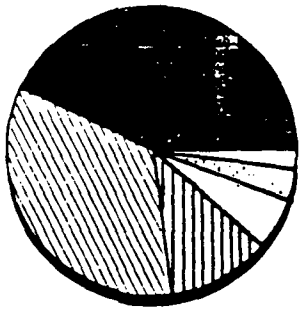
State	No. Plants	Gas Capacity, mmcfd	Gas throughput, mmcfd	NGL Products, m B/D
Texas	411	25,090	13,380	618
Louisiana	100	22,601	14,070	333
Oklahoma	103	4,765	3,110	145
Kansas	23	4,894	2,648	45
New Mexico	41	3,626	2,211	96
	678	60,976	35,419	1,237
Other	181	9,508	5,738	218
U.S. Total	859	70,484	41,157	1,455

NATURAL GAS LIQUIDS SUPPLY/DEMAND

U.S. gas plant production of natural gas liquids totals some 570 million barrels per year, or approximately 1.5 million barrels per day. The distribution of this production during 1984 is as follows:

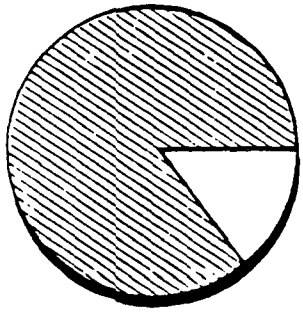
Ethane	28.7%
Propane	34.2%
Normal and Iso-Butane	19.6%
Pentanes plus, including plant condensate	17.5%

PROPANE CONSUMPTION



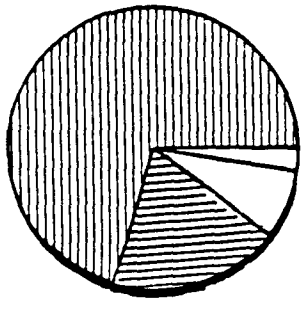
- 2.10% UTILITY GAS
- 3.29% EXPORT
- 5.09% ENGINE FUEL
- 12.57% OTHER
- 34.13% RES & COMM
- 42.82% CHEM & INDUST

ETHANE CONSUMPTION



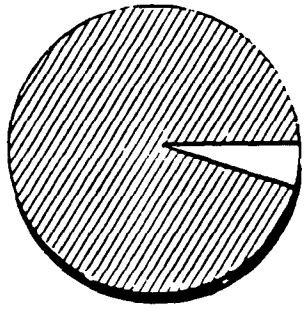
- 13.59% OTHER
- 86.41% CHEMICAL & IND

BUTANE CONSUMPTION



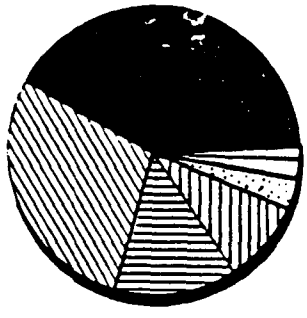
- 1.89% OTHER
- 7.55% EXPORT
- 20.13% CHEM & IND
- 70.43% GASOLINE

PENTANES + CONSUMPTION



- 4.76% CHEM & INDUST
- 95.24% GASOLINE

NGL CONSUMPTION



- 1.13% UTILITY GAS
- 2.13% ENGINE FUEL
- 3% EXPORT
- 3.14% OTHER
- 14.27% RES & COMM
- 28.54% GASOLINE
- 41.79% CHEM & INDUST

PHYSICAL PROPERTIES OF NATURAL GAS LIQUIDS COMPONENTS

Component	Vapor Pressure psia @ 100 F.	Boiling Point @ 14.7 psia	Specific Gravity 60 F./60 F.
Methane	(5,000)	−259	0.3
Ethane	(800)	−127	0.356
Propane	190	−43.7	0.508
n-Butane	51.6	31.1	0.584
i-Butane	72.2	10.9	0.536
n-Pentane	15.6	96.9	0.631
i-Pentane	20.4	82.1	0.625
Hexane	5.0	155.7	0.664
Heptane	1.6	209.2	0.688

In addition, field facilities handling natural gas prior to delivery into a gas processing plant produce an estimated 350 thousand barrels per day of lease condensate, which is usually transported to refineries along with crude oil.

Total U.S. supply of natural gas liquids is augmented by refinery production and imports.

Refineries produce and market about 120 million barrels per year, or about 325 thousand barrels per day, of natural gas liquids, mainly propane. Refinery yields of natural gas liquids amount to 2-3% of total crude oil charged to the refinery.

Total imports of natural gas liquids are approximately 70 million barrels per year, or roughly 200 thousand barrels per day. About 80% of these imports are from Canada.

Approximately 80% of total U.S. natural gas liquids production is consumed in three major uses: petrochemical feedstocks; motor gasoline manufacture; and residential and commercial heating fuels. The remainder is used in a wide variety of applications, including engine fuels, industrial fuels, utility peak shaving, crop drying, and other agricultural and process fuel applications.

TRANSPORTATION AND STORAGE

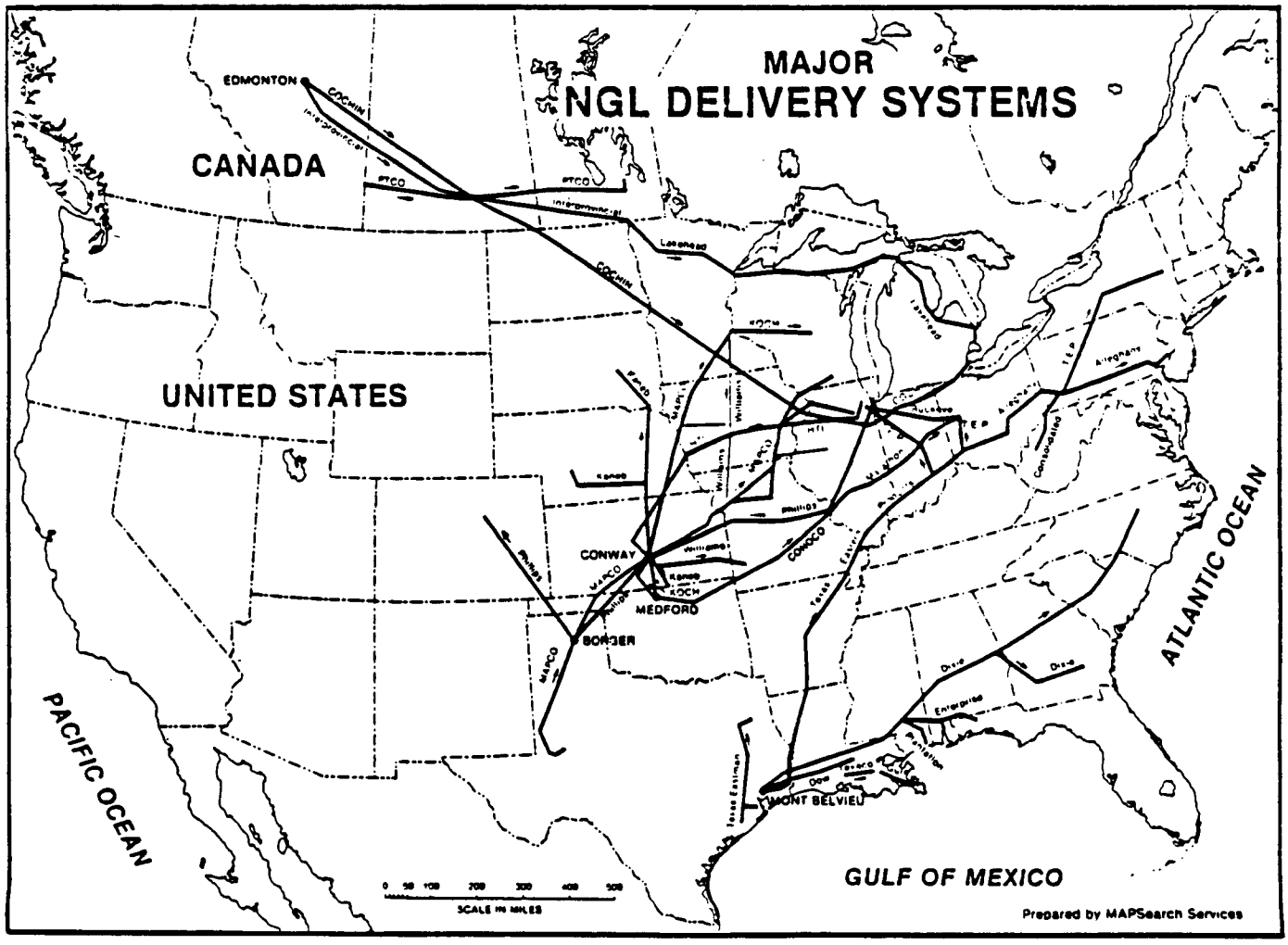
A national network of some 70 thousand miles of high pressure pipelines transport unfractionated NGL streams from production areas to fractionating centers and then transport finished products to major markets.

Four major pipelines extend from the West Texas-New Mexico fields to the major terminal and fractionation center of the U.S. – Mont Belvieu, Texas, located near the petrochemical and refining center of the nation. Other pipeline systems deliver West Texas-New Mexico natural gas liquids to a second major terminal, storage, and fractionation point in central Kansas.

From Mont Belvieu, two major pipeline systems deliver LP-gas fuels to the northeastern and southeastern United States.

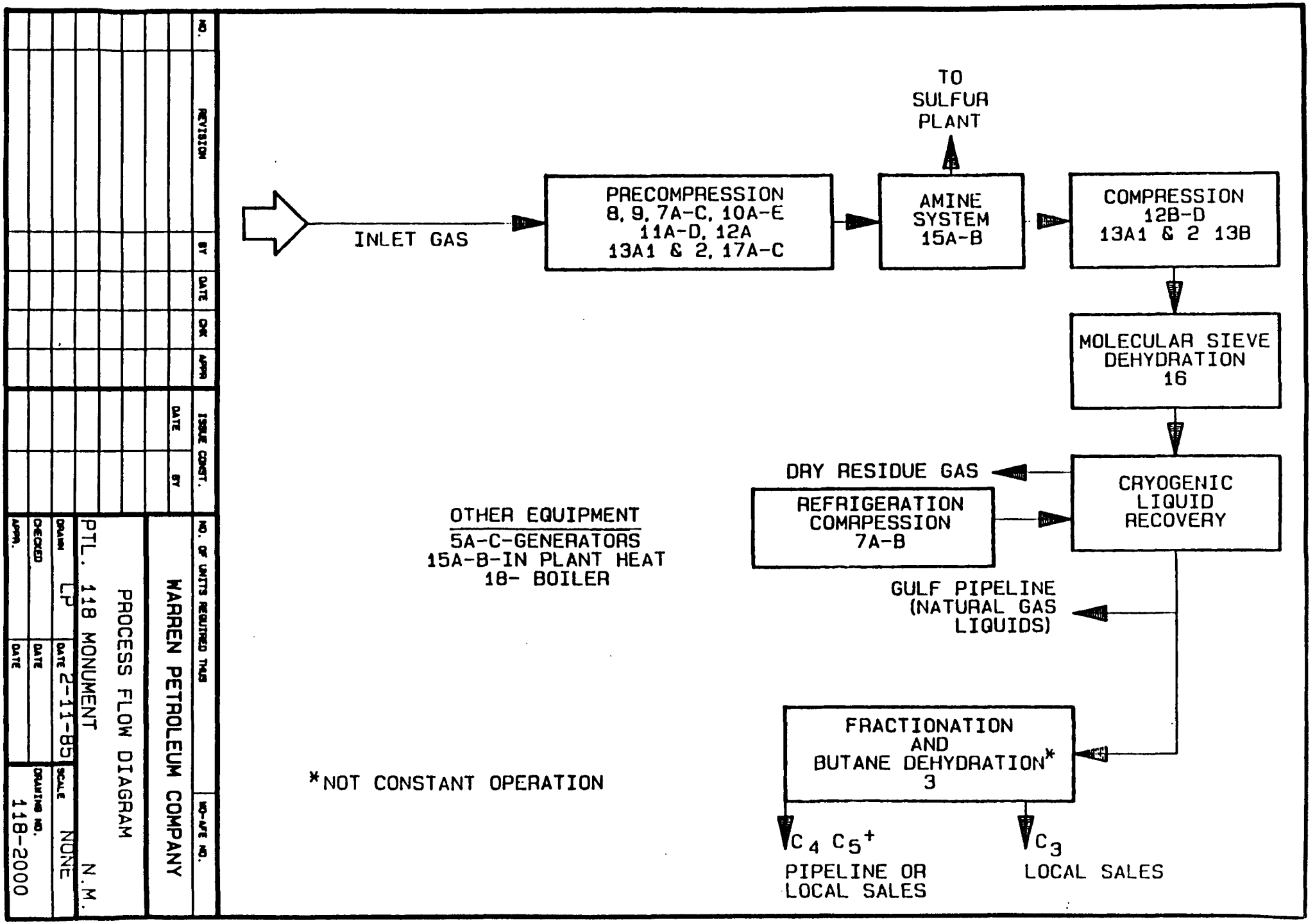
Several pipeline systems extend from central Kansas storage and fractionating facilities into west and upper midwest markets.

Total natural gas liquids production is relatively constant throughout the year. However, depending on weather and other factors, demand may vary considerably. Therefore the industry has installed and operates underground storage facilities totaling nearly half a billion barrels capacity. The bulk of this capacity is located near the refining and petrochemical complexes of the Texas and Louisiana Gulf Coasts, with a second major installation in the midcontinent hub of central Kansas.



NATURAL GAS PROCESSING FOR THE MONUMENT PLANT

The following diagram outlines gas processing for the Monument Plant. The numbers present for each process represent Warren identifiable unit numbers for individual compressors or heaters needed to complete each phase of the process.

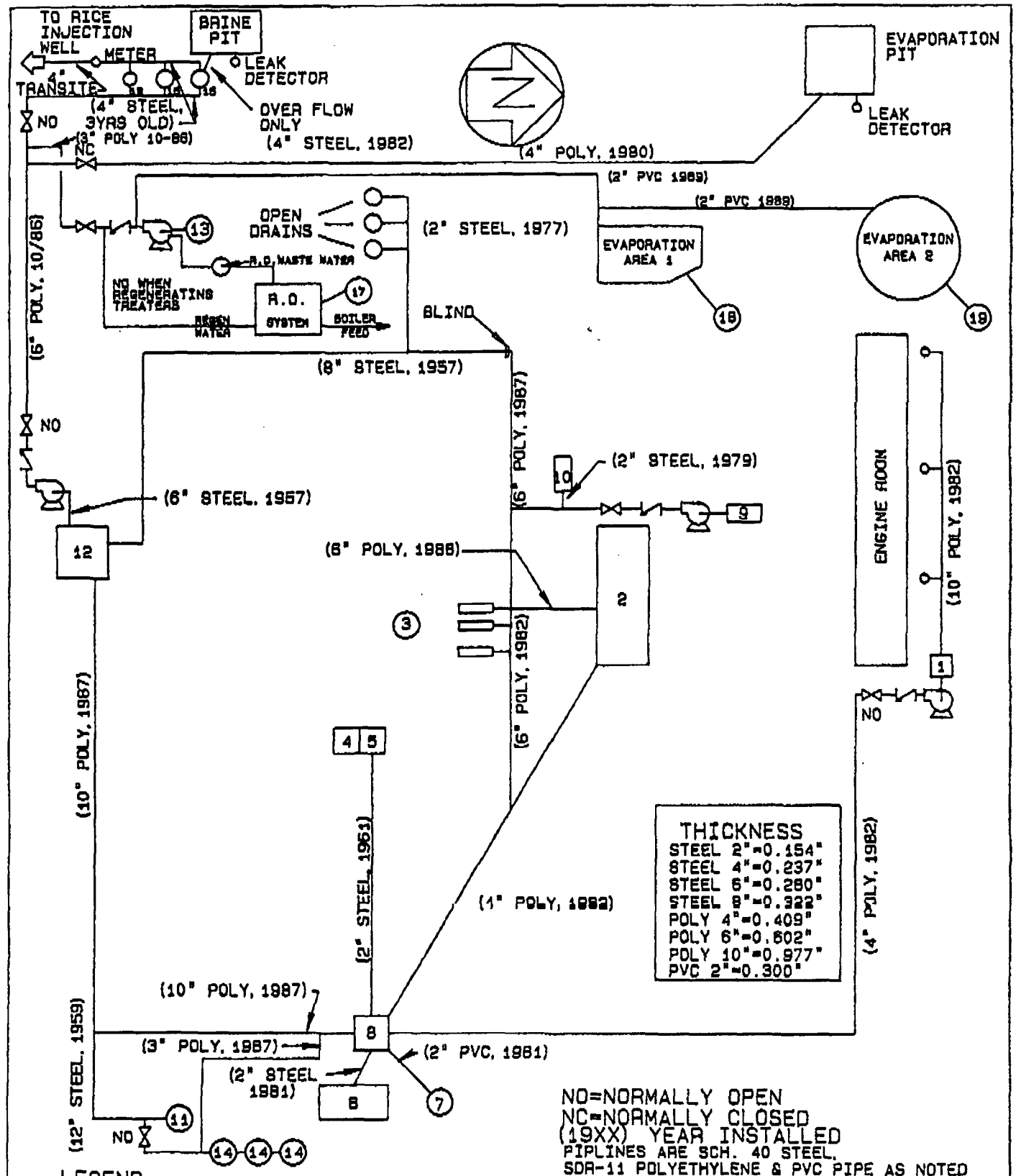

TO SULFUR PLANT
INLET GAS
PRECOMPRESSION 8, 9, 7A-C, 10A-E 11A-D, 12A 13A1 & 2, 17A-C
AMINE SYSTEM 15A-B
COMPRESSION 12B-D 13A1 & 2 13B
MOLECULAR SIEVE DEHYDRATION 16
CRYOGENIC LIQUID RECOVERY
DRY RESIDUE GAS
REFRIGERATION COMPRESSION 7A-B
GULF PIPELINE (NATURAL GAS LIQUIDS)
FRACTIONATION AND BUTANE DEHYDRATION* 3
C_4 C_5^+
PIPELINE OR LOCAL SALES
C_3
LOCAL SALES
OTHER EQUIPMENT
5A-C-GENERATORS
15A-B-IN PLANT HEAT
18- BOILER
*NOT CONSTANT OPERATION
NO. REVISION BY DATE CHK APPR
ISSUE CONST. DATE BY
NO. OF UNITS REQUIRED THIS
NO-AFE NO.
APPR. CHECKED DRAWN DATE
LP DATE 2-11-85
PTL. 118 MONUMENT N.M.
PROCESS FLOW DIAGRAM
WARREN PETROLEUM COMPANY
DRAWING NO. 118-2000
SCALE NONE

2

NATURAL GAS PROCESSING FOR THE MONUMENT PLANT

The generalized block flow diagram presented at the beginning of this section lists sources of wastewater that are in association with gas processing. These discharges, along with inlet gas scrubber (process) water, are the major sources for disposal for gas processing plants.

The Wastewater System Disposal diagram for the Monument Plant directly follows. This diagram also shows the final disposition of the water. This is reiterated on the summary pages presented at the end of this section.



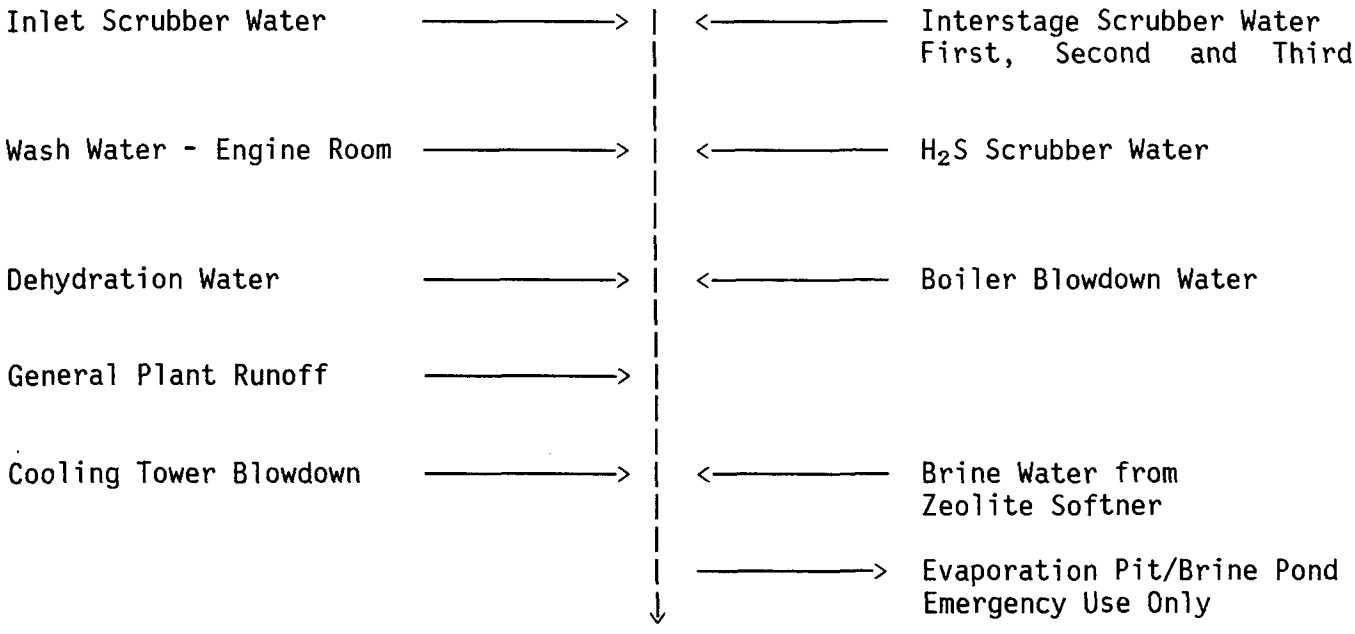
SUMP/PUMP INFORMATION FOR THE MONUMENT PLANT

The capacity of each sump is as follows:

North Engine Room Sump 7,200 gallons.
South Engine Room Sump 10,200 gallons.
East Sump 13,400 gallons.
Main Sump 11,300 gallons.

The capacity of the sump into which all effluent flows is 21,840 gallons stored in three tanks. Any overflow would go to the brine pit. The effluent in the tanks is then sent to the Rice Engineering well by gravity feed. There is no pump on the discharge line to Rice Engineering. The sump capacities upstream of the three tanks are listed above. We do not have pump curves for the two pumps that deliver effluent to the three tanks.

SUMMARY OF WASTE WATER DISCHARGE
MONUMENT PLANT



RICE INJECTION WELL

Note:

In the event of any emergency shutdown of the Rice Injection Well, waste water would be sent to the evaporation pond for 30 days. If Rice Engineering did not resume injection, the water would be hauled from the plant by vacuum truck and delivered to an alternate, state approved well.

Reverse Osmosis reject water ——————> Agricultural Evaporation Area

Accidental Spill: Procedures in the Spill Control and Countermeasure Plan would would take effect.

SECTION VI

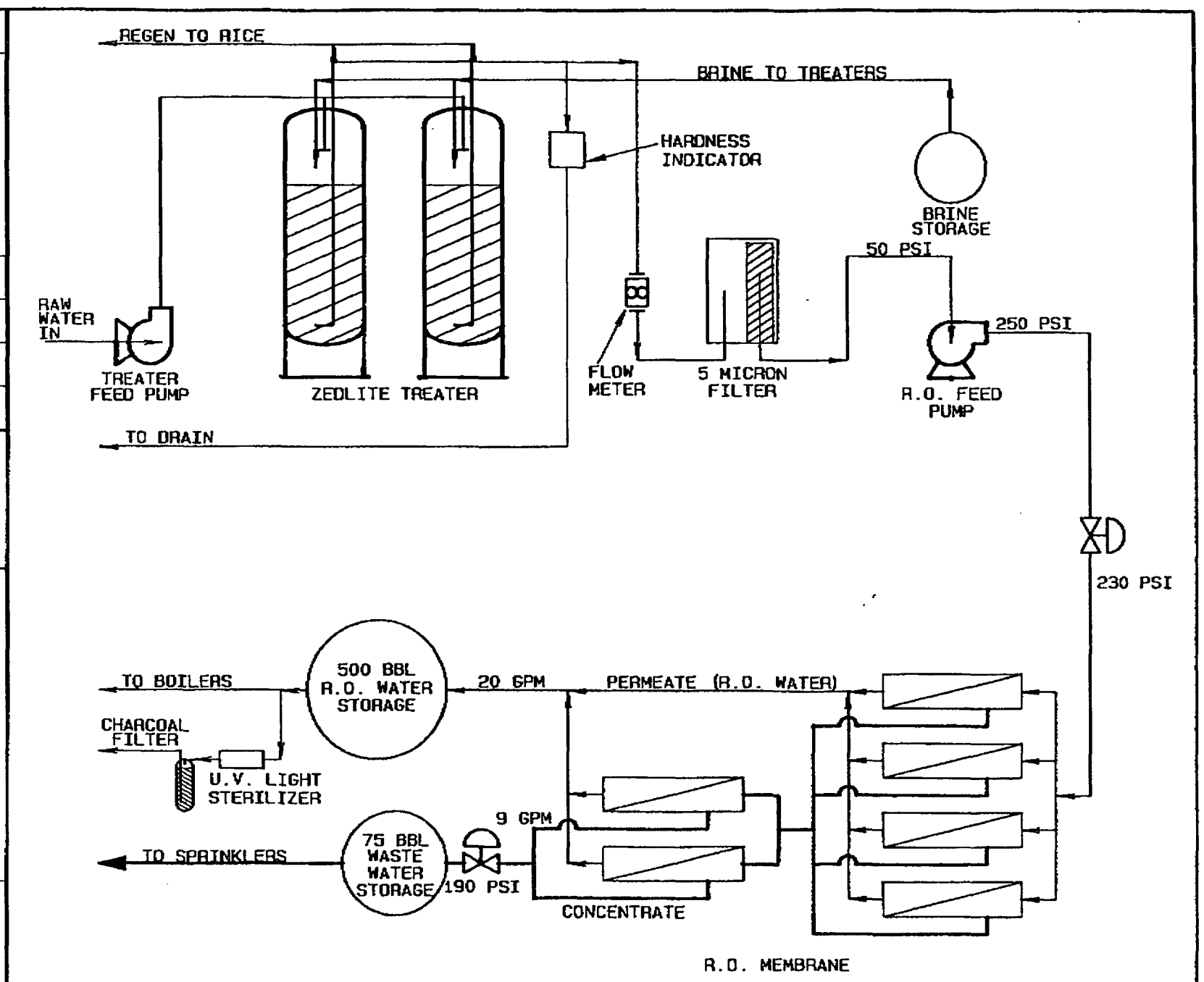
GENERAL DESCRIPTION

REVERSE OSMOSIS WATER TREATMENT

SECTION VI

REVERSE OSMOSIS WATER TREATMENT

The Reverse Osmosis Unit and the Zeolite treaters are located south of the office. This unit was designed for boiler feed water. Following is a one line diagram of the flow through the treaters. Each outlet is labelled with a designated destination. The regeneration water will continue to be delivered to Rice, whereas the waste water from the Reverse Osmosis unit will be evapotranspirated from the evaporation areas.



NO.	REVISION	BY	DATE	CHK	APPR

ISSUE CONST.	
DATE	BY

NO. OF UNITS REQUIRED THUB

WARREN PETROLEUM COMPANY
A DIVISION OF CHEVRON U.S.A. INC.
TULSA, OKLAHOMA

NO-DATE NO.

REVERSE OSMOSIS SYSTEM

PLANT 118 MONUMENT LEA COUNTY, NM

APPR.	CHECKED	DRAWN	DATE	SCALE
DATE	DATE	GMT	8/4/89	NONE

DRAWING NO.
118-1002

The Monument Plant has two Zeolite treaters. One is always in raw water service and one in regeneration/standby service. They are both rated at 50 GPM, with a softening capacity of 600,000 grains.

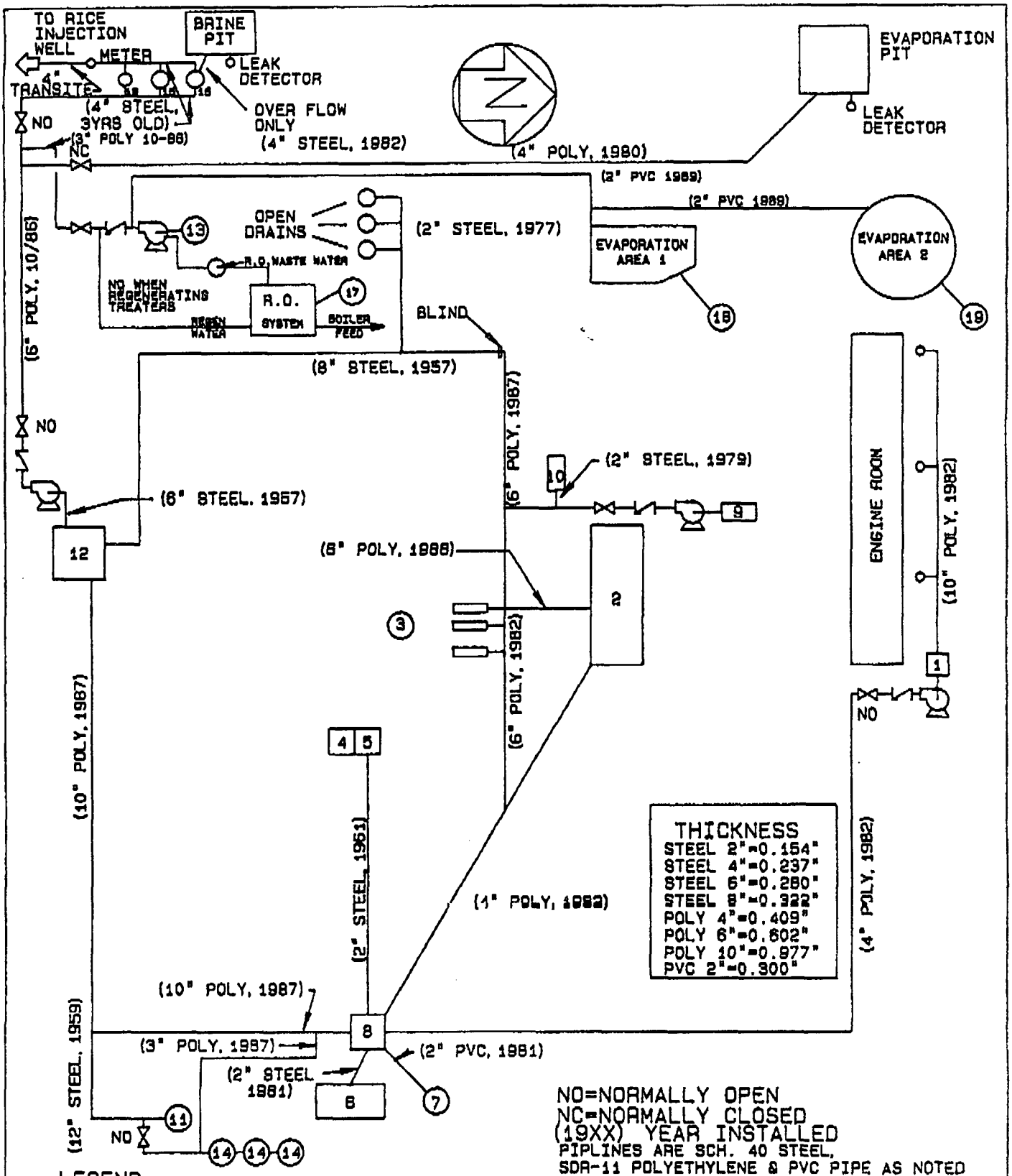
A Calgon water hardness indicator samples the treater water discharge once every 10 minutes. The window will appear green when the water has less than 3 ppm hardness and red when above. Red indicates that the treating bed has become saturated with Ca+ and Mg+ cations and allowing some of them to pass through. It is time to switch beds and regenerate the existing saturated bed.

A flow meter measures the gallons of water treated by one bed. The meter will trigger a bed switch at the set gallonage or can be manually triggered.

The regeneration cycle consists of a backwash, which fluffs the resin, making more surface area available for the Na+ cation exchange. The fluff cycle lasts 10 minutes. A long period is allowed, usually 45 minutes plus, for salt solution to pass through the bed. The salt/brine solution is aspirated by eduction from the black tank into the bed. The Na+ replaces the Ca+ and Mg+ on the surface of the Zeolite and the Ca+, Mg+ solution is flushed down the Rice Engineering disposal line.

After the timer cuts the salt flow, the bed goes through a slow wash to rid "non-bedded" salt from the beds and to settle the resin. Then a "hard" wash takes place to give a final clean. Both wash cycles go to Rice disposal.

The bed is then placed in a standby mode until required.



LEGEND

1-NORTH ENGINE ROOM SUMP
2-COOLING TOWER
3-CONDENSORS
4-BOILER
5-BOILER
6-BOILER
7-H_2S SCRUBBER
8-EAST SUMP
9-SOUTH ENGINE ROOM SUMP
10-CONDENSORS
11-CONDENSATE TANK
12-SOUTH MAIN SUMP
13-ZEOLITE H_2O TREATER
14-SHELL TANKS (3)
15-WASTE WATER STORAGE (2)
16-WASTE WATER OIL SKIMMER
17-REVERSE OSMOSIS SYSTEM
18-EVAPORATION 1
19-EVAPORATION 2

Revised Per Field 7/89
Revised Per Field 4/88

NO. OF UNITS REQUIRED THIS		WO-AFE NO.	
WARREN PETROLEUM COMPANY A DIVISION OF CHEVRON U.S.A.			
WASTE WATER SYSTEM LAYOUT PLANT 118 MONUMENT		LEA, COUNTY, NM.	
DRAWN	HPK	DATE 10/11/85	SCALE NONE
CHECKED	LLJ	DATE 10/11/85	DRAWING NO.
APPR.	PDA	DATE 10/11/85	118-1001-1

SECTION VI

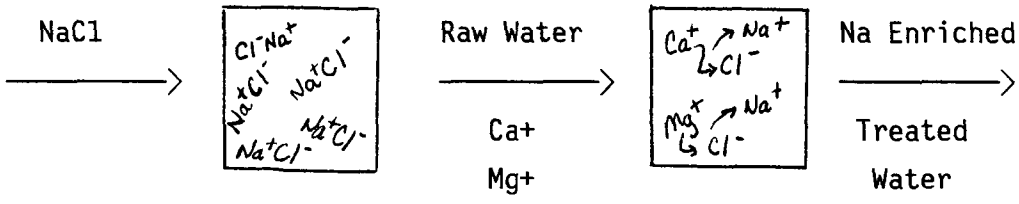
REVERSE OSMOSIS WATER TREATMENT

HOW A ZEOLITE TREATER WORKS:

ZEOLITE: is a polystyrene resin material with a strong ability to split salts into positively charged ions called "cations" and negatively charged ions called "anions".

The purpose of the Zeolite treater is to exchange the scale forming cations, such as calcium and magnesium, with the more desirable cation sodium. This process is referred to as "ion exchange".

The sodium cation Na+ comes by passing a salt solution, or brine NaCl over the Zeolite resin. The molecule of salt is split into cation Na+ and anion Cl-.



Zeolite Regeneration Cycle

Zeolite Treating Cycle

Once the Na+ and Cl- saturation of the Zeolite resin bed is accomplished, raw water is passed over the resin. The Ca+ (calcium) cation and Mg+ (magnesium) cation replace the Na+ on the resin. The Na+ is released in the water and carried to the Reverse Osmosis membranes.

INTRODUCTION

Reverse Osmosis is a pressure driven membrane separation process that is capable of separating dissolved solutes from a solvent, usually water. The solute may be organic or inorganic in nature and range in size from 1-10 Angstroms or less. The ability of reverse osmosis membranes to reject organic substances depends upon the molecular weight, geometry of the solute, and other factors. A well designed reverse osmosis system is capable of removing 90-99% of most dissolved organic and inorganic compounds.

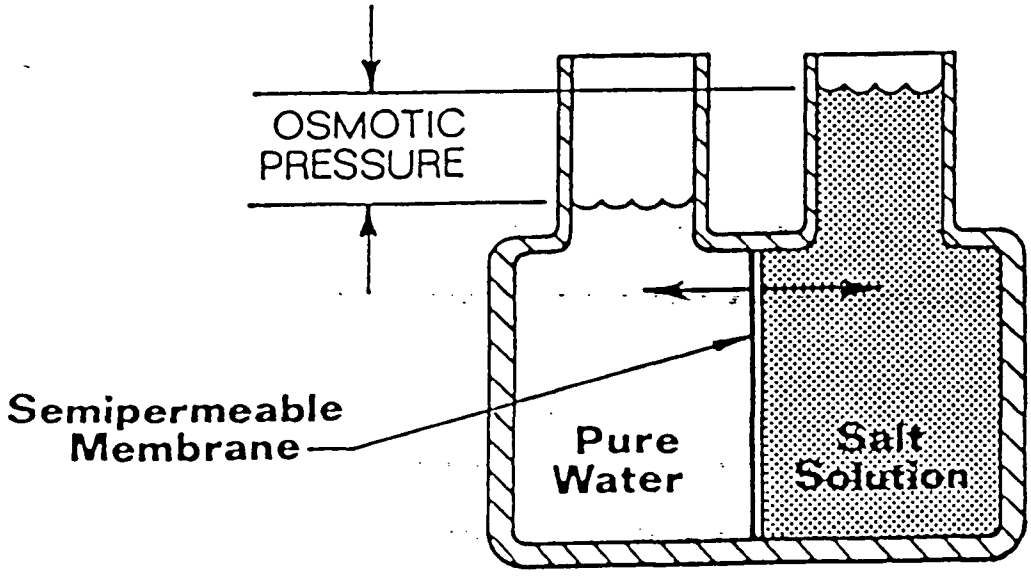
Desal's reverse osmosis membranes are constructed from cellulose acetate, polyamides, or other polymers. The present generation of high rejection - high flow TFM™ membranes are manufactured by depositing thin films of rejecting materials over bases selected for their superior support and flow characteristics.

Most current reverse osmosis applications are related to water treatment for commercial, industrial, municipal, agricultural, and military facilities. However, reverse osmosis technology is expanding into wastewater treatment/reclamation, metal recovery, and custom industrial separations due to energy-saving operation versus competitive processes such as distillation. Please consult the Desal Reverse Osmosis Product Summary and Technical Bulletins for details.

REVERSE OSMOSIS THEORY

When a salt solution is separated from demineralized water by a semipermeable membrane, the higher osmotic pressure of the salt solution causes demineralized water to flow into the salt solution compartment. (See figure below). Water will continue to flow and rise in the salt solution compartment until the increase in water height equals the osmotic pressure of the salt solution. If pressure is exerted on the salt solution compartment, water can be made to flow in the reverse direction. This is the process of reverse osmosis.

OSMOTIC EQUILIBRIUM



Osmotic pressure of a solution is expressed by the following equation:

$$\Pi = \phi \Sigma MiRT$$

where,

Π = osmotic pressure, atm

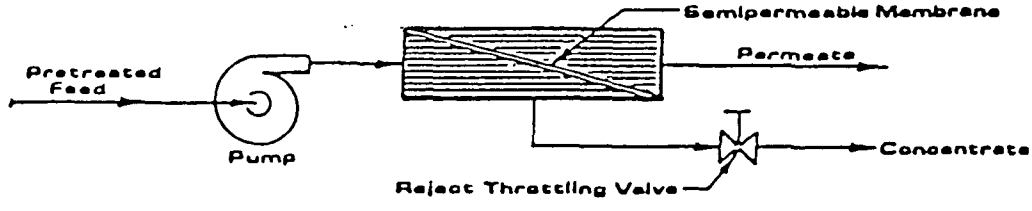
ϕ = osmotic pressure coefficient (about 0.93 for most dilute salt solutions)

ΣMi = sum of the ions present expressed as moles/kg of solution (approximately equal to moles/liter for most dilute solutions)

R = gas constant, 0.082 liter-atm/°K-mole

T = temperature, °K

A simplified flow diagram of a typical RO system shows how the RO process operates. Pressure is applied to the feed stream by a pump, producing permeate and concentrate which are continuously withdrawn. Concentrate contains a high level of dissolved solids while the permeate contains a low level.



Water and salt flux across a reverse osmosis membrane are defined by the following equations:

$$Q_w = A (\Delta P - \Delta \Pi)$$

$$Q_s = B (\Delta C)$$

where,

Q_w = permeate flow, gm (water)/cm^2-sec
Q_s = salt flow, gm (salt)/cm^2-sec
A = water permeability constant, gm(water)/cm^2-sec-atm
B = salt permeability constant, cm/sec
P = pressure differential across the membrane, atm
$\Delta\Pi$ = osmotic pressure differential across the membrane, atm
ΔC = concentration gradient across the membrane, gm(salt)/cm^3

Permeate flow, Q_w, is proportional to the driving pressure minus the differential osmotic pressure.

Salt flow is independent of pressure and is a function of the difference in dissolved solids concentration across the membrane.

Qualitative changes in flux rate and salt passage quotient (product water TDS/average feed water TDS) caused by independent increases in RO system operating parameters and feed water concentration are tabulated below.

VARIABLES AFFECTING FLUX RATE AND SALT PASSAGE

Increasing Variable	Flux	Salt Passage Quotient
Net driving pressure	Increases	Decreases
Temperature	Increases	No change
Recovery	Decreases	Increases
Feed-brine velocity	Increases	Decreases
Feed TDS	Decreases	Increases
Feed Foulants	Decreases	Increases

As indicated by the permeate flow equation, an increase in net driving pressure results in an increased flux rate. Salt

flow, Q_s, does not change with pressure, so that increased permeation rates result in a dilution of the permeate stream and a lowering of the salt passage quotient.

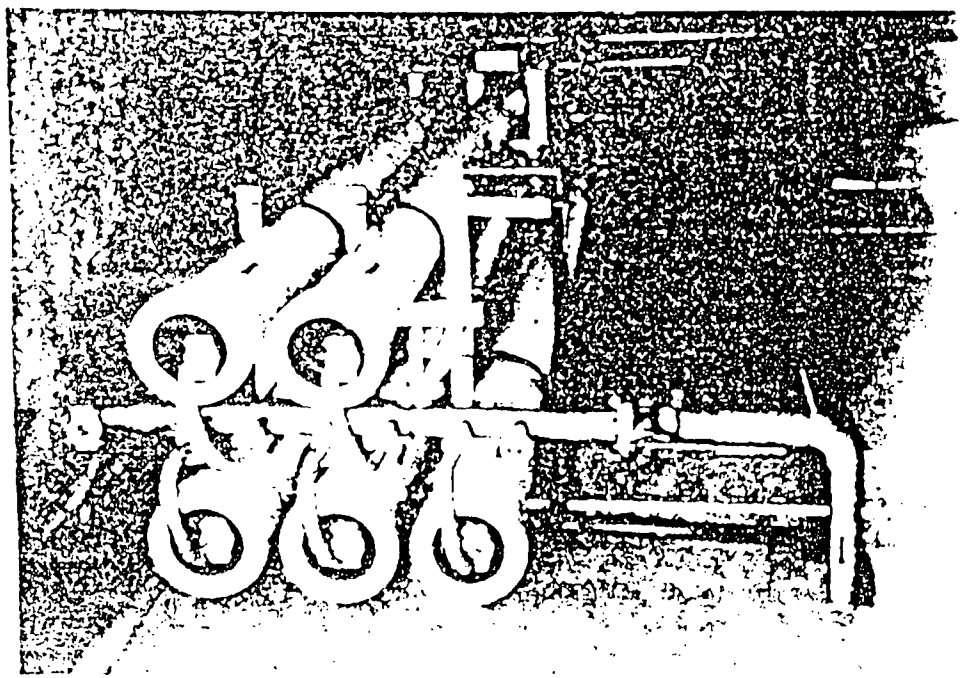
Coefficients of permeate and salt passage (A and B) show about the same increase with temperature. For this reason, no change in the salt passage quotient is seen with temperature increases.

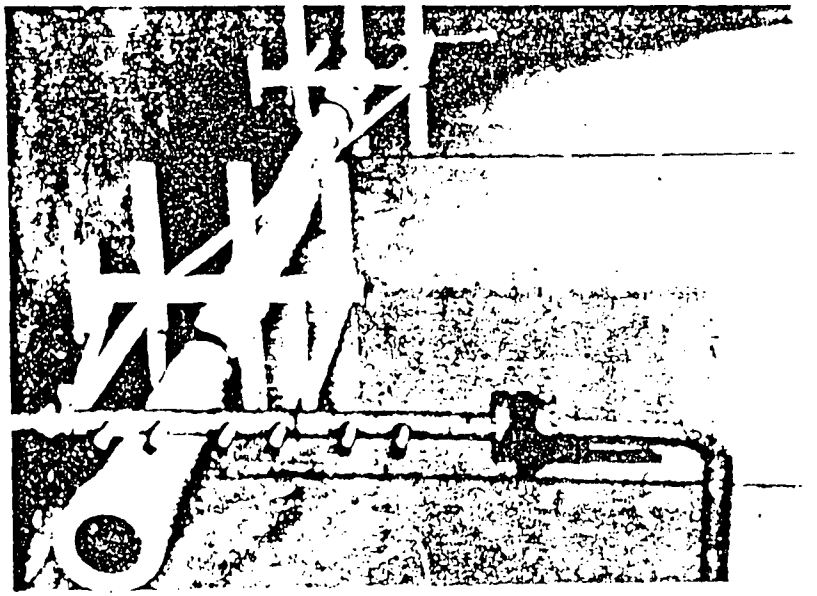
Increased product recovery will increase the average feed-brine osmotic pressure. The result is higher salt passage due to the increased feed-brine TDS concentration and a lower net driving pressure.

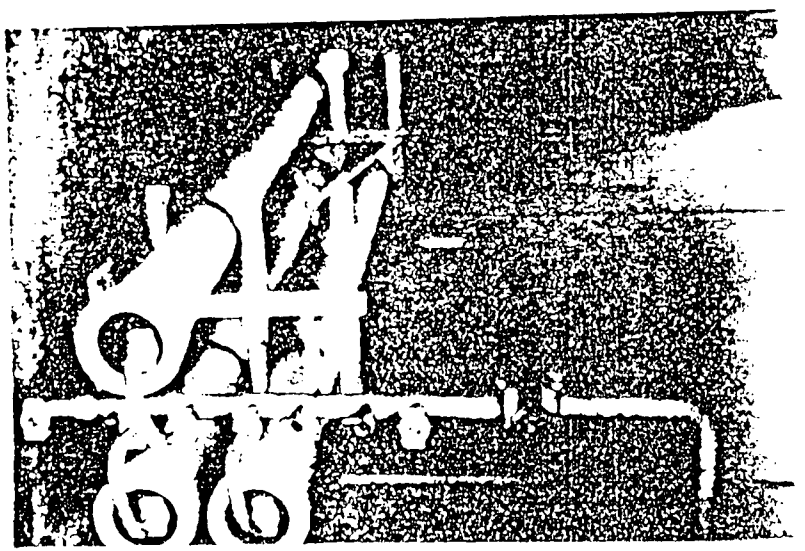
Concentration polarization refers to a local salt concentration increase at the membrane surface. The salt left at the membrane surface as a result of permeate passage cannot diffuse away from the membrane fast enough to prevent a local salt concentration increase. Feed-brine velocity is a significant factor in reducing the thickness of this stagnant boundary layer. Reduction of the boundary layer thickness decreases salt passage.

At constant feed pressure, increased feedwater TDS decreases the net driving force across the membrane by increasing osmotic pressure. Salt passage increases due to a higher ΔC term in the salt passage equation.

Foulants present in the feedwater deposit on membrane surfaces and increase the thickness of the laminar boundary layer. The results are increased resistance to permeation and concentration polarization.

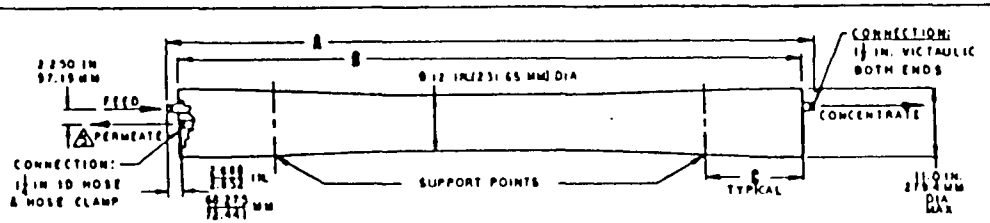


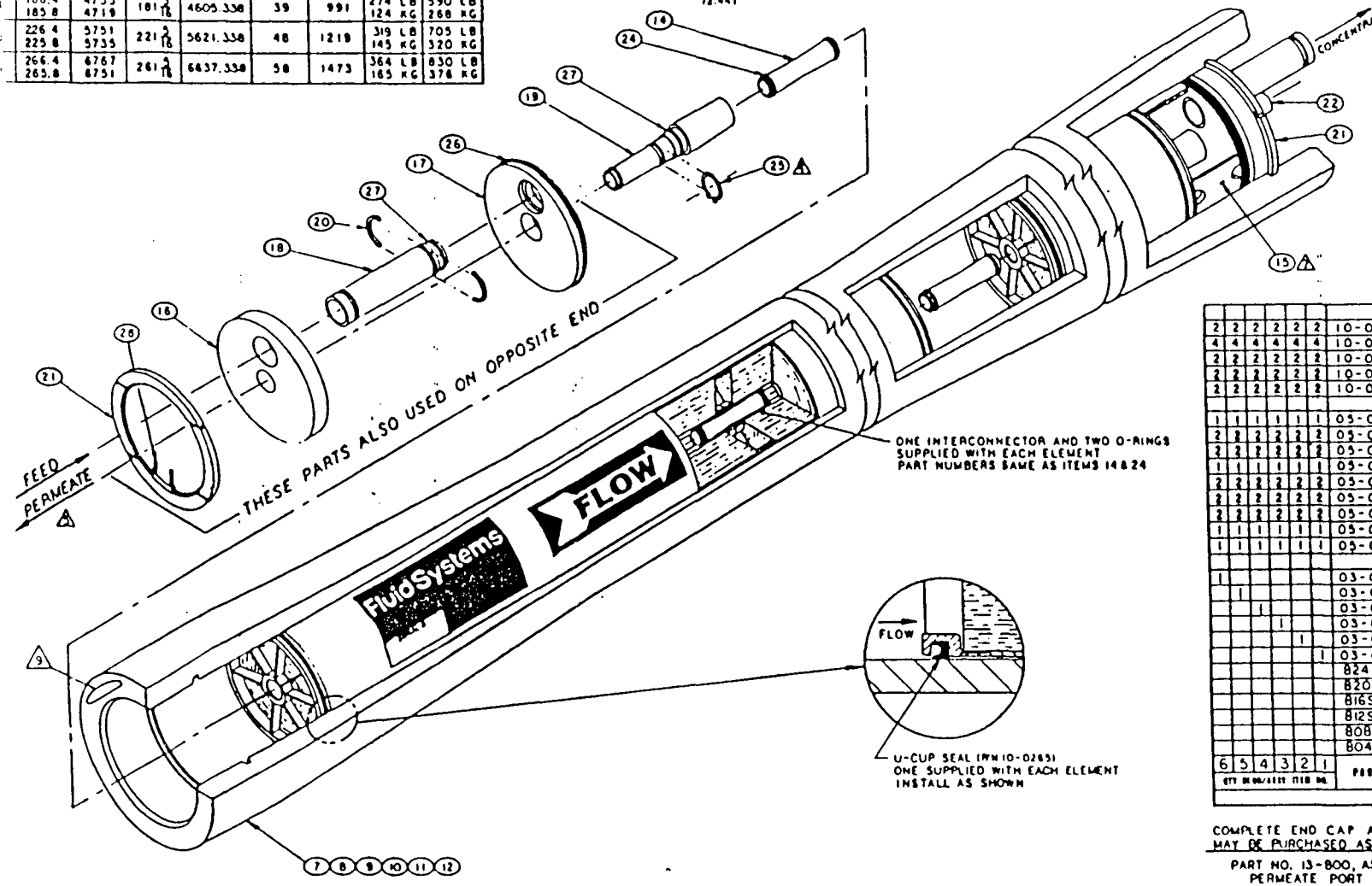




INTERFACE DIMENSIONS

A IN	A MM	B IN ± 1/8	B MM ±9.525	C IN ± 1/4	C MM ±12.7	APPROX WT FRP TUBE ASSY	APPROX WT LOADED ASSY, WET
66.4 65.8	1687 1671	81 1/8	1957.338	16	406	134 LB 61 KG	225 LB 102 KG
106.4 105.8	2703 2687	101 1/8	2573.338	21	533	184 LB 83 KG	350 LB 159 KG
146.4 145.8	3719 3703	141 1/8	3589.338	30	762	229 LB 104 KG	470 LB 213 KG
186.4 185.8	4735 4719	181 1/8	4605.338	39	991	274 LB 124 KG	590 LB 268 KG
226.4 225.8	5751 5735	221 1/8	5621.338	48	1218	319 LB 145 KG	705 LB 320 KG
266.4 265.8	6767 6751	261 1/8	6637.338	58	1473	364 LB 165 KG	830 LB 376 KG





NOTES:

1. INSTALLATION AND REMOVAL OF END CAP ASSY REQUIRES LUBRICANT ON O-RINGS AND O-RING PATHS TO REDUCE FRICTION.
2. TO INSTALL ELEMENTS, APPLY LUBRICANT ON U-CUP SEALS AND INTERCONNECTOR O-RINGS TO REDUCE FRICTION.
3. CAUTION: EXCESSIVE USE OF LUBRICANTS SHOULD BE AVOIDED TO PREVENT BLOCKING OF FLOW CHANNELS AND AVOID FOULING OF MEMBRANE SURFACES.
4. TO INSTALL AND REMOVE RETAINING RING, TRUARC PLIERS, PART NO 0604 OR EQUIVALENT IS RECOMMENDED.
5. PERMEATE MAY BE TAKEN FROM EITHER END OF ASSY BY INTERCHANGING END CAP ASSEMBLIES.
6. MAX OPERATING PRESSURE – 600 PSI.
7. THRUST RING MUST BE INSTALLED ON THE CONCENTRATE DISCHARGE END OF THE ASSEMBLY.
8. NOTE ON LUBRICANTS: DIFFERENT LUBRICANTS MAY BE UTILIZED. GLYCERIN IS WATER SOLUBLE AND IS RECOMMENDED IN MOST APPLICATIONS. SILICONE LUBRICANTS MAY ALSO BE APPLIED; HOWEVER, AS THEY ARE NOT WATER SOLUBLE, CARE MUST BE UTILIZED TO AVOID EXCESS APPLICATION.
9. FRP PRESS. TUBE SERIAL NO./IDENT. TAG.

								29
2	2	2	2	2	2	10-0712	RETAINING RING (FOR SEGMENTED RING SET)	28
4	4	4	4	4	4	10-0716	O-RING (FOR FEED/CONC PORT, PERM PORT, PERM PLUG)	27
2	2	2	2	2	2	10-0602	O-RING (FOR END PLUG)	26
2	2	2	2	2	2	10-0330	RETAINING RING (FOR PERM PORT & PERM PLUG)	25
2	2	2	2	2	2	10-0251	O-RING (FOR INTERCONNECTOR)	24
								23
1	1	1	1	1	1	05-0907	PERMEATE PLUG (BLACK ACETAL)	22
2	2	2	2	2	2	05-0902	SEGMENTED RING SET	21
2	2	2	2	2	2	05-0901	RETAINING RING SET (FOR FEED/CONC PORT)	20
1	1	1	1	1	1	05-0900	PERMEATE PORT (BLACK ACETAL)	19
2	2	2	2	2	2	05-0899	FEED/CONCENTRATE PORT (316 STN STL)	18
2	2	2	2	2	2	05-0898	END PLUG	17
2	2	2	2	2	2	05-0897	SUPPORT PLATE	16
1	1	1	1	1	1	05-0895	THRUST RING	15
1	1	1	1	1	1	05-0227	INTERCONNECTOR	14
								13
1						03-0806	FRP PRESSURE TUBE	12
	1					03-0805	FRP PRESSURE TUBE	11
		1				03-0804	FRP PRESSURE TUBE	10
			1			03-0803	FRP PRESSURE TUBE	9
				1		03-0802	FRP PRESSURE TUBE	8
					1	03-0801	FRP PRESSURE TUBE	7
						824SP00	PRESSURE TUBE ASSY	6
						820SP00	PRESSURE TUBE ASSY	5
						816SP00	PRESSURE TUBE ASSY	4
						812SP00	PRESSURE TUBE ASSY	3
						808SP00	PRESSURE TUBE ASSY	2
						804SP00	PRESSURE TUBE ASSY	1
6	5	4	3	2	1	QTY REQ/ASSY ITEM NO.	PART NO.	DESCRIPTION

PARTS LIST

COMPLETE END CAP ASSEMBLIES MAY BE PURCHASED AS FOLLOWS:

PART NO. 13-800, ASSY WITH PERMEATE PORT

PART NO. 33-800, ASSY WITH PERMEATE PLUG

Fluid Systems

TITLE
PRESSURE TUBE ASSY
8 IN. CLOSE-COUPLED
STANDARD PRESSURE ELEMENTS
FRP PRESSURE TUBE

DRAWING NO. 22-463

REVISION C

DESAL-3LP PERFORMANCE DATA

Specific ion rejections for Desal-3LP operating on Escondido Tap Water are tabulated below. In general, Desal-3LP Performance will be related to the feedwater composition and RO design and operating parameters. Some of the factors that influence performance will be discussed in Section 6.

Ion	Concentration, mg/l	% Rejection
Na^+	70.0	98.0
Ca^{+2}	57.0	99.5
Mg^{+2}	20.0	99.5
HCO_3^-	168.0	98.1
SO_4^{-2}	131.0	99.5
CL^-	49.0	98.8
SiO_2	12.4	98.0
TDS	518.0	98.7

---

*Determined at 200 psi and 25% recovery.

$$\text{Specific ion rejection} = 1 - \frac{\text{Concentration of ion in permeate}}{\text{Concentration of ion in feed}}$$

DESAL-3LP GENERAL SYSTEM DESIGN GUIDELINES

1. The minimum concentrate flow is determined by the crossflow velocity in the last element in a given vessel. For design purposes, the following criteria may be used to approximate minimum concentrate flow:

   a. Minimum CONCENTRATE to PERMEATE flow ratio in last element of the last stage: 6:1

   b. Minimum CONCENTRATE to PERMEATE flow ratio in last element of all other stages: 5:1

2. Recommended Vessel Arrays:

   2-stage systems . . . 4:2

   3-stage systems . . . 4:2:1

3. Recovery/Number of Stages:

   50% recovery . . . . 1 stage

   75% recovery . . . . 2 stages

   90% recovery . . . . 3 stages

4. Number of Elements Per Vessel: 1-6

5. Maximum Permeate Flow Per Element - See flux rates at standard conditions in Section 4.

6. Maximum Pressure Drop Per Element: 12 psi (0.8 Bar)

7. Maximum Pressure Drop Per Vessel: 50 psi (3.4 Bar)

8.

Element Diameter	Maximum Feed Flow GPM	M^3/Hr
4 inch	20	4.54
8 inch	80	18.17

CALGON CORPORATION
SUBSIDIARY OF MERCK & CO., INC.
WATER MANAGEMENT DIVISION CALGON CORPORATION BOX 1346 PITTSBURGH, PA 15230 (412) 777-8000

WATER ANALYSIS REPORT

CUSTOMER NAME: WARREN PETROLEUM COMPANY SPONSOR: STAFFORD
LOCATION: MONUMENT PLANT MAIL DROP: CARLSBAD, N. M.
MONUMENT, N. M.
COPIES: ---

SAMPLE NUMBER: 228563
DESCRIPTION: REVERSE OSMOSIS REJECT WATER
SAMPLE POINT: R. O. UNIT
DATE SAMPLED: 5/8/89 TIME SAMPLED: 14:00

PH @ 25C	8.0	
A READING	---	ML N/30 H2SO4 (--- MG/L CaCO3)
M.O. READING	32.4	ML N/30 H2SO4 (541. MG/L CaCO3)
B READING	---	ML N/30 H2SO4 (--- MG/L CaCO3)
CONDUCTIVITY	1900	UN-NEUTRALIZED, umhos/cm
SUSPENDED SOLIDS	EST <5	MG/L

	-MG/L-
HYDROXIDE (OH)	---
CARBONATE (CO3)	---
BICARBONATE (HCO3)	659
SILICA (SiO2)	110
CHLORIDE (Cl)	150
SULFATE (SO4)	160
ORTHO PHOSPHATE(PO4)	0.05
NITRATE (NO3/NO2)	35

	TOTAL (MG/L)	DISSOLVED (MG/L)
CALCIUM (Ca)	0.5	0.5
MAGNESIUM (Mg)	<0.1	<0.1
SODIUM (Na)	440	440
POTASSIUM (K)	3.0	3.0
IRON (Fe)	0.7	<0.05
COPPER (Cu)	<0.05	<0.05
MANGANESE (Mn)	<0.05	<0.05
ALUMINUM (Al)	<0.1	<0.1
ZINC (Zn)	<0.05	<0.05
NICKEL (Ni)	<0.05	<0.05
CHROMIUM (CrO4)	<0.05	<0.05

COMMENTS : PH IS <8.2 BUT ON ADDITION OF NEUTRAL BARIUM CHLORIDE
A HEAVY WHITE PRECIPITATE WAS FORMED.

CALGON ANALYTICAL LABORATORIES, APPROVED BY: RJF
REPORTED: 05/26/89 RECEIVED: 05/15/89

CALGON CORPORATION
SUBSIDIARY OF MERCK & CO., INC.
WATER MANAGEMENT DIVISION CALGON CORPORATION BOX 1346 PITTSBURGH, PA 15230 (412) 777-8000

WATER ANALYSIS REPORT

CUSTOMER NAME: WARREN PETROLEUM COMPANY SPONSOR: STAFFORD
LOCATION: MONUMENT PLANT MAIL DROP: CARLSBAD, N. M.
MONUMENT, N. M.
COPIES: ---

SAMPLE NUMBER: 228564
DESCRIPTION: REVERSE OSMOSIS ~~REJECT~~ Product WATER Boiler Feedwater
SAMPLE POINT: R. O. UNIT
DATE SAMPLED: 5/8/89 TIME SAMPLED: 14:00

PH @ 25C	6.0	
A READING	---	ML N/30 H2SO4 (--- MG/L CaCO3)
M.O. READING	0.4	ML N/30 H2SO4 (6. MG/L CaCO3)
CONDUCTIVITY	16.4	UN-NEUTRALIZED, umhos/cm
SUSPENDED SOLIDS	EST <5	MG/L

	-MG/L-
HYDROXIDE (OH)	---
CARBONATE (CO3)	---
BICARBONATE (HCO3)	8
SILICA (SiO2)	1.1
CHLORIDE (Cl)	1
SULFATE (SO4)	<5
ORTHO PHOSPHATE(PO4)	<0.05
POLYPHOSPHATE(PO4)	<0.1
NITRATE (NO3/NO2)	<0.5
TOTAL ORGANIC CARBON	2

	TOTAL (MG/L)	DISSOLVED (MG/L)
CALCIUM (Ca)	0.3	0.2
MAGNESIUM (Mg)	<0.1	<0.1
SODIUM (Na)	2.8	2.6
POTASSIUM (K)	<0.5	<0.5
IRON (Fe)	0.1	<0.05
COPPER (Cu)	<0.05	<0.05
MANGANESE (Mn)	<0.05	<0.05
ALUMINUM (Al)	<0.1	<0.1
ZINC (Zn)	<0.05	<0.05
NICKEL (Ni)	<0.05	<0.05
CHROMIUM (CrO4)	<0.05	<0.05

CALGON ANALYTICAL LABORATORIES, APPROVED BY: RJF
REPORTED: 05/26/89 RECEIVED: 05/15/89

SECTION VII

BRINE POND

SECTION VII
BRINE POND

The south brine pond is located in the SE/4 of the SW/4 of Sec. 1 of T-20-S; R-36-E, in Lea County, New Mexico on property owned by Warren Petroleum Company, a division of Chevron U.S.A. Inc. The pond measures 216' x 216' across the top and has a maximum useable depth of 14'-7". The water capacity of this pond is 45,500 bbls. The pond will be used primarily for brine storage and for handling excess water from the plant to Rice Engineering. Any overflow held in the brine pond is pumped to the Rice Engineering injection well.

Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

August 16, 1982

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P. O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Re: BRINE STORAGE POND AT THE MONUMENT PLANT

Dear Mr. Simpson,

This letter is to inform you that Warren Petroleum Company intends to comply with Rule 703 of the Rules and Regulations of the New Mexico Oil Conservation Division and Section 3-104 of the Water Quality Control Commission Regulations. Thus, as per your letter dated August 6, 1982, plans and specifications for re-lining the brine pit are enclosed.

If you have any questions, comments, or recommendations, feel free to call me at (505) 393-2823.

Sincerely,

G. W. FINCH

GWF/jr

cc: R. H. Brotherton
J. E. Moody

The following is a proposed Scope of Work for the upgrade of the brine pit at the Warren Petroleum Company, Monument Plant. Storage will be rpovided for approximately 2,000,000 Gal. of 10 lb. brine. Please refer to the attached drawings when reviewing this Scope of Work.

SCOPE OF WORK

1. LOCATION
   A. The brine pit is not near any water course, lake-beds, sink-holes, or other depressions, thus the existing pit will be upgraded.

2. DESIGN AND CONSTRUCTION
   A. The pit is approximately 245' X 245' X 7'. The levees are over 4' above ground level. The upper pit liner will be approximately 6' below the ground level.
   B. The levees will be compacted with caliche to make the surface smooth and uniform.
   C. The top of the levees will be flat and level and at least 10' wide. A 4" thick caliche pad will be constructed over the top of the levee and around the entire perimeter of the pit.
   D. The pit will be double lined and in the following sequence: liner, leakage detection system, liner. The bottom liner will extend a minimum of 3' up the side of the levees.
   E. The existing liner will be repaired and used for the bottom liner. The top liner will be fiberglass 75 mil average thickness. Both liners are resistant to hydrocarbons, salt and aqueous acids and alkalis. They are also sun, rot, and fungus resistant.
   F. The bed of the pit and the inside grades of the levee will be smooth and compacted, and free of holes, rocks, stumps, clods, or any other debris which might rupture the liner.
   G. A trench will be dug on the top of the levee the entire perimeter of the pit for the purpose of anchoring the top liner. This trench will be located a minimum of 18" from the slope break and will be a minimum of 18" deep.

3. LEAKAGE DETECTION SYSTEM
   A. The leakage detection system will be built on top of the first liner and will be inspected and approved by the Oil Conservation Commission prior to installation of the final liner. The 4"

3. LEAK DETECTION SYSTEM (Cont'd)

perforated pipe will be 40' on center, so that no point is more than 20' from a drainage canal.

B. The leakage detection system will consist of perforated pipe sloped 1':100' (minimum) connected into a common header located at the outer perimeter of the pit. The header will connect into steel sump located on the outside perimeter of the levees. The perforated pipe will be 4" PVC and the insdie dimensions of the sump are 3' diameter X 18' tall. The header will be 6" PVC pipe.

4. INSTALLATION OF FLEXIBLE MEMBRANE LINERS

A. The liner will be put in place only after the pit-bed leakage detection system, and levee walls have been inspected and approved by an Oil Conservation Commission Representative.

B. The pit liner shall be installed and joints sealed according to the manufacturer's specifications and with the approval of the Oil Conservation Commission Representative.

C. The liner shall be laid as evenly and wrinkle-free as possible and shall rest smoothly on the pit-bed and the inner face of the levees, and shall be of sufficient size to extend down to the bottom of the anchor trench.

D. The fiberglass top liner will anchor past the asphalt liner.

5. FENCES AND SIGNS

A. The existing fence will be repaired where necessary.

B. A sign not less than 12" X 24" with lettering of not less than two inches shall be posted in a conspicuous place on the fence surrounding the brine pit installation. The sign will be maintained in legible condition and will identify the operator (WARREN PETROLEUM CO.) of the brine pit, the location of the system by quarter-quarter section, township and range, and the permit number of the permit authorizing the installation.

W ARREN PETROLEUM COMPANY

MANUFACTURING — ENGINEERING

TI IA, OKLAHOMA

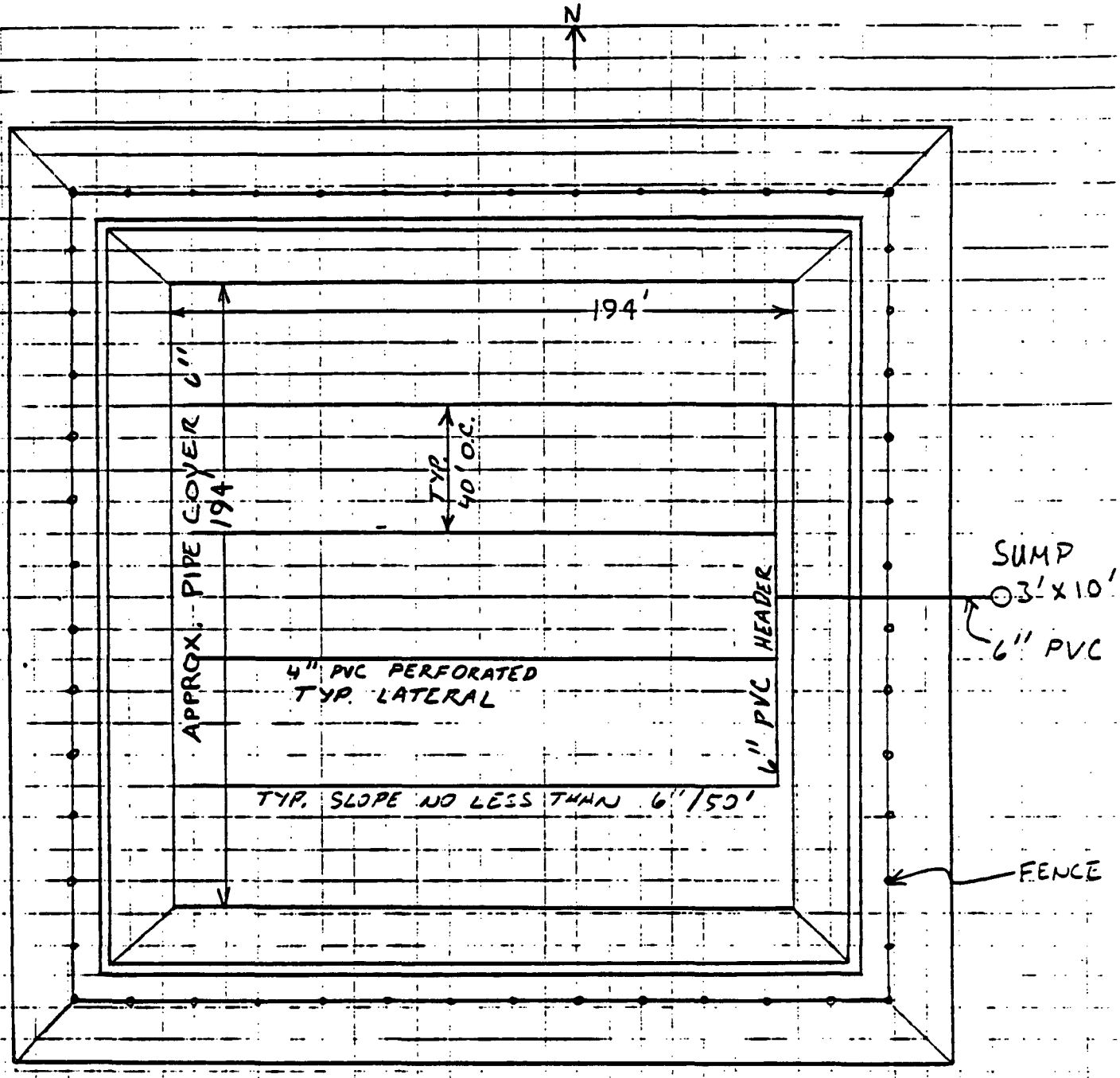
JOB NO. _____

AFE _____

BY _____ CHECK _____

DA Aug. 13 ,19 92

JOB: TOP VIEW OF BRINE PIT



.RREN PETROLEUM COMPANY

ANUFACTURING — ENGINEERING

A, OKLAHOMA

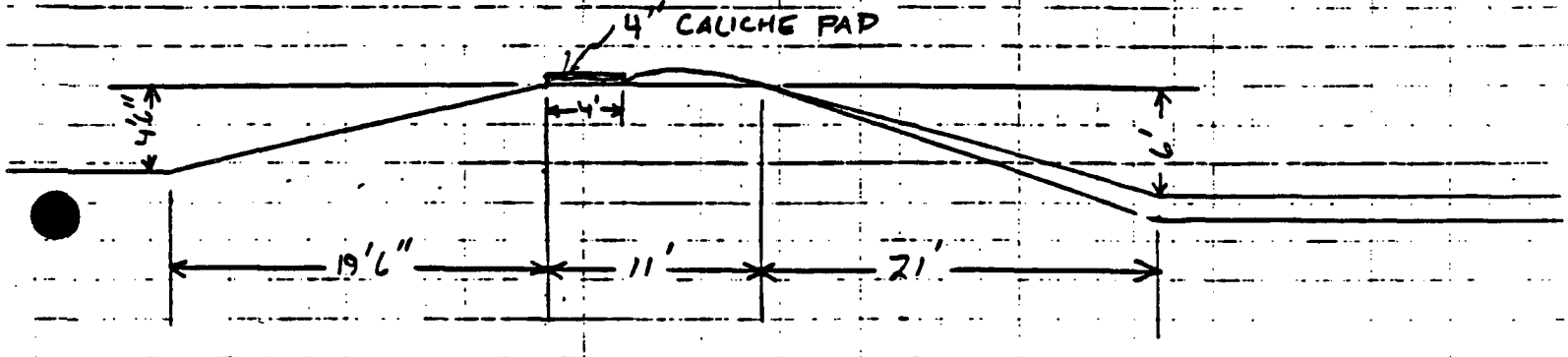
JOB NO. _____

AFE _____

BY AMF CHECK _____

AT 1... 17 ,19 82

JOB: END VIEW OF LEVEE



Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

November 11, 1982

State of New Mexico
Energy and Minerals Department
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

ATTENTION: Mr. Oscar Simpson

Re: Brine Storage Pond at the Monument Plant

Dear Mr. Simpson,

Attached are the revised plans and specifications for the construction of a new brine pond at the Warren Petroleum Company, Monument Plant. Specifications for the fiberglass and PVC liners and the Soil support media are also enclosed.

If you have any questions, comments, or recommendations please contact me.

Sincerely,

George W. Finch

GWF/jr
Attachments
cc: J. E. Moody, Tulsa

"SCOPE OF WORK"

1. LOCATION

   A. The Brine Pit is not near any water course, lake-beds, sink holes, or other depressions, thus the existing pit will be upgraded.

2. DESIGN AND CONSTRUCTION

   A. The existing pit is 255' X 255' X 8'. The levees are 4' 6" above ground level. The pit will be drained by pumping all the brine water to Rice Engineering Company, rinsed with fresh water and again drained by pumping the water to Rice Engineering Company. The liner will then be removed and disposed of in an environmentally acceptable manner.

   B. The pond will be excavated to 9'6" below ground level as depicted in the drawings. The levees will be upgraded and 95% compacted with the excavated material to make the surface smooth and uniform. The existing slopes (1:3 inside and outside) of the levees will be retained. The top of the liners will be 95% compacted with crushed caliche after the liners have been installed.

   C. The pit will be double lined and in the following sequence, 36 mil PVC liner, leakage detection system, 4" sand pad, and 75 mil fiber-glass liner. All liners will be anchored in a suitable anchor ditch to be described later. A Mirafi 140N soil support will be used to prevent sand from filtering into the leak system ditches.

3. LEAKAGE DETECTION SYSTEM

   A. The leakage detection system will consist of 4" SCH 40 PVC pipe located in a gravel filled ditch sloping 1':100' (minimum) connected to 6" SCH.40 PVC pipe located in the center of the pit sloping 1':100' (Minimum) to a sump outside of the pit.

   B. The 4" SCH.40 PVC pipe will be perforated with 5/8" O.D. holes 5" on center at a 120° angle. The pipe will be set in the bottom of the ditch so that the holes are facing downward. The ditch will then be backfilled with ½"-1" washed gravel.

C. The 6" SCH.40 PVC pipe will not be perforated. The ditch for the 6" Sch. 40 PVC pipe will be backfilled with the excavated material. Both the 4" and 6" SCH.40 PVC pipe will be joined with solvent welded couplings.

D. The 6" SCH.40 PVC pipe will connect to a steel sump located outside of the pit. The sump will consist of 36" O.D. ERW pipe (.250"W) with a ¼" steel cap welded on the bottom. A 6" steel nipple will be welded to the side for connection to the 6" SCH.40 PVC pipe. A 6" changeover coupling will be used to join the PVC and steel pipe. The watertight cover will be constructed of ¼" steel plate. The entire outside surface of the sump will be coated with pipe dope to prevent corrision.

E. After the leakage detection system is constructed, a 4" sand pad will be spread over the bottom of the pit. A Mirafi 140N soil support will be placed between the gravel and sand to prevent sand from filtering into the ditches. The support will extend a minimum of 2' from the edge of the ditch.

4. POND LINERS

A. An EPA approved 36 mil minimum thickness PVC liner will be used for the bottom liner. This liner is not oil or sun resistant but will not be exposed to either medium.

B. An EPA approved 75 mil thickness fiberglass top liner will be used. This liner is sun and oil resistant.

C. The joints of both liners will be sealed according to the attached drawings.

D. The liners will be laid as evenly and wrinkle-free as possible and shall rest smoothly on the pit-bed and the inner face of the levees,

E. Both liners will anchor into the anchor ditch. The anchor ditch will be 2' from inside edge of the pit and will be 18" deep X 9" wide. The liners will extend to the bottom of the anchor ditch and 6" beyond. The ditch will be backfilled with excavated material.

MIRAFI TYPICAL PROPERTY VALUES*

PROPERTY	UNIT	TEST METHOD	140N
WEIGHT	oz/sy	ASTM D-3776-79	4.5
THICKNESS	mils	ASTM D-1777-64	60
GRAB STRENGTH	lb	ASTM D-1682-64	120
GRAB ELONGATION	%	ASTM D-1682-64	55
MODULUS (10% ELONGATION)	lb	ASTM D-1682-64	N/A
TRAPEZIOD TEAR STRENGTH	lb	ASTM D-1117-80	50
MULLEN BRUST STRENGTH	psi	ASTM D-3786-80[1]	210
PUNCTURE STRENGTH	lb	ASTM D-3787-80[2]	70
ABRASION RESISTANCE	lb	ASTM D-3884-80[3] & D-1682-64	N/A
COEF. OF PERMEABILITY,k	cm/sec	CFMC-GET-2	0.2
WATER FLOW RATE	gal/min/sf	CFMC-GET-2	225
AIR FLOW RATE	cf/min/sf	ASTM D-737	225
EQUIVALENT OPENING SIZE(EOS)	US Std. Sieve	COE CW 02215-77	100+
OPEN AREA	%	COE Method	N/A
RETENTION EFFICIENCY (Suspended Solids)	%	Virginia DOT VTM-51	N/A
SLURRY FLOW RATE	gal/min/sf	Virginia DOT VTM-51	N/A
GRADIENT RATIO	---	COE CW 02215-77	3
ULTRAVIOLET RADIATION STABILITY	%	ASTM G-26/ D-1682-64 [4]	0
ASPHALT RETENTION	oz/sf	Texas DOT Item 3099	N/A
SHRINKAGE FROM ASPHALT	%	Texas DOT Item 3099	N/A

[1] Diaphragm Bursting Tester

[2] Tension Testing Machine with ring clamp; steel ball replaced with a 5/16" diameter solid steel cylinder(with hemispherical tip) centered within the ring clamp.

[3] ASTM D-1682 as above after abrasion as required by ASTM D-3884 Rotary Platform, Double Head Method; rubber-base abrasive wheels equal to CS-17 "Calibrase" by Taber Instrument Co.;1kg load per wheel; 1,000 revolutions.

[4] ASTM D-1682 as above after 250 cycles in Xenon-arc weathermeter (Type BH or Type C apparatus as described in ASTM G-26). One cycle consists of 102 minutes of light only followed by 18 minutes of light with water spray.

* The product specifications are average values. For minimum certified values contact your local Mirafi representative or the Mirafi Technical Department at 1-800-438-1855.

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TYPICAL LAMINATE PHYSICAL PROPERTIES

"KEM-LINE" FRP LINING

PROPERTY	UNITS	VALUE
Tensile Strength	PSI	21,000
Tensile Modulus	PSI X 10^5	17
Elongation	%	5
Flexural Strength	PSI	28,000
Flexural Modulus	PSI X 10^5	10
Heat Distortion Temperature	^oF	210^o
Barcol Hardness	-	35
Normal Temperature Range	^oF	$-20^o/220^o$

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"FIBRE-LINE" FRP pond liners are fabricated with a low viscosity resilient Isophthalic Polyester resin containing Styrene Monomer. Kote-Flex resin is thixotropic and promoted for pond liner sheets where toughness, chemical resistance and flexability are required.

STANDARDS FOR SANITARY LANDFILL LINERS

(a) Permeability - The "FRP" liner is suitable for use as an impermeable barrier with a value of permeability of 1×10^{-7} cm/sec. or less.

Note: The Polyester resins are used for the manufacture of fiberglass tanks and lining of steel tanks and vessels.

(b) Resistance to Leachate - The manufacturers warranty states that the membrane is capable of preventing leachate from reaching the soil under the membrane.

(c) TYPICAL LAMINATE PHYSICAL PROPERTIES OF "FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Specific Gravity (Resin)	-	1.1
Factory & Field Seam Strength	-	Exceeds that of parent material
Thickness	Mil - Minimum Mil - Average	65 75
Glass Content	%	31
Tensile Strength ASTM - D-638	PSI	14,800
Compressive Strength ASTM - D-695	PSI	25,000
Flexural Strength ASTM - D-790	PSI	25,000
Flexural Modulus	PSI $\times 10^6$	1.0

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(c) Con't) TYPICAL LAMINATE PHYSICAL PROPERTIES OF

"FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Izod Impact ASTM - D-256	(Ft.-lbs./in). Notched Unnotched	 13.7 16.6
Barcol Harness ASTM - D-785	-	45-50
Water Absorption	24 hr.,25°C,%	.17
Elongation ASTM - D-638	%	4.0
Normal Temperature Usage Range	°F	-20°/180°
Heat Distortion Point	°C/°F	88°/192°
Ultraviolet Effects With Aging By Weathermeter G-23 ASTM - D-1435	Outdoor Exposure 1 Year	Yellowing & Caulking
Oxygenated Solvents	"FIBRE-LINE" "KEM-LINE"	Poor Good
Aromatic Solvents (100% Level)	"FIBRE-LINE" "KEM-LINE"	Poor Good
Aromatic Solvents (50% or less)	"FIBRE-LINE"	Good
Halogenate Solvents	"FIBRE-LINE" "KEM-LINE"	Poor Good
Petroleum Solvents	"FIBRE-LINE" "KEM-LINE"	Good Good
Methane Gas	"FIBRE-LINE" "KEM-LINE"	Good Good
Note: Used in Waste and Sewage plants.		
General	"FIBRE-LINE" Acids (except for concentrate H_2SO_4 and HNO_3) "KEM-LINE	Good Good

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(c) Con't TYPICAL LAMINATE PHYSICAL PROPERTIES OF

"FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Burial	"FIBRE-LINE"	Good
	"KEM-LINE	Good

Note: Many uses. Buried Gas Tanks, Fiberglass pipe, Fiberglass Vessels.

I certify the above information to be true and correct to the best of my knowledge.

Witness

Hal K. Jarrell, President

POLYCOR POLYESTER RESINS

939-I-032

939-I-032 is a low viscosity, resilient isophthalic polyester resin containing styrene monomer. This resin is thixotropic and promoted for filament winding and pit liners where toughness, chemical resistance, and flexibility is required.

TYPICAL PROPERTIES OF LIQUID RESIN

Brookfield Viscosity, 25°C., cps. #3 Spindle @ 60 rpm	300-500
Thixotropic Index, Minimum	2
Color	Clear
Stability, uncatalyzed in dark @ 25°C., Minimum, Months	3

TYPICAL CURING PROPERTIES 25°C., 1% MEKP into 100 Gram Mass

Gel Time, Minutes	10
Total Time to Peak, Minutes	17
Peak Exotherm, °C.	177

PROPERTIES OF 1/8" UNFILLED CASTING

Flexural Strength, psi.	16,000
Flexural Modulus, psi.	$.41 \times 10^6$
Tensile Strength, psi.	9,500
Barcol Hardness	40-45
Heat Distortion Temp. °C.	88
Water Absorption, 24 hrs., 25°C., %	.2
Elongation, %	3.6

PROPERTIES OF 1/8" LAMINATE (3 Plies 1½ oz. Mat 30% glass)

Flexural Strength, psi.	24,800
Flexural Modulus, psi.	$.95 \times 10^6$
Tensile Strength, psi.	13,000
Izod Impact, Unnotched	16.6
Barcol Hardness	45-50
Water Absorption 24 hrs., 25°C., %	.17
Elongation, %	4.0

Results obained with this data cannot be guaranteed and final determination of the suitability of any information or material for the use contemplated or the manner of use is the sole responsibility of the user.

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STANDARD SPECIFICATIONS

POLYVINYL CHLORIDE PLASTIC LININGS

I. GENERAL REQUIREMENTS

The work covered by these specifications consists of installing polyvinyl chloride (PVC) plastic linings in the water containment structures.

II. PVC MATERIALS

A. General. The materials supplied under these specifications shall be first quality products designed and manufactured specifically for the purpose of this work, and which have been satisfactorily demonstrated by prior use to be suitable and durable for such purposes.

B. Description of PVC Materials. PVC (polyvinyl chloride) plastic lining shall consist of widths of calendered PVC sheeting fabricated into large sections by means of solvent-bonded factory seams into a single piece, or into the minimum number of large pieces required to fit the facility.

1. Physical Characteristics. The PVC materials shall have the physical characteristics.

PROPERTY	SPECIFICATION LIMIT	TEST METHOD
Thickness	Specified ± 10%	
Specific Gravity	1.24 - 1.30	
Tensile Strength, psi, min.	2200	ASTM D882-B
Elongation, % min.	300%	ASTM D882-B
100% Modulus, psi	1000 - 1600	ASTM D882-B
Elmendorfer Tear, gms/mil, min.	160	ASTM 689
Graves Tear, lbs/in. min.	270	ASTM D1004
Water extraction, % max.	0.35	ASTM D1239
Volatility, % max.	0.7	ASTM D1203
Impact Cold Cract, °F	-20	ASTM 1790
Dimensional Stability, max. % (100°C-15 minutes)	5	
Outdoor Exposure, sun hours	1500	
Solvent Bonded Seam Strength, % of Tensile, min.	80%	
Resistance to Burial		Formulation shall have passed USBR Test (specially formulated for resistance to micro-biological attack)
Alkali Resistances		Passes Corps. of Eng. CRD-572-61

Color - Gray (Std.)
Factory Seals - 3/4" solvent bonded

2. PVC Polyvinyl Chloride Materials shall be manufactured from domestic virgin polyvinyl chloride resin and specifically compounded for use in hydraulic facilities. Reprocessed material shall not be used.

III. FACTORY FABRICATION

Individual widths of PVC materials shall be fabricated into large sections by solvent bonding into a single piece, or into the minimum number of pieces, up to 100 feet wide, as required to fit the facility. Lap joints with a minimum joint width of 3/4 inch shall be used. After fabrication, the lining shall be accordion folded in both directions and packaged for minimum handling in the field.

IV. PLACING OF PVC LINING

A. General. The PVC lining shall be placed over the prepared surfaces to be lined in such a manner as to assure minimum handling. It shall be sealed to all concrete structures and other openings through the lining in accordance with details shown on drawings. The lining shall be closely fitted and sealed around inlets, outlets, and other projections through the lining. Any portion of lining damaged during installation by any cause shall be removed or repaired by using an additional piece of lining as specified hereinafter.

1. Field Joints. Lap joints of the same kind as used in the factory shall be used to seal factory-fabricated pieces of PVC together in the field. Lap joints shall be formed by lapping the edges of pieces a minimum of two inches. The contact surfaces of the pieces shall be wiped clean to remove all dirt, dust, moisture, or other foreign materials. Sufficient vinyl-to-vinyl bonding solvent shall be applied to both contact surfaces in the joint area and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out.

2. Joints to Structures. All curing compounds and coatings shall be completely removed from the joint area. Joining of PVC to concrete shall be made with vinyl-to-concrete adhesive. The minimum width of concrete shelf provided for the cemented joint shall be eight inches, and batten strips shall be used to reinforce the adhesive bond.

3. Repairs to PVC. Any necessary repairs to the PVC shall be patched with the lining material itself and vinyl-to-vinyl bonding solvent.

4. Quality of Workmanship. All joints, on completion of the work, shall be tightly bonded. Any lining surface showing injury due to scuffing, penetration by foreign objects, or distress from rough subgrade shall be replaced or covered and sealed with an additional layer of PVC of the proper size.

Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

MARCH 30, 1983

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPT.
P. O. BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

Attention: Mr. Oscar Simpson

Ref: Brine Pond at the Monument Plant #118

Dear Mr. Simpson,

Please find enclosed the revised plans and Scope of Work for the proposed modifications to the brine pond at the Warren Petroleum Company, Monument Plant. Also enclosed are liner samples and specifications. The sieve analysis of gravel and sand will be forwarded at a later date.

If you have any questions, please advise.

G. W. Finch

GWF/jr
Attachments
cc: J. E. Moody - Tulsa ✓

Gulf

"SCOPE OF WORK"

1. LOCATION

   A. The Brine Pit is not near any water course, lake beds, sink holes, or other depressions, thus the existing pit will be upgraded.

2. DESIGN AND CONSTRUCTION

   A. The existing pit is 225' X 225' X 8'. The levees are 4'6" above ground level. The pit will be drained by pumping all the brine water to Rice Engineering Company, rinsed with fresh water and again drained by pumping the water to Rice Engineering Company. The liner will then be removed and disposed of by burying near the site of the brine pit. If large amounts of salt and debris exist they will be disposed of in an approved sanitary landfill.

   B. The pond will be excavated to 9'6" below ground level as depicted in the drawings. The levees will be graded and 95% compacted with the excavated material to make the surface smooth and uniform. The existing slopes (1:3 inside and outside) of the levees will be retained. The top of the liners will be 95% compacted with crushed caliche after the liners have been installed.

   C. The pit will be double lined and in the following sequence, 36 mil PVC liner, leakage detection system, 4" (min.) sand pad, and 75 mil fiberglass liner. All liners will be anchored in a suitable anchor ditch to be described later. A Mirafi 140N soil support will be used to prevent sand from filtering into the leak system ditch.

3. LEAKAGE DETECTION SYSTEM

   A. The leakage detection system will consist of 6" SCH 40 PVC pipe located in a gravel filled ditch sloping 1':100' (minimum). The ditch will be located down the center of the pit and will drain into a sump outside of the pit.

   B. The 6" SCH 40 PVC pipe will be preforated with 5/8" O.D. holes 5" on center at a 120° angle. The pipe will be set in the bottom

of the ditch so that the holes are facing downward. The ditch will then be backfilled with ½" - 1" washed gravel.

C. The 6" SCH 40 PVC pipe will connect to a steel sump located outside of the pit. The sump will consist of 36" OD ERW pipe (.250"W) with a ¼" steel cap welded on the bottom. A 6" steel nipple will be welded to the side for connection to the 6" SCH 40 PVC pipe. A 6" changeover coupling will be used to join the PVC and steel pipe. The watertight cover will be constructed of ¼" steel plate. The entire outside surface of the sump will be coated with pipe dope to prevent corrision.

D. After the leakage detection system is constructed, one 4" sand pad will be spread over the bottom of the pit. A Mirafi 140N soil support will be placed between the gravel and sand to prevent sand from filtering into the ditches. The support will extend up the sides of the pond and anchor into the ditch.

4. POND LINERS

A. An EPA approved 36 mil minimum thickness PVC liner will be used for the bottom liner. This liner is not oil or sun resistant but will not be exposed to either medium.

B. An EPA approved 75 mil thickness fibergalss top liner will be used. This liner is sun and oil resistant.

C. The joints of both liners will be sealed according to the attached drawings.

D. The liners will be laid as evenly and wrinkle-free as possible and shall rest smoothly on the pit-bed and the inner face of the levees.

E. Both liners will anchor into the anchor ditch. The anchor ditch will be 2' from inside edge of the pit and will be 18" deep X 9" wide. The liners will extend to the bottom of the anchor ditch and 6" beyond. The ditch will be backfilled with excavated material.

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TYPICAL LAMINATE PHYSICAL PROPERTIES

"KEM-LINE" FRP LINING

PROPERTY	UNITS	VALUE
Tensile Strength	PSI	21,000
Tensile Modulus	PSI X 10^5	17
Elongation	%	5
Flexural Strength	PSI	28,000
Flexural Modulus	PSI X 10^5	10
Heat Distortion Temperature	^oF	210^o
Barcol Hardness	-	35
Normal Temperature Range	^oF	$-20^o/220^o$

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"FIBRE-LINE" FRP pond liners are fabricated with a low viscosity resilient Isophthalic Polyester resin containing Styrene Monomer. Kote-Flex resin is thixotropic and promoted for pond liner sheets where toughness, chemical resistance and flexability are required.

STANDARDS FOR SANITARY LANDFILL LINERS

(a) Permeability - The "FRP" liner is suitable for use as an impermeable barrier with a value of permeability of 1×10^{-7} cm/sec. or less.

Note: The Polyester resins are used for the manufacture of fiberglass tanks and lining of steel tanks and vessels.

(b) Resistance to Leachate - The manufacturers warranty states that the membrane is capable of preventing leachate from reaching the soil under the membrane.

(c) TYPICAL LAMINATE PHYSICAL PROPERTIES OF "FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Specific Gravity (Resin)	-	1.1
Factory & Field Seam Strength	-	Exceeds that of parent material
Thickness	Mil - Minimum Mil - Average	65 75
Glass Content	%	31
Tensile Strength ASTM - D-638	PSI	14,800
Compressive Strength ASTM - D-695	PSI	25,000
Flexural Strength ASTM - D-790	PSI	25,000
Flexural Modulus	PSI X 10^6	1.0

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(c) Con't) TYPICAL LAMINATE PHYSICAL PROPERTIES OF

"FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Izod Impact ASTM - D-256	(Ft.-lbs./in). Notched Unnotched	 13.7 16.6
Barcol Harness ASTM - D-785	-	45-50
Water Absorption	24 hr.,25°C,%	.17
Elongation ASTM - D-638	%	4.0
Normal Temperature Usage Range	°F	-20°/180°
Heat Distortion Point	°C/°F	88°/192°
Ultraviolet Effects With Aging By Weathermeter G-23 ASTM - D-1435	Outdoor Exposure 1 Year	Yellowing & Caulking
Oxygenated Solvents	"FIBRE-LINE" "KEM-LINE"	Poor Good
Aromatic Solvents (100% Level)	"FIBRE-LINE" "KEM-LINE"	Poor Good
Aromatic Solvents (50% or less)	"FIBRE-LINE"	Good
Halogenate Solvents	"FIBRE-LINE" "KEM-LINE"	Poor Good
Petroleum Solvents	"FIBRE-LINE" "KEM-LINE"	Good Good
Methane Gas	"FIBRE-LINE" "KEM-LINE"	Good Good
Note: Used in Waste and Sewage plants.		
General	"FIBRE-LINE" Acids (except for concentrate H_2SO_4 and HNO_3) "KEM-LINE	Good Good

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(c) Con't TYPICAL LAMINATE PHYSICAL PROPERTIES OF

"FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Burial	"FIBRE-LINE"	Good
	"KEM-LINE	Good

Note: Many uses. Buried Gas Tanks, Fiberglass pipe, Fiberglass Vessels.

I certify the above information to be true and correct to the best of my knowledge.

Witness

Hal K. Jarrell President

POLYCOR POLYESTER RESINS

939-I-032

939-I-032 is a low viscosity, resilient isophthalic polyester resin containing styrene monomer. This resin is thixotropic and promoted for filament winding and pit liners where toughness, chemical resistance, and flexibility is required.

TYPICAL PROPERTIES OF LIQUID RESIN

Brookfield Viscosity, 25°C., cps. #3 Spindle @ 60 rpm	300-500
Thixotropic Index, Minimum	2
Color	Clear
Stability, uncatalyzed in dark @ 25°C., Minimum, Months	3

TYPICAL CURING PROPERTIES 25°C., 1% MEKP into 100 Gram Mass

Gel Time, Minutes	10
Total Time to Peak, Minutes	17
Peak Exotherm, °C.	177

PROPERTIES OF 1/8" UNFILLED CASTING

Flexural Strength, psi.	16,000
Flexural Modulus, psi.	$.41 \times 10^6$
Tensile Strength, psi.	9,500
Barcol Hardness	40-45
Heat Distortion Temp. °C.	88
Water Absorption, 24 hrs., 25°C.,%	.2
Elongation, %	3.6

PROPERTIES OF 1/8" LAMINATE (3 Plies 1½ oz. Mat 30% glass)

Flexural Strength, psi.	24,800
Flexural Modulus, psi.	$.95 \times 10^6$
Tensile Strength, psi.	13,000
Izod Impact, Unnotched	16.6
Barcol Hardness	45-50
Water Absorption 24 hrs., 25°C.,%	.17
Elongation, %	4.0

Results obained with this data cannot be guaranteed and final determination of the suitability of any information or material for the use contemplated or the manner of use is the sole responsibility of the user.

MIRAFI TYPICAL PROPERTY VALUES*

PROPERTY	UNIT	TEST METHOD	140N
WEIGHT	oz/sy	ASTM D-3776-79	4.5
THICKNESS	mils	ASTM D-1777-64	60
GRAB STRENGTH	lb	ASTM D-1682-64	120
GRAB ELONGATION	%	ASTM D-1682-64	55
MODULUS (10% ELONGATION)	lb	ASTM D-1682-64	N/A
TRAPEZIOD TEAR STRENGTH	lb	ASTM D-1117-80	50
MULLEN BRUST STRENGTH	psi	ASTM D-3786-80[1]	210
PUNCTURE STRENGTH	lb	ASTM D-3787-80[2]	70
ABRASION RESISTANCE	lb	ASTM D-3884-80[3] & D-1682-64	N/A
COEF. OF PERMEABILITY,k	cm/sec	CFMC-GET-2	0.2
WATER FLOW RATE	gal/min/sf	CFMC-GET-2	225
AIR FLOW RATE	cf/min/sf	ASTM D-737	225
EQUIVALENT OPENING SIZE(EOS)	US Std. Sieve	COE CW 02215-77	100+
OPEN AREA	%	COE Method	N/A
RETENTION EFFICIENCY (Suspended Solids)	%	Virginia DOT VTM-51	N/A
SLURRY FLOW RATE	gal/min/sf	Virginia DOT VTM-51	N/A
GRADIENT RATIO	---	COE CW 02215-77	3
ULTRAVIOLET RADIATION STABILITY	%	ASTM G-26/ D-1682-64 [4]	0
ASPHALT RETENTION	oz/sf	Texas DOT Item 3099	N/A
SHRINKAGE FROM ASPHALT	%	Texas DOT Item 3099	N/A

[1] Diaphragm Bursting Tester

[2] Tension Testing Machine with ring clamp; steel ball replaced with a 5/16" diameter solid steel cylinder(with hemispheric tip) centered within the ring clamp.

[3] ASTM D-1682 as above after abrasion as required by ASTM D-3884 Rotary Platform, Double Head Method; rubber-base abrasive wheels equal to CS-17 "Calibrase" by Taber Instrument Co.;1kg load per wheel; 1,000 revolutions.

[4] ASTM D-1682 as above after 250 cycles in Xenon-arc weathermeter (Type BH or Type C apparatus as described in ASTM G-26). One cycle consists of 102 minutes of light only followed by 18 minutes of light with water spray.

* The product specifications are average values. For minimum certified values contact your local Mirafi representative or the Mirafi Technical Department at 1-800-438-1855.

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STANDARD SPECIFICATIONS

POLYVINYL CHLORIDE PLASTIC LININGS

I. GENERAL REQUIREMENTS

The work covered by these specifications consists of installing polyvinyl chloride (PVC) plastic linings in the water containment structures.

II. PVC MATERIALS

A. General. The materials supplied under these specifications shall be first quality products designed and manufactured specifically for the purpose of this work, and which have been satisfactorily demonstrated by prior use to be suitable and durable for such purposes.

B. Description of PVC Materials. PVC (polyvinyl chloride) plastic lining shall consist of widths of calendered PVC sheeting fabricated into large sections by means of solvent-bonded factory seams into a single piece, or into the minimum number of large pieces required to fit the facility.

1. Physical Characteristics. The PVC materials shall have the physical characteristics.

PROPERTY	SPECIFICATION LIMIT	TEST METHOD
Thickness	Specified + 10%	
Specific Gravity	1.24 - 1.30	
Tensile Strength, psi, min.	2200	ASTM D882-B
Elongation, % min.	300%	ASTM D882-B
100% Modulus, psi	1000 - 1600	ASTM D882-B
Elmendorfer Tear, gms/mil, min.	160	ASTM 689
Graves Tear, lbs/in. min.	270	ASTM D1004
Water extraction, % max.	0.35	ASTM D1239
Volatility, % max.	0.7	ASTM D1203
Impact Cold Cract, ^{o}F	-20	ASTM 1790
Dimensional Stability, max. % ($100^{o}C$-15 minutes)	5	
Outdoor Exposure, sun hours	1500	
Solvent Bonded Seam Strength, % of Tensile, min.	80%	
Resistance to Burial		Formulation shall have passe USBR Test (specially formula for resistance to micro-biological attack)
Alkali Resistances		Passes Corps. of Eng. CRD-572-61

Color - Gray (Std.)
Factory Seals - 3/4" solvent bonded

2. PVC Polyvinyl Chloride Materials shall be manufactured from domestic virgin polyvinyl chloride resin and specifically compounded for use in hydraulic facilities. Reprocessed material shall not be used.

III. FACTORY FABRICATION

Individual widths of PVC materials shall be fabricated into large sections by solvent bonding into a single piece, or into the minimum number of pieces, up to 100 feet wide, as required to fit the facility. Lap joints with a minimum joint width of 3/4 inch shall be used. After fabrication, the lining shall be accordion folded in both directions and packaged for minimum handling in the field.

IV. PLACING OF PVC LINING

A. General. The PVC lining shall be placed over the prepared surfaces to be lined in such a manner as to assure minimum handling. It shall be sealed to all concrete structures and other openings through the lining in accordance with details shown on drawings. The lining shall be closely fitted and sealed around inlets, outlets, and other projections through the lining. Any portion of lining damaged during installation by any cause shall be removed or repaired by using an additional piece of lining as specified hereinafter.

1. Field Joints. Lap joints of the same kind as used in the factory shall be used to seal factory-fabricated pieces of PVC together in the field. Lap joints shall be formed by lapping the edges of pieces a minimum of two inches. The contact surfaces of the pieces shall be wiped clean to remove all dirt, dust, moisture, or other foreign materials. Sufficient vinyl-to-vinyl bonding solvent shall be applied to both contact surfaces in the joint area and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out.

2. Joints to Structures. All curing compounds and coatings shall be completely removed from the joint area. Joining of PVC to concrete shall be made with vinyl-to-concrete adhesive. The minimum width of concrete shelf provided for the cemented joint shall be eight inches, and batten strips shall be used to reinforce the adhesive bond.

3. Repairs to PVC. Any necessary repairs to the PVC shall be patched with the lining material itself and vinyl-to-vinyl bonding solvent.

4. Quality of Workmanship. All joints, on completion of the work, shall be tightly bonded. Any lining surface showing injury due to scuffing, penetrati by foreign objects, or distress from rough subgrade shall be replaced or covered and sealed with an additional layer of PVC of the proper size.

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

May 3rd, 1983

State Of New Mexico
Energy And Minerals Department
P.O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Dear Mr. Simpson:

Please find attached the sieve analysis for the sand and gravel to be used in the construction of a brine pond at the Monument Plant.

If you have any questions please advise.

Sincerely,

George W. Finch

G. W. Finch
Plant Manager,
Monument Plant #118

GWF/th

Attachment

cc: J. E. Moody - Tulsa

ENGINEERING SERVICES

Albuquerque Testing Laboratory, Inc.
532 Jefferson N.E. (87108)
P. O. Box 4101 (87106)
Albuquerque, New Mexico
(505) 268-4537

Caprock Sand and Gravel
P.O. Box 151
Hobbs, New Mexico 88240

ATL Lab No. 5426

Report Date: December 16, 19

Attention: Mr. Bill J. Woolley

TEST RESULTS

PROJECT: Plant Use

Source of Material: One (1) sample of sand and one (1) sample of aggregate submitted to our laboratory on December 10, 1981.

SIEVE ANALYSIS TEST: (ASTM C-117 & C-136 - Cumulative % Passing)

Sieve Size	Aggregate	ASTM C-33* Specifications	Sand	ASTM C-33 Specifications
1"	100	95-100		
3/4"	70			
1/2"	19*	25-60		
3/8"	3		100	100
No. 4	1	0-10	94*	95-100
No. 8	1	0-5	76	80-100
No. 16			63	50-85
No. 30			46	25-60
No. 50			20	10-30
No. 100			5	2-10
No. 200			2.5	
Material Finer than No. 200 Sieve by Washing			2.3	

SAND EQUIVALENT TEST: (ASTM C-2418)

		66.7	
		67.2	
		67.9	
	Average	67.4	75%, maximum

Respectfully Submitted,

ATL ENGINEERING SERVICES

*Size 57

Dale S. Decker

Dale S. Decker, P.E.

DSD/c

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

September 02, 1983

State of New Mexico
Energy and Minerals Department
P.O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

ATTENTION: Mr. Joe Ramey

Dear Sir:

The following are modifications to the construction of a brine pond at the Monument Plant No. 118, Lea County, New Mexico.

1. The bottom of the pond will slope 1'/100' to the center of the pit into a leak detection ditch also sloping 1'/100'. In the original proposal the bottom of the pond also sloped 1'/100' toward the outside of the pond.

2. The 6" PVC pipe will be perforated with 3/8" holes in lieu of 5/8".

3. The leak detection sump will be 18' long instead of 16'4", and the base will be set in concrete.

4. The Mirafi 140N material will cover only the leak detection ditch and will be 5' wide.

5. The 4" sand pad will extend up the sides.

6. The PVC liner will be 30 mil in lieu of 36 mil.

7. The anchor ditch will be 2'6" deep.

A drawing with these revisions will be forwarded to you as soon as it is available. I understand that these modifications have already been approved by you in a phone conversation on September 1 between you and John Fulgenzi.

If you have any questions, please contact John at 393-2823.

Sincerely,

B. R. Jerrell

BRT/vh

cc: J. E. Moody

SECTION VII
BRINE POND DESCRIPTION

Location

The brine pond is located in the SE/4 of the SW/4 of Sec. 1 of T-20-S; R-36-E in Lea County, New Mexico, on property owned by Warren Petroleum Company, a division of Chevron U.S.A. Inc.

The brine pond is not near any water course, lake beds, sink-holes, or other depressions.

Design

The storage pond measures 216' x 216' across the top, with a maximum useable depth of 14'-7". The levees surrounding the pond are over 4'-6" above grade elevation. The upper pit liner is approximately 10'-1" below grade elevation at maximum depth.

The levees are constructed of compacted caliche and a sand/gravel mixture, to make the surface smooth and uniform.

The top of the levee is relatively flat and level and approximately 10' wide.

The pit is double lined in the following sequence:

- 30 mil thickness polyvinyl chloride (PVC) liner, sand pad with leak detector, and 100 mil thickness polyethylene liner, as approved by the New Mexico Oil and Conservation Division.

- The bottom and top liners extend over the levee and are anchored in a ditch a minimum of 2' below the top of the levee.

- A minimum of 2" of sand/gravel mixture separates the top and bottom liners along the tops and sides of the pond. A minimum 6" sand pad separates the top and bottom liner at the bottom of the pond. The sand/gravel mixture is smooth and uniform throughout the pond, as described. Clumps, rocks, and debris were removed during construction.

- A 6' tall chain-link fence, topped with three strands of barbed wire, surrounds the perimeter of the levee. A 10' wide service road, constructed of medium size washed gravel, was built between the top of the liner and the fence. The fence has one drive-through and three walk-through gates, which are locked for security reasons. The key for these locks is in the Control Room at the plant, which is staffed 24-hours each day. A sign is located next to the east walk-in gate describing the storage pond, its relative location and phone numbers to contact in an emergency.

- A leak detection system exists, which consists of a network of 4" perforated PVC pipe on 40' centers. No point of the pond bottom is more than 20' from a drainage canal. The pipe is sloped 1' per 100' minimum and connected to a common drain header of 6" PVC pipe, which is located along the outer perimeter of the pond bottom. The header drains into a 3' diameter X 18' deep steel sump, located at the outer perimeter, on the east side of the storage pond. The sump is inspected periodically to determine if a leak in the top liner is indicated. The leak detection system was approved by the New Mexico Oil Conservation Division.

STANDARD SPECIFICATIONS
POLYVINYL CHLORIDE PLASTIC LININGS

I. General Requirements

The work covered by these specifications consists of installing polyvinyl chloride (PVC) plastic linings in the water containment structures.

II. PVC Materials

A. **General** The materials supplied under these specifications shall be first quality products, designed and manufactured specifically for the purpose of this work and which have been satisfactorily demonstrated by prior use to be suitable and durable for such purposes.

B. **Description of PVC Materials** PVC (Polyvinyl Chloride) plastic lining shall consist of widths of calendared PVC sheeting, fabricated into large sections by means of solvent-bonding factory seams into a single piece, or into the minimum number of large pieces required to fit the facility.

1. **Physical Characteristics** The PVC materials shall have the physical characteristics.

Property	Specification Limit	Test Method
Thickness	Specified ± 10%	
Specific Gravity	1.24 - 1.30	
Tensile Strengh, psi, min.	2200	ASTM D882-B
Elongation, % min.	300%	ASTM D882-B
100% Modulus, psi	1000 - 1600	ASTM D882-B
Elmendorfer Tear, gms/mil, min.	160	ASTM 689
Graves Tear, lbs/in. min.	270	ASTM D1004
Water extraction, % max.	0.35	ASTM D1239
Volatility, % max.	0.7	ASTM D1203
Dimensional Stability, max. % (100°C - 15 minutes)	5	
Outdoor Exposure, sun hours	1500	
Solvent Bonded Seam Strength, % of Tensile, min.	80%	
Impact Cold Cract, °F	-20	ASTM 1790

II. PVC Materials (Continued)

Property	Specification Limit	Test Method
Resistance to Burial		Formulation shall have passed USBR Test (specially formulated for resistance to microbiological attack)
Alkali Resistances		Passes Corprs of Engineers CRD-572-61
Color - Gray (Std.)		
Factory Seals - 3/4" solvent bonded		

2. PVC Polyvinyl Chloride Materials shall be manufactured from domestic virgin polyvinyl chloride resin and specifically compounded for use in hydraulic facilities. Reprocessed material shall not be used.

III. Factory Fabrication

Individual widths of PVC materials shall be fabricated into large sections by solvent bonding into a single piece, or into the minimum number of pieces, up to 100 feet wide, as required to fit the facility. Lap joints, with a minimum joint width of 3/4", shall be used. After fabrication, the lining shall be accordion folded in both directions and packaged for minimum handling in the field.

IV. Placing of PVC Lining

A. General The PVC lining shall be placed over the prepared surfaces to be lined in such a manner as to assure minimum handling. It shall be sealed to all concrete structures and other openings through the lining, in accordance with details shown on drawings. The lining shall be closely fitted and sealed around inlets, outlets, and other projections through the lining. Any portion of lining damaged during installation, by any cause, shall be removed or repaired by using an additional piece, as specified hereinafter.

1. Field Joints Lap joints, of the same kind as used in the factory, shall be used to seal factory-fabricated pieces of PVC together in the field. Lap joints shall be formed by lapping the edges of pieces a minimum of two inches. The contact surfaces of the pieces shall be wiped clean, to remove dirt, dust, moisture, or other foreign materials. Sufficient vinyl-to-vinyl bonding solvent shall be applied to both contact surfaces in the joint area and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out.

2. Joints to Structures All curing compounds and coatings shall be completely removed from the joint area. Joining of PVC to concrete shall be made with vinyl-to-concrete adhesive. The minimum width of concrete shelf provided for the cemented joint shall be eight inches, and batten strips shall be used to reinforce the adhesive bond.

3. Repairs to PVC Any necessary repairs to the PVC shall be patched with the lining material itself and vinyl-to-vinyl bonding solvent.

4. Quality of Workmanship All joints, on completion of the work, shall be tightly bonded. Any lining surface showing injury due to scuffing, penetration by foreign objects, or distress from rough subgrade, shall be replaced or covered and sealed with an additional layer of PVC of the proper size.

SCHLEGEL LINING TECHNOLOGY, INC.

PHYSICAL PROPERTIES OF SLT SHEET
TYPE "HDPE FORTIFLEX"

PROPERTY	TEST METHOD	VALUE	UNIT
Density[1] (Natural)	ASTM D-792	0.938±0.002	gm/cm^3
Melt Index [1]	ASTM D-1238 "E"	0.25±0.05	gm/10 min
Mositure Content[1]	Moisture Balance	≤0.1	%
Oxidative Induction Time[1/2]	ASTM D-3895 @200°C	100	Minutes
Thickness[2]	ASTM-D-1593	±10	%
Environmental Stress	ASTM-D1693 "C"	>5000	hours
Crack Resistance[2]	ASTM D-1693 "B"	>2000	hours
Dimensional Stability[2]	ASTM D-1204 120°C @ 1 Hr.	±2.0	%
Tensile Properties[2]			
(1) Yield Strength	ASTM D-638 Type IV	2800	lb/in^2
(2) Break Strength	ASTM D-638 Type IV	4000	lb/in^2
(3) Yield Elongation	ASTM D-638 Type IV	15	%
(4) Break Elongation	ASTM D-638 Type IV	750	%

1 - Resin Property Requiring Routine Testing
2 - Liner Property Requiring Routine Testing

All Testing Frequencies per SLT Quality Assurance Manual

PHYSICAL PROPERTIES OF SLT SHEET
TYPE "HDPE FORTIFLEX"

PROPERTY	TEST METHOD	VALUE	UNIT
Elasticity			hours
Flexural Modulus	ASTM D-790	115,000	lb/in^2
Tensile Modulus[2]	ASTM D-638	100,000	lb/in^2
Resistance to Soil	ASTM D-3083 ASTM D-638 Type IV		
(1) Tensile Strength at Break		±10	% change
(2) Elongation at Break		±10	% change
Volatile Loss	ASTM D-1203 "A"	<0.1	%
Water Absorbtion	ASTM D-570	0.0079	%
Water Vapor Transmission	ASTM E-96 "B"	0.0009	$9m/m^2 24$ hrs.
Puncture Resistance[2]	FTMS 101-C Method 2065	108 (for 1.5mm) 128 (for 2.0mm) 166 (for 2.5mm)	lbs
Tear Resistance[2]	ASTM D-1004	50 (for 1.5mm) 70 (for 2.0mm) 85 (for 2.5mm)	lb_f

1 - Resin Property Requiring Routine Testing
2 - Liner Property Requiring Routine Testing

All Testing Frequencies per SLT Quality Assurance Manual

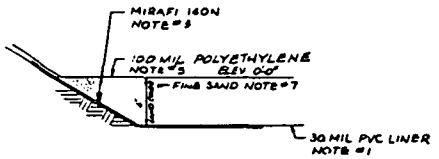
SCHLEGEL LINING TECHNOLOGY, INC.

PHYSICAL PROPERTIES OF SLT SHEET TYPE "HDPE FORTIFLEX"

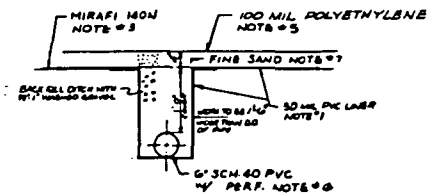
PROPERTY	TEST METHOD	VALUE	UNIT
Abrasion Resistance (Tabor Wear Index)	ASTM D-3389	0.406 (for 1.5mm) 0.377 (for 2.0mm) 0.272 (for 2.5mm)	gms
Tensile Impact[2]	ASTM D-1822	400	m^J/mm^2
Low Temp Brittleness	ASTM D-746-"B"	<-103	^oF
Surface hardness	ASTM-D-2240	65	Shore D
Coefficient of Liner Thermal Expansion	ASTM D-696	1.2×10^{-4}	$.C^{-1}$
Carbon Black Content[2]	ASTM D-1603	2.0-3.0	%
Carbon Black Dispersion[2]	ASTM D-3015	A	Rating
Fungus Resistance	ASTM G-21-80	0	Growth
Bacterial Resistance	ASTM G-22-76	0	Growth
Ozone Resistance	ASTM D-1149 (7 days, 100pphm, 104^oF)	No Cracks	7x

1 - Resin Property Requiring Routine Testing
2 - Liner Property Requiring Routine Testing

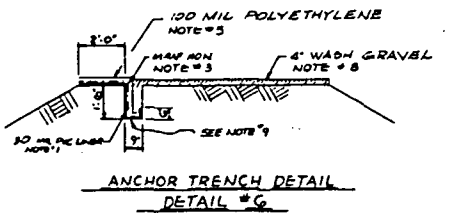
All Testing Frequencies per SLT Quality Assurance Manual



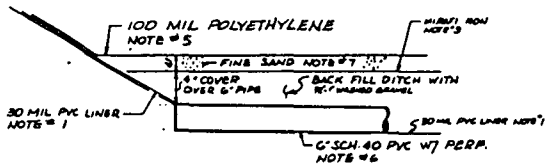
DETAIL # 4



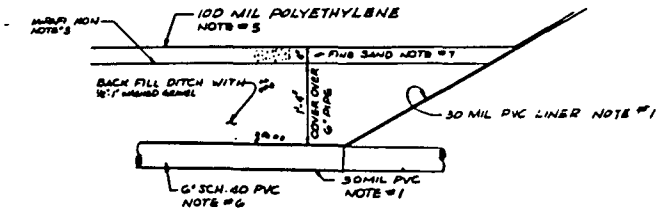
PVC DRAIN LATERAL FR. SECTION (A)
DETAIL # 5



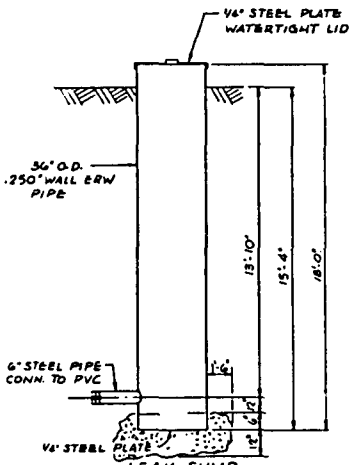
ANCHOR TRENCH DETAIL
DETAIL # 6



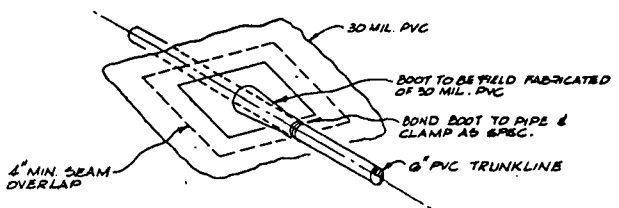
TRUNK LINE DETAIL FR. SECTION (B)
DETAIL # 7



TRUNK LINE DETAIL FR. SECTION (B)
DETAIL # 8



LEAK SUMP
DETAIL # 9



DETAIL OF LINER SEAMS AROUND 6" TRUNKLINE
DETAIL # 10

PRINTED
JAN 31 1989

GENERAL NOTES	GENERAL NOTES	DWG. NO.	REFERENCE DRAWINGS
		118-5004	SOUTH BRINE POND PLAN & SECTIONS

NO.	REVISION	BY	DATE	CHK.	APPR.

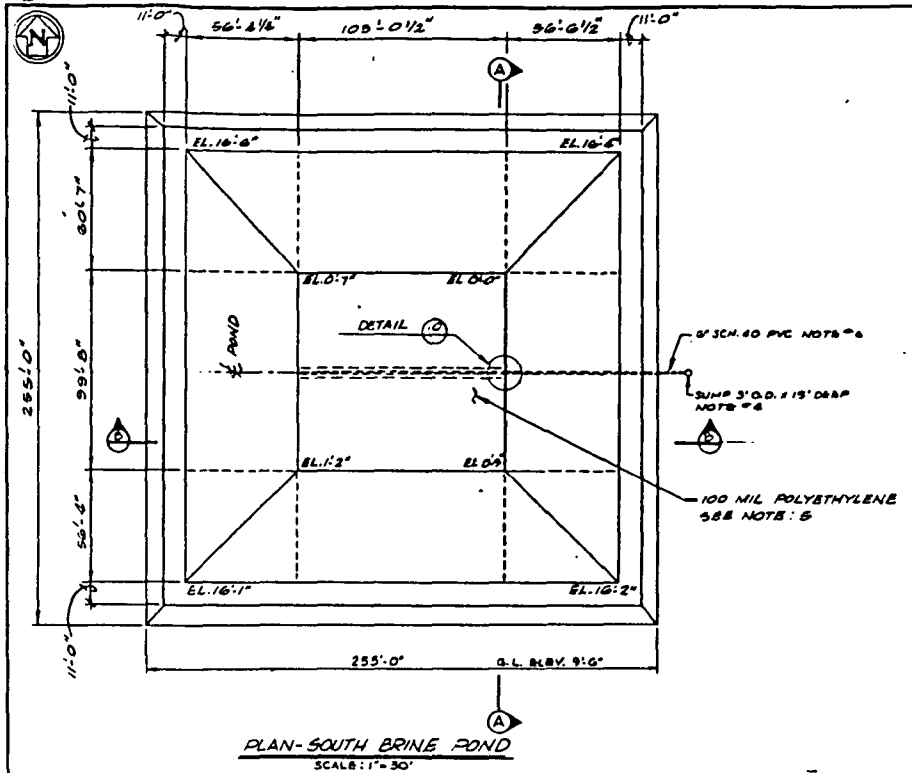
NO.	REVISION	BY	DATE	CHK.	APPR.
1	36" SLV. PER FIELD MARK-UP	JH	1-89		
2	ADDED DETAIL # 10	JH	1-89		

DATE	FIELD	OFFICE

WARREN PETROLEUM CO.
TULSA, OKLAHOMA

SOUTH BRINE P
MISCELLANOUS
PLANT No 118 MONU

DRAWN	KS	DATE 11-3-87	SCALE
CHECKED		DATE	
APPROVED		DATE	118



PLAN - SOUTH BRINE POND

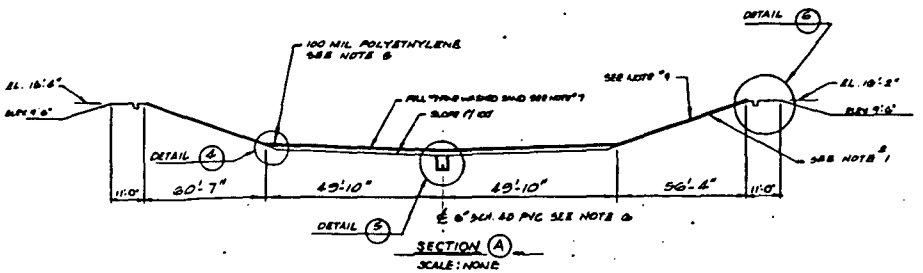
SCALE: 1" = 30'

NOTES

1. 30 MIL THICKNESS PVC LINER
2.
3. MIRAFI 140N SOIL SUPPORT MEDIA
4. SUMP CONSTRUCTED OF 36" ERW PIPE WITH .250" WALL. BOTTOM AND TOP CAPS ARE CONSTRUCTED OF ¼" STEEL PLATE.
5. 100 MIL. THICKNESS POLYETHYLENE LINER N.M. OCD APPROVED.
6. 6" SCH. 40 PVC PIPE WITH ⅜" O.D. HOLES DRILLED EVERY 5" SET AT A 120° ANGLE. TOTAL OPEN AREA 1.47 IN²/FT.
7. FINE WASHED SAND - USED FOR LEAKAGE CANALS.
8. SMALL WASH GRAVEL USED TO COVER TOP OF LEVEES.
9. PVC LINER AND SOIL SUPPORT & POLYETHYLENE LINER MUST EXTEND INTO SIDES OF ANCHOR DITCH.
10. ½" DIA. HOLE WITH COVERS SPACED EVERY 50' AROUND TOP OF POLYETHYLENE LINER.
11. CAPACITY 60,000 BBL'S

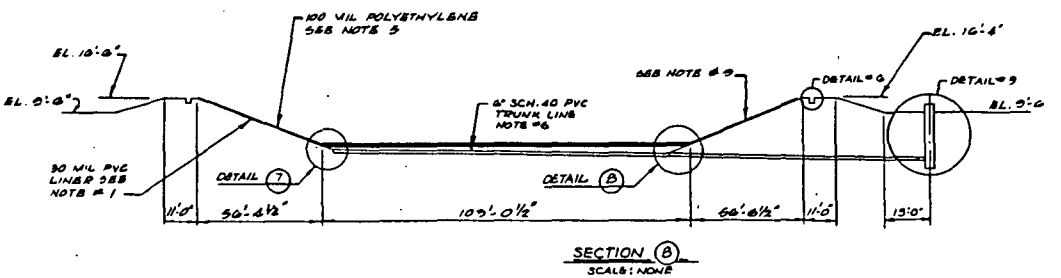
MATERIAL LIST

ITEM	
30 MIL PVC LINER	47,740 FT²
100 MIL POLYETHYLENE LINER	48,510 FT²
6" SCH. 40 PVC PIPE	198 FT
⅜-1" WASHED GRAVEL	10 YD³
MIRAFI 140N SUPPORT	660 FT²
SAND	650 YD³
36" .25" WALL ERW PIPE	18 FT
EXCAVATION	4000 YD³
BRINE CAPACITY	60,000 BBL. CAP.



SECTION (A)

SCALE: NONE



SECTION (B)

SCALE: NONE

PRINTED

JAN 31 1989

DWG. NO.	REFERENCE DRAWINGS
118-9005	SOUTH BRINE POND MISC. DETAILS

NO.	REVISION	BY	DATE	CHK.	APPR.
1	ADD SLOPE FOR FIELD MARKUP	JAL	1-89		
2	ADD CUT & FILL SLOPE & REV. MATL LIST	JAL	1-89		

ISSUE		
DATE	PRELIM.	CONST.

WARREN PETROLEUM COMPANY
TULSA, OKLAHOMA

SOUTH BRINE POND
PLAN & SECTIONS

PLANT NO 118 MONUMENT, N.M.

DRAWN K.S.	DATE 11-3-82	SCALE NOTED 5-10
CHECKED	DATE	118-9004
APPROVED	DATE	

SECTION VIII

EVAPORATION PIT

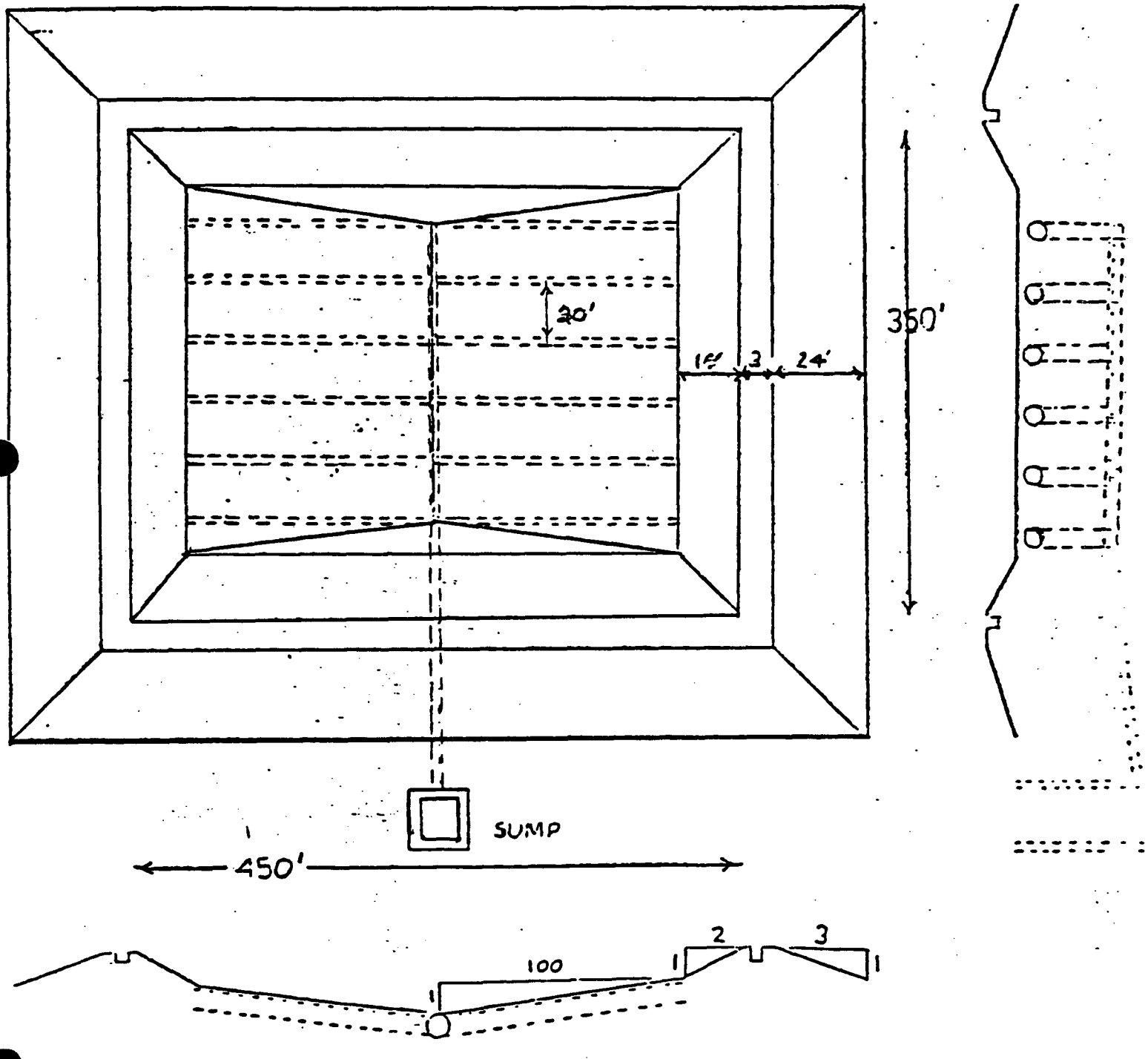
SECTION VIII
EVAPORATION PIT

The evaporation pit would be used in the event of an emergency.

The lining materials used for the evaporation pit are 36 mil chlorinated polyethylene (CPE) laminate and 30 mil CPE. The pit has a leak detection system.

The evaporation pit is located 1200 feet to the northwest of the amine coolers. The freeboard for the evaporation pit is at least two feet beneath the top of the level. The pit has a reserve time of approximately thirty days.

JUNE 15, 1977 EVAPORATION PIT



Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

September 22, 1977

Oil Conservation Commission
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. Joe D. Ramey

Dear Mr. Ramey:

We do appreciate your letter of September 13, 1977, and your clarification of exceptions to requirements for our lined evaporation pit installation.

We will install the drainage system such that no point in the pit will be more than 20 feet from the drainage grid.

A standby water disposal agreement will be kept effective and active. Our present and continuing contract with Rice Engineering and Operating, Inc., presently assures the plant sufficient standby water disposal. With this standby system, a freeboard of at least two feet beneath the top of the levee will be maintained at all times.

Again, we thank you for your prompt attention.

Sincerely,

J. F. Mussa
Plant Manager

JFM/DDH:kb

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

September 13, 1977

Warren Petroleum Company
P. O. Box 67
Monument, New Mexico 88265

Attention: Mr. J. F. Mussa

Gentlemen:

Reference is made to your letter dated August 26, 1977, addressed to our Hobbs office and concerning your proposed lined evaporation pit at the Monument plant.

It is our understanding that this pit will comply with the New Mexico Oil Conservation Commission "Specifications for the Design and Construction of Lined Evaporation Pits" with the following exceptions:

1. Your proposed leakage detection drainage system would be so spaced that points under the liner could be as much as 40 feet from the drainage system.

2. There would be less than 600 square feet of evaporative surface per barrel per day of water placed in the pit.

3. The excavation would be more than six inches deep in some places.

As discussed with you on the phone, the Commission cannot without a hearing consider the deviation from the required drainage grid distances, and it is our understanding that you now plan to install a drainage system such that no point in the pit would be more than 20 feet from the drainage grid.

As to the excavation being more than six inches deep, the Commission recognizes that in a pit as large as you propose, it is necessary to excavate more than six inches in order to keep the drainage system close to the surface of the pit bed and yet maintain the required drainage slope of at least six inches per fifty feet. You are therefore hereby authorized to excavate to a maximum depth of 2.5 feet below mean ground level.

As to the lack of 600 square feet of evaporative surface per barrel of water disposed of on a daily average basis, we understand that this is an auxiliary disposal system and that you will maintain a disposal contract to get rid of such water as cannot be handled in the pit. Upon receipt of written commitment from Warren that a standby water disposal agreement will be kept in force, and that a freeboard of at least two feet beneath the top of the levee and the surface of the water will be maintained at all times, the Commission will authorize disposal of more than 263 barrels per day into the pit (the maximum under our Pit Specifications).

Yours very truly,

JOE D. RAMEY
Director

JDR/DSN/fd

cc: OCC Hobbs

Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

August 26, 1977

Mr. Jerry Sexton
New Mexico Oil Conservation Commission
P. O. Box 2045
Hobbs, NM 88240

Dear Mr. Sexton:

This is a request for permission to construct a water disposal pit (see the attachment for specific details). This will be a lined evaporation pit constructed in accordance to local, state, and Federal regulations with the following exceptions submitted for your approval:

1. It has been recommended to us by the construction people and the pit liner manufacturer that because of the ground conditions, it should not be necessary to construct a drainage system with no point less than 20 ft. from a drainage channel. Instead, we request to have drainage ditches under the liner at 80 ft. apart. We are advised that any leakage will flow along the liner underside and into a drainage ditch and will thus indicate leakage in any case.

2. There will not be 600 sq. ft. of surface area per barrel of water to be evaporated due to limited space available and due to the fact that we have an alternate means of disposing of the water via pumps and pipeline to an engineering firm.

3. Excavation will be more than 6" in some places.

We hope that these exceptions will meet with your approval and we can begin construction of the pit at the earliest possible date. Thank you very much.

Sincerely,

J. F. Mussa
Plant Manager

JFM:kb

Attachment

SECTION IX

EVAPORATION AREAS

SECTION IX
EVAPORATION AREAS

DISCHARGE PLAN FOR WASTE WATER FROM THE REVERSE OSMOSIS TREATER

There will be three evaporation areas for the discharge of the waste water from the reverse osmosis unit. This will be the only water discharged on both of the evaporation areas. Evaporation Area 1, located south of the parking lot, has 9,000 square feet of area planted in Bermuda grass. Evaporation Area 2, located north of the parking lot, has 25,800 square feet of area planted in Bermuda grass. Evaporation Area 3, located east of the sulfur plant at the flare, has 68,800 square feet of area planted in Bermuda grass. The total square footage of all three evaporation areas is 103,600 square feet, which is 2.38 acres.

The maximum amount of water that will be discharged is 300 barrels of water per day (12,600 gallons). All calculations used for calculating how much area was needed were based on the 300 barrels per day figure. One point to be considered is that the reverse osmosis unit is not treating water every day and water will be discharged on the evaporation areas only when the unit is treating water for boiler make-up.

Mr. Carl Barnes, an agronomist with the New Mexico State University Agricultural Science Center at Artesia, New Mexico, was contacted and he recommended planting Bermuda grass because it is more drought tolerant than fescue and it spreads, whereas fescue does not spread. He stated that Bermuda grass, on a normal summer day, had an evapotraspiration (ET) rate of 0.30 acre inches per day, with the rate possibly going as high as 0.50 acre inches per day, when temperatures were unusually high, humidity was low, and wind speed above average. During winter months, when the Bermuda grass was in the dormant stage, the evapotraspiration (ET) rate would be about 0.05. The amount of area (.8 acre) in the evaporation areas would take care of about .175 acre inches per day, which is almost half the rate Bermuda grass normally transpires during an average summer

day. During the months when Bermuda grass is not in the dormant stage (April thru September) the root zone would be depleted of any excess water. During the months when it is in the dormant and semi-dormant stage, the root zone would have some excess water, which would be depleted when the grass became active again. The root zone of Bermuda grass is normally about 6 feet, unless there is some type of rock or other hard layered impediment. The above figures do not include annual precipitation, wind and heat evaporation, or 6 trees each about 3 inches in diameter. Both evaporation areas are in an open area where the evaporation from the sun, wind, and ambient temperature will enhance the evaporation and evapotranspiration process.

SPRINKLER SYSTEM

Evaporation Area #1 has ground level pop-up half-circle springkers that put out 2.8 gallons per minute at 25 pounds of water pressure, with the highest point of stream 6 feet above the nozzle. Evaporation Area #2 was 2.5 gpm full circle sprinklers, mounted on pipe 3 feet above the ground, with the highest point of stream 100 feet above the ground. Having the sprinklers 3 feet above the ground will disperse any organics and speed up the evaporation process. Evaporation Area #3 has 2.5 gpm full-circle sprinklers, mounted on pipe 3 feet above the ground, with the highest point of stream 10 feet above ground.

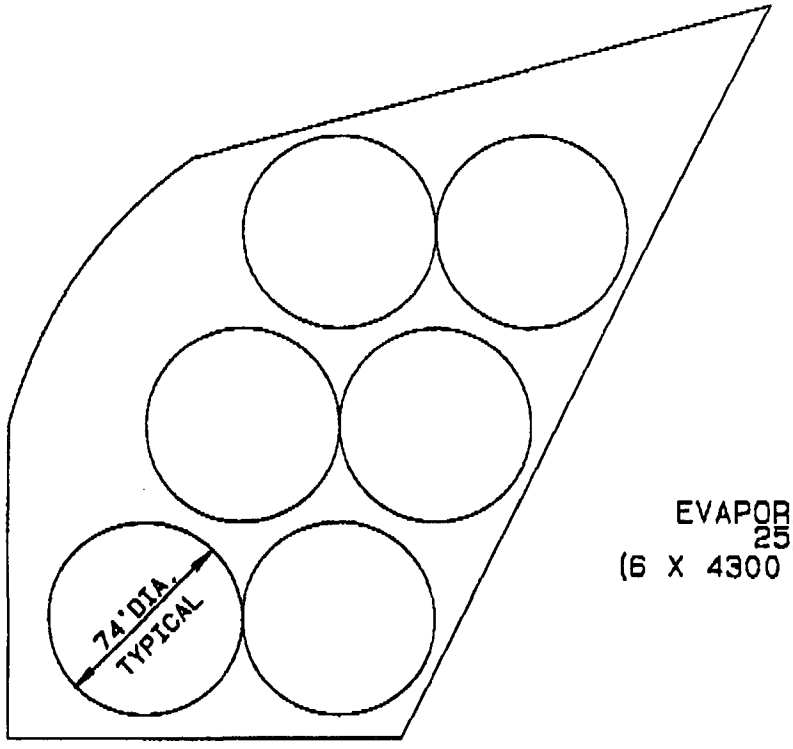
SPECIAL CIRCUMSTANCES

In the event of high rainfall, or mechanical problems with the sprinkler system, the waste water from the reverse osmosis treater can be diverted to Rice Engineering for disposal, or to our evaporation pit.

300 BARRELS PER DAY MAXIMUM
12,600 GALLONS PER DAY
0.463 ACRE INCHES PER DAY

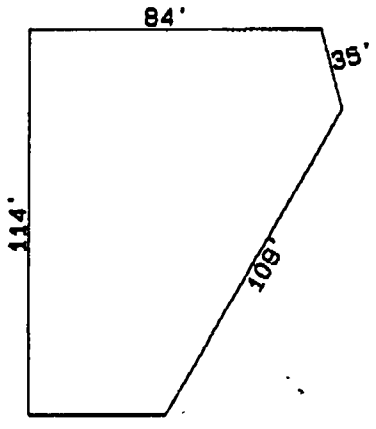
	ACRES SUPPORTED	(SQ. FT.)
AVG. (ET)/DAY SUMMER .30 ACRE INCHES/DAY 8158 GALS/DAY	1.54	67,000 SQ. FT.
AVG. (ET)/DAY WINTER .10 ACRE INCHES DAY 2720 GALS/DAY	4.60	200,000 SQ. FT.

The above figures do not include natural evaporation from air temperature and wind.



EVAPORATION AREA II
25,800 FT²
(6 X 4300 FT² EACH CIRCLE)

PARKING LOT



EVAPORATION AREA I 900 FT²

NO.	REVISION	BY	DATE	CHK	APPR	ISSUE CONST. DATE	ISSUE CONST. BY

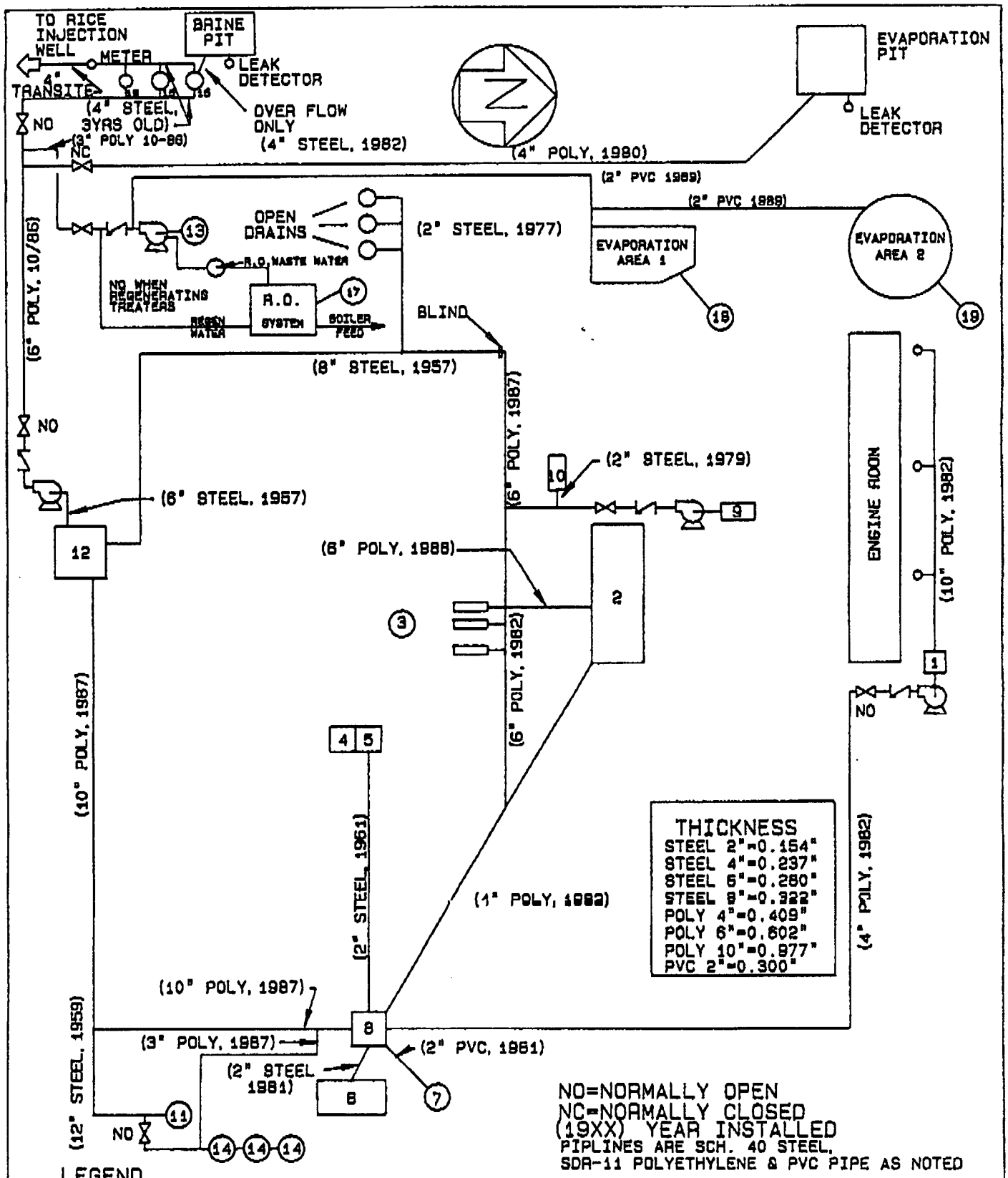
NO. OF UNITS REQUIRED THIS | WO-AFE NO.

WARREN PETROLEUM COMPANY
A DIVISION OF CHEVRON U.S.A. INC.
TULSA, OKLAHOMA

EVAPORATION AREA I AND II

PLANT 11B MONUMENT LEA COUNTY, NM.

DRAWN GMT	DATE 8/8/88	SCALE NONE	
CHECKED	DATE	DRAWING NO.	
APPR.	DATE	118-1003	



LEGEND

1-NORTH ENGINE ROOM SUMP
2-COOLING TOWER
3-CONDENSORS
4-BOILER
5-BOILER
6-BOILER
7-H_2S SCRUBBER
8-EAST SUMP
9-SOUTH ENGINE ROOM SUMP
10-CONDENSORS
11-CONDENSATE TANK
12-SOUTH MAIN SUMP
13-ZEOLITE H_2O TREATER
14-SHELL TANKS (3)
15-WASTE WATER STORAGE (2)
16-WASTE WATER OIL SKIMMER
17-REVERSE OSMOSIS SYSTEM
18-EVAPORATION 1
19-EVAPORATION 2

Revised Per Field 7/89
Revised Per Field 4/88

NO. OF UNITS REQUIRED THUS	WO-AFE NO.

WARREN PETROLEUM COMPANY
A DIVISION OF CHEVRON U.S.A.

WASTE WATER SYSTEM LAYOUT
PLANT 118 MONUMENT LEA, COUNTY, NM.

DRAWN	HPK	DATE 10/11/85	SCALE NONE
CHECKED	LLJ	DATE 10/11/85	DRAWING NO.
APPR.	PDA	DATE 10/11/85	118-1001-1

SECTION X

HYDROLOGIC & GEOLOGIC DATA

SECTION X

HYDROLOGIC & GEOLOGIC DATA

Wastewater is removed from the Monument Plant as described throughout this document. Warren does not operate any injection wells for removal of wastewater from this plant.

The September 20, 1989 update to the Monument Discharge Plan describes the evapotranspiration of Reverse Osmosis Reject Water within an agricultural evaporation area.

Futher hydrologic and/or geologic data will be researched at the request of the Oil Conservation Division.

SECTION XI

CHEMICAL ANALYSES

SECTION XI
CHEMICAL ANALYSES

The information provided herein describes the sources and disposition of wastewater from the Monument Plant which has a disposal system whereby no effluent is allowed to reach the ground or to enter a navigable waterway.

Contingency measures would be taken by the plant for wastewater disposal should normally used removal methods ever be rendered inoperable. These procedures have been carefully formulated and would take effect in the event that an emergency would necessitate their implementation.

Section XII, which follows, contains a current copy of the Spill Prevention Control and Countermeasure (SPCC) Plan for the facility. The SPCC Plan is maintained on site and would be implemented in the event of a spill.

Wastewater sample analyses are attached. To obtain highly consistent analyses of the effluent would be difficult due to the several sources throughout each plant which combine to provide the whole.

Also included is a Water Analysis Report for the Reverse Osmosis Reject Water.

JORDAN LABORATORIES, INC.
CHEMISTS AND ENGINEERS
CORPUS CHRISTI, TEXAS
JUNE 27, 1985

JUL 2 1985

WARREN PETROLEUM COMPANY
P.O. BOX 1589
TULSA, OKLAHOMA 74102

REPORT OF ANALYSIS

IDENTIFICATION: W.P.C. MONUMENT
2:00 PM 6-6-85

	MG/L
PHENOLS	0.08
BENZENE	0.12
TOLUENE	0.33
ORTHOXYLENE AND PARAXYLENE	0.60
METAXYLENE	0.66
ALUMINUM	0.50
ARSENIC	0.018
BORON	0.56
CADMIUM	<0.0001
MOLYBDENUM	0.01
NICKEL	<0.01

LAB. NO. M23-3539

RESPECTFULLY SUBMITTED,

CARL F. CROWNOVER

CALGON CORPORATION
SUBSIDIARY OF MERCK & CO., INC
WATER MANAGEMENT DIVISION CALGON CORPORATION BOX 1346 PITTSBURGH, PA 15230 (412) 777-8000

WATER ANALYSIS REPORT

CUSTOMER NAME: WARREN PETROLEUM COMPANY SPONSOR: STAFFORD
LOCATION: MONUMENT PLANT MAIL DROP: CARLSBAD, N. M.
MONUMENT, N. M.
COPIES: ---

SAMPLE NUMBER: 228563
DESCRIPTION: REVERSE OSMOSIS REJECT WATER
SAMPLE POINT: R. O. UNIT
DATE SAMPLED: 5/8/89 TIME SAMPLED: 14:00

PH @ 25C	8.0	
A READING	---	ML N/30 H2SO4 (--- MG/L CaCO3)
M.O. READING	32.4	ML N/30 H2SO4 (541. MG/L CaCO3)
B READING	---	ML N/30 H2SO4 (--- MG/L CaCO3)
CONDUCTIVITY	1900	UN-NEUTRALIZED, umhos/cm
SUSPENDED SOLIDS	EST <5	MG/L

	-MG/L-
HYDROXIDE (OH)	---
CARBONATE (CO3)	---
BICARBONATE (HCO3)	659
SILICA (SiO2)	110
CHLORIDE (Cl)	150
SULFATE (SO4)	160
ORTHO PHOSPHATE(PO4)	0.05
NITRATE (NO3/NO2)	35

	TOTAL (MG/L)	DISSOLVED (MG/L)
CALCIUM (Ca)	0.5	0.5
MAGNESIUM (Mg)	<0.1	<0.1
SODIUM (Na)	440	440
POTASSIUM (K)	3.0	3.0
IRON (Fe)	0.7	<0.05
COPPER (Cu)	<0.05	<0.05
MANGANESE (Mn)	<0.05	<0.05
ALUMINUM (Al)	<0.1	<0.1
ZINC (Zn)	<0.05	<0.05
NICKEL (Ni)	<0.05	<0.05
CHROMIUM (CrO4)	<0.05	<0.05

COMMENTS : PH IS <8.2 BUT ON ADDITION OF NEUTRAL BARIUM CHLORIDE
A HEAVY WHITE PRECIPITATE WAS FORMED.

CALGON ANALYTICAL LABORATORIES, APPROVED BY: RJF
REPORTED: 05/26/89 RECEIVED: 05/15/89

UNICHEM INTERNATIONAL

INDUSTRIAL DIVISION

P.O. BOX 1499
HOBBS, NM 88240
505-393-7751

P.O. BOX 572
BORGER, TX 79007
806-273-6531

P.O. BOX 755
CASPER, WY 82601
307-235-5906

RT. 4 BOX 100
BOBBY LANE
BEAUMONT, TX 7770[illegible]
409-724-6535

WATER ANALYSIS

ALL RESULTS EXPRESSED IN PPM UNLESS OTHERWISE NOTED

CLIENT NAME: WARREN PETROLEUM COMPANY
FACILITY:
LOCATION: SOUTHEASTERN, N.M.

DATE: 01/30/85
SAMPLE DATE: 01/08/85
DATE ANALYZED: 01/30/85

SAMPLE IDENTIFICATION :		SAUNDERS PLANT WASTE WATER	VADA PLANT WASTE WATER	MONUMENT PLANT WASTE WATER
pH		8.03	10.30	8.10
PHENO ALKALINITY	(CaCO3)	NIL	7000	NIL
TOTAL ALKALINITY	(CaCO3)	256	8700	160
BICARBONATE	(HCO3)	312.3	NIL	195.2
CARBONATE	(CO3)	NIL	3820.0	NIL
HYDROXIDE	(OH)	NIL	1802.0	NIL
TOTAL HARDNESS	(CaCO3)	1368	124	360
CALCIUM	(Ca)	416.0	27.2	113.6
CALCIUM	(CaCO3)	1040	68	284
MAGNESIUM	(Mg)	78.7	13.4	18.2
MAGNESIUM	(CaCO3)	328	56	76
CHLORIDE	(Cl)	364	200	172
CHROMATE	(CrO4)	***	***	***
SULFATE	(SO4)	1927	2410	1497
TOTAL PHOSPHATE	(PO4)	13.3	NIL	7.8
ORTHO PHOSPHATE	(PO4)	11.9	NIL	7.8
POLY PHOSPHATE	(PO4)	1.4	NIL	NIL
SILICA	(SiO2)	112.4	27.7	93.5
SILICA	(CaCO3)	187.7	46.3	156.1
SPECIFIC CONDUCTANCE	(umhos)	1705	1240	845
IRON	(Fe)	1.10	1.30	2.50
COPPER	(Cu)	0.08	NIL	NIL
CALCULATED :				
TOTAL DISSOLVED SOLIDS		3881	14894	2840
SODIUM	(Na)	657	6594	742

ANALYZED BY: _____ (HOBBS LAB)

APPROVED BY: _____

*** INDICATES THAT THIS TEST WAS NOT RUN

UNICHEM INTERNATIONAL

INDUSTRIAL DIVISION

P.O. BOX 1499
HOBBS, NM 88240
505-393-7751

P.O. BOX 572
BORGER, TX 79007
806-273-6531

P.O. BOX 755
CASPER, WY 82601
307-235-5906

RT. 4 BOX 100
BOBBY LANE
BEAUMONT, TX 77705
409-724-6535

WATER ANALYSIS

ALL RESULTS EXPRESSED IN PPM UNLESS OTHERWISE NOTED

CLIENT NAME: WARREN PETROLEUM COMPANY
FACILITY:
LOCATION: SOUTHEASTERN, N.M.

DATE: 01/30/85
SAMPLE DATE: 01/08/85
DATE ANALYZED: 01/30/85

SAMPLE IDENTIFICATION :	SAUNDERS PLANT WASTE WATER	VADA PLANT WASTE WATER	MONUMENT PLANT WASTE WATER
ZINC	NIL	0.08	0.05
LEAD	.04	NIL	NIL
CHROMIUM	0.3	0.02	0.1
BARIUM	.05	NIL	0.1
COBALT	NIL	NIL	NIL

NOTE: Sampling and analytical procedures used in these analyses conform with those outlined in Standard Methods for the Examination of Water and Wastewater (APHA) and/or Methods for Chemical Analysis of Water and Waste (EPA).

.* INDICATES THAT THIS TEST WAS NOT RUN

SECTION XII

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

SECTION XII

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

Any water removed from diked areas by vacuum truck is hauled to the south sump and the water is deposited there before being sent to Rice Engineering. Any oil is reclaimed and put in the Shell Oil tanks. Pure rainwater is allowed to evaporate from the plant yard.

There has been no accumulation of sludge in the skimmers. Any particles are apparently held in suspension and removed by vacuum.

Plant inspections are made a minimum of three times per day; and, most of the time, the inspection is made once every four hours. The inspection consists of the visual observation of all plant operations (including the waste closest to the plant leading to the Rice injection well). Any leaks are found and repaired as soon as possible. Since this method has proved successful in that no spills have occurred from the storage tanks, other formal means for corrosion checks are not deemed necessary at this time. If we do suspect a problem, a thickness test is run on the tank.

MONUMENT PLANT

WARREN PETROLEUM COMPANY
DIVISION OF CHEVRON U.S.A. INC.

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

1639/09209/LLJ/MONUMT DISG PLN
(kln)

MONUMENT PLANT
SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
QUICK REFERENCE REPORTING/NOTIFICATION PROCEDURES

QUICK REFERENCE DOCUMENT

SPILL CONTAINMENT AND NOTIFICATION PROCEDURES

If a spill occurs, the flow should be stopped and help acquired, if necessary. Contact Plant Manager or alternates if he is not available. Contain the spill using producedures in this plan. Refer to reporting requirements after spill cleanup. These procedures directly follow.

CONTACTS

K. A. Peterson	(505) 393-2823 or (505) 392-3336
M. L. Ingram	(918) 560-4060 or (918) 494-0037
D. E. Todd	(918) 560-4052 or (918) 494-8779
L. T. Reed	(918) 560-4119 or (918) 663-3397

DIRECTED CONTACTS

National Response Center	(800) 424-8802
Eighth Coast Guard District Duty Officer	(504) 589-6225
EPA Region VI	(214) 767-2720
Emergency Response (EPA Region VI)	(214) 767-2666
New Mexico Oil Conservation Division	
Santa Fe Office	(505) 827-5800
Hobbs District Office	(505) 393-6161
New Mexico Environmental Improvement Division	
Santa Fe Office	(505) 984-0200
Carlsbad District Office	(505) 887-3436 or (505) 885-9023
New Mexico State Corporation Commission	
Pipeline Division/Santa Fe	(505) 827-4497

MISCELLANEOUS CONTACTS

Fire Department	(505) 393-3060 (Monument) 911 (Hobbs)
Ambulance	911 (Hobbs)
Hospital	(505) 392-6581
Sheriff Department	(505) 393-2515
Equipment/Disposal Services (General Petroleum)	(505) 393-6220

1639/09209/LLJ/MONUMT DISG PLN
(kln)

MONUMENT PLANT

SPILL NOTIFICATION PROCEDURES

Federal, state and local water pollution control agencies require that certain discharges be reported. Discharges exhibiting any of the characteristics described below must be reported to the appropriate government agencies, as indicated.

OIL/HAZARDOUS SUBSTANCES

Reportable Spills

1. Any discharge of oil into or adjacent to navigable waters, or

2. Any release of a reportable quantity[1] of a hazardous substance to the environment (water, air, or land).

Report[3] Immediate, by telephone.

Agencies

State of New Mexico Environmental Improvement Division, Santa Fe - 505/984-0200, Carlsbad - 505/887-3436, or 505/885-9023; and U. S. Environmental Protection Agency - Emergency Response, Dallas Regional Office - 214/767-2666; and National Response Center - 800/424-8802; and State of New Mexico Oil Conservation Division, Santa Fe - 505/827-5800, or Hobbs - 505/393-6161.

MAJOR BREAKS, SPILLS, OR LEAKS

Reportable Spills

1. Discharge of 25, or more, barrels of crude oil, or condensate, or 100 barrels, or more, of salt water - none of which reaches a body of water, and/or,

MAJOR BREAKS, SPILLS, OR LEAKS

Reportable Spills (Continued)

2. Discharge of one, or more, barrels of crude oil, or condensate, or 25 barrels, or more, of salt water into a body of water, and/or,

3. Endanger health or damage property.

Report[3]

As soon as possible, by telephone. Written report within 10 days of incident to District Office.

Agencies

State of New Mexico Oil Conservation Division, Santa Fe - 505/827-5800, and Hobbs - 505/393-6161.

MINOR BREAKS, SPILLS, OR LEAKS

Reportable Spills

Discharges between 5 to 25 barrels of crude oil, or condensate, or between 25 to 100 barrels of salt water - none of which reaches a body of water.

Report[3]

Written report within 10 days of incident to District Office.

Agencies

State of New Mexico Oil Conservation Division - Hobbs District Office: 505/393-6161.

PIPELINE LEAK

Reportable Spills

1. Caused a death, or caused a personal injury requiring hospitalization, and/or

2.[2] Required taking a segment of pipeline out of service, and/or

3.[2] Resulted in gas igniting, and/or

4. Caused an estimated property damage of $5,000, or more, or

5. Was significant, although not part of No. 1. through No. 4., above.

Report[3]

Immediate, by telephone. Written report within 10 days of incident.

Agencies

U. S. Department of Transportation, through the National Response Center, 800/424-8802; and New Mexico State Corporation Commission, Santa Fe - 505/827-4497.

[1]Reportable quantities of hazardous substances are listed at the end of this Plan.

[2]Notice is not required if No. 2. and No. 3. occurred solely as a result of, or in connection with, a planned or routine maintenance or construction.

[3]Contents of Telephone Report

a. Name, title, and telephone number of reporter.
b. Name of facility.
c. Name of Owner or Operator.
d. Location of facility.
e. Time and type of incident (e.g., fire, explosion, etc.).
f. Location of spill or discharge, including name of waters involved.
g. Type and quantity of material spilled.
h. Other information that may be required.
i. Request the name of the person to whom you reported.

Additional information to be included in the written report.

a. Initial start-up date of facility.
b. Maximum storage or handling capacity, daily average throughput.
c. Description of facility, including process flows, plot plan, and topographic map.
d. Copy of SPCC Plan.
e. Cause of the spill(s).
f. Corrective action(s) taken.
g. Preventive measure(s) taken.
h. Extent of any physical damage and/or personal injuries.

All reported information should be logged and documented for recordkeeping purposes.

RULE 116
STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT - OIL CONSERVATION DIVISION
RULES AND REGULATIONS (3-1-82)

RULE 116. NOTIFICATION OF FIRE, BREAKS, LEAKS, SPILLS, AND BLOWOUTS

The Division shall be notified of any fire, break, leak, spill, or blowout occurring at any injection or disposal facility or at any oil or gas drilling, producing, transporting, or processing facility in the State of New Mexico by the person operating or controlling such facility.

"Facility" for the purpose of this rule, shall include any oil or gas well, any injection or disposal well, and any drilling or workover well; any pipeline through which crude oil, condensate, casinghead or natural gas, or injection or disposal fluid (gaseous or liquid) is gathered, piped, or transported (including field flow-lines and lead-lines, but not including natural gas distribution systems); any receiving tank, holding tank, or storage tank, or receiving and storing receptacle into which crude oil, condensate, injection or disposal fluid, or casing-head or natural gas is produced, received, or stored; any injection or disposal pumping or compression station including related equipment; any processing or refining plant in which crude oil, condensate, or casing-head or natural gas is processed or refined; and any tank or drilling pit or slush pit associated with oil or gas well or injection or disposal well drilling operations or any tank, storage pit or pond associated with oil or gas production or processing operations or with injection or disposal operations and containing hydrocarbons or hydrocarbon waste or residue, salt water, strong caustics or strong acids, or other deleterious chemicals or harmful contaminants.

Notification of such fire, break, leak, spill, or blowout shall be in accordance with the provisions set forth below:

SPILL NOTIFICATION PROCEDURES (Continued)

1. Well Blowouts. Notification of well blowouts and/or fires shall be "immediate notification" described below. ("Well blowout" is defined as being loss of control over and subsequent eruption of any drilling or workover well, or the rupture of the casing, casinghead, or wellhead of any oil or gas well or injection or disposal well, whether active or inactive, accompanied by the sudden emission of fluids, gaseous or liquid, from the well).

2. "Major" Breaks, Spills, or Leaks. Notification of breaks, spills, or leaks of 25 or more barrels of crude oil or condensate, or 100 barrels or more of salt water, none of which reaches a watercourse or enters a stream or lake; breaks, spills, or leaks in which one or more barrels of crude oil or condensate or 25 barrels or more of salt water does reach a watercourse or enters a stream or lake; and breaks, spills, or leaks of hydrocarbons or hydrocarbon waste or residue, salt water, strong caustics or strong acids, gases, or other deleterious chemicals or harmful contaminants of any magnitude which may with reasonable probability endanger human health or result in substantial damage to property, shall be "immediate notification" described below.

3. "Minor" Breaks, Spills, or Leaks. Notification of breaks, spills, or leaks of 5 barrels, or more, but less than 25 barrels of crude oil or condensate, or 25 barrels, or more, but not less than 100 barrels of salt water, none of which reaches a watercourse or enters a stream or lake, shall be "subsequent notification" described below.

4. Gas Leaks and Gas Line Breaks. Notification of gas leaks from any source or of gas pipeline breaks in which natural or casinghead gas of any quantity has escaped or is escaping which may with reasonable probability endanger human health or result in substantial damage to property shall be "immediate notification" described below. Notification of gas pipeline breaks or leaks in which the loss is estimated to be 1000 or more MCF of natural or casinghead gas, but in which there is no danger to human health nor of substantial damage to property shall be "subsequent notification" described below.

5. Tank Fires. Notification of fires in tanks or other receptacles caused by lightening or any other cause, if the loss is, or it appears that the loss will be, 25 or more barrels of crude oil or condensate, or fires which may reasonably probability endanger human health or result in substantial damage to property, shall be "immediate notification" as described below. If the loss is, or it appears that the loss will be at least 5 barrels, but less than 25 barrels, notification shall be "subsequent notification" described below.

6. Drilling Pits, Slush Pits, and Storage Pits and Ponds. Notification of breaks and spills from any drilling pit, slush pit, or storage pit or pond in which any hydrocarbon or hydrocarbon waste or residue, strong caustic or strong acid, or other deleterious chemical or harmful contaminant endangers human health or does substantial surface damage, or reaches a watercourse or enters a stream or lake in such quantity as may with reasonable probability endanger human health or result in substantial damage to such watercourse, stream, or lake, or the contents thereof, shall be "immediate notification" as described below. Notification of breaks or spills of such magnitude as to not endanger human health, cause substantial surface damage, or result in substantial damage to any watercourse, stream, or lake, or the contents thereof, shall be "subsequent notification" described below, provided however, no notification shall be required where there is no threat of any damage resulting from the break or spill.

IMMEDIATE NOTIFICATION. "Immediate Notification" shall be as soon as possible after discovery and shall be either in person or by telephone to the district office of the Division district in which the incident occurs, or if the incident occurs after normal business hours, to the District Supervisor, the Oil and Gas Inspector, or the Deputy Oil and Gas Inspector. A complete written report ("Subsequent Notification") of the incident shall also be submitted in duplicate to the appropriate district office of the Division within ten days after discovery of the incident.

SUBSEQUENT NOTIFICATION. "Subsequent Notification" shall be a complete written report of the incident and shall be submitted in duplicate to the district office of the Division district in which the incident occurred within ten days after discovery of the incident.

CONTENT OF NOTIFICATION. All reports of fires, breaks, leaks, spills, or blowouts, whether verbal or written, shall identify the location of the incident by quarter-quarter, section, township and range, and by distance and direction from the nearest town or prominent landmark so that the exact site of the incident can be readily located on the ground. The report shall specify the nature and quantity of the loss and also the general conditions prevailing in the area, including precipitation, temperature, and soil conditions. The report shall also detail the measures that have been taken and are being taken to remedy the situation reported.

WATERCOURSE, for the purpose of this rule, is defined as any lakebed or gully, draw, stream bed, wash, arroyo, or natural or man-made channel through which water flows or has flowed.

DISTRICT OFFICE - DISTRICT I
1000 West Broadway
P. O. Box 1980
Telehphone: (505) 393-6161

J. T. Sexton, Supervisor and Deputy Oil and Gas Inspector
P. F. Kautz, Geologist and Deputy Oil and Gas Inspector

Deputy Oil and Gas Inspectors:
J. R. Griffin
R. A. Sadler
E. W. Seay
D. R. Smith
Lyle Turnacliff

MONUMENT PLANT
SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
PART I
GENERAL INFORMATION

PART I

GENERAL INFORMATION

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

1. Facility Name: Monument Plant

2. Facility Type: Gas Processing

3. Facility Location: SW¼, Sec 36, R36E, T19S, NW¼, Sec. 1, R36E, T20S

4. Owner or Operator: Warren Petroleum Company
A Division of Chevron U.S.A. Inc.

Name and Address: 1350 South Boulder
Tulsa, OK 74119, or

P.O. Box 1589
Tulsa, OK 74102

5. Name and title of SPCC contact: K. A. Peterson, Plant Manager

6. Did facility experience a reportable oil spill event during the twelve months prior to 1-10-74 (effective date of 40 CFR, Part 112)? No. (If yes, complete Attachment 1).

Management Approval

This SPCC Plan will be implemented as herein described:

Signature: _____
M. L. Ingram, Manager - Western Area

Certification

I hereby certify that I have examined the facility, and being familiar with the provisions of 40 CFR, Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.

Registered Professional Engineer: L. T. Reed
(Print)

_____
(Signature)

(Seal)

Date: 12/28/89 Registration No. 14256 State: OK

Last Certification: 06/05/86

1639/12289/LLJ/MONUMT DISG PLN

7. Potential spills - prediction and control:

SOURCE	TYPE	MAJOR TYPE OF FAILURE	TOTAL QUANTITY (BBLS)	RATE (BBLS/Hr)	FLOW DIRECTION	SECONDARY CONTAINMENT
1. Slop Oil Tank (Shell Pipeline)	Welded Flat Bottom	Rupture	500	500	S	Earthen Dike
2. Slop Oil Tank (Shell Pipeline)	Welded Flat Bottom, Vert.	"	"	"	S	"
3. Brine Storage	Bolted Flat Bottom, Vert.	"	210	210	W	None
4. Diethenolamine (DEA) Storage	Bolted Flat Bottom, Vert.	"	210	210	NW	None
5. Hot Oil Storage	Welded, Horizontal	"	250	250	W	"
6. Water Treating Chemical	Fiberglass, Horizontal	"	24	24	S	Concrete Dike
7. Sulfuric Acid Storage	Welded Vertical	"	35	35	S	Concrete Dike
8. Lube Oil Storage	Bolted, Horizontal	"	200	200	W	None
9. Lube Oil Storage	Bolted, Horizontal	"	200	200	W	"
10. Diesel Storage	Welded, Horizontal	"	13	13	W	"
11. Varsol Solvent	Welded, Horizontal	"	13	13	W	"
12. Waste Wtr. Storage	Welded, Horizontal	"	210	210	E	"
13. Waste Wtr. Storage	Welded, Horizontal	"	210	210	E	"
14. Waste Water Oil Skimmer	Welded, Horizontal	"	100	100	E	"
15. Slop Oil Tank Shell P/L	Welded Flat Bottom	"	500	500	S	Earthen Dike

8. Are containment, diversionary structures, or equipment to prevent oil from reaching navigable waters practicable? (If, NO, complete Attachment 2.)
Yes.

9. Inspections and Records:

A. Do the required instructions follow written procedures, as contained in this plan? No.

Describe briefing program: In addition to written communication, there is verbal communication concerning pollution prevention and control. All employees at this location are aware of our Company's commitment in the area of pollution control.

MONUMENT PLANT
SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
PART II
ALTERNATE A
DESIGN AND OPERATING INFORMATION
ONSHORE FACILITY (EXCLUDING PRODUCTION)

PART II, ALTERNATE A

DESIGN AND OPERATING INFORMATION
ONSHORE FACILITY (EXCLUDING PRODUCTION)

A. Facility Drainage

1. Drainage from diked storage areas is controlled as follows: (Include operating description of valves, pumps, ejectors, etc.). (Note: Flapper-type valves should not be used).

   Diked areas are drained by use of a vacuum truck.

2. Drainage from undiked areas is controlled as follows. (Include description of ponds, lagoons, or catchment basins and methods of retaining and returning oil to facility).

   All liquids (water and small amounts of oil) enter a closed drain system, then enter an oil reclamation system where the oil is separated and is returned to the Shell Oil tanks. The water is injected into a disposal well. Please refer to Part V of this Spill Plan for a diagram of the waste water system for the plant.

3. The procedure for supervising the drainage of rainwater from secondary containment into a storm drain or an open watercourse is as follows: (Include description of inspection for pollutants and method of valving security. A record of inspection and drainage events is to be maintained on a form similar to Attachment 3).

   All diked areas are completely closed. When pure rainwater has accumulated, so as to require the drainage from other areas

A. Facility Drainage (Continued)

within the plant, the water is visually inspected for the presence of oil. If no evidence of oil is present, the areas are drained. No drainage water enters a watercourse or storm drain.

B. Bulk Storage Tanks

1. Describe tank design, materials of construction, fail-safe engineering, features, and if need, corrosion protection:

   Refer to Part I, Item 7.

2. Describe secondary containment design, construction materials, and volume: Slop oil tanks have a common 1,500 barrel dike.

3. Describe tank inspection methods, procedures, and recordkeeping: Tanks are externally inspected for rust, corrosion and leaks.

4. Internal heating coil leakage is controlled by one, or more, of the following control factors:

   a. Monitoring the steam return or exhaust lines for oil. Describe monitoring procedure: Not applicable.

   b. Passing the steam return or exhaust through a settling tank, skimmer, or other separation system. Not applicable.

   c. Installing external heating systems. Not applicable.

5. Disposal facilities for plant effluents discharged into navigable waters are observed frequently for indication of possible upsets which may cause an oil spill event. Not applicable.

Note: No effluents are discharged into navigable waters.

C. Facility Transfer Operations, Pumping and Inplant Process

1. Corrosion protection for buried pipelines:

   a. Are pipelines wrapped and coated to reduce corrosion? Yes.

   b. Is cathodic protection provided for pipelines, if determined necessary by electrolytic testing? Yes.

   c. When a pipeline section is exposed, is it examined and corrective action taken, as necessary? Yes.

2. Area pipeline terminal connections capped or blank-flanged and marked, if the pipeline is not in service, or on standby service, for extended periods? Yes.

   Describe criteria for determining when to cap or blank-flange:

   All open lines are capped or blind flanged.

3. Are pipe supports designed to minimize abrasion and corrosion and allow for expansion and contraction? Yes.

   Describe pipe support design:

   Piping on supports have been equipped with a slip-shoe between the pipe and support.

4. Describe procedures for regularly examining all aboveground valves and pipelines, including flange joints, valve glands and bodies, catch pans, pipelines supports, locking of valves, and metal surfaces:

   Aboveground valves and pipelines are observed on a frequent basis, both within the plant and the field system.

C. Facility Transfer Operations, Pumping and Inplant Process (Continued)

5. Describe procedures for warning vehicles entering the facility to avoid damaging aboveground piping.

Non-company vehicles are allowed within the plant yard after signing log book and being informed of the Emergency and Disaster Plan for the Monument Plant.

D. Facility Tank Car and Tank Truck Loading/Unloading Rack

Does tank car and tank truck loading/unloading occur at the facility? If "Yes", complete No. 1 through No. 5 below. Yes.

1. Do loading/unloading procedures meet the minimum requirement and regulations of the Department of Transportation? Yes.

2. Does the unloading area have a quick drainage system? Not applicable.

3. Will the containment system hold the maximum capacity of any single compartment of a tank truck loaded/unloaded in the plant? Not applicable.

Describe containment system design, construction materials, and volume: The products loaded and unloaded at this facility are gaseous at atmospheric conditions.

4. Is an interlocked warning light, a physical barrier system, or warning signs provided in the loading/unloading areas to prevent vehicular departure before disconnect of transfer lines? Yes.

Describe methods, procedures, and/or equipment used to prevent premature vehicular departure: Wheel chock blocks and ground line are in place before loading begins. They are removed upon completion of the loading operation.

D. Facility Tank Car and Tank Truck Loading/Unloading Rack (Continued)

5. Area drains and outlets on tank trucks and tank cars checked for leakage before loading/unloading or departure? Yes.

E. Security

1. Are plants fenced that are handling, processing, or storing oil? Yes.

2. Are entrance gates locked and/or guarded when the plant is unattended or not in production? Yes.

3. Are any valves which permit direct outward flow of a tank's contents locked closed when in non-operating or standby status? No.

4. Starter controls on all oil pumps in non-operating or standby status are:

   a. Locked in the "Off" position. Not applicable.

   b. Located at site accessible only to authorized personnel. Not applicable.

5. Discussion of Items 1 through 4, as appropriate:

   2. Plant is never unattended.

   4. No oil pumps in service.

6. Discussion of lighting around the facility:

   Lighting is adequate enough for the plant personnel to observe anyone who arrives at the facility and to detect any problems or spills within the plant.

MONUMENT PLANT
SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
PART II
ALTERNATE B
DESIGN AND OPERATING INFORMATION
ONSHORE OIL PRODUCTION FACILITY

PART II, ALTERNATE B

DESIGN AND OPERATING INFORMATION
ONSHORE OIL PRODUCTION FACILITY

A. Facility Drainage

1. Drainage from diked storage areas is controlled as follows: (Include operating description of valves, pumps, ejectors, etc.). Not applicable.

2. The procedure for supervising the drainage of rainwater from secondary containment into a storm drain or an open watercourse is as follows: (Include description of inspection for pollutants and method of valving security. A record of inspection and drainage events is to be maintained on a form similar to Attachment 3). Not applicable.

3. Field drainage ditches, road ditches, and oil traps, sumps, or skimmers, if such exist, are inspected at regularly scheduled intervals for accumulation of oil. Yes.

   Describe inspection procedures, intervals, and methods employed to remove oil. A vacuum truck goes out daily to collect oil and water.

B. Bulk Storage Tanks

1. Describe tank design, materials of construction, fail-safe engineering features: Not applicable.

2. Describe secondary containment design, construction materials, and volume: Not applicable.

B. Bulk Storage Tanks (Continued)

3. Describe tank inspection methods, procedures, and recordkeeping: Not applicable.

C. Facility Transfer Operations

1. Describe scheduled basis for examinations of aboveground valves and pipelines and salt water disposal facilities.

Aboveground equipment is observed for leaks on a routine basis by the Field Operator. All leaks, or equipment problems, are reported and repaired immediately.

2. Describe flowline maintenance program to prevent spills:

Lines are checked for leaks on a routine basis.

D. Oil Drilling and Workover Facilities

1. A blowout preventer (BOP) assembly and well control system is installed before drilling below any casing string and, as required, during workover operations. Not applicable.

2. The BOP assembly is capable of controlling any expected wellhead pressure. Not applicable.

3. Casing and BOP installations conform to state regulations. Not applicable.

MONUMENT PLANT
SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
PART III
SPILL HISTORY

PART III
SPILL HISTORY

There have been no spills at the Monument Plant. It is very unlikely that a spill would occur which would leave the property, thereby entering a navigable waterway. However, Form S/WPC-SPCC-1 (an example of which follows) will be used to record information, should a spill occur.

OIL SPILL REPORT

Date:

1. Location
   a. Unit or Plant:
   b. Field:
   c. Facility involved:

2. Environment
   a. Wind velocity (mph):
   b. Wind direction:
   c. Wave height (feet):
   d. Current direction:

3. Spill
   a. Type of oil:
   b. Estimated volume* (barrels):
   c. Cause:
   d. Action taken**:
   e. Time spill started:
   f. Shutoff:
   g. Movement direction and present location:

4. Land Areas Endangered

5. Cleanup Procedure
   a. Equipment used:
   b. Dispersant used (name type):
   c. Volume (gallons):
   d. Use authorized by (agency/person):
   e. Effectiveness of cleanup (Include time required to disperse slick, naturally or with chemicals):
   f. Completed cleanup date:

6. Agencies and Persons Notified/Time and Date

*Describe on the back of this page how the volume was calculated.

**If cause was mechanical, list suggested modifications to prevent future spills on the back of this page.

Signature:

Position:

Date:

Note: Copies of this form are completed and kept as Part III of this plan.

1639/09209/LLJ/MONUMT DISG PLN
(kln)

OIL SPILL REPORT

Date:

1. Location
   a. Unit or Plant:
   b. Field:
   c. Facility involved:

2. Environment
   a. Wind velocity (mph):
   b. Wind direction:
   c. Wave height (feet):
   d. Current direction:

3. Spill
   a. Type of oil:
   b. Estimated volume* (barrels):
   c. Cause:
   d. Action taken**:
   e. Time spill started:
   f. Shutoff:
   g. Movement direction and present location:

4. Land Areas Endangered

5. Cleanup Procedure
   a. Equipment used:
   b. Dispersant used (name type):
   c. Volume (gallons):
   d. Use authorized by (agency/person):
   e. Effectiveness of cleanup (Include time required to disperse slick, naturally or with chemicals):
   f. Completed cleanup date:

6. Agencies and Persons Notified/Time and Date

*Describe on the back of this page how the volume was calculated.

**If cause was mechanical, list suggested modifications to prevent future spills on the back of this page.

Signature:

Position:

Date:

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OIL SPILL REPORT

Date:

1. Location
   a. Unit or Plant:
   b. Field:
   c. Facility involved:

2. Environment
   a. Wind velocity (mph):
   b. Wind direction:
   c. Wave height (feet):
   d. Current direction:

3. Spill
   a. Type of oil:
   b. Estimated volume* (barrels):
   c. Cause:
   d. Action taken**:
   e. Time spill started:
   f. Shutoff:
   g. Movement direction and present location:

4. Land Areas Endangered

5. Cleanup Procedure
   a. Equipment used:
   b. Dispersant used (name type):
   c. Volume (gallons):
   d. Use authorized by (agency/person):
   e. Effectiveness of cleanup (Include time required to disperse slick, naturally or with chemicals):
   f. Completed cleanup date:

6. Agencies and Persons Notified/Time and Date

*Describe on the back of this page how the volume was calculated.

**If cause was mechanical, list suggested modifications to prevent future spills on the back of this page.

Signature:

Position:

Date:

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OIL SPILL REPORT

Date:

1. Location
   a. Unit or Plant:
   b. Field:
   c. Facility involved:

2. Environment
   a. Wind velocity (mph):
   b. Wind direction:
   c. Wave height (feet):
   d. Current direction:

3. Spill
   a. Type of oil:
   b. Estimated volume* (barrels):
   c. Cause:
   d. Action taken**:
   e. Time spill started:
   f. Shutoff:
   g. Movement direction and present location:

4. Land Areas Endangered

5. Cleanup Procedure
   a. Equipment used:
   b. Dispersant used (name type):
   c. Volume (gallons):
   d. Use authorized by (agency/person):
   e. Effectiveness of cleanup (Include time required to disperse slick, naturally or with chemicals):
   f. Completed cleanup date:

6. Agencies and Persons Notified/Time and Date

*Describe on the back of this page how the volume was calculated.

**If cause was mechanical, list suggested modifications to prevent future spills on the back of this page.

Signature:

Position:

Date:

Note: Copies of this form are completed and kept as Part III of this plan.

OIL SPILL REPORT

Date:

1. Location
   a. Unit or Plant:
   b. Field:
   c. Facility involved:

2. Environment
   a. Wind velocity (mph):
   b. Wind direction:
   c. Wave height (feet):
   d. Current direction:

3. Spill
   a. Type of oil:
   b. Estimated volume* (barrels):
   c. Cause:
   d. Action taken**:
   e. Time spill started:
   f. Shutoff:
   g. Movement direction and present location:

4. Land Areas Endangered

5. Cleanup Procedure
   a. Equipment used:
   b. Dispersant used (name type):
   c. Volume (gallons):
   d. Use authorized by (agency/person):
   e. Effectiveness of cleanup (Include time required to disperse slick, naturally or with chemicals):
   f. Completed cleanup date:

6. Agencies and Persons Notified/Time and Date

*Describe on the back of this page how the volume was calculated.

**If cause was mechanical, list suggested modifications to prevent future spills on the back of this page.

Signature:

Position:

Date:

Note: Copies of this form are completed and kept as Part III of this plan.

MONUMENT PLANT
SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

PART IV
ONSHORE FACILITY BULK STORAGE TANKS
DRAINAGE SYSTEM
(ATTACHMENT #3)

PART IV

ONSHORE FACILITY BULK STORAGE TANKS - DRAINAGE SYSTEM

Inspection Procedure: Diked areas are drained by use of a vacuum truck.

Record of drainage, bypassing, inspection, and oil removal from secondary containment: Not applicable.

Drainage Location	Date Drainage Date	Bypassing Open	Bypassing Closed	Inspection Date	Oil Removal	Signature	Installed Seal #

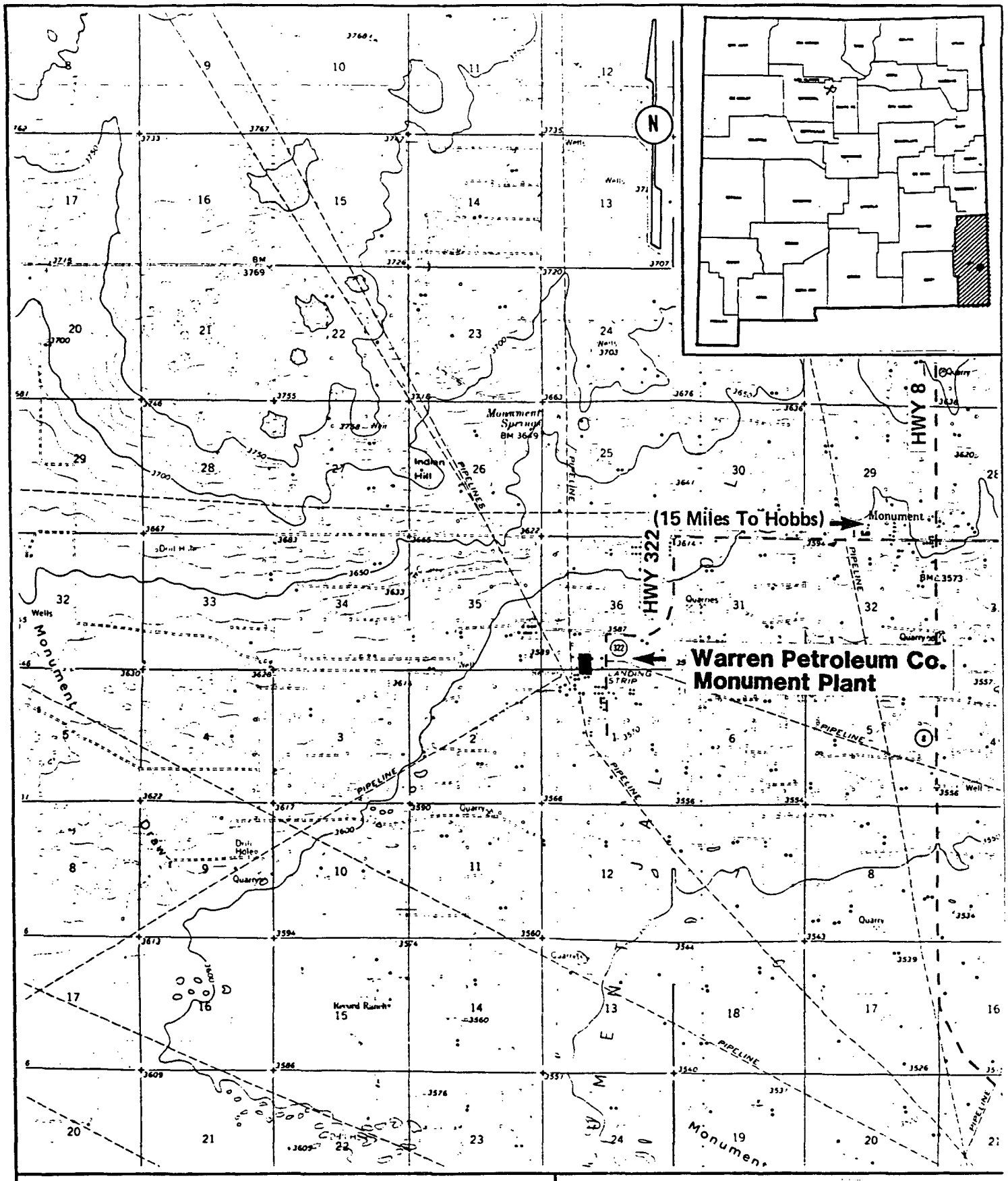
Only areas where there has been accumulated, uncontaminated rainfall are drained. Diked areas containing rainwater with accumulated oil are cleared by use of a vacuum truck.

MONUMENT PLANT

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

PART V

LOCATION MAPS/PLANS



PLANT LOCATIONS

SEC. 36, T-19-S, R-36-E and
SEC. 1, T-20-S, R-36-E

APPROX. EL. 3585'

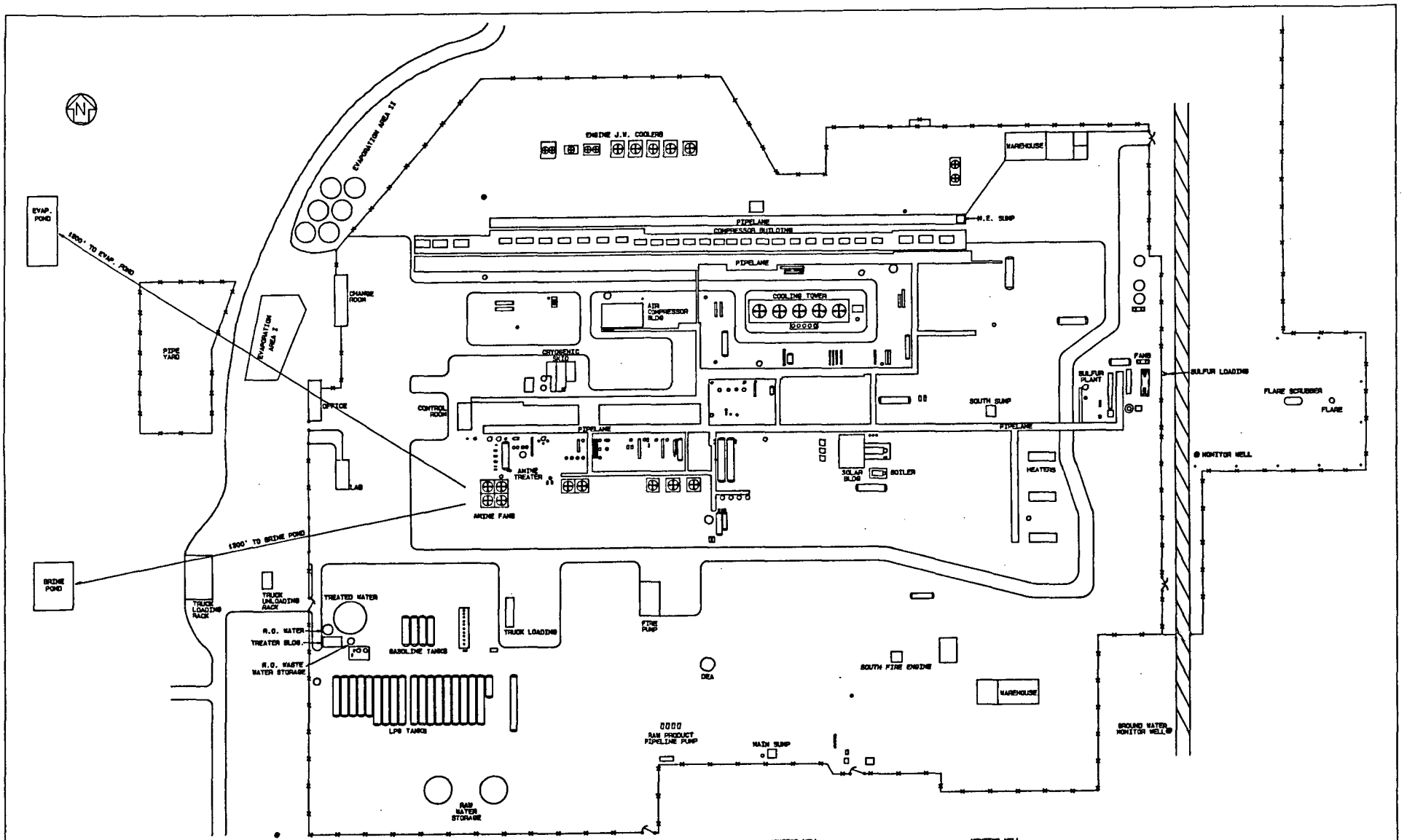
APPROX. LAT. 32°35'40" N

APPROX. LONG 103°15'44" W

SCALE	DATE
1"=1 MI.	7-16-82

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.

MONUMENT
PLANT NO. 118
LEA CO. N.M.



GENERAL NOTES	GENERAL NOTES	DWG. NO.	REFERENCE DRAWINGS

NO.	REVISION	BY	DATE	CHK.	APPR
1	REDRAWN	LP	7-20		

APE OR NO	ISSUE		
	DATE	PRELIM.	CONST.

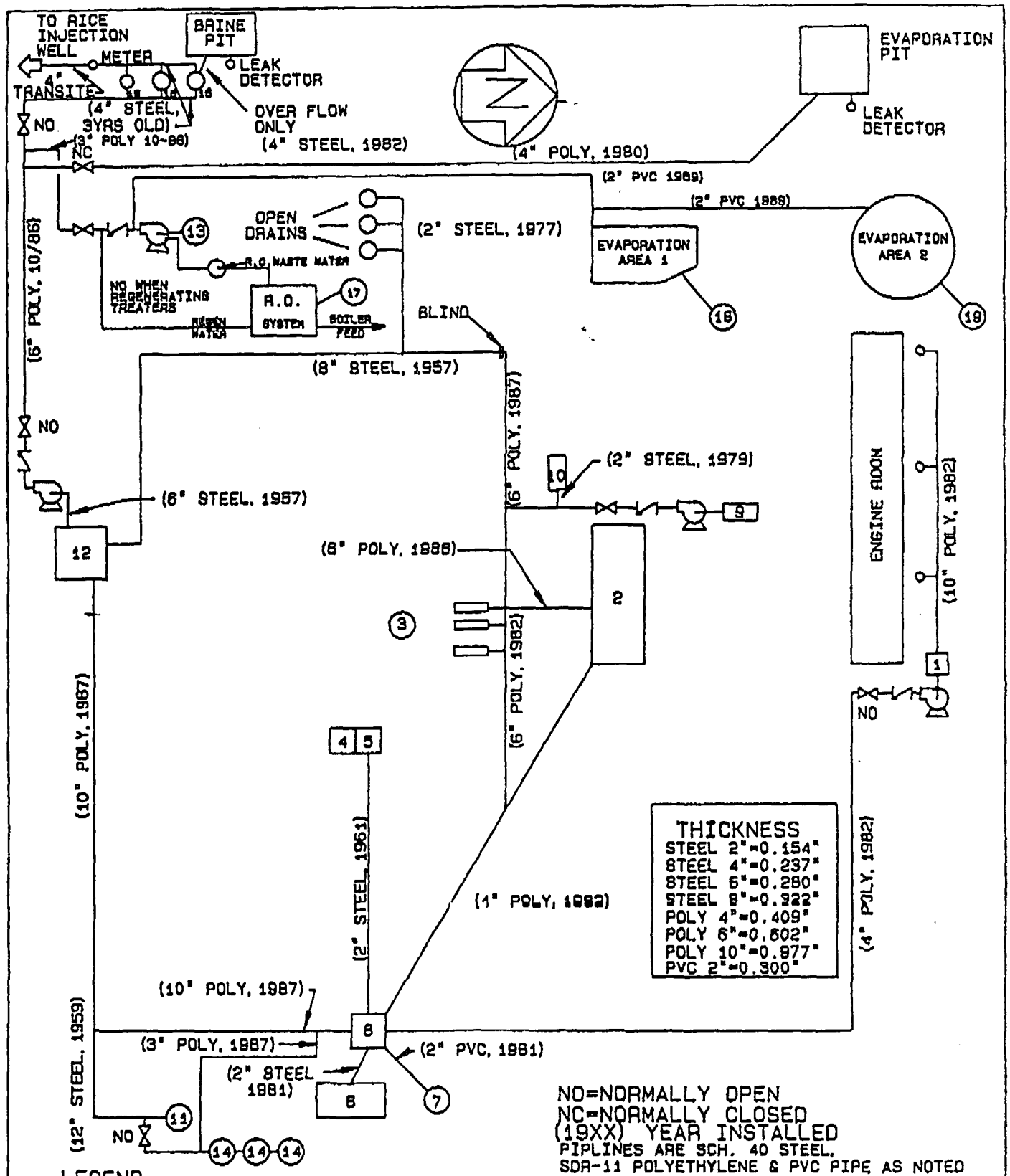
WARREN PETROLEUM COMPANY
A DIVISION OF CHEVRON U.S.A. INC.
TULSA, OKLAHOMA

PLOT PLAN

PLT. 118 MONUMENT — MONUMENT NM.

DRAWN LP	DATE 7-20-88	SCALE 1"=60'
CHECKED	DATE	
APPR.	DATE	

118-1000-1



LEGEND

1-NORTH ENGINE ROOM SUMP
2-COOLING TOWER
3-CONDENSORS
4-BOILER
5-BOILER
6-BOILER
7-H_2S SCRUBBER
8-EAST SUMP
9-SOUTH ENGINE ROOM SUMP
10-CONDENSORS
11-CONDENSATE TANK
12-SOUTH MAIN SUMP
13-ZEOLITE H_2O TREATER
14-SHELL TANKS (3)
15-WASTE WATER STORAGE (2)
16-WASTE WATER OIL SKIMMER
17-REVERSE OSMOSIS SYSTEM
18-EVAPORATION 1
19-EVAPORATION 2

Revised Per Field 7/89
Revised Per Field 4/88

NO. OF UNITS REQUIRED THIS	WO-AFE NO.

WARREN PETROLEUM COMPANY
A DIVISION OF CHEVRON U.S.A.

WASTE WATER SYSTEM LAYOUT
PLANT 118 MONUMENT LEA, COUNTY, NM.

DRAWN	HPK	DATE 10/11/85	SCALE NONE
CHECKED	LLJ	DATE 10/11/85	DRAWING NO.
APPR.	PDA	DATE 10/11/85	118-1001-1

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	F
5344-82-1 5215	YS7100000	(2-CHLOROPHENYL) THIOUREA					C7-H7-Cl-N2-S 4906210	X	X	100	100/10000		X	P
3037-72-7 5174	ED4200000	(4-AMINOBUTYL) DIETHOXYMETHYLSILANE					C9-H23-N-02-Si 4906210	X		1	1000			
57-14-7 8566	MV2450000	1,1 DIMETHYLHYDRAZINE	1163	DMH	0940	3-3-1	C2-H8-N2 4906210	X	X	1	1000	X	X	U
60-29-7 696	KI5775000	1,1'-OXYBIS-ETHANE	1155		1210		C4-H10-O 4908157		X	100			X	U
71-55-6 1629	KJ2975000	1,1,1 TRICHLOROETHANE	2831		1720		C2-H3-Cl3 4941176		X	1000		X	X	U
630-20-6	KI8450000	1,1,1,2-TETRACHOROETHANE		TEC			C2-H2-Cl4		X	1			X	U
79-00-5	KJ3150000	1,1,2 TRICHLOROETHANE	2831		2495		C2-H3-Cl3		X	1		X	X	U
127-18-4 4591	KX3850000	1,1,2,2, TETRACHLOROETHENE (PERCHLOROETHYLENE)	1897		2020		C2-Cl4 4940355		X	1		X	X	U
79-34-5	KI8575000	1,1,2,2-TETRACHLOROETHANE	1702	TEC	2340		C2-H2-Cl4		X	1		X	X	U
75-34-3 3148	KI0175000	1,1-DICHLOROETHANE	2362	DCH	1160	2-3-0	C2-H4-Cl2		X	1000			X	U
78-99-9 8525	TX9450000	1,1-DICHLOROPROPANE	1279	DPB			C3-H6-Cl2		X	1000				
95-50-1 6211	CZ4500000	1,2 DICHLOROBENZENE	1591	DBO	0867		C6-H4-Cl2 4941127		X	100		X	X	U
78-87-5 4358	TX9625000	1,2 DICHLOROPROPANE	1279	DPX	2190	2-3-0	C3-H4-Cl2 4909269		X	1000		X	X	U
95-94-3	DB9450000	1,2,4,5-TETRACHLOROBENZENE			T345	1-1-0	C6-H2-Cl4		X	5000			X	U
120-82-1	DC2100000	1,2,4-TRICHLOROBENZENE		TCB	2481	2-1-0	C6-H3-Cl3		X	100		X		
95-63-6 5162	DC3325000	1,2,4-TRIMETHYL BENZENE	1993		T306	0-2-0	C9-H12 4913161			1	10000	X		
218-01-9	GC0700000	1,2-BENZPHENANTHRENE			0692		C18-H12		X	1			X	U
106-88-7 2689	EK3675000	1,2-BUTYLENE OXIDE	3022	BTO	E225	2-3-2	C4-H8-O					X		
96-12-8 3090	TX8750000	1,2-DIBROMO-3-CHLOROPROPANE	2872		0935		C3-H5-Br2-Cl 4906210	X		1		X	X	U
106-93-4 3409	KH9275000	1,2-DIBROMOETHANE	1605	EDB	1140		C2-H4-Br2 4940335	X		1000		X	X	U
107-06-2 3410	KI0525000	1,2-DICHLOROETHANE	1184	EDC	0874	2-3-0	C2-H4-Cl2 4909166	X		5000		X	X	U
540-59-0 3520	KV9360000	1,2-DICHLOROETHYLENE	1150	DEL	0870	2-3-2	C2-H2-Cl2					X		

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CI
10140-87-1 4987	KK4200000	1,2-DICHLOROETHANOL ACETATE					C4-H6-C12-02	X		1	1000			
123-33-1 8806	UR5950000	1,2-DIHYDRO-3,6-PYRIDAZINEDIONE					C4-H4-N2-02		X	5000			X	U1
56-49-5	FZ6750000	1,2-DIHYDRO-3-METHYL-BENZ[J]ACEAN-THRYLENE			M136		C21-H16		X	1			X	U1
540-73-8 3272	MV2625000	1,2-DIMETHYLHYDRAZINE	2382				C2-H8-N2		X	1			X	U0
122-66-7	MW2625000	1,2-DIPHENYLHYDRAZINE					C12-H12-N2		X	1		X	X	U1
111-54-6		1,2-ETHANEDIYLBISCARBAMODITHIOIC ACID							X	5000			X	U1
94-58-6	DA6125000	1,2-METHYLENEDIOXY-4-PROPYL-BENZENE					C10-H12-02		X	1			X	U0
120-58-1	DA5950000	1,2-METHYLENEDIOXY-4-PROPENYL-BENZENE					C10-H10-02		X	1			X	U1
156-60-5	KV9400000	1,2-TRANS-DICHLOROETHYLENE				2-3-2	C2-H2-C12		X	1000			X	U0
189-55-9	DI5775000	1,2:7,8-DIBENZOPYRENE					C24-H14		X	1			X	U0
99-35-4 8046	DC3850000	1,3,5-TRINITROBENZENE	1354				C6-H3-N3-05 4917140	X		10			X	U2
108-46-3 4409	VG9625000	1,3-BENZENEDIOL	2876	RSC	2221		C6-H6-N2 4940367	X		5000			X	U2
541-73-1 8514	CZ4499000	1,3-DICHLOROBENZENE	1591	DCM	D149		C6-H4-C12	X		100		X	X	U0
142-28-9 8526	TX9660000	1,3-DICHLOROPROPANE	1279	DPC			C3-H6-C12	X		1000				
542-75-6	UC8310000	1,3-DICHLOROPROPYLENE		DPS		2-3-0	C3-H4-C12	X		100		X	X	U0
764-41-0	EM4900000	1,4-DICHLORO-2-BUTENE		DCB		3-3-2	C4-H6-C12	X		1			X	U0
106-46-7 6212	CZ4550000	1,4-DICHLOROBENZENE	1592	DCM	0868		C6-H4-C12 4941128	X		100		X	X	U0
123-91-1 617	JG9225000	1,4-DIETHYLENE DIOXIDE	1165		1010		C4-H8-02 4909155	X		1		X	X	U1
123-31-9 3626	MX3500000	1,4-DIOXANE	2662	HDB	1490	2-1-0	C6-H6-02		X	1	500/10000	X		
130-15-4	QL7175000	1,4-NAPHTHALENEDIONE					C10-H6-02		X	5000			X	U1
100-14-1 4877	XS9093000	1-(CHLOROMETHYL)-4-NITRO-BENZENE					C7-H6-Cl-N-02	X		1	500/10000			
82-28-0	CB5740000	1-AMINO-4-METHOXY-ANTHRAQUINONE					C15-H11-N-03					X		

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	INIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CO
101-55-3		1-BROMO-4-PHENOXY-BENZENE					C12-H9-Br-O		X	100			X	U0
504-60-9 7482	RZ2464000	1-METHYLBUTADIENE	1993		P207		C5-H8 4907227		X	100			X	U1
107-10-8 1392	UH9100000	1-PROPANAMINE	1277		P137		C3-H9-N 4908269		X	5000			X	U1
58-36-6 5118	SP6800000	10,10'-OXYDIPHENOXARSINE					C24-H16-As2-O3	X		1	500/10000			
1116-54-7	KL9550000	2,2'-(NITROSOIMINO) BIS ETHANOL				0907	C4-H10-N2-O3		X	1			X	U17
4418-66-0 5116	GP3325000	2,2'-THIOBIS (4-CHLORO-6-METHYL-PHENOL)					C14-H12-C12-O2-S	X		1	100/10000			
97-18-7 5115	SN0525000	2,2'-THIOBIS(4,6-DICHLOROPHENOL)					C12-H6-C14-O2-S	X		1	100/10000			
75-99-0 3166	UF0690000	2,2-DICHLOROPROPIONIC ACID	1760	DCN			C3-H4-C12-O2 4931455		X	5000				
58-90-2	SM9275000	2,3,4,6-TETRACHLOROPHENOL				2355	C6-H2-C14-O		X	10			X	U21
15950-66-0		2,3,4-TRICHLOROPHENOL					C6-H3-C13-O		X	10				
933-78-8		2,3,5-TRICHLOROPHENOL					C6-H3-C13-O		X	10				
933-75-5	SN1300000	2,3,6-TRICHLOROPHENOL					C6-H3-C13-O		X	10				
78-88-6 8528	UC8400000	2,3-DICHLOROPROPENE	2047	DPF		3-3-0	C3-H4-C12		X	100				
26471-62-5 1613	NQ9490000	2,4 DIISOCYANATOMETHYLBENZENE	2078				C9-H6-N2-O2 4921575		X	100			X	U223
93-76-5 9136	AJ8400000	2,4,5-T	2765	TCA	2324		C8-H5-C13-O3 4941185		X	1000			X	U232
1319-72-8 8028		2,4,5-T AMINES	2765	TCA	2324		C8-H5-C13-O3		X	5000				
2008-46-0 8028		2,4,5-T AMINES	2765	TCA	2324		C8-H5-C13-O3		X	5000				
3813-14-7 8028		2,4,5-T AMINES	2765	TCA	2324		C8-H5-C13-O3		X	5000				
6369-96-6 8028		2,4,5-T AMINES	2765	TCA	2324		C8-H5-C13-O3		X	5000				
6369-97-7 8028		2,4,5-T AMINES	2765	TCA	2324		C8-H5-C13-O3		X	5000				
93-79-8 8028	AJ8485000	2,4,5-T ESTERS	2765	TPE	2324		C12-H13-C13-O3 4962390		X	1000				
1928-47-8 8028		2,4,5-T ESTERS	2765	TPE	2324		C12-H13-C13-O3		X	1000				

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CI
2545-59-7 8028	AJ8420000	2,4,5-T ESTERS	2765	TPE	2324		C14-H17-C13-04		X	1000				
25168-15-4 8028	AJ8520000	2,4,5-T ESTERS	2765	TPE	2324		C14-H17-C13-04		X	1000				
61792-07-2 8028		2,4,5-T ESTERS	2765	TPE	2324		C14-H17-C13-04		X	1000				
13560-99-1 8028	AJ8650000	2,4,5-T SALTS	2765	TAS	2324		C8-H4-C13-03 .Na		X	1000				
32534-95-5 1637		2,4,5-TP ACID ESTERS	2765	TPE	2324		4962180		X	100				
95-95-4 4682	SN1400000	2,4,5-TRICHLOROPHENOL			TPH		C6-H3-C13-0		X	10		X	X	U2
88-06-2 4682	SN1575000	2,4,6 TRICHLOROPHENOL					C6-H3-C13-0		X	10		X	X	U2
88-05-1 4864	BI0700000	2,4,6-TRIMETHYLANILINE					C9-H13-N	X		1	500			
94-75-7 8523	AG6825000	2,4-D	2765	OCA	0846		C8-H6-C12-03 4941126		X	100		X	X	U2
94-11-1 547	AG8750000	2,4-D ESTERS	2765	DES	B728		C11-H12-C12-03 4962130		X	100				
94-79-1		2,4-D ESTERS	2765	DES	B728		C12-H14-C12-03		X	100				
94-80-4	AG8050000	2,4-D ESTERS	2765	DES	B728		C12-H14-C12-03		X	100				
1320-18-9		2,4-D ESTERS	2765	DES	B278		C12-H14-C12-03		X	100				
1928-38-7	AG8810000	2,4-D ESTERS	2765	DES	B278		C12-H14-C12-03		X	100				
1928-61-8		2,4-D ESTERS	2765	DES	B278		C12-H14-C12-03		X	100				
1929-73-3	AG7700000	2,4-D ESTERS	2765	DES	B278		C12-H14-C12-03		X	100				
2971-38-2	AG8200000	2,4-D ESTERS	2765	DES	B278		C12-H14-C12-03		X	100				
25168-26-7	AG8575000	2,4-D ESTERS	2765	DES	B278		C16-H22-C12-03		X	100				
53467-11-1		2,4-D ESTERS	2765	DES	B278		C16-H22-C12-03		X	100				
615-05-4	BZ8580500	2,4-DIAMINOANISOLE				D808	C7-H10-N2-0					X		
39156-41-7	ST2705000	2,4-DIAMINOANISOLE SULFATE					C7-H10-N2-0 .xH2-04-S					X		
95-80-7	XS9625000	2,4-DIAMINOTOLUENE	1709			2465	C7-H10-N2		X	1		X	X	U22

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CC
120-83-2 8522	SK8575000	2,4-DICHLOROPHENOL	2020	DCP	0895		C6-H4-C12-O		X	100			X	U81
105-67-9	ZE5600000	2,4-DIMETHYLPHENOL					C8-H10-O		X	100			X	U101
51-28-5 8574	SL2800000	2,4-DINITROPHENOL	0076	DNP			C6-H4-N2-O5		X	10			X	P048
329-71-5 8575	SL2900000	2,5-DINITROPHENOL	1599	DNE			C6-H4-N2-O5		X	10				
87-65-0	SK8750000	2,6-DICHLOROPHENOL		DCP			C6-H4-C12-O		X	100			X	U082
573-56-8 8576	SL2975000	2,6-DINITROPHENOL	1599	DNH			C6-H4-N2-O5		X	10				
606-20-2 8577	XT1925000	2,6-DINITROTOLUENE	2038				C7-H6-N2-O4		X	1000			X	U105
87-62-7	ZE9275000	2,6-XYLIDINE					C8-H11-N					X		
93-72-1 8029	UF8225000	2-(2,4,5-TRICHLOROPHENOXY)-PROPIONIC ACID	2765		5125		C9-H7-C13-O2 4941179		X	100			X	U233
121-14-2 8578	XT1575000	2-4 DINTROTOLUENE	1600		0990		C7-H6-N2-O4		X	1000			X	U106
53-96-3	AB9450000	2-ACETYLAMINOFLUORENE			0065		C15-H13-N-O		X	1			X	U005
117-79-3	CB5120000	2-AMINOANTHRAQUINONE					C14-H9-N-O2					X		
1338-23-4 3933	EL9470000	2-BUTANONE PEROXIDE	2550		1750				X	10			X	U160
532-27-4 3972	AM6300000	2-CHLOROACETOPHENONE	1697		0618		C8-H7-C1-O 4925220					X		
1622-32-8		2-CHLOROETHANESULFONYL CHLORIDE					C2-H4-C12-O2-S	X		1	500			
110-75-8	KN6300000	2-CHLOROETHYL VINYL ETHER				2-3-2	C4-H7-C1-O		X	1000			X	U042
95-57-8	SK2625000	2-CHLOROPHENOL	2020		0672		C6-H5-C1-O		X	100			X	U048
110-80-5 3413	KK8050000	2-ETHOXYETHANOL	1171		1033	2-2-0	C4-H10-O2 4913116			1		X		
98-01-1 3522	LT7000000	2-FURANCARBOXYLALDEHYDE	1199		1325		C5-H4-O2 4913146		X	5000			X	U125
109-86-4 3415	KL5775000	2-METHOXYETHANOL	1188		0590	2-2-0	C3-H8-O2 4913162					X		
99-55-8	XU8225000	2-METHYL-5-NITRO-BENZENAMINE					C7-H8-N2-O2		X	1			X	U190
140-76-1 5154	UT2975000	2-METHYL-5-VINYL-PYRIDINE					C8-H9-N	X		1	500			

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA C
88-75-5 6902	SM2100000	2-NITROPHENOL	1663	NTP			C6-H5-N-O3		X	100			X	
79-46-9 6904	TZ5250000	2-NITROPROPANE	2608	NPM	1941	2-3-1	C3-H7-N-O2		X	1			X	X U1
90-43-7	DV5775000	2-PHENYLPHENOL			P227		C12-H10-O						X	
109-06-8 8859	TJ4900000	2-PICOLINE	2313			2-2-0	C6-H7-N		X	5000				X U1
91-94-1	DD0525000	3,3'-DICHLOROBENZIDINE			0869		C12-H10-C12-N2		X	1			X	X U0
119-90-4	DD0875000	3,3'-DIMETHOXYBENZIDINE			0873		C14-H16-N2-O2		X	1			X	X U0
119-93-7	DD1225000	3,3'-DIMETHYLBENZIDINE			2450		C14-H16-N		X	1			X	X U0
78-71-7		3,3-BIS(CHLOROMETHYL) OXETANE					C5-H8-C12-O	X		1	500			
609-19-8	SN1650000	3,4,5-TRICHLOROPHENOL					C6-H3-C13-O		X	10				
225-51-4	CU2975000	3,4-BENZ[C]ACRIDINE					C17-H11-N		X	1			X	U01
102-36-3 5032	NQ8760000	3,4-DICHLOROPHENYL ISOCYANATE					C7-H3-C12-N-O	X		1	500/10000			
610-39-9 8579	XT2100000	3,4-DINITROTOLUENE	2038	DNU			C7-H6-N2-O4		X					
23950-58-5	CV3460000	3,5-DICHLORO-N-(1,1-DIMETHYL-2 PROPYNYL) BENZAMIDE			K208		C12-H11-C12-N-O		X	5000			X	U13
64-00-6 5117	FB7875000	3-(1-METHYLETHYL)-PHENOL, METHYL-CARBAMATE					C11-H15-N-O2	X		1	500/10000			
98-16-8 4705	XU9180000	3-(TRIFLUOROMETHYL)-BENZENAMINE	2948				C7-H6-F3-N	X		1	500			
542-76-7 5156	UG1400000	3-CHLOROPROPIONITRILE				2-1	C3-H4-C1-N	X	X	1000	1000		X	P02
3569-57-1	WS2800000	3-CHLOROPROPYL OCTYLSULFOXIDE						X		1	500			
70-69-9	UG7350000	4'-AMINOPROPIOPHENONE					C9-H11-N-O	X		1	100/10000			
101-61-1	BY5250000	4,4' METHYLENE BIS(N,N-DIMETHYL) BENZENEAMINE					C17-H22-N2					X		
101-80-4	BY7900000	4,4'-DIAMINODIPHENYL ETHER			1977		C12-H12-N2-O					X		
80-05-7 8331	SL6300000	4,4'-ISOPROPYLIDENEDIPHENOL			0372		C15-H16-O2					X		
101-77-9 3080	BY5425000	4,4'-METHYLENE DIANILINE	2651		1732		C13-H14-N2					X		

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101-14-4	CY1050000	4,4'-METHYLENEBIS(2-CHLOROANILINE)				2650	C13-H12-C12-N2		X	1		X	X	U
139-65-1	BY9625000	4,4'-THIODIANILINE					C12-H12-N2-S					X		
3615-21-2	DD7350000	4,5-DICHLOROBENZIMIDAZOLE 2-(TRIFLUOROMETHYL)-						X		1	500/10000			
131-89-5	SK6650000	4,6-DINITRO-O-CYCLOHEXYPHENOL	9026				C12-H14-N2-05		X	100			X	P
534-52-1	GO9625000	4,6-DINITRO-O-CRESOL	1598	DNC	0975		C7-H6-N2-05	X	X	10	10/10000	X	X	P
106-49-0 9128	XU3150000	4-AMINO-1-METHYL BENZENE	1708				C7-H9-N		X	1				
504-24-5 5165	US1750000	4-AMINO-PYRIDINE	2671				C5-H6-N2	X	X	1000	500/10000		X	P
60-09-3	BY8225000	4-AMINOAZOBENZENE				A508	C12-H11-N3					X		
92-67-1	DU8925000	4-AMINOBIPHENYL				0162	C12-H11-N					X		
59-50-7 2885	GO7100000	4-CHLORO-M-CRESOL	2669				C7-H7-C1-O		X	5000			X	U
106-47-8	BX0700000	4-CHLOROBENZENAMINE	2018		C138		C6-H6-C1-N		X	1000			X	P
7005-72-3		4-CHLOROPHENYL PHENYL ETHER					C12-H9-C1-O		X	5000				
60-11-7	BX7350000	4-DIMETHYLAMINOAZOBENZENE				0929	C14-H15-N3		X	1		X	X	U
3254-63-5 5134	TC5075000	4-METHYLTHIOPHENYL DIMETHYL PHOSPHATE					C9-H13-04-P-S	X		1	500			
1124-33-0 5166	UT6380000	4-NITRO-, 1-OXIDE-PYRIDINE					C5-H4-N2-03	X		1	500/10000			
100-01-6 7342	BY7000000	4-NITRO-BENZENAMINE	1661		1865		C6-H6-N2-02 4921467	X		5000			X	P
92-93-3	DV5600000	4-NITROBIPHENYL				1875	C12-H9-N-02					X		
100-02-7 8901	SM2275000	4-NITROPHENOL	1663	NPH	N607		C6-H5-N-03		X	100		X	X	U
51-43-4	DO2625000	4-[1-HYDROXY-2-(METHYLAMINO)ETHYL]-1,2-BENZENEDIOL					C9-H13-N-03		X	1000			X	P
99-59-2	BZ7175000	5-NITRO-O-ANISIDINE					C7-H8-N2-03					X		
66-75-1	YU8925000	5-[BIS(2-CHLOROETHYL)AMINO] URACIL					C8-H11-C12-N3-02		X	1			X	U
57-97-6	CW3850000	7,12-DIMETHYL-1,2-BENZ[A]ANTHRACENE					C20-H16		X	1			X	U

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83-32-9		ACENAPHTHENE					C12-H10		X	100				
208-96-8	AB1254000	ACENAPHTHYLENE					C12-H8		X	5000				
75-07-0 2269	AB1925000	ACETALDEHYDE	1089	AAD	0010	2-4-2	C2-H4-O 4907210		X	1000		X	X	U001
60-35-5	AB4025000	ACETAMIDE			A625		C2-H5-N-O					X		
64-19-7 9215	AF1300000	ACETIC ACID	2789	AAC	0020	2-2-1	C2-H4-O2 4931401		X	5000				
141-78-6 665	AH5425000	ACETIC ACID, ETHYL ESTER	1173	ETA	1040	1-3-0	C4-H8-O2 4909160		X	5000			X	U112
301-04-2 3732	AI5250000	ACETIC ACID, LEAD SALT	1616	LAC			C4-H6-O4 .Pb 4966640		X	5000			X	U144
563-68-8	AJ5425000	ACETIC ACID, THALIUM(I) SALT					C2-H3-O2 .Tl		X	100			X	U214
108-24-7 2276	AK1925000	ACETIC ANHYDRIDE	1715	ACA	0030	2-2-1	C4-H6-O3 4931304		X	5000				
67-64-1 8	AL3150000	ACETONE	1090	ACT	0040	1-3-0	C3-H6-O 4908105		X	5000		X	X	U002
75-86-5 2278	OD9275000	ACETONE CYANOHYDRIN	1541	ACY		4-1-2	C4-H7-N-O 4921401	X	X	10	1000		X	P069
1752-30-3	AL7350000	ACETONE THIOSEMICARBAZIDE	1090	ACT			C4-H9-N3-S	X		1	1000/10000			
75-05-8 11	AL7700000	ACETONITRILE	1648	ACN	0060	2-3-0	C2-H3-N 4907405		X	5000		X	X	U003
98-86-2 7421	AM5250000	ACETOPHENONE	1993	ACP	A169	1-2-0	C8-H8-O 4915273		X	5000			X	U004
900-95-8	WH6650000	ACETOXYTRIPHENYLSTANNANE					C20-H18-O2-Sn	X		1	500/10000			
506-96-7 2283	AO5955000	ACETYL BROMIDE	1716	ABM			C2-H3-Br-O 4931705		X	5000				
75-36-5 2284	AO6390000	ACETYL CHLORIDE	1717	ACC	A179	3-3-2	C2-H3-Cl-O 4907601		X	5000			X	U006
107-02-8 2300	AS1050000	ACROLEIN	1092	ARL	0110	3-3-2	C3-H4-O 4906410	X	X	1	500	X	X	P007
79-06-1 2302	AS3325000	ACRYLAMIDE	1993	AAN	0115		C3-H5-N-O 4913187	X	X	5000	1000/10000	X	X	U007
79-10-7 29	AS4375000	ACRYLIC ACID	2218	ACR	0117	3-2-2	C3-H4-O2 4931405		X	5000		X		
107-13-1 4849	AT5250000	ACRYLONITRILE	1093	ACN	0120	4-3-2	C3-H3-N 4906420	X	X	100	10000	X	X	U009
814-68-6 4850	AT7350000	ACRYLYL CHLORIDE					C3-H3-Cl-O	X		1	100			

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124-04-9 2308	AU8400000	ADIPIC ACID	9077	ADA	A155	0-1	C6-H10-O4 4966110		X	5000				
111-69-3 2309	AV2625000	ADIPONITRILE	2205	ADN	A509	4-2-0	C6-H8-N2	X		1	1000			
116-06-3 4852	UE2275000	ALDICARB		PAD	0123		C7-H14-N2-O2-S	X	X	1	100/10000		X	P
309-00-2 4853	IO2150000	ALDRIN	2761	ALD	0125		C12-H8-Cl6 4921403	X	X	1	500/10000	X	X	P
107-18-6 2357	BA5075000	ALLYL ALCOHOL	1098	ALA	0130	3-3-0	C3-H6-O 4907425	X	X	100	1000		X	P
107-05-1 2360	UC7350000	ALLYL CHLORIDE	1100	ALC	0140	3-3-1	C3-H5-Cl 4907412		X	1000		X		
107-11-9 2358	BA5425000	ALLYLAMINE	2334			3-3-1	C3-H7-N	X		1	500			
319-84-6	GV3500000	ALPHA - BHC					C6-H6-Cl6		X	1				
122-09-8	SH4025000	ALPHA,ALPHA-DIMETHYLPHENETHYLAMINE					C10-H15-N		X	5000			X	P0
959-98-8		ALPHA-ENDOSULFAN					C9-H6-Cl6-O3-S		X	1				
134-32-7 4006	QJ0300000	ALPHA-NAPHTHYLAMINE	2077		1815	2-1-0	C10-H9-N		X	1		X	X	U1
7429-90-5	BD0330000	ALUMINUM (FUME OR DUST)	1309		0160		Al					X		
1344-28-1	BD1200000	ALUMINUM OXIDE			0160		Al2-O3					X		
20859-73-8 59	BD1400000	ALUMINUM PHOSPHIDE	1397				Al-P 4916305	X	X	100	500		X	P00
10043-01-3 2394	BD1700000	ALUMINUM SULFATE	1760	ALM			O12-S3 .2Al 4944165		X	5000				
54-62-6 4857	MA1050000	AMINOPTERIN					C19-H20-N8-O5	X		1	500/10000			
78-53-5 4858	TF0525000	AMITON					C10-H24-N-O3-P-S 4966208	X		1	500			
3734-97-2 4859	TF1400000	AMITON OXALATE					C10-H24-N-O3-P-S .C2-H2-O4	X		1	100/10000			
61-82-5	XZ3850000	AMITROLE					C2-H4-N4		X	1			X	U01
7664-41-7 5360	BO0875000	AMMONIA	1005	AMA	0170	3-1-0	H3-N 4904210	X	X	100	500	X		
631-61-8 2412	AF3675000	AMMONIUM ACETATE	9079	AAT			C2-H4-O2 .H-O4-S 4966708		X	5000				
1863-63-4 2414	DG3378000	AMMONIUM BENZOATE	9080	ABZ			C7-H6-O2 .H3-N 4966304		X	5000				

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CE
1066-33-7 2415	BQ8600000	AMMONIUM BICARBONATE	9081	ABC			C-O3 .2H4-N 4966308		X	5000				
7789-09-5 2425	HX7650000	AMMONIUM BICHROMATE	1431	AMB	0686		Cr2-H8-N2-07 4918330		X	1000				
1341-49-7 2431	BQ9200000	AMMONIUM BIFLOURIDE	2817	ABF			F2-H5-N 4932307		X	100				
10192-30-0 2419	WT3595000	AMMONIUM BISULFITE	2693	ASU			H3-N .H2-O3-S 4932346		X	5000				
1111-78-0 2420	EY8575000	AMMONIUM CARBAMATE	9083	ACM			C-H3-N-02 .H3-N 4941145		X	5000				
506-87-6 2421	BP1925000	AMMONIUM CARBONATE	9084	ACB			C-H2-O3 .2H3-N 4941149		X	5000				
12125-02-9 2422	BP4550000	AMMONIUM CHLORIDE	9085	ACC	0175		H4-N .Cl 4966316		X	5000				
7788-98-9 2423	GB2880000	AMMONIUM CHROMATE	9086	ACH	0686		Cr-H2-04 .2H3-N 4963302		X	1000				
3012-65-5 2424	GE7573000	AMMONIUM CITRATE, DIBASIC	9087	ACI			C6-H8-07 .2H3-N 4966320		X	5000				
12125-01-8 2427	BQ6300000	AMMONIUM FLOURIDE	2505	AFR			H4-N .F 4944105		X	100				
13826-83-0 5375	BQ6100000	AMMONIUM FLUOBORATE	9088	AFB			B-F-H4-N 4944125		X	5000				
1336-21-6 2434	BQ9625000	AMMONIUM HYDROXIDE	2672	AMH			H4-N .H-O		X	1000				
6484-52-2 5397	BR9050000	AMMONIUM NITRATE (SOLUTION)	2426	AMN	A613		H-N-O3 .H3-N 4918744					X		
5972-73-6 2449		AMMONIUM OXALATE	2449	AOX			C2-H8-N2-04		X	5000				
6009-70-7 2449		AMMONIUM OXALATE	2449	AOX			C2-H8-N2-04		X	5000				
14258-49-2 2449		AMMONIUM OXALATE	2449	AOX			C2-H8-N2-04		X	5000				
131-74-8 5403	BS3855000	AMMONIUM PICRATE	0004				C6-H3-N3-07 .H3-N 4901507		X	10			X	P000
16919-19-0 5407	GQ9450000	AMMONIUM SILICOFLOURIDE	2854	ASL			F6-Si .2H4-N 4944135		X	1000				
7773-06-0 2457	WO6125000	AMMONIUM SULFAMATE	9089	ASM	0185		H2-N-O3-S .H4-N 4966732		X	5000				
7783-20-2	BS4500000	AMMONIUM SULFATE (SOLUTION)	2506	AMS			O4-S .2H4-N						X	
12135-76-1 2458	BS4920000	AMMONIUM SULFIDE	2683	ASF			H8-N2-S 4909303		X	100				
10196-04-0 2459	WT3505000	AMMONIUM SULFITE	9090	AMF			H3-N .1/2H2-O3-S 4966332		X	5000				

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3164-29-2	WW8050000	AMMONIUM TARTRATE	9091	ATR			C4-H6-O6 .2H3-N							
2460							4966336		X	5000				
14307-43-8		AMMONIUM TARTRATE	9091	ATR			C4-H6-O6 .XH3-N							
2460									X	5000				
1762-95-4	XK7875000	AMMONIUM THIOCYANATE	9092	AMT			C-N-S .H4-N							
2461							4966738		X	5000				
7783-18-8	XN6465000	AMMONIUM THIOSULFATE	9093	ATF			H3-N .1/2H3-O4-P							
2462							4966750		X	5000				
7803-55-6	YW0875000	AMMONIUM VANADATE	2859				O3-V .H4-N							
2435									X	1000			X	PI
300-62-9	SH9450000	AMPHETAMINE					C9-H13-N							
4862								X		1	1000			
628-63-7	AJ1925000	AMYL ACETATE	1104	AML	0190	1-3-0	C7-H14-O2							
2465							4909111		X	5000				
62-53-3	BW6650000	ANILINE	1547	ANL	0220	3-2-0	C6-H7-N							
2485							4921410	X	X	5000	1000		X	X UO
120-12-7	CA9350000	ANTHRACENE		ATH	0227	0-1	C14-H10							
9283									X	5000			X	
7440-36-0	CC4025000	ANTIMONY	2871		0230		Sb							
2500									X	5000			X	
		ANTIMONY COMPOUNDS												
2494									X				X	
7647-18-9	CC5075000	ANTIMONY PENTACHLORIDE	1730	APC	0230		Cl5-Sb							
5464							4932310		X	1000				
7783-70-2	CC5800000	ANTIMONY PENTAFLOURIDE	1732	APF	0230		F5-Pb							
146							4932005	X		1	500			
28300-74-5	CC6825000	ANTIMONY POTASSIUM TARTRATE	1551	APT	0230		C4-H4-O7-Sb .K							
2499							4941114		X	100				
7789-61-9	CC4400000	ANTIMONY TRIBROMIDE	1549	ATB	0230		Br3-Sb							
2502							4932317		X	1000				
10025-91-9	CC4900000	ANTIMONY TRICHLORIDE	1733	ATM	0230		Cl3-Sb							
2504							4932318		X	1000				
7783-56-4	CC5150000	ANTIMONY TRIFLOURIDE	1549	ATT	0230		F3-Sb							
2506							4932335		X	1000				
1309-64-4	CC5650000	ANTIMONY TRIOXIDE	9201	ATX	0230		O3-Sb2							
2507							4966905		X	1000				
1397-94-0	CD0350000	ANTIMYCIN A					C28-H40-N2-O9							
4866								X		1	1000/10000			
86-88-4	YT9275000	ANTU	1651		0235		C11-H10-N2-S							
4867								X	X	100	500/10000		X	P075
12674-11-2	TQ1351000	AROCLOR 1016	2315	PCB										
									X	10				
11104-28-2	TQ1352000	AROCLOR 1221	2315	PCB	C106									
									X	10				

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11141-16-5	TQ1354000	AROCLOR 1232	2315	PCB	C108				X	10				
53469-21-9	TQ1356000	AROCLOR 1242	2314	PCB	0630				X	10				
12672-29-6	TQ1358000	AROCLOR 1248	2315	PCB	C225				X	10				
11097-69-1	TQ1360000	AROCLOR 1254	2315	PCB	0631				X	10				
11096-82-5	TQ1362000	AROCLOR 1260	2315	PCB	C107				X	10				
7440-38-2 171	CG0525000	ARSENIC	1558		0260		As 4923207		X	1		X		
1327-52-2		ARSENIC ACID	1554	ASA	0260		As-H3-04		X	1			X	P0
7778-39-4 160	CG0700000	ARSENIC ACID	1554	ASA	0260		As-H3-04 4923105		X	1			X	P0
5502		ARSENIC AND COMPOUNDS							X			X		
1303-32-8		ARSENIC DISULFIDE	1557	ARD	0260		As4-S4		X	5000				
1303-28-2 2528	CG2275000	ARSENIC PENTOXIDE	1559	APO	0260		As2-05 4923112	X	X	5000	100/10000		X	P0
1303-33-9 2531	CG2638000	ARSENIC TRISULFIDE	1557	ART	0260		As2-S3 4923222		X	5000				
1327-53-3 2530	CG3325000	ARSENOUS OXIDE	1561	ATO			As2-03 4923115	X	X	5000	100/10000		X	P0
7784-34-1 2529	CG1750000	ARSENOUS TRICHLORIDE	1560	AST			As-C13 4923209	X	X	5000	500			
7784-42-1 178	CG6475000	ARSINE	2188		0270		As-H3 4920135	X		1	100			
1332-21-4	CI6475000	ASBESTOS	2590		9020				X	1		X		
115-02-6	VT9625000	AZASERINE					C5-H7-N3-04		X	1			X	U0
2642-71-9 4873	TD8400000	AZINPHOS-ETHYL			AZM	A618	C12-H16-N3-03-P-S2	X		1	100/10000			
86-50-0 5528	TE1925000	AZINPHOS-METHYL	2783	AZM	0300		C10-H12-N3-03-P-S2 4921526	X	X	1	10/10000			
7440-39-3 2548	CQ8370000	BARIUM	1400				Ba					X		
2554		BARIUM COMPOUNDS										X		
542-62-1 2555	CQ8785000	BARIUM CYANIDE	1565	BCY	0310		C2-Ba-N2 4923410		X	10			X	P0

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98-87-3	CZ5075000	BENZAL CHLORIDE	1886				C7-H6-C12							
2606							4908110	X	X	5000	500		X	X
55-21-0	CU8700000	BENZAMIDE					C7-H7-N-O							
												X		
71-43-2	CY1400000	BENZENE	1114	BNZ	0320	2-3-0	C6-H6							
2577							4908110		X	1000			X	X
98-05-5	CY3150000	BENZENEARSONIC ACID					C6-H7-As-O3							
4878								X		1	10/10000			
98-09-9	DB8750000	BENZENESULFONYL CHLORIDE	2225				C6-H5-Cl-O2-S							
2582									X	100	10000		X	X
92-87-5	DC9625000	BENZIDINE	1885		0330		C12-H12-N2							
223							4921503		X	1		X	X	X
65-85-0	DG0875000	BENZOIC ACID	9094	BZA	8409	2-1	C7-H6-O2							
2585							4966340		X	5000				
100-47-0	DI2450000	BENZONITRILE	2224	BZN			C7-H5-N							
2590							4913134		X	5000				
98-07-7	XT9275000	BENZOTRICHLORIDE	2226	BCL	8408	3-1-0	C7-H5-Cl3							
2592								X	X	1	100		X	X
98-88-4	DM8600000	BENZOYL CHLORIDE	1736	BZC	8507	3-2-1	C7-H5-Cl-O							
2594							4931725		X	1000			X	
94-36-0	DM8575000	BENZOYL PEROXIDE	2085	DPO	0335		C14-H10-O4							
233							4919113						X	
50-32-8	DJ3675000	BENZO[A]PYRENE			0726		C20-H12							
									X	1			X	X
205-99-2	CU1400000	BENZO[B]FLUORANTHENE					C20-H12							
									X	1				
191-24-2	DI6200500	BENZO[GHI]PERYLENE					C22-H12							
									X	5000				
206-44-0	LL4025000	BENZO[JK]FLOURENE			F115		C16-H10							
									X	100			X	X
207-08-9	DF6350000	BENZO[K]FLUORANTHENE					C20-H12							
									X	1				
100-44-7	XS8925000	BENZYL CHLORIDE	1738	BZC	0340	2-2-1	C7-H7-Cl							
2602							4936012	X	X	100	500		X	X
140-29-4	AM1400000	BENZYL CYANIDE	2470			2-1-0	C8-H7-N							
								X		1	500			
56-55-3	CV9275000	BENZ[A]ANTHRACENE			0350		C18-H12							
									X	1			X	X
7440-41-7	DS1750000	BERYLLIUM	1567	BEM	0360		Be							
8324									X	1		X	X	X
7787-47-5	DS2625000	BERYLLIUM CHLORIDE	1566	BEC	0360		Be-Cl2							
2610							4923305		X	5000				
		BERYLLIUM COMPOUNDS												
238									X			X		

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7787-49-7 2612	DS2800000	BERYLLIUM FLUORIDE	1566	BEF	0360		Be-F2 4923310		X	5000				
7787-55-5 2613		BERYLLIUM NITRATE	2464	BEN	0360		Be-N2-06		X	5000				
13597-99-4 2613	DS3675000	BERYLLIUM NITRATE	2464	BEN	0360		Be-N2-06 4918759		X	5000				
319-85-7	GV4375000	BETA - BHC					C6-H6-C16		X	1				
91-58-7	QJ2275000	BETA-CHLORONAPHTHALENE					C10-H7-C1		X	5000			X	U047
33213-65-9		BETA-ENDOSULFAN					C9-H6-C16-03-S		X	1				
91-59-8 4007	QM2100000	BETA-NAPHTHYLAMINE	1650		1820		C10-H9-N		X	1		X	X	U168
57-57-8 9020	RQ7350000	BETA-PROPIOLACTONE	1993	PLT	2163	0-2-0	C3-H4-02 4913110	X		1	500	X		
15271-41-7 4883	RB7700000	BICYCLO[2.2.1]HEPTANE-2-CARBONI-TRILE, 5-CHLORO-6-((((METHYLA					C10-H12-C1-N3-02	X		1	500/10000			
92-52-4 5603	DU8050000	BIPHENYL	1993		1011	2-1-0	C12-H10 4913108					X		
108-60-1	KN1750000	BIS (2-CHLORO-1-METHYLETHYL) ETHER	2490				C6-H12-C12-0		X	1000		X	X	U027
111-44-4 3150	KN0875000	BIS (2-CHLOROETHYL) ETHER	1916	DEE	0880		C4-H8-C12-0 4921550	X	X	1	10000	X	X	U025
111-91-1	PA3675000	BIS (2-CHLOROETHOXY) METHANE					C5-H10-C12-02		X	1000			X	U024
103-23-1 8580	AU9700000	BIS (2-ETHYLHEXYL) ADIPATE				D107	C22-H42-04					X		
542-88-1 3146	KN1575000	BIS (CHLOROMETHYL) ETHER	2249		2630		C2-H4-C12-0	X	X	1	100	X	X	P016
137-26-8 1603	JO1400000	BIS (DIMETHYLTHIOCARBAMOYL) DISULFIDE	2771				C6-H12-N2-S4 4941187		X	10			X	U244
534-07-6 3125	UC1430000	BIS(CHLOROMETHYL) KATONE	2649				C3-H4-C12-0	X		1	10/10000			
4044-65-9 4885	NX9150000	BITOSCANATE					C8-H4-N2-S2	X		1	500/10000			
10294-34-5 254	ED1925000	BORON TRICHLORIDE	1741	BRT			B-C13 4932011	X		1	500			
353-42-4 4888	ED8400000	BORON TRIFLOURIDE / METHYL ETHER	2965	BRT	0382	3-2-1	C2-H6-0 .B-F3	X		1	1000			
7637-07-2 255	ED2275000	BORON TRIFLOURIDE	1008		0382	3-2-1	B-F3 4904110	X		1	500			
38772-56-7 4889	GN4934700	BROMADIOLONE					C30-H23-Br-04	X		1	100/10000			

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7726-95-6 257	EF9100000	BROMINE	1744	BRX	0390		Br2 4936110	X		1	500					
598-31-2 2648	UC0525000	BROMOACETONE	1569				C3-H5-Br-O 4920101		X	1000					X	P
75-25-2 2656	PB5600000	BROMOFORM	2515		0400		C-H-Br3		X	100			X		X	U
74-83-9 1091	PA4900000	BROMOMETHANE	1062	MTB	1680	3-1-0	C-H3-Br 4921440	X	X	1000	1000		X		X	U
357-57-3 2664	EH8925000	BRUCINE	1570	BRU	0405		C23-H26-N2-04 4921411		X	100					X	P
106-99-0 4891	EI9275000	BUTADIENE	1010	BDI	0410		C4-H6			1	10000		X			
123-86-4 2672	AF7350000	BUTYL ACETATE	1123	BCN	0440	1-3-0	C6-H12-02 4909128		X	5000						
141-32-2 2674	UD3150000	BUTYL ACRYLATE	2348	BTC	0450	2-2-2	C7-H12-02 4912215						X			
85-68-7 5354	TH9990000	BUTYL BENZYL PHTHALATE		BPH		1-1-0	C19-H20-04		X	100			X			
109-73-9 2677	EO2975000	BUTYLAMINE	1125	BAM	0470	2-3-0	C4-H11-N 4908120		X	1000						
123-72-8 291	ES2275000	BUTYRALDEHYDE	1129	BTR	8707	2-3-0	C4-H8-O 4908119						X			
107-92-6 2749	ES5425000	BUTYRIC ACID	2820	BRA	8709	2-2-0	C4-H8-02 4931414		X	5000						
2650-18-2	BQ4550000	C.I. ACID BLUE 9, DIAMMONIUM SALT					C37-H36-N2-09-S3 .2N-H3						X			
3844-45-9	BQ4725000	C.I. ACID BLUE 9, DISODIUM SALT					C37-H36-N2-09-S3 .2Na						X			
4680-78-8	BQ4375000	C.I. ACID GREEN 3					C37-H36-N2-06-S2 .Na						X			
569-64-2	BQ1180000	C.I. BASIC GREEN 4					C23-H25-N2 .Cl						X			
989-38-8	DH0175000	C.I. BASIC RED 1					C28-H30-N2-03 .Cl-H						X			
1937-37-7	QJ6160000	C.I. DIRECT BLACK 38			1012		C34-H25-N9-07-S2 .2Na						X			
16071-86-6	GL7375000	C.I. DIRECT BROWN 95			D137		C31-H20-N6-09-S .Cu .2Na						X			
2832-40-8	AC3662000	C.I. DISPERSE YELLOW 3			C722		C15-H15-N3-02						X			
81-88-9	BP3675000	C.I. FOOD RED 15			0848		C28-H31-N2-03 .Cl						X			
3761-53-3	QJ6825000	C.I. FOOD RED 5					C18-H14-N2-07-S2 .2Na						X			

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3118-97-6	GL5850000	C.I. SOLVENT ORANGE 7					C18-H16-N2-O					X		
97-56-3	XU8800000	C.I. SOLVENT YELLOW 3					C14-H15-N3					X		
492-80-8	BY3500000	C.I. SOLVENT YELLOW 34 (AURAMINE)			A609		C17-H21-N3		X	1000		X	X	U0
842-07-9	QL4900000	C.I. SOLVENT YELLOW 14			S106		C16-H12-N2-O					X		
128-66-5	HQ7030000	C.I. VAT YELLOW 4					C24-H12-O2					X		
75-60-5 2754	CH7525000	CACODYLIC ACID	1572	CDA			C2-H7-As-O2		X	1			X	U1
7440-43-9	EU9800000	CADMIUM	2570		0490		Cd		X	1		X		
543-90-8 2755	EU9810000	CADMIUM ACETATE	2570	CAT			C2-H4-O2 .1/2Cd 4962303		X	100				
7789-42-6 2756	EU9935000	CADMIUM BROMIDE	2570	CMB			Br2-Cd 4962305		X	100				
10108-64-2 2757	EV0175000	CADMIUM CHLORIDE	2570	CDC			Cd-Cl2 4962505		X	100				
2758		CADMIUM COMPOUNDS							X			X		
1306-19-0 4895	EV1925000	CADMIUM OXIDE	2570	COX	0491		Cd-O	X		1	100/10000			
2223-93-0 4896	RG1050000	CADMIUM STEARATE					C36-H72-O4 .Cd	X		1	1000/10000			
7778-44-1 2765	CG0830000	CALCIUM ARSENATE	1573	CCA	0500		As2-O8 .3Ca 4923217	X	X	1000	500/10000			
52740-16-6 2767	CH9493100	CALCIUM ARSENITE	1574	CAS			As2-O6 .3Ca 4923219		X	1000				
75-20-7 2769	EV9400000	CALCIUM CARBIDE	1402	CCB			C2-Ca 4916408		X	10				
13765-19-0 2773	GB2750000	CALCIUM CHROMATE	9096	CCR	0686		Cr-O4 .Ca 4963307		X	1000			X	U03
156-62-7 303	GS6000000	CALCIUM CYANAMIDE	1403		0510		C-N2 .Ca 4945516					X		
592-01-8 2775	EW0700000	CALCIUM CYANIDE	1575	CCN			C2-Ca-N2 4923223		X	10			X	P02
26264-06-2 2777	DB6620000	CALCIUM DODECYLBENZENE SULFONATE	9097				C36-H60-O6-S2 .Ca 4963309		X	1000				
7778-54-3 2783	NH3485500	CALCIUM HYPOCHLORITE, DRY	1748	CHY	C110		C12-H2-O2 .Ca 4918715		X	10				
56-25-7 4899	RN8575000	CANTHARIDIN					C10-H12-O4	X		1	100/10000			

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133-06-2 2803	GW5075000	CAPTAN	9099	CPT	0529		C9-H8-C13-N-02-S 4961167		X	10		X		
51-83-2 4900	GA0875000	CARBACHOL CHLORIDE					C6-H15-N2-02 .CL		X	1	500/10000			
26419-73-8	FC1050000	CARBAMIC ACID, METHYL-, O-(((2,4-DIMETHYL-1, 3-DITHIOLAN-2-Y					C8-H14-N2-02-S2		X	1	100/10000			
630-10-4	YU1820000	CARBAMIMIDOSELENOIC ACID					C-H4-N2-Se		X	1000			X	P1
63-25-2 2808	FC5950000	CARBARYL	2757	CBY	0525		C12-H11-N-02 4941121		X	100		X		
1563-66-2 2809	FB9450000	CARBOFURAN	2757	CBF	0526		C12-H15-N-03 4921525	X	X	10	10/10000			
75-15-0 2813	FF6650000	CARBON DISULFIDE	1131	CBB	0540	2-3-0	C-S2 4908125	X	X	100	10000	X	X	P0
353-50-4 2829	FG6125000	CARBON OXYFLOURIDE	2417		C105		C-F2-O 4920559		X	1000			X	U0
56-23-5 2828	FG4900000	CARBON TETRACHLORIDE	1846	CBT	0570		C-C14 4940320		X	5000		X	X	U2
463-58-1 2830	FG6400000	CARBONYL SULFIDE	2204			3-4-1	C-O-S 4920169					X		
786-19-6 4904	TD5250000	CARBOPHENOTHION			C605		C11-H16-C1-02-P-S3		X	1	500			
120-80-9 8407	UX1050000	CATECHOL		CTC	0571		C6-H6-02					X		
133-90-4	DG1925000	CHLORAMBEN			A623		C7-H5-C12-N-02					X		
305-03-3	ES7525000	CHLORAMBUCIL					C14-H19-C12-N-02		X	1			X	U0
57-74-9 4906	PB9800000	CHLORDANE	2762	CDN	0611		C10-H6-C18	X	X	1	1000	X	X	U0
470-90-6 4907	TB8750000	CHLORFENVINFOS					C12-H14-C13-04-P		X	1	500			
		CHLORINATED BENZENES							X					
		CHLORINATED ETHANES							X					
76-13-1	KJ4000000	CHLORINATED FLUOROCARBON (313 - FREON 113 ONLY)			2485		C2-C13-F3					X		
		CHLORINATED NAPHTHALENE							X					
		CHLORINATED PHENOLS							X			X		
7782-50-5 2862	FO2100000	CHLORINE	1017	CLX	0640		C12 4904120	X	X	10	100	X		

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506-77-4 8479	GT2275000	CHLORINE CYANIDE	1589				C-Cl-N		X	10				
10049-04-4	FO3000000	CHLORINE DIOXIDE	9191		0614		Cl-O2					X	X	P
24934-91-6 4909	TD5170000	CHLORMEPHOS					C5-H12-Cl-O2-P-S2		X	1	500			
999-81-5 4910	BP5250000	CHLORMEQUAT CHLORIDE					C5-H13-Cl-N .Cl		X	1	100/10000			
494-03-1	QM2450000	CHLORNAPHAZINE					C14-H15-Cl2-N		X	1			X	U
107-20-0 2867	AB2450000	CHLOROACETALDEHYDE	2232		0617		C2-H3-Cl-O		X	1000	10000		X	P
79-11-8 4912	AF8575000	CHLOROACETIC ACID	1750	MCA	M145	3-1-0	C2-H3-Cl-O2 4931444	X		1	100/10000	X		
		CHLOROALKYL ETHERS							X					
108-90-7 2877	CZ0175000	CHLOROBENZENE	1134	CRB	0620	2-3-0	C6-H5-Cl 4909153		X	100		X	X	U
510-15-6	DD2275000	CHLOROBENZILATE			1113		C16-H14-Cl2-O3		X	1		X	X	U
124-48-1	PA6360000	CHLORODIBROMOMETHANE					C-H-Br2-Cl		X	100				
75-00-3 674	KH7525000	CHLOROETHANE	1037	ECL	1110	2-4-0	C2-H5-Cl 4908162		X	100		X		
107-07-3 681	KK0875000	CHLOROETHANOL	1135	ECH	1120		C2-H5-Cl-O 4921420	X		1	500			
627-11-2 4914	LQ5950000	CHLOROETHYL CHLOROFORMATE					C3-H4-Cl2-O2		X	1	1000			
67-66-3 2893	FS9100000	CHLOROFORM	1888	CRF	0670		C-H-Cl3 4940311	X	X	5000	10000	X	X	U
74-87-3 1094	PA6300000	CHLOROMETHANE	1063	MTC	1710	2-4-0	C-H3-Cl 4905761		X	1		X	X	U
107-30-2	KN6650000	CHLOROMETHYL METHYL ETHER	1239	CME	2640		C2-H5-Cl-O 4907430	X	X	1	100	X	X	U
3691-35-8 4918	NK5335000	CHLOROPHACINONE			R109		C23-H15-Cl-O3		X	1	100/10000			
126-99-8 391	EI9625000	CHLOROPRENE	1991	CRP	0680	2-3-0	C4-H5-Cl 4907223					X		
7790-94-5 5911	FX5730000	CHLOROSULFONIC ACID	1754	CSA			Cl-H-O3-S 4930204		X	1000				
1897-45-6	NT2600000	CHLOROTHALINOL			C629		C8-Cl4-N2					X		
1982-47-4 4919	YS6125000	CHLOROXURON					C15-H15-Cl-N2-O2		X	1	500/10000			

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2921-88-2	TF6300000	CHLORPYRIFOS	2783	DUR	0681		C9-H11-C13-N-03-P-S						
2937							4941123		X	1			
21923-23-9	TF1590000	CHLORTHIOPHOS					C11-H15-C12-03-P-S2						
4920								X		1	500		
1066-30-4	AG2975000	CHROMIC ACETATE	9101	CRT	0690		C6-H9-06 .Cr						
2938							4963312		X	1000			
11115-74-5		CHROMIC ACID SOLUTION	1755	CMA	0686								
2940									X	1000			
7738-94-5	GB2450000	CHROMIC ACID, SOLID	1463	CMA	0686		Cr-H2-04						
5922									X	1000			
10025-73-7	GB5425000	CHROMIC CHLORIDE	9102				C13-Cr						
4921								X		1	1/10000		
10101-53-8	GB7200000	CHROMIC SULFATE	9100	CHS			012-S3 .2Cr						
2944							4963314		X	1000			
7440-47-3	GB4200000	CHROMIUM			0685		Cr						
									X	1		X	
		CHROMIUM COMPOUNDS											
									X			X	
10049-05-5	GB5250000	CHROMOUS CHLORIDE	9102	CRC			C12-Cr						
2949							4963322		X	1000			
7440-48-4	GF8750000	COBALT			0072		Co						
4922										1	10000	X	
10210-68-1	GG0300000	COBALT CARBONYL					C8-Co2-08						
4923								X		1	10/10000		
		COBALT COMPOUNDS											
												X	
62207-76-5	GG0575000	COBALT, ((2,2'-(1,2-ETHANEDIYLBIS					C16-H12-Co-F2-N2-02						
4924		(NITRILOMETHYLIDYNE)) BIS (6						X		1	100/10000		
7789-43-7	GF9595000	COBALTOUS BROMIDE	9103	COB			Br2-Co						
2965							4963710		X	1000			
544-18-3	LQ7450000	COBALTOUS FORMATE	9104	CFM			C2-H2-04 .Co						
2966							4963327		X	1000			
14017-41-5	WO5966570	COBALTOUS SULFAMATE	9105	CBS			H6-N2-06-S2 .Co						
2967							4963329		X	1000			
	GH0346000	COKE OVEN EMISSIONS			0725	2-4-0							
									X	1			
64-86-8	GH0700000	COLCHICINE					C22-H25-N-06						
4925								X		1	10/10000		
7440-50-8	GL5325000	COPPER			0730		Cu						
									X	5000		X	
		COPPER COMPOUNDS											
									X			X	
544-92-3	GL7150000	COPPER CYANIDE	1587	CCY			C-Cu-N						
455							4923418		X	10		X	P01

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56-72-4	GN6300000	COUMAPHOS	2783	COU	0736		C14-H16-Cl-O5-P-S							
3006							4921505	X	X	10	100/10000			
5836-29-3	GN7630000	COUMATETRALYL					C19-H16-O3							
4928								X		1	500/10000			
1319-77-3	GO5950000	CREOSOLS (MIXED ISOMERS)	2076		0760		C7-H8-O							
6071							4931417		X	1000		X	X	U
8001-58-9	GF8615000	CREOSOTE	2761	CCT	C129	2-2-0								
3011									X	1			X	U
535-89-7	UV8050000	CRIMIDINE					C7-H10-Cl-N3							
4930								X		1	100/10000			
4170-30-3	GP9499000	CROTONALDEHYDE	1143	CTA	0770	3-3-2	C4-H6-O							
4931							4909137	X	X	100	1000		X	U
123-73-9	GP9625000	CROTONALDEHYDE, (E)-	1143	CTA	0770		C4-H6-O							
4931								X	X	100	1000		X	U
98-82-8	GR8575000	CUMENE	1918				C9-H12							
3018							4913160		X	5000		X	X	U
80-15-9	MX2450000	CUMENE HYDROPEROXIDE	2116		C616		C9-H12-O2							
478							4919525		X	10		X	X	U
135-20-6	NC4725000	CUPFERRON					C6-H6-N2-O2 .H4-N							
												X		
142-71-2	AG3480000	CUPRIC ACETATE	9106	CST			C4-H6-O4 .Cu							
8445							4962310		X	100				
7447-39-4		CUPRIC CHLORIDE	2802	CPC			Cl-Cu							
2988							4944173		X	100				
3251-23-8	QU7400000	CUPRIC NITRATE	1479	CNI			N2-O6 .Cu							
3023							4916744		X	100				
5893-66-3		CUPRIC OXALATE	2449	COL			C2-Cu-O4							
3024									X	100				
7758-98-7	GL8800000	CUPRIC SULFATE	9109	CSF			O4-S .Cu							
3025							4961316		X	10				
10380-29-7		CUPRIC SULFATE, AMMONIATED	9110	CSN			Cu-H12-N4 .H2-O .O4-S							
3026							4962313		X	100				
815-82-7		CUPRIC TARTRATE	9111	CTT			C4-H6-O6 .Cu							
3027							4962614		X	100				
57-12-5	MW7050000	CYANIDE (SOLUABLE SALTS)	1935	PTC	0790		C-N							
487							4923230		X	10			X	P0
		CYANIDE COMPOUNDS (CN- ONLY)												
									X			X		
460-19-5	GT1925000	CYANOGEN	1026	CYG	0800	4-4-2	C2-N2							
490							4920115		X	100			X	P0
506-68-3	GT2100000	CYANOGEN BROMIDE	1889	CBR			C-Br-N							
488							4923229	X	X	1000	500/10000		X	U2
506-78-5	NN1750000	CYANOGEN IODIDE					C-I-N							
4933								X		1	1000/10000			

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2636-26-2 4934	TF7600000	CYANOPHOS					C4-H7-C12-04-P		X	1	1000			
675-14-9 4935	XZ1750000	CYANURIC FLOURIDE					C3-F3-N3		X	1	100			
110-82-7 3043	GU6300000	CYCLOHEXANE	1145	CHX	0810		C6-H12 4908132		X	1000		X	X	U0
108-94-1 3044	GW1050000	CYCLOHEXANONE	1915	CCH	0830	1-2-0	C6-H10-O 4913179		X	5000			X	U0
66-81-9 4936	MA4375000	CYCLOHEXIMIDE					C15-H23-N-04		X	1	100/10000			
108-91-8 496	GX0700000	CYCLOHEXYLAMINE	2357	CHA	0842	2-3-0	C6-H13-N 4909139	X		1	10000			
50-18-0	RP5950000	CYCLOPHOSPHAMIDE				A617	C7-H15-C12-N2-02-P .H2-O		X	1			X	U0
20830-81-3	HB7875000	DAUNOMYCIN				A617	C27-H29-N-010		X	1			X	U0
72-54-8 8491	KI0700000	DDD	2761	DDD	0119		C14-H10-C14		X	1			X	U0
72-55-9	KV9450000	DDE				0906	C14-H8-C14		X	1				
50-29-3 3067	KJ3325000	DDT	2761	DDT	0847		C14-H9-C15 4941129		X	1			X	U0
		DDT CONGENERS							X					
17702-41-9 503	HD1400000	DECABORANE(14)	1868	DBR	0853	3-2-1	B10-H14 4916610	X		1	500/10000			
1163-19-5	KN3525000	DECABROMODIPHENYL OXIDE				0105	C12-Br10-O					X		
319-86-8	GV4550000	DELTA - BHC					C6-H6-C16		X	1				
8065-48-3 4940	TF3150000	DEMETON			DTN	0857	C8-H19-03-P-S2 .C8-H19-03-P-S2 4908132		X	1	500			
919-86-8 4941	TG1750000	DEMETON-S-METHYL					C6-H15-03-P-S2 4908132		X	1	500			
117-81-7	TI0350000	DI (2-ETHYLHEXYL) PHTHLATATE				1015	C24-H38-04		X	1		X	X	U0
10311-84-9 4942	TD5165000	DIALIFOS				T178	C14-H17-C1-N-04-P-S2 4908132		X	1	100/10000			
2303-16-4	EZ8225000	DIALLATE					C10-H17-C12-N-O-S 4908132		X	1		X	X	U0
496-72-0	XS9820000	DIAMINOTOLUENE				2465	C7-H10-N2		X	1				
823-40-5	XS9750000	DIAMINOTOLUENE				T197	C7-H10-N2		X	1			X	U0

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25376-45-8 1612	XS9445000	DIAMINOTOLUENE	1709				C7-H10-N2 4940356	X	X	1		X	X	U
334-88-3	PA7000000	DIAZAMETHANE			0861		C-H2-N2					X		
5333-41-5 3082	TF3325000	DIAZINON	2783	DZN	2720		C12-H21-N2-03-P-S 4941141	X	X	1				
53-70-3	HN2625000	DIBENZ(A,H)ANTHRACENE			D156		C22-H14		X	1			X	U0
132-64-9		DIBENZOFURAN			D639		C12-H8-O					X		
19287-45-7 4943	HQ9275000	DIBORANE	1911		0862	3-4-3	B2-H6 4905420	X	X	1	100			
84-74-2 5717	TI0875000	DIBUTYL PHTHALATE	9095		0864	0-1-0	C16-H22-04 4962110	X	X	10		X		U0
1918-00-9 3119	DG7525000	DICAMBA	2769	DIC	8345		C8-H6-C12-03 4963334	X	X	1000				
1194-65-6 3122	DI3500000	DICHLOBENIL	2769	DIB			C7-H3-C12-N 4963809	X	X	100				
117-80-6 3123	QL7525000	DICHLONE	2761	DCL			C10-H4-C12-02 4960617	X	X	1				
25321-22-6	CZ4430000	DICHLOROBENZENE (MIXED)	1591	DBM	0867		C6-H4-C12		X	100		X		
75-27-4	PA5310000	DICHLOROBROMOMETHANE					C-H-Br-C12		X	5000		X		
75-71-8 3138	PA8200000	DICHLORODIFLUOROMETHANE	1028	DCF	0871		C-C12-F2 4904516	X	X	5000			X	U0
75-09-2 3154	PA8050000	DICHLOROMETHANE (METHYLENE CHLORIDE)	1593	DCM	1730	2-1-0	C-H2-C12 4941132	X	X	1000		X	X	U0
149-74-6 3960	VV3530000	DICHLOROMETHYLPHENYLSILANE	2437				C7-H8-C12-Si	X	X	1	1000			
8003-19-8 550	TX9800000	DICHLOROPROPANE / DICHLOROPROPENE	2047	DPP			C3-H6-C12 .C3-H4-C12 4907640	X	X	100				
26638-19-7	TX9350000	DICHLOROPROPANE	1279	DPP			C3-H6-C12		X	1000				
26952-23-8 3163	UC8280000	DICHLOROPROPENE	2047	DPU			C3-H4-C12		X	100				
62-73-7 3172	TC0350000	DICHLORVOS	2783	DCV	0850		C4-H7-C12-04-P 4921534	X	X	10	1000	X		
115-32-2 9395	DC8400000	DICOFOL	2761		D126		C14-H9-C15-0 4966930	X	X	10		X		
141-66-2 4949	TC3850000	DICROTOPHOS			0902		C8-H16-N-05-P	X	X	1	100			
60-57-1 3187	IO1750000	DIELDRIN	2761	DED	0905		C12-H8-C16-0 4941134	X	X	1			X	P0

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1464-53-5 4950	EJ8225000	DIEPOXYBUTANE					C4-H6-02	X	X	1	500		X	X U
111-42-2 8532	KL2975000	DIETHANOLAMINE		DEA		1-1-0	C4-H11-N-02					X		
814-49-3 4951	TD1400000	DIETHYL CHLOROPHOSPHATE					C4-H10-C1-03-P	X		1	500			
84-66-2 8534	TI1050000	DIETHYL PHTHALATE		DHP	0933	0-1-0	C12-H14-04	X	1000			X	X	U
64-67-5 3212	WS7875000	DIETHYL SULFATE	1594		0913	3-1-1	C4-H10-04-S 4933320					X		
311-45-5	TC2275000	DIETHYL-P-NITROPHENYL PHOSPHATE					C10-H14-N-06-P	X		100			X	P
109-89-7 3193	HZ8750000	DIETHYLAMINE	1154	DEN	5091	2-3-0	C4-H11-N 4907815	X		100				
692-42-2		DIETHYLARSINE						X		1			X	P
1642-54-2 4953	TL1225000	DIETHYLCARBAMAZINE CITRATE					C10-H21-N3-0 .C6-H8-07	X		1	100/10000			
56-53-1	WJ5600000	DIETHYLSTILBESTROL					C18-H20-02	X		1			X	U
71-63-6 4954	IH2275000	DIGITOXIN					C41-H64-013	X		100	10000			
2238-07-5 4955	KN2350000	DIGLYCIDYL ETHER			0923		C6-H10-03	X		1	1000			
20830-75-5 4956	IH6125000	DIGOXIN					C41-H64-014	X		1	10/10000			
115-26-4 4957	TD4025000	DIMEFOX					C4-H12-F-N2-0-P	X		1	500			
60-51-5 4958	TE1750000	DIMETHOATE			D617		C5-H12-N-03-P-S2	X	X	10	500/10000		X	P
2524-03-0 3253	TD1830000	DIMETHYL PHOSPHOCHLORIDOTHIOATE	2922				C2-H6-C1-02-P-S 4933319	X		1	500			
131-11-3 4960	TI1575000	DIMETHYL PHTHALATE			0950	0-1-0	C10-H10-04	X		5000	10000	X	X	U
77-78-1 589	WS8225000	DIMETHYL SULFATE	1595	DSF	0960	4-2-0	C2-H6-04-S 4933322	X	X	1	500	X	X	U
75-18-3 590	PV5075000	DIMETHYL SULFIDE	1164	DSL	D650	2-4-0	C2-H6-S 4908151	X		1	100			
99-98-9 4963	ST0874000	DIMETHYL-P-PHENYLENEDIAMINE					C8-H12-N2	X		1	10/10000			
124-40-3 8562	IP8750000	DIMETHYLAMINE, ANHYDROUS	1032	DMA	0928	3-4-0	C2-H7-N 4905510	X		1000			X	U
79-44-7 3251	FD4200000	DIMETHYLCARBAMOYL CHLORIDE	2262				C3-H6-C1-N-0	X		1		X	X	U

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CO
75-78-5 583	VV3150000	DIMETHYLDICHLOROSILANE	1162	DMD		3-3-1	C2-H6-C12-Si 4907610	X		1	500			
644-64-4 4966	EZ9084000	DIMETILAN					C10-H16-N4-O3	X		1	500/10000			
25154-54-5 3286	CZ7340000	DINITROBENZENE (MIXED ISOMERS)	1597	DNB	0970		C6-H4-N2-O4 4921422		X	100				
25550-58-7 6320	SL2627000	DINITROPHENOL SOLUTION	1599	DNH	0657		C6-H4-N2-O5 4921425		X	10				
25321-14-6 3297	XT1300000	DINITROTOLUENE, LIQUID	1600	DTT	0990		C7-H6-N2-O4 4963120		X	1000				
88-85-7 4968	SJ9800000	DINOSEB			0118		C10-H12-N2-O5	X	X	1000	100/10000		X	P0
1420-07-1 4969	SK0100000	DINOTERB					C10-H12-N2-O5	X		1	500/10000			
117-84-0 4970	TI1925000	DIOCTYL PHTHALATE		DOP	1000	0-1-0	C24-H38-O4		X	5000	10000	X	X	U1
78-34-2 4971	TE3350000	DIOXATHION			2740		C12-H26-O6-P2-S4	X		1	500			
1746-01-6	HP3500000	DIOXINE			2325		C12-H4-C14-O2		X	1				
82-66-6 4973	NK5600000	DIPHACINONE			0726		C23-H16-O3	X		1	10/10000			
85-00-7 3319	JM5690000	DIQUAT	2781	DIQ	2681		C12-H12-N2 .2Br 4963342		X	1000				
2764-72-9 3319		DIQUAT	2781	DIQ	2681				X	1000				
2602-46-2	QJ6400000	DIRECT BLUE 6			0136		C32-H20-N6-O14-S4 .4Na					X		
298-04-4 3327	TD9275000	DISULFOTON	2783	DIS	2680		C8-H19-O2-P-S3 4921511	X	X	1	500		X	P0
514-73-8 4976	DL7060000	DITHIAZANINE IODIDE					C23-H24-N2-S2 .I	X		1	500/10000			
541-53-7 4977	EC1575000	DITHIOBIURET					C2-H5-N3-S2	X	X	100	100/10000		X	P0
330-54-1 3334	YS8925000	DIURON	2767	DIU	2684		C9-H10-C12-N2-O 4962620		X	100				
27176-87-0 3336	DB6600000	DODECYLBENZENESULFONIC ACID	2584	DSA			C18-H30-O3-S 4931426		X	1000				
316-42-7 4978	JY5250000	EMETINE, DIHYDROCHLORIDE					C29-H40-N2-O4 .2Cl-H	X		1	1/10000			
115-29-7 3350	RB9275000	ENDOSULFAN	2761	ESF	2425		C9-H6-C16-O3-S 4921516	X	X	1	10/10000		X	P0
		ENDOSULFAN CONGENERS							X					

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1031-07-8		ENDOSULFAN SULFATE							X	1				
145-73-3	RN7875000	ENDOTHALL					C8-H10-05		X	1			X	P0
2778-04-3	TF8225000	ENDOTHION					C9-H13-06-P-S							
4980								X		1	500/10000			
72-20-8	IO1575000	ENDRIN	2761	EDR	1017		C12-H8-C16-0							
4981							4921521	X	X	1	500/10000		X	P0
7421-93-4		ENDRIN ALDEHYDE							X	1				
		ENDRIN CONGENERS							X				X	
106-89-8	TX4900000	EPICHLOROHYDRIN	2023	EPC	0645	3-2-2	C3-H5-C1-0							
3354							4907420	X	X	1000	1000	X	X	004
2104-64-5	TB1925000	EPN			1019		C14-H14-N-04-P-S							
4983								X		1	100/10000			
50-14-6	KE1050000	ERGOCALCIFEROL					C28-H44-0							
4984								X		1	1000/10000			
379-79-3	KE8225000	ERGOTAMINE TARTRATE					C66-H70-N10-010 .C4-H6-06							
4985								X			500/10000			
563-12-2	TE4550000	ETHION	2783	ETO	2750		C9-H22-04-P2-S4							
3365							4921565	X	X	10	1000			
13194-48-4	TE4025000	ETHOPROPHOS			M195		C8-H19-02-P-S2							
4989								X		1	1000			
140-88-5	AT0710000	ETHYL ACRYLATE	1917	EAC	1050	2-3-2	C5-H8-02							
666							4909167		X	1000		X	X	U11
541-41-3	LQ6125000	ETHYL CHLOROFORMATE	1182	ECF		3-1	C3-H5-C1-02							
3393							4907617					X		
97-63-2	OZ4550000	ETHYL METHACRYLATE	2277	ETM	E115	2-3-0	C6-H10-02							
3434							4907232		X	1000			X	U11
62-50-0	PB2100000	ETHYL METHANESULFONATE					C3-H8-03-S							
									X	1			X	U11
542-90-5	XK9900000	ETHYL THIOCYANATE					C3-H5-N-S							
4990								X		1	10000			
100-41-4	DA0700000	ETHYLBENZENE	1175	ETB	1080	2-3-0	C8-H10							
6424							4909163		X	1000		X		
538-07-8	YE1225000	ETHYLBIS (2-CHLOROETHYL) AMINE					C8-H13-C12-N							
4991								X		1	500			
371-62-0	KL1575000	ETHYLENE FLUOROHYDRIN					C2-H5-F-0							
4992								X		1	10			
107-21-1	KW2975000	ETHYLENE GLYCOL		EGL	1911	1-1-0	C2-H6-02							
8660												X		
75-21-8	KX2450000	ETHYLENE OXIDE	1040	EOX	1191	2-4-3	C2-H4-0							
694							4906610	X	X	1	1000		X	X	U11

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74-85-1 3404	KU5340000	ETHYLENE, LIQUID	1962	ETL	1115	1-4-2	C2-H4 4905734					X		
60-00-4 3408	AH4025000	ETHYLENEDIAMINE TETRAACETIC ACID (EDTA)	9117	EDT			C10-H16-N2-08 4966910		X	5000				
107-15-3 3407	KH8575000	ETHYLENEDIAMINE	1604	EDA	1130	3-2-0	C2-H8-N2 4935628	X	X	5000	10000			
151-56-4 4995	KX1576000	ETHYLENEIMINE (AZIRIDINE)	1185	ETI	1175		C2-H5-N 4906220	X	X	1	500	X	X	P
96-45-7	NI9625000	ETHYLENETHIOUREA			1159		C3-H6-N2-S		X	1		X	X	U
52-85-7	TF7650000	FAMPHUR					C10-H16-N-05-P-S2		X	1000			X	P
22224-92-6 4997	TB3675000	FENAMIPHOS					C13-H22-N-03-P-S		X	1	10/10000			
122-14-5 4998	TG0350000	FENITROTHION					C9-H12-N-05-P-S		X	1	500			
115-90-2 4999	TF3850000	FENSULFOTHION			1251		C11-H17-04-P-S2		X	1	500			
1185-57-5 3462	GE7540000	FERRIC AMMONIUM CITRATE	9118	FAC			C6-H8-07 .xFe .xH3-N 4963349		X	1000				
2944-67-4 3463		FERRIC AMMONIUM OXALATE	9119	FAO			C2-H2-04 .1/3Fe .H3-N		X	1000				
55488-87-4 3463		FERRIC AMMONIUM OXALATE	9119	FAO			C2-H2-04 .xFe .xH3-N		X	1000				
7705-08-0 3467	LI9100000	FERRIC CHLORIDE	2582	FCL	1265		C13-Fe 4932342		X	1000				
9004-66-4	NI2200000	FERRIC DEXTRAN							X	5000			X	U1
7783-50-8 3468	NO6865000	FERRIC FLUORIDE	9120	FFX			F3-Fe 4962626		X	100				
10421-48-4 3469	QU8915000	FERRIC NITRATE	1466	FNT			Fe-N3-09 4918725		X	1000				
10028-22-5 3470	NO8505000	FERRIC SULFATE	9121	FSF			Fe2-012-S# 4963827		X	1000				
10045-89-3 3473	WS5850000	FERROUS AMMONIUM SULFATE	9122	FAS			Fe .2H3-N .2H2 04-S 4963354		X	1000				
7758-94-3 3476	NO5400000	FERROUS CHLORIDE	1759	FEC			C12-Fe 4941131		X	100				
7720-78-7 3478	NO8500000	FERROUS SULFATE	9125	FRS			04-S .Fe 4963832		X	1000				
7782-63-0 3478	NO8510000	FERROUS SULFATE	9125	FRS			04-S .Fe		X	1000				
4301-50-2 5000	DU8335000	FLUENETIL					C16-H15-F-02		X	1	100/10000			

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2164-17-2	YT1575000	FLUOMETURON					C10-H11-F3-N2-O						X	
86-73-7	LL5670000	FLUORENE			F106		C13-H10		X					
7782-41-4 764	LM6475000	FLUORINE	1045	FXX	1270		F2 4904030	X	X	10	500		X	P0
640-19-7 5002	AC1225000	FLUOROACETAMIDE					C2-H4-F-N-O	X	X	100	100/10000		X	P0
144-49-0 3502	AH5950000	FLUOROACETIC ACID	2642				C2-H3-F-O2	X		1	10/10000			
359-06-8 5004	AD6825000	FLUOROACETYL CHLORIDE					C2-H2-Cl-F-O	X		1	10			
51-21-8 5005	YR0350000	FLUOROURACIL					C4-H3-F-N2-O2	X		1	500/10000			
944-22-9 5006	TA5950000	FONOFOS			2685		C10-H15-O-P-S2	X		1	500			
50-00-0 769	LP8925000	FORMALDEHYDE	2209	FMS	1290	2-4-0	C-H2-O 4940341	X	X	1000	500	X	X	U1
107-16-4 5008	AM0350000	FORMALDEHYDE CYANOHYDRIN					C2-H3-N-O	X		1	1000			
23422-53-9 5009	FC2800000	FORMETANATE HYDROCHLORIDE					C11-H15-N3-O2 .Cl-H	X		1	500/10000			
64-18-6 3513	LQ4900000	FORMIC ACID	1779	FMA	1310	3-2-0	C-H2-O2 4931320		X	5000			X	U1
2540-82-1 5010	TE1050000	FORMOTHION					C6-H12-N-O4-P-S2	X		1	100			
17702-57-7	FB9880000	FORMPARANATE					C12-H17-N3-O2	X		1	100/10000			
21548-32-3 5012	NJ6490000	FOSTHIETAN					C6-H12-N-O3-P-S2	X		1	500			
3878-19-1 5013	DD9010000	FUBERIDAZOLE					C11-H8-N2-O	X		1	100/10000			
628-86-4	OW4055000	FULMINIC ACID, MERCURY(II) SALT	1035				C2-Hg-N2-O2		X	10			X	P0
110-17-8 3517	LS9625000	FUMARIC ACID	9126	FUM			C4-H4-O4 4966352		X	5000				
110-00-9 785	LT8524000	FURAN	2389			1-4-1	C4-H4-O 4909175	X	X	100	500		X	U1
13450-90-3 5015	LW9100000	GALIUM TRICHLORIDE					Cl3-Ga	X		500	10000			
765-34-4 3535	MB3150000	GLYCIDYLADEHYDE	2622				C3-H4-O2		X	1			X	U1
		GLYCOL ETHERS											X	

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		HALOETHERS							X					
		HALOMETHANES							X					
76-44-8 3552	PC0700000	HEPTACHLOR	2761	HTC	1369		C10-H5-C17 4960630	X	X	1		X	X	P059
		HEPTACHLOR CONGENERS							X					
1024-57-3	PB9450000	HEPTACHLOR EPOXIDE					C10-H5-C17-O		X	1				
87-68-3 3557	EJ0700000	HEXACHLORO-1,3-BUTADIENE	2279			2-1-1	C4-C16					X	X	U128
118-74-1 3556	DA2975000	HEXACHLOROBENZENE	2729		1376		C6-C16		X	1		X	X	U127
77-47-4 3558	GY1225000	HEXACHLOROCYCLOPENTADIENE	2646	HCC	1374		C5-C16 4933015	X	X	1	100	X	X	U130
67-72-1 833	KI4025000	HEXACHLOROETHANE	9037		1372		C2-C16 4941225		X	1		X	X	U131
1335-87-1 5017	QJ7350000	HEXACHLORONAPHTHALENE			1373		C10-H2-C16			1	10000	X		
70-30-4 3560	SM0700000	HEXACHLOROPHENE	2875				C13-H5-C16-O2 .Na		X	100			X	U132
1888-71-7	UD0175000	HEXACHLOROPROPENE					C3-C16		X	1000			X	U243
757-58-4 837	XF1575000	HEXAETHYL TETRAPHOSPHATE	2783				C12-H30-O13-P4 4921423		X	100			X	P062
680-31-9	TD0875000	HEXAMETHYLPHOSPHORAMIDE			H129		C6-H18-N3-O-P					X		
302-01-2 964	MU7180000	HYDRAZINE	2029	HDZ	1390	3-3-2	H4-N2 4906225	X	X	1	1000	X	X	U133
10034-93-2	MV9625000	HYDRAZINE SULFATE					H4-N2 .H2-O4-S					X		
7647-01-0 6743	MW4025000	HYDROGEN CHLORIDE	1050	HDC	1430	4-4-2	Cl-H 4904270	X	X	1	500	X		
74-90-8 3614	MW6825000	HYDROGEN CYANIDE	1613	HCN	1440	4-4-2	C-H-N 4921417	X	X	10	100	X	X	P063
7664-39-3 5022	MW7890000	HYDROGEN FLOURIDE	1052	HFX	1460		F-H 4930024	X	X	100	100	X	X	U134
7722-84-1 5023	MX0900000	HYDROGEN PEROXIDE	2015	HPO	1470		H2-O2 4918335	X		1	1000			
7783-07-5 894	MX1050000	HYDROGEN SELENIDE	2202		1475		H2-Se 4905415	X		1	10			
7783-06-4 3625	MX1225000	HYDROGEN SULFIDE	1053	HDS	1480	3-4-0	H2-S 4905410	X	X	100	500		X	U135

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193-39-5	NK9300000	INDENO(1,2,3-CD) PYRENE					C22-H12		X	1			X	U1
13463-40-6 3655	NQ4900000	IRON, PENTACARBONYL-	1994		1521		C5-Fe-05	X		1	100			
123-92-2 8743	NS9800000	ISO-AMYL ACETATE	1104	AML	1530	1-3-0	C7-H14-02		X	5000				
110-19-0 3662	AI4025000	ISO-BUTYL ACETATE	1213		1534		C6-H12-02 4909207		X	5000				
78-81-9 3666	NP9900000	ISO-BUTYLAMINE	1214		M319		C4-H11-N 4908186		X	1000				
79-31-2 3675	NQ4375000	ISO-BUTYRIC ACID	2529				C4-H8-02 4931438		X	5000				
297-78-9 5030	PC1225000	ISOBENZAN					C9-H4-C18-0	X		1	100/10000			
78-83-1 3661	NP9625000	ISOBUTYL ALCOHOL	1212	IAL	1536	1-3-0	C4-H10-0 4909131		X	5000			X	U14
78-84-2 8366	NQ4025000	ISOBUTYRALDEHYDE	2045	BAD		2-3-1	C4-H8-0 4908185					X		
78-82-0 3677	TZ4900000	ISOBUTYRONITRILE	2284	IBN	K206	3-3-0	C4-H7-N 4909208	X		1	1000			
465-73-6 5033	IQ1925000	ISODRIN					C12-H8-C16	X	X	1	100/10000		X	P06
55-91-4 5034	TE5075000	ISOFLUORPHATE					C6-H14-F-03-P	X	X	100	100		X	P04
78-59-1 8758	GW7700000	ISOPHORONE	1993	IPH	1538		C9-H14-0 4915278		X	5000				
4098-71-9 3693	NQ9370000	ISOPHORONE DIISOCYANATE	2290		1539		C12-H18-N2-02	X		1	100			
75-79-5 6834	NT4037000	ISOPRENE	1218	IPR		2-4-2	C5-H8 4907230		X	100				
42504-46-1		ISOPROPANOLAMINE DODECYLBENZENE SULFONATE	9127				C18-H30-03-S .C3-H9-N-0		X	1000				
67-63-0 946	NT8050000	ISOPROPYL ALCOHOL (313 - MANUFACTURE ONLY BY STRONG ACID PROCESS)	1219	IPA	1560	1-3-0	C3-H8-0 4909205					X		
108-23-6 3706	LQ6475000	ISOPROPYL CHLOROFORMATE	2407				C4-H7-C1-02	X		1	1000			
625-55-8 3710	LQ8750000	ISOPROPYL FORMATE	2408			2-3-0	C4-H8-02	X		1	500			
119-38-0 5038	FA2100000	ISOPROPYLMETHYLPYRAZOLYL DIMETHYL-CARBAMATE					C10-H17-N3-02	X		1	500			
143-50-0 3721	PC8575000	KEPONE	2761	KPE	K216		C10-C110-0 4960140	X		1			X	U14
78-97-7 5039	QD8225000	LACTONITRILE				4-2-1	C3-H5-N-0	X		*****	1000			

CAS NO. / NIOSH NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA C
303-34-4	GE7875000	LASIOCARPINE					C21-H33-N-07		X	1			X	U
7439-92-1	OF7525000	LEAD	2291		1591		Pb		X	1		X		
7645-25-2	CG1000000	LEAD ARSENATE	1617	LAR			As-H3-04 .xPb							
3733									X	5000				
7784-40-9	CG0980000	LEAD ARSENATE	1617	LAR			As-H-04 .Pb							
3733									X	5000				
10102-48-4		LEAD ARSENATE	1617	LAR			Pb-H-As-04							
3733									X	5000				
7758-95-4	OF9450000	LEAD CHLORIDE	2291	LCL			C12-Pb							
3735							4944130		X	100				
		LEAD COMPOUNDS												
3736									X			X		
13814-96-5	ED2700000	LEAD FLUOBORATE	2291				B2-F8 .Pb							
3739							4944133		X	100				
7783-46-2	OG1225000	LEAD FLUORIDE	2811	LFR			F2-Pb							
3740							4944140		X	100				
10101-63-0	OG1515000	LEAD IODIDE	2811	LID			I2-Pb							
3741							4966950		X	100				
10099-74-8	OG2100000	LEAD NITRATE	1469	LNT			N2-06 .Pb							
3742									X	100				
7446-27-7	OG3675000	LEAD PHOSPHATE					08-P2 .3Pb							
									X	1			X	U14
1072-35-1		LEAD STEARATE	2811	LSA			C18-H36-02 .1/2Pb							
3746									X	5000				
7428-48-0	WI4300000	LEAD STEARATE	2811	LSA			C36-H70-04 .Pb							
3746							4966960		X	5000				
52652-59-2		LEAD STEARATE	2811	LSA			Pb-C18-H35-02							
3746									X	5000				
56189-09-4		LEAD STEARATE	2811	LSA			C36-H70-06-Pb2							
3746									X	5000				
1335-32-6	OF8750000	LEAD SUBACETATE					C4-H10-08-Pb3							
									X	1			X	U14
7446-14-2	OG4375000	LEAD SULFATE	2291	LSF			04-S .Pb							
6895							4966650		X	100				
15739-80-7		LEAD SULFATE	1794	LSF			H2-04-S .xPb							
6895									X	100				
1314-87-0	OG4550000	LEAD SULFIDE	2811	LSU			Pb-S							
3748							4966987		X	5000				
592-87-0	AL1538000	LEAD THIOCYANATE	2291	LTC			C-H-N-S .1/2Pb							
3750							4966356		X	100				
21609-90-5	TB1720000	LEPTOPHOS				P128	C13-H10-Cr-C12-02-P-S							
5040									X	1	500/10000			

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	P
541-25-3 5041	CH2975000	LEWISITE	1955				C2-H2-As-Cl3 4920517	X		1	10			
58-89-9 9399	GV4900000	LINDANE	2761	BHC	1595		C6-H6-Cl6	X	X	1	1000/10000	X	X	L
14307-35-8 3766	GB2915000	LITHIUM CHROMATE	9134	LCR			Cr-H2-O4 .2Li 4963720		X	1000				
7580-67-8 996	OJ6300000	LITHIUM HYDRIDE	2805	LHD	1503		H-Li 4916425	X		1	100			
108-39-4 8468	GO6125000	M-CRESOL	2076			3-1-0	C7-H8-O		X	1000		X	X	U
99-65-0 8572	CZ7350000	M-DINITROBENZENE	1597		0970		C6-H4-N2-O4		X	100				
554-84-7 9903	SM1925000	M-NITROPHENOL	1663				C6-H5-N-O3		X	100				
99-08-1 8907	XT2975000	M-NITROTOLUENE	1664		1945	2-1-4	C7-H7-N-O2		X	1000				
108-38-3 9183	ZE2275000	M-XYLENE	1307				C8-H10		X	1000		X		
121-75-5 3804	WM8400000	MALATHION	2783	MLT	1616		C10-H19-O6-P-S2 4941156		X	100				
110-16-7 3805	GM9625000	MALEIC ACID	2215	MLI			C4-H4-O4 4941155		X	5000				
108-31-6 3806	GN3675000	MALEIC ANHYDRIDE	2215		1618		C4-H2-O3 4941161		X	5000		X	X	U1
109-77-3 3809	OO3150000	MALONONITRILE	2647				C3-H2-N2	X	X	1000	500/10000		X	U1
12427-38-2 3811	OP0700000	MANEB	2968		M177		C4-H7-N2-S4 .Mn					X		
7439-96-5	OO9275000	MANGANESE			1620		Mn					X		
		MANGANESE COMPOUNDS										X		
108-78-1	OS0700000	MELAMINE					C3-H6-N6					X		
148-82-3	AY3675000	MELPHALAN					C13-H18-Cl2-N2-O2		X	1			X	U1
950-10-7 5047	JP1050000	MEPHOSFOLAN					C8-H16-N-O3-P-S2	X		1	500			
1600-27-7 1031	AI8575000	MERCURIC ACETATE	1629	MAT			C4-H6-O4 .Hg 4923241	X		1	500/10000			
7487-94-7 3828	OV9100000	MERCURIC CHLORIDE	1624	MRC			Cl2-Hg 4923245	X		1	500/10000			
592-04-1 3829	OW1515000	MERCURIC CYANIDE	1636	MCN			C2-Hg-N2 4923246	X		1				

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10045-94-0 3830	OW8225000	MERCURIC NITRATE	1625	MNT			N2-O6 .Hg 4918769		X	10				
21908-53-2 5050	OW8750000	MERCURIC OXIDE	1641	MOX			Hg-O 4923251	X		1	500/10000			
7783-35-9 3833	OX0500000	MERCURIC SULFATE	1645	MRS			O4-S 2Hg 4923257		X	10				
592-85-8 1048	XL1550000	MERCURIC THIOCYANATE	1646	MRT			C-N-S .1/2Hg 4923258		X	10				
7782-86-7 3837		MERCUROUS NITRATE	1627	MRN			Hg2-N2-O6		X	10				
10415-75-5 3837	OW8000000	MERCUROUS NITRATE	1627	MRN			N-O3 .Hg 4918752		X	10				
7439-97-6 1064	OV4550000	MERCURY	2809	MCR	1631		Hg 4944325		X	1		X	X	U1
1062		MERCURY COMPOUNDS							X			X		
10476-95-6	UC9800000	METHACROLEIN DIACETATE					C8-H12-O4	X		1	1000			
760-93-0 5053	OZ5700000	METHACRYLIC ANHYDRIDE					C8-H10-O3	X		1	500			
126-98-7 5054	UD1400000	METHACRYLONITRILE			1654	2-3-2	C4-H5-N	X	X	1	500		X	U1
920-46-7		METHACRYLOYL CHLORIDE					C4-H5-Cl-O	X		1	100			
30674-80-7 5056	OZ4950000	METHACRYLOYLOXYETHYL ISOCYANATE					C7-H9-N-O3	X		1	100			
10265-92-6 5057	TB4970000	METHAMIDOPHOS			M308		C2-H8-N-O2-P-S	X		1	100/10000			
558-25-8 5058	PB2975000	METHANESULFONYL FLOURIDE					C-H3-F-O2-S	X		1	1000			
67-56-1 3874	PC1400000	METHANOL	1230	MAL	1660	1-3-0	C-H4-O 4909230		X	5000		X	X	U1
91-80-5	UT1400000	METHAPYRILENE					C14-H19-N3-S		X	5000			X	U1
950-37-8 5059	TE2100000	METHIDATHION			M105		C6-H11-N2-O4-P-S3	X		1	500/10000			
2032-65-7 3824	FC5775000	METHIOCARB	2757	MCD			C11-H15-N-O2-S 4962145	X	X	10	500/10000			
16752-77-5 5061	AK2975000	METHOMYL			1644		C5-H10-N2-O2-S	X	X	100	500/10000		X	P0
72-43-5 3875	KJ3675000	METHOXYCHLOR	2761		1646		C16-H15-Cl3-O2 4960646		X	1		X	X	U2
151-38-2 5062	OV6300000	METHOXYETHYLMERCURIC ACETATE					C5-H10-Hg-O3	X		1	500/10000			

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80-63-7 5063	AS6380000	METHYL 2-CHLOROACRYLATE					C4-H5-Cl-O2 	X		1	500			
96-33-3 1078	AT2800000	METHYL ACRYLATE	1919	MAM	1653	2-3-2	C4-H6-O2 4907245					X		
79-22-1 1096	FB3675000	METHYL CHLOROFORMATE	1238	MHC			C2-H3-Cl-O2 4907429	X	X	1000	500		X	U1
624-92-0 3268	JO1927500	METHYL DISULFIDE	2381		0651		C2-H6-S2 	X		1	100			
78-93-3 1105	EL6475000	METHYL ETHYL KETONE	1193		0430	1-3-0	C4-H8-O 4909243		X	5000		X	X	U1
74-88-4 3941	PA9450000	METHYL IODIDE	2644		1772		C-H3-I 		X	1		X	X	U1
108-10-1 3943	SA9275000	METHYL ISOBUTYL KETONE	1245	MIK	1385		C6-H12-O 4909245		X	5000		X	X	U1
624-83-9 1112	NQ9450000	METHYL ISOCYANATE	2480		1773	2-3-3	C2-H3-N-O 4907448	X	X	1	500	X	X	P0
556-61-6 3947	PA9625000	METHYL ISOTHIOCYANATE	2477		M345		C2-H3-N-S 	X		1	500			
74-93-1 3950	PB4375000	METHYL MERCAPTAN	1064	MMC	1643	2-4-0	C-H4-S 4905520	X	X	100	500		X	U1
80-62-6 7075	OZ5075000	METHYL METHACRYLATE	1247	MMM	1774	2-3-2	C5-H8-O2 4907250		X	1000		X	X	U1
3735-23-7 5070	TD6125000	METHYL PHENKAPTON					C9-H11-Cl2-O2-P-S3 	X		1	500			
676-97-1 1126	TA1840000	METHYL PHOSPHONIC DICHLORIDE	9206				C-H3-Cl2-O-P 4936020	X		1	100			
1634-04-4 7091	KN5250000	METHYL TERT-BUTYL ETHER	1993		B146		C5-H12-O 4908224					X		
556-64-9 5072	XL1575000	METHYL THIOCYANATE			M346		C2-H3-N-S 	X		1	10000			
78-94-4 3976	EM9800000	METHYL VINYL KETONE	1251	MVK		3-3-2	C4-H6-O 4907260	X		1	10			
101-68-8 8588	NQ9350000	METHYLENE BIS(PHENYLISOCYANATE)	2489		1073		C15-H10-N2-O2 					X		
74-95-3 3093	PA7350000	METHYLENE BROMIDE	2664				C2-H5-Br 		X	1000		X	X	U0
60-34-4 1110	MV5600000	METHYLHYDRAZINE	1244	MHZ	1794	3-3-2	C-H6-N2 4906230	X	X	10	500	X	X	P0
502-39-6 5075	QW1750000	METHYLMERCURIC DICYANAMIDE					C3-H6-Hg-N4 	X		1	500/10000			
56-04-2 	YR0875000	METHYLTHIOURACIL					C5-H6-N2-O-S 	X		1			X	U1
75-79-6 3974	VV4450000	METHYLTRICHLOROSILANE	1250	MTS		3-3-2	C-H3-Cl3-Si 4907630	X		1	500			

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1129-41-5 5077	FC9050000	METOLCARB					C9-H11-N-02 4921531	X	X	1	100/10000			
7786-34-7 3977	GQ5250000	MEVINPHOS	2783	PHO	2065		C7-H13-06-P 4921531	X	X	10	10			
315-18-4 3978	FC0700000	MEXACARBATE	2757	ZEC	2128		C12-H18-N2-02 4921541	X	X	1000	500/10000			
90-94-8 3979	DJ0250000	MICHLER'S KETONE			T206		C17-H20-N2-0 4907535					X		
50-07-7 5080	CN0700000	MITOMYCIN C			A617		C15-H18-N4-05 4907535	X	X	1	500/10000		X	U0
1313-27-5 8862	QA4725000	MOLYBDENUM TRIOXIDE		MTO			Mo-03 4907535					X		
6923-22-4 5081	TC4375000	MONOCROTOPHOS			2690		C7-H14-N-05-P 4907535	X		1	10/10000			
75-04-7 3987	KH2150000	MONOETHYLAMINE	1036	EAM	1070		C2-H7-N 4907535		X	100				
74-89-5 8850	PF6300000	MONOMETHYLAMINE	1061	MTA	1665		C-H5-N 4905530		X	100				
2763-96-4 5082	NY3325000	MUSCIMOL					C4-H6-N2-02 4907535	X	X	1000	10000		X	P0
505-60-2 5083	WQ0900000	MUSTARD GAS	1955			3-2-0	C5-H8 4908234	X		1	500	X		
62-75-9 5093	IQ0525000	N'-NITROSODIMETHYLAMINE			1942		C2-H6-N2-0 4907535	X	X	1	1000	X	X	P0
4835-11-4 5018		N,N'-DIBUTYLHEXAMETHYLENEDIAMINE					C14-H32-N2 4907535	X		1	500			
1615-80-1 5019	MV2275000	N,N'-DIETHYLHYDRAZINE					C4-H12-N2 4907535	X		1			X	U0
121-69-7 3247	BX4725000	N,N-DIMETHYLANILINE	2253		0931		C8-H11-N 4907535					X		
62-44-2 5020	AM4375000	N-(4-ETHOXYPHENYL)-ACETAMIDE					C10-H13-N-02 4907535	X		1			X	U19
591-08-2 5021	YR7700000	N-(AMINOTHIOXOMETHYL) ACETAMIDE					C3-H6-N2-0-S 4907535	X		1000			X	P0
71-36-3 277	EJ1400000	N-BUTYL ALCOHOL	1120		0460	1-3-0	C4-H10-0 4909117	X		5000		X	X	U0
759-73-9 5022	YT3150000	N-NITROSO-N-ETHYLUREA					C3-H7-N3-02 4907535	X		1		X	X	U17
70-25-7 7093	MF4200000	N-NITROSO-N-METHYL-N'-NITRO-GUANIDINE	1325				C2-H5-N5-03 4916723	X		1			X	U16
615-53-2 5023	FC6300000	N-NITROSO-N-METHYLURETHANE					C4-H8-N2-03 4907535	X		1			X	U17
684-93-5 5024	YT7875000	N-NITROSO-N-METHYLUREA					C2-H5-N3-02 4907535	X		1		X	X	U17

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924-16-3	EJ4025000	N-NITROSODI-N-BUTYLAMINE			1944		C8-H18-N2-O		X	1			X	X	U
621-64-7	JL9700000	N-NITROSODI-N-PROPYLAMINE			1948		C6-H14-N2-O		X	1			X	X	U
55-18-5	IA3500000	N-NITROSODIETHYLAMINE			1947		C4-H10-N2-O		X	1			X	X	U
86-30-6	JJ9800000	N-NITROSODIPHENYLAMINE			N109		C12-H10-N2-O		X	100			X		
4549-40-0	YZ0875000	N-NITROSOMETHYLVINYLAMINE					C3-H6-N2-O		X	1			X	X	P
59-89-2	QE7525000	N-NITROSOMORPHOLINE			1943		C4-H8-N2-O2						X		
16543-55-8	QS6550000	N-NITROSONORNICOTINE					C9-H11-N3-O						X		
100-75-4	TN2100000	N-NITROSOPIPERIDINE			1949		C5-H10-N2-O		X	1			X	X	U
930-55-2	UY1575000	N-NITROSOPYRROLIDINE			1950		C4-H8-N2-O		X	1				X	U
300-76-5 3999	TB9450000	NALED	2783	NLD	0932		C4-H7-Br2-Cl2-O4-P 4961656		X	10					
91-20-3 8873	QJ0525000	NAPHTHALENE	1334	NTM	1810	2-2-0	C10-H8 4940360		X	100			X	X	U
1338-24-5 7164	QK8750000	NAPHTHENIC ACID	9137	NTI			 4962356		X	100					
7440-02-0 5084	QR5950000	NICKEL		NKA	1842		Ni 		X	1	10000		X		
15699-18-0 4022	WS6050000	NICKEL AMMONIUM SULFATE	9138	NAS			H3-N .H2-O4-S .1/2Ni 4966360		X	5000					
13463-39-3 1170	QR6300000	NICKEL CARBONYL	1259	NKC	1841	4-3-3	C4-Ni-O4 4906050	X	X	1	1			X	P
7718-54-9 4026	QR6475000	NICKEL CHLORIDE	9139	NCL			Cl2-Ni 4966364		X	5000					
37211-05-5 4026		NICKEL CHLORIDE	9139	NCL			Cl2-Ni 		X	5000					
		NICKEL COMPOUNDS					 		X				X		
557-19-7 4027	QR6495000	NICKEL CYANIDE	1653	NCN			C2-N2-Ni 4923275		X	1				X	P
12054-48-7 4028	QR7040000	NICKEL HYDROXIDE	9140	NKH			H2-Ni-O2 4963863		X	1000					
14216-75-2 4029		NICKEL NITRATE	2725	NNT			N2-Ni-O6 		X	5000					
7786-81-4 4031	QR9400000	NICKEL SULFATE	9141	NKS			O4-S .Ni 4966368		X	5000					

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54-11-5 4032	QS5250000	NICOTINE	1655	NIC	1855	4-1-0	C10-H14-N2	X	X	100	100		X	P
65-30-5 5087	QS9625000	NICOTINE SULFATE	1658	NCS			C20-H26-N4 .04-S 4921451	X		1	100/10000			
7697-37-2 7198	QU5775000	NITRIC ACID	2031	NAC	1860		H-N-03 4918528	X	X	1000	1000	X		
10102-43-9 1192	QX0525000	NITRIC OXIDE	1660	NTX	1890		N-0 4920330	X	X	10	100		X	P
139-13-9 8893	AJ0175000	NITRILOTRIACETIC ACID					C6-H9-N-06					X		
98-95-3 4053	DA6475000	NITROBENZENE	1662	NTB	1870	3-2-0	C6-H5-N-02 4921455	X	X	1000	1000	X	X	U
1122-60-7 5091	GV6600000	NITROCYCLOHEXANE				2-2-3	C6-H11-N-02	X		1	500			
1836-75-5	KN8400000	NITROFEN					C12-H7-C12-N-03					X		
10102-44-0 4072	QW9800000	NITROGEN DIOXIDE	1067	NOX	1903		N-02 4920340	X	X	10	100		X	P
10544-72-6 4072	QX1575000	NITROGEN DIOXIDE	1067	NOX	1903		N2-04 4920360		X	10			X	P
51-75-2 5046	IA1750000	NITROGEN MUSTARD					C5-H11-C12-N	X		1	10	X		
55-63-0 1531	QX2600000	NITROGLYCERIN	1204		1912	2-2-4	C3-H5-N3-09 4910311		X	10		X	X	PO
25154-55-6 4083	SM1920000	NITROPHENOL (MIXED ISOMERS)	1663	NIP			C6-H5-N-03 4963394		X	100				
	SM1920000	NITROPHENOLS	1663	NIP	N607		C6-H5-N-03		X					
		NITROSAMINES							X					
1321-12-6 4090	XT2972000	NITROTOLUENE	1664	NTR	1945	2-1-4	C7-H7-N-02 4963155		X	1000				
991-42-4 5094	RB8750000	NORBORMIDE					C33-H25-N3-03	X		1	100/10000			
3288-58-2	TD9670000	O,O-DIETHYL-S-METHYL-DITHIO-PHOSPHATE					C5-H13-02-P-S2		X	5000			X	UOE
2587-90-8	TF9450000	O,O-DIMETHYLPHOSPHOROTHIOIC ACID						X		1	500			
2665-30-7 5133	TB1680000	O-(4-NITROPHENYL) O-PHENYL METHYL-PHOSPHONOTHIOIC ACID EST					C13-H12-N-04-P-S	X		1	500			
90-04-0	BZ5410000	O-ANISIDINE	2431		0225		C7-H9-N-0					X		
134-29-2	BZ6500000	O-ANISIDINE HYDROCHLORIDE					C7-H9-N-0 .C1-H					X		

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95-48-7 3014	GO6300000	O-CRESOL	2076	CRO	0760	3-2-0	C7-H8-O		X	1000	1000/10000	X	X	U052
528-29-0 8570	CZ7450000	O-DINITROBENZENE	1597	DNO	0970		C6-H4-N2-O4		X	100				
2703-13-1	TB1160000	O-ETHYL O-(4-(METHYLTHIO)ETHYL)PHEN METHYL-PHOSPHONOTHIOIC ACID					C10-H15-O2-P-S2	X		1	500			
88-72-2 8906	XT3150000	O-NITROTOLUENE	1664	NIE	1945	2-1-4	C7-H7-N-O2		X	1000				
95-53-4 9128	XU2975000	O-TOLUIDINE	1708	TLI	2475	3-2-0	C7-H9-N 4913175			1		X		
636-21-5	XU7350000	O-TOLUIDINE HYDROCHLORIDE					C7-H9-N Cl-H		X	1		X	X	U222
3165-93-3 397	XU5250000	O-TOLUIDINE HYDROCHLORIDE	1579				C7-H8-Cl-N .Cl-H 4921412	X		1			X	U049
95-47-6 9182	ZE2450000	O-XYLENE	1307				C8-H10		X	1000		X	X	
2234-13-1	QK0250000	OCTACHLORONAPHTHALENE			1955		C10-C18					X		
152-16-9 4974	UX5950000	OCTAMETHYLDIPHOSPHORAMIDE					C8-H24-N4-O3-P2	X	X	100	100		X	P085
5095		ORGANORHODIUM COMPLEX	2787				4910547	X		1	10/10000			
20816-12-0 4135	RN1140000	OSMIUM TETROXIDE	2471		1960		O4-Os		X	1000	10000	X	X	P087
630-60-4 5098	RN3675000	OUABAIN					C29-H44-O12	X		1	100/10000			
23135-22-0 5099	RP2300000	OXAMYL			2585		C7-H13-N3-O3-S	X		1	100/10000			
2497-07-6 5101	TD8600000	OXYDISULFOTON					C8-H19-O3-P-S3	X		1	500			
10028-15-6 5102	RS8225000	OZONE			1980		O3	X		1	100			
104-94-9	BZ5450000	P-ANISIDINE	2431		0225		C7-H9-N-O					X		
120-71-8	BZ6720000	P-CRESIDINE			M108		C8-H11-N-O					X		
106-44-5 8467	GO6475000	P-CRESOL	2076	CSO		3-1-0	C7-H8-O		X	1000		X	X	U052
100-25-4 8571	CZ7525000	P-DINITROBENZENE	1597	DNZ	0970		C6-H4-N2-O4		X	100				
156-10-5	JK0175000	P-NITROSODIPHENYLAMINE					C12-H10-N2-O					X		
99-99-0 8908	XT3325000	P-NITROTOLUENE	1664	NTT	1945	3-1-0	C7-H7-N-O2		X	1000				

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CC
106-50-3	SS8050000	P-PHENYLENEDIAMINE	1673			2042	C6-H8-N2					X		
106-42-3	ZE2625000	P-XYLENE	1307				C8-H10							
9181							4909351		X	1000		X		
30525-89-4	RV0540000	PARAFORMALDEHYDE	2213	PFA		2-1-0	(C-H2-O)n							
4156							4941143		X	1000				
123-63-7	YK0525000	PARALDEHYDE	1264	PDH		2-3-1	C6-H12-O3							
1278							4909260		X	1000				
1910-42-5	DW2275000	PARAQUAT	2588		1982		C12-H14-N2 .2Cl							
5103								X		1	10/10000			
2074-50-2	DW2010000	PARAQUAT METHOSULFATE	2588		1982		C12-H14-N2 .2C-H3-O4-S							
5104								X		1	10/10000			
56-38-2	TF4920000	PARATHION	2783	PTO	1984		C10-H14-N-O5-P-S							
1281							4921469	X	X	1	100	X	X	P089
298-00-0	TG0246000	PARATHION-METHYL	2783	MPT	1775		C8-H10-N-O5-P-S							
3956							4921443	X	X	100	100/10000		X	P071
12002-03-8	GL6475000	PARIS GREEN	1585	CAA			C4-H6-As6-Cu4-O16							
2981							4923220	X	X	100	500/10000			
19624-22-7	RY8925000	PENTABORANE	1380	PTB	1986	3-3-2	B5-H9							
1285							4906060	X		1	500			
608-93-5	DA6640000	PENTACHLOROBENZENE				P238	C6-H-C15							
									X	10			X	U183
76-01-7	KI6300000	PENTACHLOROETHANE	1669			P119	C2-H-C15							
4165									X	1	10000		X	U184
87-86-5	SM6300000	PENTACHLOROPHENOL	2020	PCP	1989		C6-H-C15-O							
4166							4961380		X	10	10000	X	X	U242
2570-26-5	RZ2120000	PENTADECYLAMINE					C15-H33-N							
5111								X		1	100/10000			
79-21-0	SD8750000	PERACETIC ACID	2131	PAA		3-2-4	C2-H4-O3							
5112								X		1	500	X		
594-42-3	PB0370000	PERCHLOROMETHYL MERCAPTAN	1670	PCM	2030		C-Cl4-S							
1295							4921473	X	X	100	500		X	P118
85-01-8	SF7175000	PHENANTHRENE				2038	1-0 C14-H10							
									X	5000				
108-95-2	SJ3325000	PHENOL	2821	PHN	2040	3-2-0	C6-H6-O							
1310								X	X	1000	500/10000	X	X	U188
696-28-6	CH5425000	PHENYL DICHLOROARSINE	1556	PDL			C6-H5-As-Cl2							
5119							4921474	X	X	1	500		X	P036
59-88-1	MV9000000	PHENYLHYDRAZINE HYDROCHLORIDE		PHH			C6-H8-N2 .Cl-H							
5120								X		1	1000/10000			
62-38-4	QV6475000	PHENYLMERCURY ACETATE	1674				C8-H8-Hg-O2							
5121								X	X	100	500/10000		X	P092
2097-19-0	YJ9050000	PHENYLSILATRANE					C12-H17-N-O3-Si							
5122								X		1	100/10000			

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CI
103-85-5	YU1400000	PHENYLTHIOUREA					C7-H8-N2-S							
5123								X	X	100	100/10000		X	P0
298-02-2	TD9450000	PHORATE			2064		C7-H17-O2-P-S3							
5124								X	X	10	10		X	P0
4104-14-7	TB4725000	PHOSACETIM					C14-H13-C12-N2-O2-P-S							
5125								X		1	100/10000			
947-02-4	NJ6475000	PHOSFOLAN					C7-H14-N-O3-P-S2							
5126								X		1	100/10000			
75-44-5	SY5600000	PHOSGENE	1076	PHG	2070		C-Cl2-O							
4228							4920540	X	X	10	10	X	X	P0
732-11-6	TE2275000	PHOSMET			2075		C11-H12-N-O4-P-S2							
5128								X		1	10/10000			
13171-21-6	TC2800000	PHOSPHAMIDON					C10-H19-Cl-N-O5-P							
5129								X		1	100			
7803-51-2	SY7525000	PHOSPHINE	2199		2080		H3-P							
1322							4920160	X	X	100	500		X	P0
50782-69-9	TB1090000	PHOSPHONOTHIOIC ACID, METHYL-, S-(2-(BIS(1-METHYLETHYL) AMINO					C11-H26-N-O2-S							
5132								X		1	100			
7664-38-2	TB6300000	PHOSPHORIC ACID	1805	PAC	2085		H3-O4-P							
4231							4930248		X	5000		X		
10025-87-3	TH4897000	PHOSPHORUS OXYCHLORIDE	1810	PPO	2094		Cl3-O-P							
4241							4932352	X	X	1000	500			
1314-56-3	TH3945000	PHOSPHORUS PENTOXIDE	1807		P103		O5-P2							
4233							4932324	X		1	10			
1314-80-3	TH4375000	PHOSPHORUS PENTASULFIDE	1340	PPP	2092		P2-S5							
7444							4916320		X	100			X	U18
10026-13-8	TB6125000	PHOSPHORUS PENTACHLORIDE	1806		2091		Cl5-P							
4243							4932323	X		1	500			
7719-12-2	TH3675000	PHOSPHORUS TRICHLORIDE	1809	PPT	2093		Cl3-P							
4249							4932359	X	X	1000	1000			
7723-14-0	TH3500000	PHOSPHORUS, WHITE OR YELLOW	1381	PPB	2090		P4							
1337							4916140	X	X	1	100	X		
		PHTHALATE ESTERS							X					
85-44-9	TI3150000	PHTHALIC ANHYDRIDE	2214	PAN	2110	2-1-0	C8-H4-O3							
4254							4934223		X			X	X	U19
57-47-6	TJ2100000	PHYSOSTIGMINE					C15-H21-N3-O2							
5141								X		1	100/10000			
57-64-7	TJ2450000	PHYSOSTIGMINE, SALICYLATE (1:1)					C15-H21-N3-O2 .C7-H6-O3							
5142								X		1	100/10000			
88-89-1	TJ7875000	PICRIC ACID	1344		2120		C6-H3-N3-O7							
4260												X		
124-87-8	TJ9100000	PICROTOXIN	1584				C13-H18-O7 .C15-H16-O6							
422							4921418	X		1	500/10000			

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110-89-4 4268	TM3500000	PIPERIDINE	2401			2-3-3	C5-H11-N 		X	1	1000			
5281-13-0	DF4911000	PIPROTAL					C24-H40-O8 		X	1	100/10000			
23505-41-1 5146	TF1610000	PIRIMIFOS-ETHYL					C13-H24-N3-O3-P-S 		X	1	1000			
	LK5060000	POLYBROMINATED BIPHENYLS (PBB'S)										X		
1336-36-3 4286	TQ1350000	POLYCHLORINATED BIPHENYLS (PCBS)	2315	PCB	A622		 4961666		X	10		X		
		POLYNUCLEAR AROMATIC HYDROCARBONS							X					
7784-41-0 4291	CG1100000	POTASSIUM ARSENATE	1677	PAS			As-H2-O4 .K 4923277		X	1000				
10124-50-2 4292	CG3800000	POTASSIUM ARSENITE	1678	POA			As-H3-O3 .Xk 4923278	X	X	1000	500/10000			
7778-50-9	HX7680000	POTASSIUM BICHROMATE	1479	PTD	0686		Cr2-K2-O7 4941160		X	1000				
7789-00-6 4300	GB2940000	POTASSIUM CHROMATE	9142	PCH	0686		Cr-O4 2K 4963364		X	1000				
151-50-8 4303	TS8750000	POTASSIUM CYANIDE	1680	PTC	0790		C-N .K 4923225	X	X	10	100		X	P0
1310-58-3 9013	TT2100000	POTASSIUM HYDROXIDE	1813	PTH	2140		H-K-O 4935225		X	1000				
7722-64-7 4324	SD6475000	POTASSIUM PERMANGANATE	1490	PTP			Mn-O4 .K 4918740		X	100				
506-61-6 5151	TT5775000	POTASSIUM SILVER CYANIDE					C2-Ag-N2 .K 		X	X	1	500		X	P0
2631-37-0 5152	FB8050000	PROMECARB					C12-H17-N-O2 		X	1	500/10000			
1120-71-4	RP5425000	PROPANE SULTONE					C3-H6-O3-S 		X	1		X	X	U19
2312-35-8 4341	WT2900000	PROPARGITE	2765	PRG			C19-H26-O4-S 4961165		X	10				
107-19-7 1379	UK5075000	PROPARGYL ALCOHOL	1986		2167	3-3-3	C3-H4-O 4907440		X	1000			X	P1
106-96-7 2661	UK4375000	PROPARGYL BROMIDE	2345			4-3-4	C3-H3-Br 		X	1	10			
123-38-6 1385	UE0350000	PROPIONALDEHYDE	1275	PAD	P129	2-3-1	C3-H6-O 4908270					X		
79-09-4 7573	UE5970000	PROPIONIC ACID	1848	PNA	2168	2-2-0	C3-H6-O2 4931448		X	5000				
123-62-6 4345	UF9100000	PROPIONIC ANHYDRIDE	2496	PAH		2-2-1	C6-H10-O3 4931449		X	5000				

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107-12-0 4346	UF9625000	PROPIONITRILE	2404			4-3-1	C3-H5-N 4906620	X	X	10	500		X	P1
114-26-1	FC3150000	PROPOXUR			0318		C11-H15-N-03					X		
109-61-5 5157	LQ6830000	PROPYL CHLOROFORMATE	2740				C4-H7-C1-02	X		1	500			
115-07-1 4355	UC6740000	PROPYLENE (PROPENE)	1077	PPL		1-4-1	C3-H6					X		
75-56-9 5159	TZ2975000	PROPYLENE OXIDE	1280	POX	2215	2-4-2	C3-H6-O 4906620	X	X	100	10000	X		
75-55-8 1396	CM8050000	PROPYLENEIMINE	1921	PII	2213		C3-H7-N 4907040	X	X	1	10000	X	X	P0
2275-18-5 5161	TD6225000	PROTHOATE					C9-H20-N-03-P-S2	X		1	100/10000			
129-00-0 5163	UR2450000	PYRENE			2217		C16-H10	X	X	5000	1000/10000			
121-21-1 9035	GZ1725000	PYRETHRINS	9184	PRR	2216		C21-H28-03		X	1				
121-29-9 9035	GZ0700000	PYRETHRINS	9184	PRR	2216		C22-H28-05		X	1				
8003-34-7 9035	UR4200000	PYRETHRINS	9184	PRR	2216		4963872		X	1				
110-86-1 1403	UR8400000	PYRIDINE	1282	PRD	2220	2-3-0	C5-H5-N 4909277		X	1000		X	X	U19
53558-25-1 5167	YT9690000	PYRIMINIL					C13-H12-N4-03	X		1	100/10000			
91-22-5 4380	VA9275000	QUINOLINE	2656	QNL		2-1-0	C9-H7-N 4963367		X	5000		X		
106-51-4 2591	QK2625000	QUINONE	2587		2222		C6-H4-02		X	10		X	X	U19
82-68-8	QA6650000	QUINTOZENE			P126		C6-C15-N-02		X	1		X	X	U19
50-55-5	ZG0350000	RESERPINE					C33-H40-N2-09		X	5000			X	U20
81-07-2	QE4200000	SACCHARIN AND SALTS (313 - MANUFACTURE ONLY)			S226		C7-H5-N-03-S		X	1		X	X	U20
94-59-7	CY2800000	SAFROLE					C10-H10-02		X	1		X	X	U20
14167-18-1	GG0590000	SALCOMINE					C16-H14-Co-N2-02	X		1	500/10000			
107-44-8 5170	TA8400000	SARIN			S315		C4-H10-F-02-P	X		1	10			
626-38-0 9271	AJ2100000	SEC-AMYL ACETATE	1104	AAS	0191	1-3-0	C7-H14-02		X	5000				

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105-46-4 8346	AF7380000	SEC-BUTYL ACETATE	1124	BTA	0441	1-3-0	C6-H12-02		X	5000				
78-92-2 8353	ED1750000	SEC-BUTYL ALCOHOL	1121	BAS	0461	1-3-0	C4-H10-0					X		
513-49-5 8359		SEC-BUTYLAMINE		BTL		3-3	C4-H11-N		X	1000				
13952-84-6 8359	ED3325000	SEC-BUTYLAMINE		BTL		3-3	C4-H11-N		X	5000				
7782-49-2 4427	VS8310000	SELENIUM	2658		2230		Se		X	100		X		
		SELENIUM COMPOUNDS							X			X		
7446-08-4 9042	VS8575000	SELENIUM DIOXIDE		SLD			O2-Se		X	10			X	U1
7488-56-4 4425	VS8925000	SELENIUM DISULFIDE	2657				S2-Se		X	1			X	U1
7791-23-3 4429	VS7000000	SELENIUM OXYCHLORIDE	2879				Cl2-O-Se 4923345	X		1	500			
7783-00-8 5172	VS7175000	SELENOUS ACID	1905	SSE			H2-03-Se	X	X	10	1000/10000		X	U1
563-41-7 5173	VT3500000	SEMICARBAZIDE HYDROCHLORIDE					C-H5-N3-O .Cl-H 	X		1	1000/10000			
7440-22-4 4430	VW3675000	SILVER			2240		Ag		X	1000		X		
		SILVER COMPOUNDS							X			X		
506-64-9 1453	VW3850000	SILVER CYANIDE	1684				C-Ag-N 4923473		X	1			X	P1
7761-88-8 4443	VW4725000	SILVER NITRATE	1493	SVN			N-03 .Ag 4918742		X	1				
7440-23-5 7794	VY0686000	SODIUM	1428	SDU	2260		Na 4916456		X	10				
7631-89-2 4457	CG1225000	SODIUM ARSENATE	1685	SDA			As-Na3-04 4923290	X	X	1000	1000/10000			
7784-46-5 1473	VY7705000	SODIUM ARSENITE	2027	SAR			As-02 .Na 4923291	X	X	1000	500/10000			
26628-22-8 1474	VY8050000	SODIUM AZIDE (NA(N3))	1687	SAZ	2243		N3-Na 4923465	X	X	1000	500		X	P1
10588-01-9 4482	HX7700000	SODIUM BICHROMATE	1479	SCR	0686		Cr2-07 .2Na 4941170		X	1000				
1333-83-1 4462	WB0350010	SODIUM BIFLUORIDE	2439	SBF			F2-H-Na 4932356		X	100				
7631-90-5 7781	VZ2000000	SODIUM BISULFITE	2693	SBS	5050		H-03-S .Na 4932376		X	5000				

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124-65-2 4468	CH7700000	SODIUM CACODYLATE	1688	SCD			C2-H6-As-O2 .Na 	X		1	100/10000			
7775-11-3 4474	GB2955000	SODIUM CHROMATE	9145	SCH	0686		Cr-O4 .2Na 4963369		X	1000				
143-33-9 7770	VZ7530000	SODIUM CYANIDE (NA(CN))	1689	SCN	0790		C-N-Na 4923277	X	X	10	100		X	P1
25155-30-0 4485	DB6825000	SODIUM DODECYLBENZENE SULFONATE	9146				C18-H29-O3-S .Na 4963374		X	1000				
62-74-8 4488	AH9100000	SODIUM FLUORACETATE	2629		2250		C2-H2-F-O2 .Na 	X	X	10	10/10000		X	P(
7681-49-4 4487	WB0350000	SODIUM FLUORIDE	1690	SDF			F-Na 4932375		X	1000				
16721-80-5 4500	WE1900000	SODIUM HYDROSULFIDE	2318	SHR			H-Na-S 4916738		X	5000				
1310-73-2 1499	WB4900000	SODIUM HYDROXIDE (SOLUTION)	1823	SHD	2260		H-Na-O 4935235		X	1000		X		
7681-52-9 9074	NH3486300	SODIUM HYPOCHLORITE	1791	SHC	2260		Cl-H-O .Na 4944143		X	100				
10022-70-5 9074		SODIUM HYPOCHLORITE	1791	SHC	2260		Cl-Na-O 		X	100				
124-41-4 4505	PC3570000	SODIUM METHYLATE, DRY	1431	SML			C-H3-O .Na 4916461		X	1000				
7632-00-0 4511	RA1225000	SODIUM NITRITE	1500	SNT	S236		N-O2 .Na 4918747		X	100				
131-52-2 4513	SM6490000	SODIUM PENTACHLOROPHENATE	2567		2261		C6-C15-O .Na 4941177	X		1	100/10000			
7558-79-4 4520	WC4500000	SODIUM PHOSPHATE, DIBASIC	9147	SPP	2262		H-O4-P .2Na 4966380		X	5000				
7601-54-9 4521	TC9490000	SODIUM PHOSPHATE, TRIBASIC	9148	SPP	2262		O4-P .3Na 4966383		X	5000				
7758-29-4 4521	TC9490000	SODIUM PHOSPHATE, TRIBASIC	9148	SPP	2262		O4-P .3Na 4966383		X	5000				
7785-84-4 4521	OY4025000	SODIUM PHOSPHATE, TRIBASIC	9148	SPP	2262		O4-P .3Na 4966383		X	5000				
10039-32-4 4520	TC5725000	SODIUM PHOSPHATE, DIBASIC	9147	SPP	2262		H-O4-P .2Na .12H2-O 		X	5000				
10101-89-0 4521	TC9575000	SODIUM PHOSPHATE, TRIBASIC	9148	SPP	2262		O4-P .3Na 4966383		X	5000				
10124-56-8 4521	OY3675000	SODIUM PHOSPHATE, TRIBASIC	9148	SPP	2262		O4-P .3Na 4966383		X	5000				
10140-65-5 4520		SODIUM PHOSPHATE, DIBASIC	9147	SPP	2262		O4-P .2Na 		X	5000				
10361-89-4 4521		SODIUM PHOSPHATE, TRIBASIC	9148	SPP	2262		O4-P .3Na 4966383		X	5000				

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13410-01-0 4525	VS6650000	SODIUM SELENATE	2630				O4-Se .2Na		X	1	100/10000		
7782-82-3 4526		SODIUM SELENITE	2630	SSE			Na2-O3-Se		X	100			
10102-18-8 4526	VS7350000	SODIUM SELENITE	2630	SSE			O3-Se .2Na 4923350	X	X	100	100/10000		
7757-82-6	WE1650000	SODIUM SULFATE (SOLUTION)					O4-S .2Na					X	
10102-20-2 5185	WY2450000	SODIUM TELLURITE					O3-Te .2Na		X	1	500/10000		
18883-66-4	LZ5775000	STREPTOZOTOCIN				A617	C8-H15-N3-O7		X	1		X	U
7789-06-2 4547	GB3240000	STRONTIUM CHROMATE	9149	SCM	0686		Cr-O4 .Sr 4963377		X	1000			
1314-96-1		STRONTIUM SULFIDE					S-Sr		X	100		X	P
57-24-9 5186	WL2275000	STRYCHNINE	1692	STR	2275		C21-H22-N2-O2 4921477	X	X	10	100/10000	X	P
60-41-3 5187	WL2550000	STRYCHNINE, SULFATE	1692	STR			C21-H22-N2-O2 .1/2H2-O4-S	X		1	100/10000		
100-42-5 4553	WL3675000	STYRENE (MONOMER)	2055	STY	2280	2-3-2	C8-H8 4907265		X	1000		X	
96-09-3	CZ9625000	STYRENE OXIDE			E230	2-2-0	C8-H8-O					X	
3689-24-5 1572	XN4375000	SULFOTEP	1704		2327		C8-H20-O5-P2-S2 4921481	X	X	100	500	X	P
7446-09-5 1554	WS4550000	SULFUR DIOXIDE	1079	SFD	2290		O2-S 4909290	X		1	500		
12771-08-3		SULFUR MONOCHLORIDE		SFM	2320				X	1000			
7783-60-0 4574	WT4800000	SULFUR TETRAFLOURIDE	2418		2322		F4-S 4920555	X		1	100		
7446-11-9 1560	WT4830000	SULFUR TRIOXIDE	1829				O3-S 4930051	X		1	100		
7664-93-9 5193	WS5600000	SULFURIC ACID	1830	SFA	2310		H2-O4-S 4930040	X	X	1000	1000	X	
8014-95-7 5193	WS5605000	SULFURIC ACID	1831	SFA	2310		H2-O4-S .O3-S 4930030		X	1000			
77-81-6 5194	TB4550000	TABUN					C5-H11-N2-O2-P	X		1	10		
13494-80-9 5195	WY2705000	TELLURIUM			2330		Te	X		1	500/10000		
7783-80-4 4586	WY2800000	TELLURIUM HEXAFLOURIDE	2195		2332		F6-Te 4920557	X		1	100		

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CC
107-49-3 4598	UX7051000	TEPP	2784	TEP	2334		C8-H20-07-P2	X	X	10	100		X	P1
13071-79-9 5198	TD7200000	TERBUFOS			2333		C9-H21-02-P-S3	X		1	100			
100-21-0	WZ0875000	TEREPHTHALIC ACID					C8-H6-04					X		
625-16-1 8273		TERT-AMYL ACETATE	1104	AYA			C7-H14-02		X	5000				
540-88-5 8347	AF7400000	TERT-BUTYL ACETATE	1123	BYA	0442		C6-H12-02		X	5000				
75-65-0 8351	ED1925000	TERT-BUTYL ALCOHOL	1120	BAT	0462	1-3-0	C4-H10-O 4909130					X		
75-64-9 8358	ED3330000	TERT-BUTYLAMINE	1125	BUA		2-4-0	C4-H11-N 4909134		X	1000				
961-11-5	TB9100000	TETRACHLORVINPHOS			2234		C10-H9-C14-04-P					X		
78-00-2 4595	TP4550000	TETRAETHYLLEAD	1649	TEL	2360	3-2-3	C8-H2-0-Pb 4921484	X	X	10	100		X	P1
597-64-8 5200	WH8625000	TETRAETHYLTIN					C8-H20-Sn	X		1	100			
109-99-9 1582	LU5950000	TETRAHYDROFURAN	2056	THF	2390	2-3-1	C4-H8-O 4908290		X	1000			X	U21
75-74-1 4613	TP4725000	TETRAMETHYLLEAD	1649	TML	2370	3-3-3	C4-H12-Pb	X		1	100			
509-14-8 1587	PB4025000	TETRANITROMETHANE	1510		2395		C-N4-08 4918180	X	X	10	500		X	P1
1314-32-5 5203	XG2975000	THALLIC OXIDE					03-T12		X	100	10000		X	P1
7440-28-0	XG3425000	THALLIUM	1707		2420		T1		X	1000		X		
		THALLIUM COMPOUNDS												
4621									X			X		
10031-59-1 9120	XG6600000	THALLIUM SULFATE	1707	TSU			04-S .XT1 4923297	X	X	100	100/10000		X	P1
10102-45-1 4622	XG5950000	THALLIUM(I) NITRATE	2727				N-03 .T1		X	100			X	U21
12039-52-0	XG6300000	THALLIUM(I) SELENIDE					Se-T1		X	1000			X	P1
6533-73-9 5204	XG4000000	THALLOUS CARBONATE					C-03 2T1	X	X	100	100/10000		X	U21
7791-12-0 5205	XG4200000	THALLOUS CHLORIDE	2573				C1-T1	X	X	100	100/10000		X	U21
2757-18-8 5206	OD1770000	THALLOUS MALONATE					C3-H2-04 .2T1	X		1	100/10000			

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	9	TPQ1 / TPQ2	313	RCRA LST
7446-18-6	X66800000	THALLOUS SULFATE	1707	TSU			O4-S .2T1	X	X	100	100/10000		X
62-55-5	AC8925000	THIOACETAMIDE					C2-H5-N-S		X	1		X	X
2231-57-4 5208	FF2975000	THIOCARBAZIDE					C-H6-N4-S	X		1	1000/10000		
39196-18-4 5210	EL8200000	THIOFANOX					C9-H16-N2-O2-S	X	X	100	100/10000		X
297-97-2 5212	TF5775000	THIONAZIN					C8-H13-N2-O3-P-S	X	X	100	500		X
108-98-5 1316	DC0525000	THIOPHENOL	2337				C6-H6-S 4921413	X	X	100	500		X
79-19-6 5214	VT4200000	THIOSEMICARBAZIDE					C-H5-N3-S	X	X	100	100/10000		X
62-56-6 4635	YU2800000	THIOUREA	2877		T109		C-H4-N2-S		X	1		X	X
614-78-8 5216	YU2975000	THIOUREA, (2-METHYLPHENYL)-					C8-H10-N2-S	X		1	500/10000		
1314-20-1	XO6950000	THORIUM DIOXIDE					O2-Th					X	
7550-45-0 1610	XR1925000	TITANIUM TETRACHLORIDE	1838	TTT			Cl4-Ti 4932385	X		1	100	X	
108-88-3 4654	XS5250000	TOLUENE	1294		2460		C7-H8 4909305		X	1000		X	X
584-84-9	CZ6300000	TOLUENE 2,4-DIISOCYANATE	2078	TDI	2470		C9-H6-N2-O2	X	X	100	500	X	
91-08-7 5219	CZ6310000	TOLUENE 2,6-DIISOCYANATE			T177		C9-H6-N2-O2	X	X	100	100	X	
8001-35-2 4662	XW5250000	TOXAPHENE	2761	TXP	0612		C10-H10-Cl8 4941188	X	X	1	500/10000	X	X
110-57-6 5220	EM4903000	TRANS- 1,4-DICHLOROBUTENE					C4-H6-Cl2	X		1	500		
1031-47-6 5221	TA1400000	TRIAMIPHOS					C12-H19-N6-O-P	X		1	500/10000		
68-76-8	DK7175000	TRIAZIQUONE					C12-H13-N3-O2					X	
24017-47-8 5222	TF5635000	TRIAZOFOS					C12-H16-N3-O3-P-S	X		1	500		
12108-13-3 8852	OP1450000	TRICARBONYL METHYLCYCLOPENTADIENYL MANGANESE			1767		C9-H7-Mn-O3	X		1	100		
1558-25-4 5223	VV2200000	TRICHLORO (CHLOROMETHYL) SILANE					C-H2-Cl4-Si	X		1	100		
27137-85-5 3159	VV3540000	TRICHLORO(DICHLOROPHENYL)SALINE	1766				C6-H3-Cl5-Si 4934225	X		1	500		

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST
75-87-6 2852	FM7870000	TRICHLOROACETALDEHYDE	2075				C2-H-C13-O 4935515	X	X	1			X
76-02-8 4676	AO7140000	TRICHLOROACETYL CHLORIDE	2442				C2-C14-O	X	X	1	500		
79-01-6 4680	KX4550000	TRICHLOROETHYLENE	1710	TCE	2490		C2-H-C13 4941171	X	X	1000		X	X
115-21-9 712	VV4200000	TRICHLOROETHYLSILANE	1196	ETS			C2-H5-C13-Si 4907620	X	X	1	500		
52-68-6 4673	TA0700000	TRICHLOROFON	2783		T116		C4-H8-C13-O4-P 4940375	X	X	100		X	
75-69-4 9134	PB6125000	TRICHLOROMONOFLUOROMETHANE	1078		1285		C-C13-F	X	X	5000			X
327-98-0 5227	TB0700000	TRICHLORONATE					C10-H12-C13-O2-P-S	X	X	1	500		
25167-82-2 4682	SN1290000	TRICHLOROPHENOL	2020	TPH	2484		C6-H3-C13-O 4940325	X	X	10			
98-13-5 4223	VV6650000	TRICHLOROPHENYLSILANE	1804				C6-H5-C13-Si 4934275	X	X	1	500		
27323-41-7 4690	DB6700000	TRIETHANOLAMINE DODECYLBENZENE SULFONATE	9151	DBS			C18-H31-O3-S .C6-H15-N-O3 4963379	X	X	1000			
998-30-1 5230	VV6682000	TRIETHOXYSILANE					C6-H16-O3-Si	X	X	1	500		
121-44-8 4691	YE0175000	TRIETHYLAMINE	1296	TEN	2480		C6-H15-N 4907877	X	X	5000			
1582-09-8 9151	XU9275000	TRIFLURALIN	1609	TFR	T338		C13-H16-F3-N3-O4					X	
75-50-3 9153	YH2285000	TRIMETHYLAMINE, ANHYDROUS	1083	TMA	T127		C3-H9-N 4905540	X	X	100			
75-77-4 1649	VV2710000	TRIMETHYLCHLOROSILANE	1298	TMC			C3-H9-C1-Si 4907680	X	X	1	1000		
824-11-3	TY6650000	TRIMETHYLOLPROPANE PHOSPHITE					C6-H11-O3-P	X	X	1	100/10000		
1066-45-1 5233	WH6850000	TRIMETHYLTIN CHLORIDE					C3-H9-C1-Sn	X	X	1	500/10000		
639-58-7 5234	WH6860000	TRIPHENYLTIN CHLORIDE					C18-H15-C1-Sn	X	X	1	500/10000		
555-77-1 5235	YE2625000	TRIS (2-CHLOROETHYL) AMINE					C6-H12-C13-N	X	X	1	100		
126-72-7	UB0350000	TRIS(2,3-DIBROMOPROPYL) PHOSPHATE					C9-H15-Br6-O4-P	X	X	1		X	X
72-57-1	QJ6475000	TRYPAN BLUE					C34-H28-N6-O14-S4 .4Na	X	X	1			X
541-09-3	YR3675000	URANYL ACETATE	9180	URA			C4-H6-O6-U	X	X	100			

CAS NO. / NOAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CI
10102-06-4	YR3805000	URANYL NITRATE	9177	UAN			N2-O8-U		X	100				
36478-76-9	YR3807000	URANYL NITRATE	9177	UAN			N2-O8-U		X	100				
51-79-6	FA8400000	URETHANE (ETHYL CARBAMATE)					C3-H7-N-O2		X	1		X	X	U238
2001-95-8 5236	YV9468000	VALINOMYCIN					C54-H90-N6-O18	X		1	1000/10000			
7440-62-2	YW1355000	VANADIUM (FUME OR DUST)			V125		V					X		
1314-62-1 4757	YW2460000	VANADIUM PENTOXIDE	2862	VOX	2570		O5-V2 4963385	X	X	1000	100/10000		X	P120
27774-13-6 4761	YW1925000	VANADYL SULFATE	9152	VSF			O5-S-V 4963384		X	1000				
108-05-4 4764	AK0875000	VINYL ACETATE MONOMER	1301	VAM	2572	2-3-2	C4-H6-O2 4907720	X	X	5000	1000	X		
593-60-2 4765	KU8400000	VINYL BROMIDE	1085		2577	2-0-1	C2-H3-Br					X		
75-01-4 1692	KU9625000	VINYL CHLORIDE	1086	VCM	2580		C2-H3-Cl 4905792		X	10		X	X	U043
75-35-4 4772	KV9275000	VINYLIDENE CHLORIDE	1303	VCI	2583	2-4-2	C2-H2-Cl2 4907280		X	5000		X	X	U078
81-81-2 5240	GN4550000	WARFARIN	3027		2586		C19-H16-O4	X	X	100	500/10000		X	P001
129-06-6 5241	GN4725000	WARFARIN SODIUM					C19-H15-O4 .Na	X		1	100/10000			
1330-20-7 8151	ZE2100000	XYLENE (MIXED ISOMERS)	1307		2590		C8-H10 4909350		X	1000		X	X	U239
1300-71-6 4791	ZE5425000	XYLENOL	2261	XYL	X101		C8-H10-O 4941193		X	1000				
28347-13-9 5242	ZE4055000	XYLYLENE DICHLORIDE					C8-H8-Cl2	X		1	100/10000			
7440-66-6 4814	ZG8600000	ZINC (FUME OR DUST)	1436		Z100		Zn		X	1000		X		
557-34-6 4794	AK1500000	ZINC ACETATE	9153	ZNA			C4-H6-O4 .Zn 4963387		X	1000				
14639-97-5 4795		ZINC AMMONIUM CHLORIDE	9154	ZAC			Cl4-Zn .2H4-N		X	1000				
14639-98-6 4795		ZINC AMMONIUM CHLORIDE	9154	ZAC			Cl5-Zn .3H4-N		X	1000				
52628-25-8 4795	ZG9150000	ZINC AMMONIUM CHLORIDE	9154	ZAC			H3-N .Cl-Zn 4966386		X	1000				
1332-07-6 8159	ED6040000	ZINC BORATE	9155	ZBO			4963389		X	1000				

CAS NO. / NDAA NO.	RTECS NO.	CHEMICAL NAME	DOT NO.	COAST GUARD CODE	IMIS CODE	NFPA CODE	MOLECULAR FORMULA / STC	302	CER-CLA	RQ	TPQ1 / TPQ2	313	RCRA LST	RCRA CC
7699-45-8 4803	ZH1150000	ZINC BROMIDE	9156	ZBR	2101		Br2-Zn 4966780		X	1000				
3486-35-9 4804	FG3375000	ZINC CARBONATE	9157	ZCB			C-03 .Zn 4963890		X	1000				
7646-85-7 4807	ZH1404000	ZINC CHLORIDE, ANHYDROUS	1840	ZCL	2611		Cl2-Zn 4932393		X	1000				
		ZINC COMPOUNDS							X			X		
557-21-1 4808	ZH1575000	ZINC CYANIDE	1713	ZCN			C2-N2-Zn 4923495		X	10			X	P1
7783-49-5 4810	ZH3500000	ZINC FLUORIDE	9158	ZFX			F2-Zn 4963195		X	1000				
557-41-5 4812	LR0550000	ZINC FORMATE	9159	ZFM			C2-H2-O4 .Zn 4963392		X	1000				
7779-86-4 4813	JP2105000	ZINC HYDROSULFITE	1931	ZHS			H2-O4-S2 .Zn 4941195		X	1000				
7779-88-6 4815	ZH4772000	ZINC NITRATE	1514	ZNT			N2-O6 .Zn 4918790		X	1000				
127-82-2 4818	DB7120000	ZINC PHENOLSULFONATE	9160	ZPS			C12-H12-O8-S2 .Zn 4966389		X	5000				
1314-84-7 4819	ZH4900000	ZINC PHOSPHIDE	1714	ZPP			P2-Zn3 4923496	X	X	100	500		X	P1
16871-71-9 8179	VV8754000	ZINC SILICOFLUORIDE	2855	ZSL			F6-Si .2K 4966392		X	5000				
7733-02-0 4826	ZH5260000	ZINC SULFATE	9161	ZSF			O4-S .Zn 4963786		X	1000				
58270-08-9		ZINC, DICHLORO(4,4-DIMETHYL-5((((METHYLYLAMINO) CARBONYL)OXY)I					C9-H15-Cl2-N3-O2-Zn	X		1	100/10000			
12122-67-7	ZH3325000	ZINEB					C4-H6-N2-S4 .Zn					X		
13746-89-9 4834	ZH8750000	ZIRCONIUM NITRATE	2728	ZIR			N4-O12 .Zr 4918791		X	5000				
16923-95-8 4836	ZH7028000	ZIRCONIUM POTASSIUM FLUORIDE	9162	ZPF			F6-Zr .2K 4966395		X	1000				
14644-61-2 4837	ZH9100000	ZIRCONIUM SULFATE	9163	ZCS			O8-S2 .Zr 4944185		X	5000				
10026-11-6 4838	ZH7175000	ZIRCONIUM TETRACHLORIDE	2503	ZCT			Cl4-Zr 4932395		X	1000				

SECTION XIII
WASTE MANAGEMENT PLAN

SECTION XIII
WASTE MANAGEMENT PLAN

This Waste Management Plan has been developed to meet Corporate and Governmental requirements concerning disposal of various operating materials at the end of its useful life.

At the present time, the Monument Plant does not generate any RCRA hazardous wastes. If, or when, it should be determined a hazardous waste exists, it will be disposed of according to RCRA standards, with documentation and proper manifests to an approved hazardous waste disposal site. Formal contracts will be negotiated and disposal sites will be selected, per Chevron's current approved hazardous waste site list.

SECTION XIII - WASTE MANAGEMENT PLAN (Continued)

1. The following list shows the types, expected amounts, and the source of wastes which are generated at the Monument facility:

ITEM	TYPE	EXPECTED AMOUNT	SOURCE	DISPOSAL METHOD
Filter	Amine, Dust, Oil, Product, Charcoal, Air, etc.	800 Cartridges/yr	Amine, oil, gas filter cases, air intake cases	Waste control of New Mexico
Cooling Tower Blowdown	Water	700 Bbls/Day	Cooling Tower	Rice Disposal Pipeline
Boiler Blowdown Water	Water	20 Bbls/Day	Waste Heat, Waste Reclaimer, Holman Boilers	Rice Disposal Pipeline
Plant Trash	Paper, Wood cardboard, household items, small concrete, etc.	9 yds/wk	Office, Shop, etc.	Waste Control of New Mexico
Cooling Tower Basin Sludge	Sludge, slurry mix	2 yards/year	Cooling Tower	Tilled into plant landfill
Oil/Scrubber Tank Bottoms	Oil sludge, sand, dirt, scrubber bottoms	Infrequent, varied amounts	Scrubbers, oil tanks	Pollution Control Inc.
Solvent	Varsol	200 gals/year	Parts washing bin	Oil Recovery Tank
Steel Drums	Lube oil, anti-freeze, chemicals, LPG odorizer	60 drums/year 12 disposed of locally	Outside vendors	Emptied and returned to vendor or crushed & delivered to Waste Control of NM
Concrete		Infrequent, varied amounts	Various in-plant	Plant landfill and Waste Control of New Mex.
Molecular sieve activated alumina, sulfur plant catalyst, ion exchange, resin, etc.	Solid particles	Infrequent, varied amounts	Dehydrators, sulfur plant water treaters	Plant landfill
Amine	DEA	Infrequent negligible amounts	Amine System drips	Rice Disposal Pipeline

SECTION XIII - WASTE MANAGEMENT PLAN (Continued)

ITEM	TYPE	EXPECTED AMOUNT	SOURCE	DISPOSAL METHOD
Hydrogen Sulfide		500 MSCFD	Amine System, Green Gas, Sulfur plant	Sulfur Conversion incineration
Wash Water	Water	50 Bbls/Day Plant Area	Engine Room	Rice Disposal P/L
Produced Water from Compression	Water	100 Bbls/Day	Scrubbers	Rice Disposal P/L
Brine Water	Brine	300 Bbls/Month	Water Treaters	Rice Disposal P/L
Hydrostatic Test Water	Water	Infrequent, varied amounts	Pipeline, vessel tests	Rice Disposal P/L
Sump or Pit Sludge	Sand, dirt, waste/wash water, sediment	2 yards/year	Waste water pits	Pollution Control, Inc.
Scrap Iron		20 tons/year	Old piping, etc.	Scrap retail dealers
Oil contaminated dirt	Dirt	Infrequent, varied amounts	Spills	Tilled into plant landfill, dirt
Used Oil*	Motor Oil	15 Bbls/Year	Engines Eqpt.	Oil Recovery Tanks
Scrubber Oil/ Condensate	Oil	250 Bbls/Month	Scrubbers	Oil Recovery Tanks
Asbestos Insulation		Infrequent, varied amounts	Oil insulated liner	Outside contracts
RO Waste Water	Water	90 Bbls/Day	R.O. Treater	Evaporation Area

*Oil and water collected in scrubbers in separated with the oil being treated to remove water and sold to Shell Pipeline Company. The water is combined with the plant discharge and sent to the Rice Engineering injection well.

1.a. The Monument Plant transformers have been tested and found not to have any PCB's.

2. For the listed wastes, operating procedures are followed to minimize the amounts generated, such as:

Steel drums - exchanged with vendors
Molecular sieve - sent in for regeneration, if practical
Hydrostatic test water - air is used for pressure testing to eliminate water disposal problems
Filters - changed based on differential indicators, not set time intervals
Blowdowns - Controlled, based upon water tests
Amine - Recovered and reused, where practical
Engine Oil - Changed only when contamination is indicated

3. All wastes listed in No. 1 have been properly classified as hazardous or non-hazardous. If a waste cannot be positively identified as hazardous or non-hazardous, then the Warren Petroleum Environmental Affairs Department is contacted to recommend an outside company to do testing and analysis.

4. The necessary safety precautions for handling each waste listed in No. 1 above is taken to avoid adverse health affects. The Safety Department and Environmental Department are contacted when specific precautions are needed. Reference to the Material Safety Data Sheets (MSDS) is made concerning proper handling of all products.

5. Potential for waste recycling is considered when the use of wastes is feasible in alternative processes, such as re-injecting water into producing formation for enhanced oil recovery.

SECTION XIV

RICE INJECTION WELL PERMIT

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Form C-110
Revised 7/1/55

(File the original and 4 copies with the appropriate district office)

CERTIFICATE OF COMPLIANCE AND AUTHORIZATION
TO TRANSPORT OIL AND NATURAL GAS

Company or Operator Rice Engineering & Operating, Inc. Lease Eunice-Monument Eumont SWD

Well No. I-1 Unit Letter I S 1 T 20S R 36E Pool Monument

County Lea Kind of Lease (State, Fed. or Patented) State

If well produces oil or condensate, give location of tanks: Unit ____ S ____ T ____ R ____

Authorized Transporter of Oil or Condensate _____

Address _____
(Give address to which approved copy of this form is to be sent)

Authorized Transporter of Gas _____

Address _____ Date Connected _____
(Give address to which approved copy of this form is to be sent)

If Gas is not being sold, give reasons and also explain its present disposition:

RECEIVED
AUG 2 1960
RICE ENGINEERING & OPERATING, INC.
HOBBS, N. M.

Reasons for Filing: (Please check proper box) New Well ( )

Change in Transporter of (Check One): Oil ( ) Dry Gas ( ) C'head ( ) Condensate ( )

Change in Ownership (X) Other ( )

Remarks: (Give explanation below)

This well had previously been operated by Skelly Oil Company as their State "D" No. 3, a marginal well in the Abo pay zone. Rice Engineering intends to make a salt water disposal well for the Eunice-Monument-Eumont SWD System in the lower San Andres Formation. This has been approved by the New Mexico Oil Conservation Commission - Order No. R-1717.

The undersigned certifies that the Rules and Regulations of the Oil Conservation Commission have been complied with.

Executed this the 21 day of July 19 60

By W. G. Abbott
W. G. Abbott

Title Division Manager

Company RICE ENGINEERING & OPER., INC.

Address Box 1142

Hobbs, New Mexico

Approved JUL 29 1960 19 ___

OIL CONSERVATION COMMISSION

By Leslie A. Clements

Title Oil & Gas Insp.

NEW MEXICO OIL CONSERVATION COMMISSION

FORM C-103
(Rev 3-55)

MISCELLANEOUS REPORTS ON WELLS

HOBBS OFFICE OCC

(Submit to appropriate District Office as per Commission Rule 1106)

1960 AUG 2 AM 9:37

Name of Company	Address
Rice Engineering & Operating, Inc.	P. O. Box 1142, Hobbs, New Mexico

Lease	Well No.	Unit Letter	Section	Township	Range
E-M-E SWD	I-1	I	1	20-S	36-E

Date Work Performed	Pool	County
7-29-60	Monument - Abo	Lea

THIS IS A REPORT OF: *(Check appropriate block)*

☐ Beginning Drilling Operations ☐ Casing Test and Cement Job ☒ Other *(Explain)*: Plug back from Monument-Abo to Monument-San Andres (Salt Water Disposal).

☐ Plugging ☐ Remedial Work

Detailed account of work done, nature and quantity of materials used, and results obtained.

1. Set drillable wire line bridging plug @ 5050' and dumped 5 sacks cement.
2. Loaded casing with water and tested casing @ 2000 psi for 30 minutes.
3. Perforated 5½" casing from 4300' to 4350', 4450' to 4550', 4650' to 4670', 4735' to 4785', 4820' to 4830', and 4910' to 4935'.
4. Tested salt water injection @ 16 bph natural by gravity.
5. Acidized with 16,000 gallons of 15% regular acid and 2500 gallons 30% regular acid, Maximum drill pipe pressure of 3400 psi @ 10 BPM injection.
6. Pulled drill pipe and tested injection at 860 BPH by gravity down casing.

RECEIVED

AUG 3 1960

RICE ENGINEERING & OPERATING, INC.
HOBBS, N. M.

Witnessed by	Position	Company
L. B. Goodheart	Engineer	Rice Engineering & Operating, Inc.

FILL IN BELOW FOR REMEDIAL WORK REPORTS *ONLY*

ORIGINAL WELL DATA

D F Elev.	T D	PBTD	Producing Interval	Completion Date
3577'	7625'	7580'	7465-7515	7-19-49

Tubing Diameter	Tubing Depth	Oil String Diameter	Oil String Depth
-	-	5½" OD	7625'

Perforated Interval(s): 7410' - 7440', 7465' - 7515'

Open Hole Interval	Producing Formation(s)
	Monument-Abo

RESULTS OF WORKOVER

Test	Date of Test	Oil Production BPD	Gas Production MCFPD	Water Production BPD	GOR Cubic feet/Bbl	Gas Well Potential MCFPD
Before Workover		Marginal Producer by Skelly Oil Company				
After Workover	7-29-60	Recompleted as Salt Water Disposal Well with test of 860 BPH.				

OIL CONSERVATION COMMISSION

Approved by

Title

Date

I hereby certify that the information given above is true and complete to the best of my knowledge.

Name W. G. Abbott

Position Division Manager

Company Rice Engineering & Operating, Inc.

(Form C-102)
(Revised 7/1/52)

NEW MEXICO OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

MISCELLANEOUS NOTICES

Submit this notice in TRIPLICATE to the District Office, Oil Conservation Commission, before the work specified is to begin. A copy will be returned to the sender on which will be given the approval, with any modifications considered advisable, or the rejection by the Commission or agent, of the plan submitted. The plan as approved should be followed, and work should not begin until approval is obtained. See additional instructions in the Rules and Regulations of the Commission.

Indicate Nature of Notice by Checking Below

NOTICE OF INTENTION TO CHANGE PLANS		NOTICE OF INTENTION TO TEMPORARILY ABANDON WELL		NOTICE OF INTENTION TO DRILL DEEPER	
NOTICE OF INTENTION TO PLUG WELL		NOTICE OF INTENTION TO PLUG BACK	X	NOTICE OF INTENTION TO SET LINER	
NOTICE OF INTENTION TO SQUEEZE		NOTICE OF INTENTION TO ACIDIZE	X	NOTICE OF INTENTION TO SHOOT (Nitro)	
NOTICE OF INTENTION TO GUN PERFORATE	X	NOTICE OF INTENTION (OTHER)		NOTICE OF INTENTION (OTHER)	

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

P. O. Box 1142, Hobbs, N. Mex. (Place) July 21, 1960 (Date)

Gentlemen:

Following is a Notice of Intention to do certain work as described below at the Rice Engineering & Operating, Inc.

E-M-E SWD (Company or Operator) Lease Well No. I-1 in I (Unit)

NE ¼ SE ¼ of Sec. 1, T. 20S, R. 36E, NMPM., Monument Pool
(40-acre Subdivision)

Lea County.

FULL DETAILS OF PROPOSED PLAN OF WORK
(FOLLOW INSTRUCTIONS IN THE RULES AND REGULATIONS)

1. Set drillable wire line bridging plug at 5050' and dump 5 sacks cement.
2. Load casing with water.
3. Test casing at 2000 psi for 30 minutes.
4. Perforate 5½" casing @ 4450' to 4550', 4650 to 4670', 4735' to 4785', 4820' to 4830', 4910' to 4935'.
5. Test injection rate of disposal well.
6. Acidize with 10,000 gallons of 15% acid.
7. Run 4½" O.D. Hydril tubing.
8. Load annular space with sweet oil.
9. Test injection rate of disposal well.

RECEIVED

JUL 25 1960

RICE ENGINEERING & OPERATING, INC.
HOBBS, N. M.

Approved JUL 22 [illegible], 19
Except as follows:

RICE ENGINEERING & OPERATING, INC.
Company or Operator

By W. G. Abbott
W. G. Abbott

Position Division Manager

Approved
OIL CONSERVATION COMMISSION

By [signature]

Title

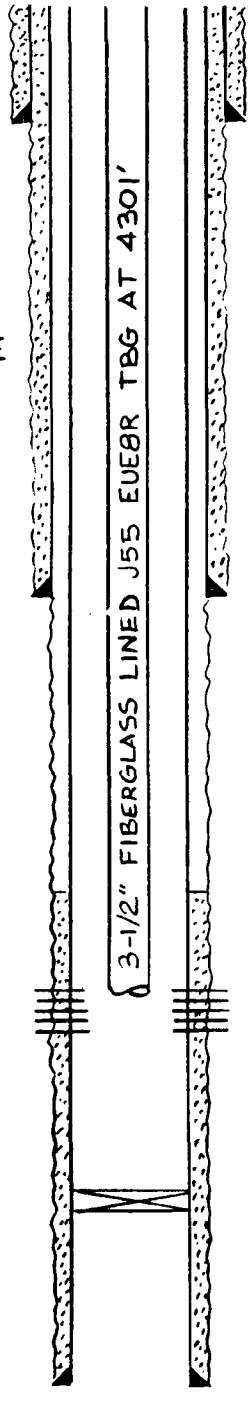
Send Communications regarding well to:

Name RICE ENGINEERING & OPERATING, INC.

Address P. O. Box 1142, Hobbs, New Mexico

2310' FSL & 660' FEL, SEC. 1, T20S, R36E, LEA CO., NEW MEXICO

DF : 3577'



17-1/2" HOLE
420 SX.

13-3/8" 44.5 PPF
CSG AT 324'

T/ANHYDRITE 930'

12-1/4" HOLE
1500 SX

B/SALT 2280'
T/YATES 2390'

9-5/8" 36 PPF
CSG AT 2786'

ANNULUS IS LOADED WITH
50 BBL 65°API OIL
BLANKET

7-7/8" HOLE
1260 SX

TOC AT 3126'

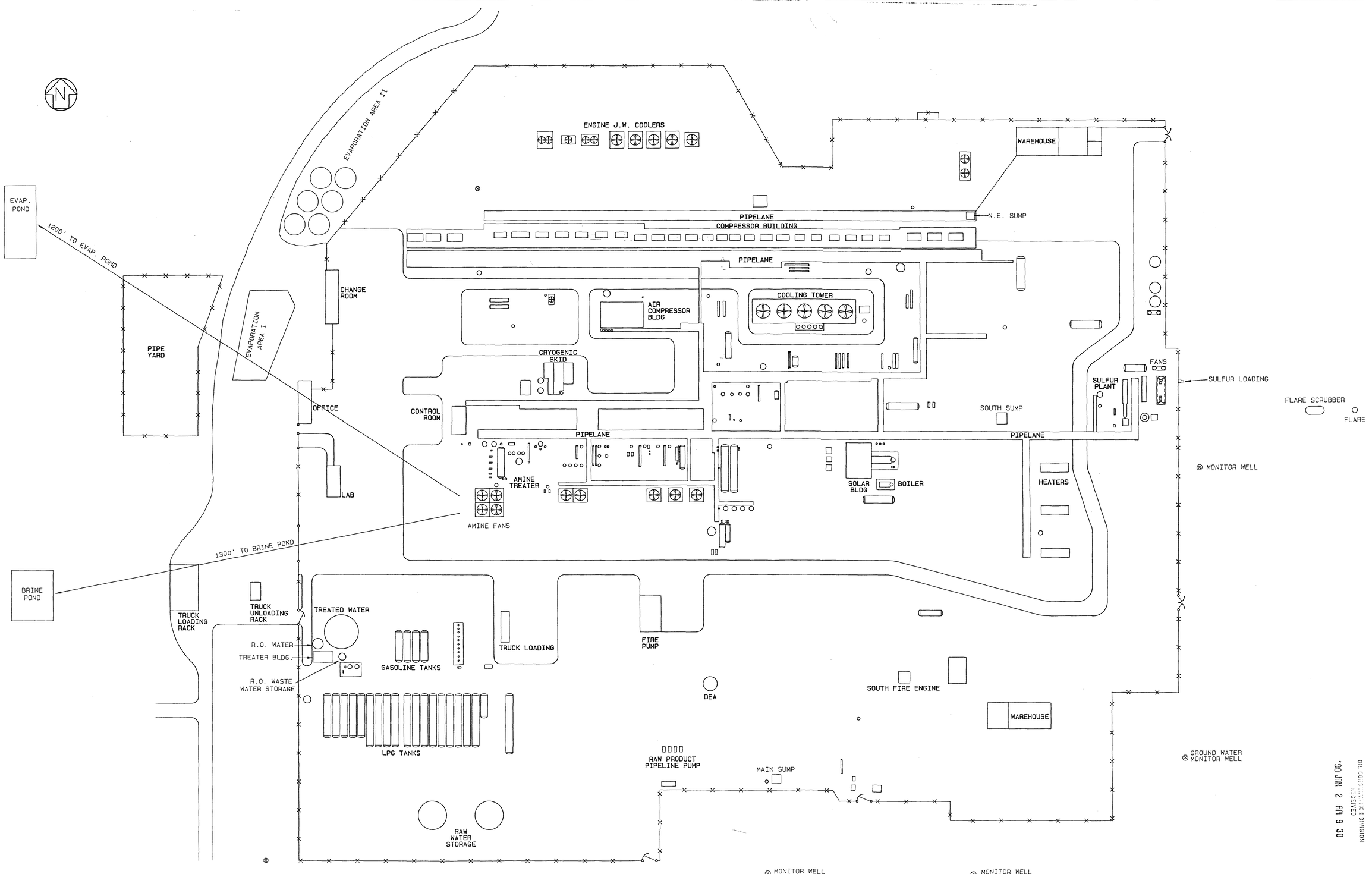
LO. SAN ANDRES
PERFS AT 4300-50,
4450-4550, 4650-70,
4735-85, 4820-30,
4910-35

T/GLORIETA 5108'
T/CLEARFORK 5663'
T/TUBBS 6270'
T/WICHITA 6869'

CIBP AT 5050' WITH
5 SX CMT ON TOP

5-1/2" 17 PPF
CSG AT TD OF 7625'

WN	3-28-89	S.A.H.	APPROVED		E-M-E SWD SYSTEM SWD WELL I-1	SCALE NONE
					Rice Engineering Corporation Great Bend, Kansas	DWG. NO.



'90 JAN 2 AM 9 30

OIL CONSERVATION DIVISION
RECEIVED

GENERAL NOTES	GENERAL NOTES	DWG. NO.	REFERENCE DRAWINGS

NO.	REVISION	BY	DATE	CHK.	APPR
	⊗ MONITOR WELL				
1	REDRAWN	LP	7-89		
	⊗ MONITOR WELL				

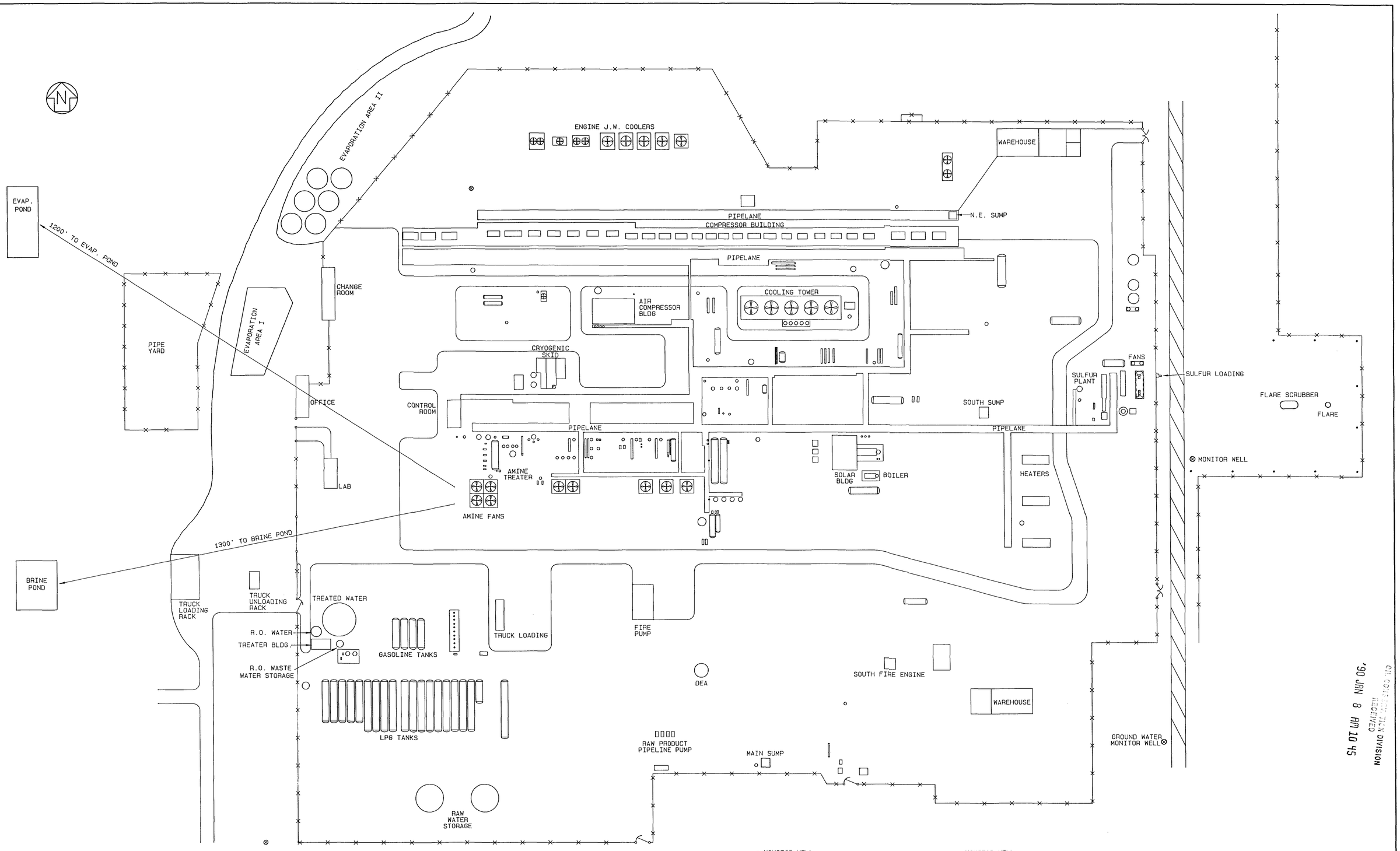
AFE OR WO	ISSUE		
	DATE	PRELIM.	CONST.

WARREN PETROLEUM COMPANY
A DIVISION OF CHEVRON U.S.A. INC.
TULSA, OKLAHOMA
AFE 82345-B

PLOT PLAN

PLT. 118 MONUMENT — MONUMENT NM.

DRAWN LP	DATE 7-20-89	SCALE 1"=60' | 5-4-3
CHECKED	DATE	118-1000-1
APPR.	DATE	



90 JAN 8 AM 10 45
RECEIVED
OIL CONSERVATION DIVISION

GENERAL NOTES	GENERAL NOTES	DWG. NO.	REFERENCE DRAWINGS

NO.	REVISION	BY	DATE	CHK.	APPR

NO.	REVISION	BY	DATE	CHK.	APPR
1	REDRAWN	LP	7-89		

AFE OR WO	ISSUE		
	DATE	PRELIM.	CONST.

WARREN PETROLEUM COMPANY
A DIVISION OF CHEVRON U.S.A. INC.
TULSA, OKLAHOMA
WP 82345-B

PLOT PLAN

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CHECKED	DATE		
APPR.	DATE		118-1000-1