I INTRODUCTION

Union Oil Company of California is the sole lessee and operator for the Hueneme Offshore Field. The field is located in Federal waters about four miles off the Ventura-Oxnard, California coast in Federal Leases OCS P-0202 and P-0203 in about 95 feet of water.

A fifteen-slot platform will be set in December, 1979, to develop the Hueneme and Sespe formations. Six producers and six injectors will be drilled beginning in March, 1980, with all wells having gravel-packed completions. Reservoir pressure will be maintained by the injection of produced water and seawater. Initial production rates are anticipated to be 1,143 barrels of oil per day, per well, with a gas-oil ratio of 195 SCF/STB. Over ninety percent of this rate will be from the Hueneme formations. Peak production rate for the field will be 6,450 BOPD in September, 1980. Injection will be maintained at 7,500 barrels of water per day. Ultimate estimated recovery in 18 years will be 9.53 million barrels of oil and 1.72 billion cubic feet of gas.

This report is a complete description and evaluation of the field and is the Plan of Development to be submitted to the concerned agencies as described in OCS Order Nos. 8 and 11. This report will, therefore, include the following: (1) the field history and geology, (2) the drilling and testing history, (3) the reservoir descriptions and evaluations, (4) the platform structure and site, (5) the drilling facilities, procedures, and completions, (6) the platform production facilities, (7) the gathering systems, (8) the onshore site and

facilities, (9) the safety controls and pollution prevention facilities, and (10) an appendix. The appendix will contain the following: (A) the reservoir rock and fluid characteristics, (B) drilling rig and drilling deck diagrams, and (C) the reservoir performance prediction.

The development plan includes:

1. Fabrication and installation of a drilling and production platform in 95 feet of water.
2. Fabrication and installation of the facilities on said platform necessary
   (a) to test, measure and transport the production,
   (b) to clean, treat and inject seawater for pressure maintenance operations, and
   (c) to inject produced water for pressure maintenance operations.
3. Installation of a drilling rig with associated facilities.
4. Installation of a production line to shore and a return line for produced water.
5. Installation of onshore facilities necessary to receive, heat, separate, measure and distribute the production.
6. Installation of safety controls and pollution prevention facilities necessary to protect operating equipment and the environment.

As many as fifteen wells can be drilled from the platform, with six producers and six injectors planned initially.

Exploratory drilling has indicated the Hueneme sand and the Sespe sand to have accumulations of oil, and the fractured Monterey to have an accumulation of gas. The Hueneme formation has produced 15.4°API crude with a gas-oil ratio of about 87 cubic feet per barrel. The Sespe formation has produced 14.1°API crude with a gas-oil ratio of about 152 cubic feet per barrel. The Monterey formation has produced gas at a low rate.

Geology Section

Pursuant to the Freedom of Information Act (5 U.S.C. 552) and its implementing regulations (43 CFR Part 2) and as provided in 30 CFR 550.199(b), the information contained in this section is deleted from the public information copy of this submission.

Proprietary

Not for Public Release

Reservoir Evaluation Section

Pursuant to the Freedom of Information Act (5 U.S.C. 552) and its implementing regulations (43 CFR Part 2) and as provided in 30 CFR 550.199(b), the information contained in this section is deleted from the public information copy of this submission.

Proprietary

Not for Public Release

IV DRILLING PROCEDURES

Six producers and six injectors will be drilled from the proposed platform. Average measured well depth for the producers is 5450' and for the injectors is 5750'. Estimated time to drill and complete each well is 27 days. Figures 6 and 7 are schematic drawings of typical well completions. It would be preferred to separate the completion intervals in all wells by cemented blank casing, as shown for the typical producer, but because of the close proximity of the two zones, this may not be practical, necessitating a single interval completion, as shown for the typical injectors.

The proposed drilling rig is a Pool Company "1000" manufactured by O.I.M.E., Odessa, Texas. The rig is capable of drilling to 12,000' with 4-1/2" drill pipe. Appendix B contains drawings of the proposed rig and drilling deck.

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TYPICAL PRODUCER

PROCEDURE

1. Rig up over celler.
2. Drill 26" hole to 300' MD (100' BML).
3. Run and cement 20" casing 100' BML.
4. Drill 17-1/2" hole to 500' MD (300' BML). Underream hole to 22" to 500' MD.
5. Run and cement 16" casing 300' BML. Install 20" Hydril.
6. Drill 12-1/4" hole to 1200' MD (1000' BML); open hole to 18".
7. Run and cement 13-3/8" casing 1000' BML. Install and test 13-5/8" BOPE.
8. Drill 12-1/4" hole to 2600' MD (2400' BML); open hole to 15".
9. Run and cement 10-3/4" liner from 1100' MD to 2600' MD (2400' BML).
10. Directionally drill 9-7/8" hole to 5540' TMD, 5340' TVD (5140' TVD BML).
11. Run logs.
12. Underream to 15" in two stages: Sespe interval 5306' to 5540' and Hueneme interval 5125' to 5215' MD.
13. Run Caliper log.
14. Run 7" combination blank and slotted 20-mesh wire wrapped casing to 5520' MD.
15. Gravel pack in two stages, Sespe and Hueneme intervals.
16. Cement blank section between gravel packed intervals.
17. Cement blank section above top gravel packed interval.
18. Run Cement Bond log.
19. Run pumping equipment on 2-7/8" tubing.
20. Remove BOPE and install Christmas tree.
21. Place well on production, pumping from Sespe and Hueneme gravel packed intervals.

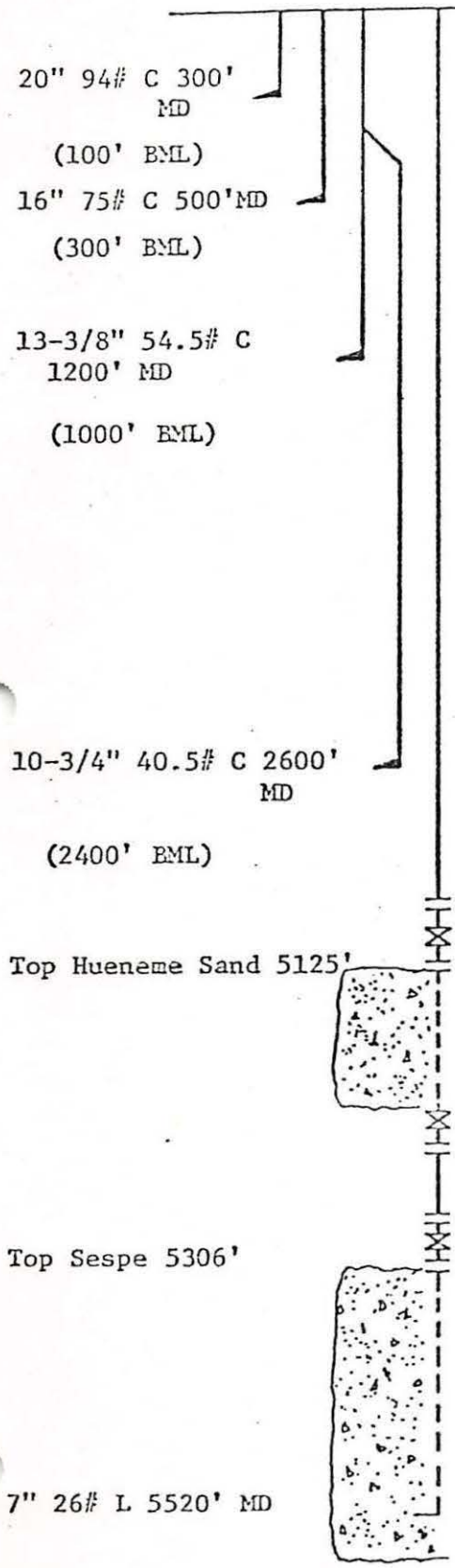
FIGURE 6
HUENEME FIELD
SANTA BARBARA CHANNEL
UNION-OCS P-0202 N°

CONFIDENTIAL

PROPOSED CONDITION
HUENEME AND SESPE PRODUCER

TYPICAL WELL SCHEMATIC

RT to MLLW	100'
Water depth	100'
RT to ML	200'



10-3/4" x 13-3/8" hanger

7" F.O. cementer 5100'

7" Lynes packer 5107'

7" P.C. 5123'

9-7/8" hole opened to 15" 5125'-5215' MD
20-mesh wire-wrapped casing 5125'-5215'
gravel packed with 10-20 mesh gravel
7" Lynes packer 5225'
F.O. cementer 5241'

F.O. cementer 5281'
7" Lynes packer 5288'
7" P.C. 5304'

9-7/8" hole opened to 15" 5306'-5540' MD

20-mesh wire-wrapped casing 5306'-5520'

Gravel packed with 10-20 mesh gravel

5540' TMD
5340' TVD
5140' TVD BML

CONFIDENTIAL

TYPICAL INJECTOR

PROCEDURE

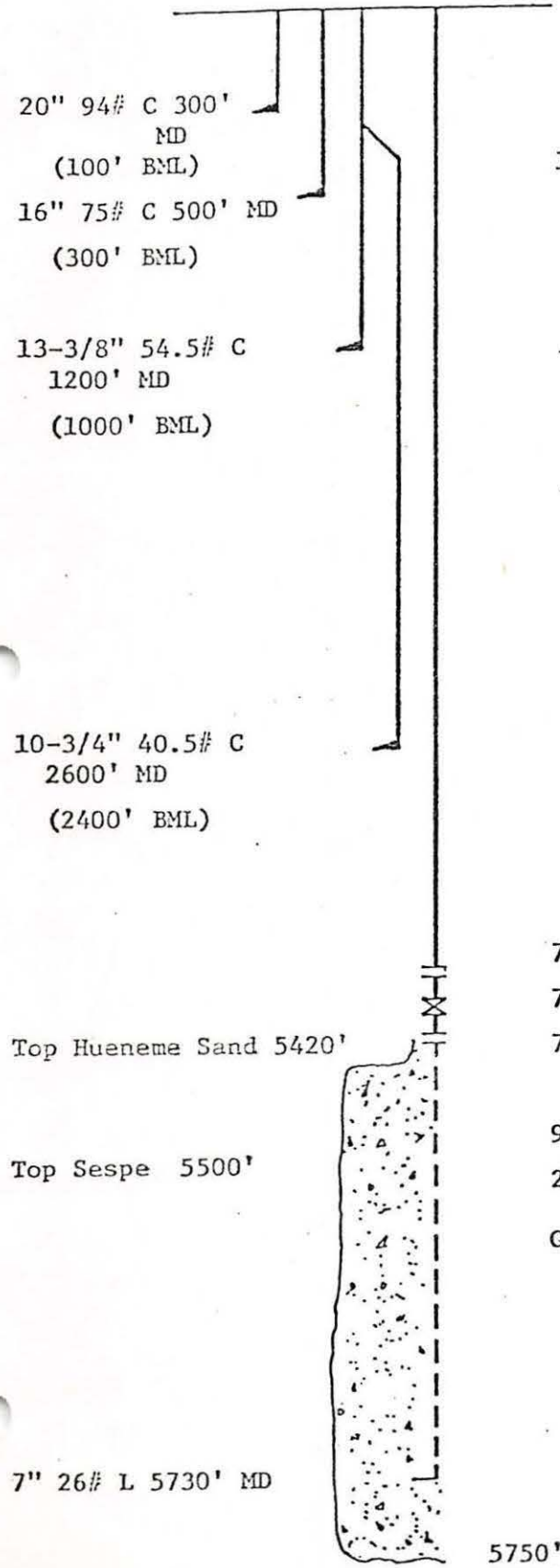
1. Rig up over cellar.
2. Drill 26" hole to 300' MD (100' BML).
3. Run and cement 20" casing 100' BML.
4. Drill 17-1/2" hole to 500' MD (300' BML). Underream hole to 22" to 500'MD.
5. Run and cement 16" casing 300' BML. Install 20" Hydril.
6. Drill 12-1/4" hole to 1200' MD (1000' BML); open hole to 18".
7. Run and cement 13-3/8" casing 1000' BML. Install and test 13-5/8" BOPE.
8. Drill 12-1/4" hole to 2600' MD (2400' BML); open hole to 15".
9. Run and cement 10-3/4" liner from 1100' MD to 2600' MD (2400' BML).
10. Directionally drill 9-7/8" hole to 5750' TMD, 5000' TVD (4800' TVD BML).
11. Run logs.
12. Underream to 15" across Sespe and Hueneme intervals from 5420' to 5750' MD.
13. Run Caliper log.
14. Run 7" combination blank and slotted 20-mesh wire wrapped casing to 5730' MD.
15. Gravel pack Sespe and Hueneme intervals.
16. Cement blank section above gravel packed interval.
17. Run Cement Bond log.
18. Run 2-7/8" injection string.
19. Remove BOPE and install injection head.
20. Commence water injection into the Sespe and Hueneme intervals.

FIGURE 7
HUENEME FIELD
SANTA BARBARA CHANNEL
UNION-OCS P-0202 N°

CONFIDENTIAL

PROPOSED CONDITION
HUENEME AND SESPE INJECTOR

TYPICAL WELL SCHEMATIC



RT to MLLW 100'
Water depth 100'
RT to ML 200'

10-3/4" x 13-3/8" hanger

7" F.O. cementer 5395'
7" Lynes packer 5402'
7" P.C. 5418'

9-7/8" hole opened to 15" 5420'-5750'
20-mesh wire-wrapped casing 5420'-5730'
Gravel packed with 10-20 mesh gravel

5750' TMD
5000' TVD
4800' TVD BML

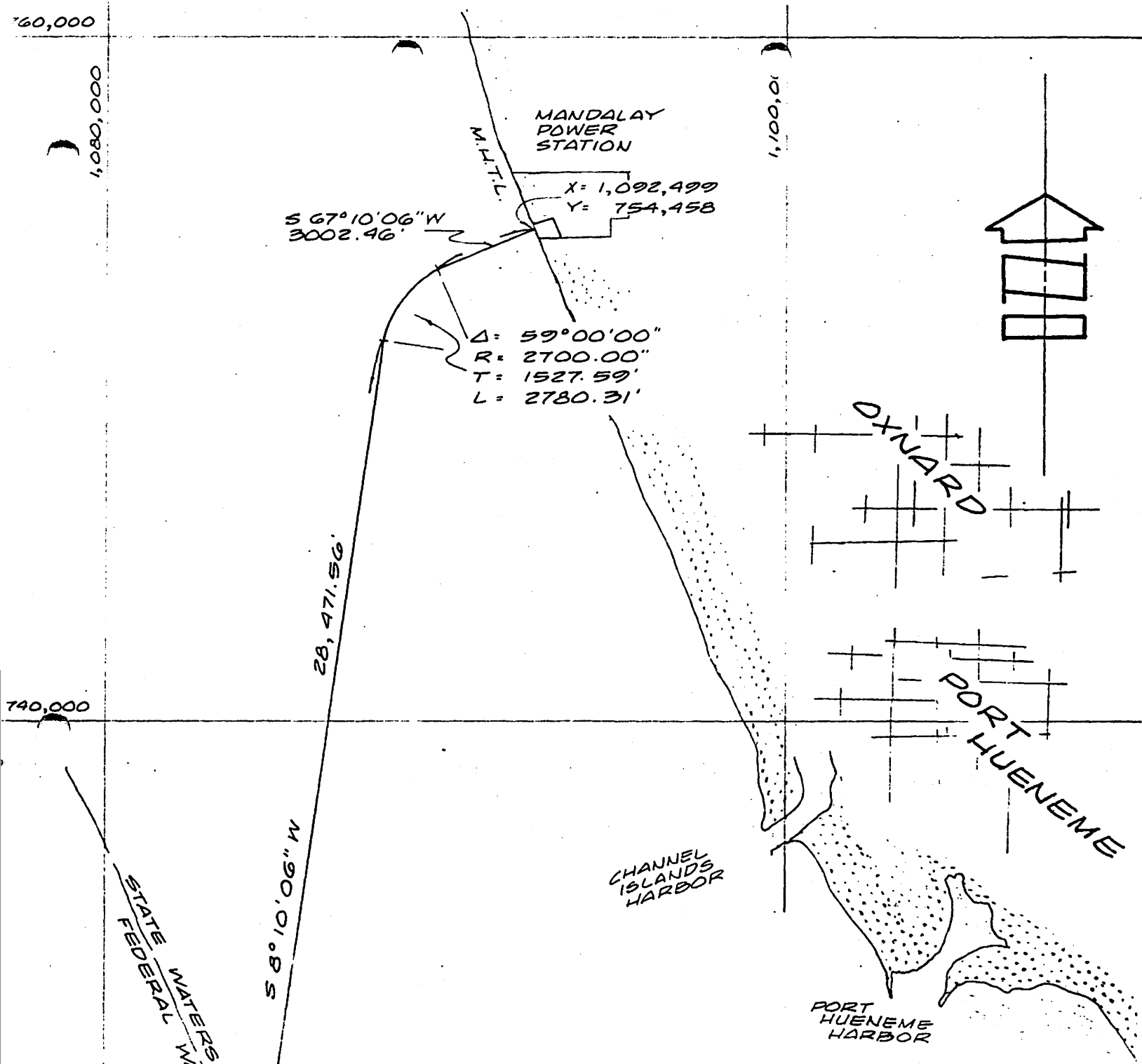
V PLATFORM STRUCTURE AND SITE

The proposed platform will be a six pile structure set in 95' of water at Lambert Grid *coordinates X = 1,084,062 and Y = 723,005, OCS P-0202 approximately four miles west of Port Hueneme. Piling will be driven and/or drilled to a depth sufficient to satisfy all safety requirements as set out in API RP-2A latest edition. The Geotechnical Consultants, Inc., report dated March, 1976, will be used for pile design, etc. The Platform will be designed to conform to the requirements for earthquake stability as set out in API RP-2A. Fifteen well slots will be provided.

The superstructure will consist of a drilling deck 96' x 80' at +63' MLLW elevation, a wellhead deck 40' x 70' at +43' MLLW elevation and a subdeck 40' x 16' at +27' MLLW elevation. The platform will have a heliport, quarters for 6-8 persons, one pedestal-mounted crane, and two boat landings.

The platform will be cathodically protected below sea level and coated with protective paint above sea level. Special provisions will be made for protection in the splash zone. Concurrent with the installation of the support facilities, a standard drilling rig with all required equipment will be installed. Power will be supplied by a submarine power cable from the onshore site. See Figure 3 for a map of the proposed location and pipeline route.

*California Zone VI



UNION OIL COMPANY OF CALIFORNIA

SKETCH SHOWING

PROPOSED PIPELINE ROUTE O.C.S. P-0202

SANTA BARBARA CHANNEL CALIFORNIA

NOVEMBER, 1978 SCALE: 1"=4000'

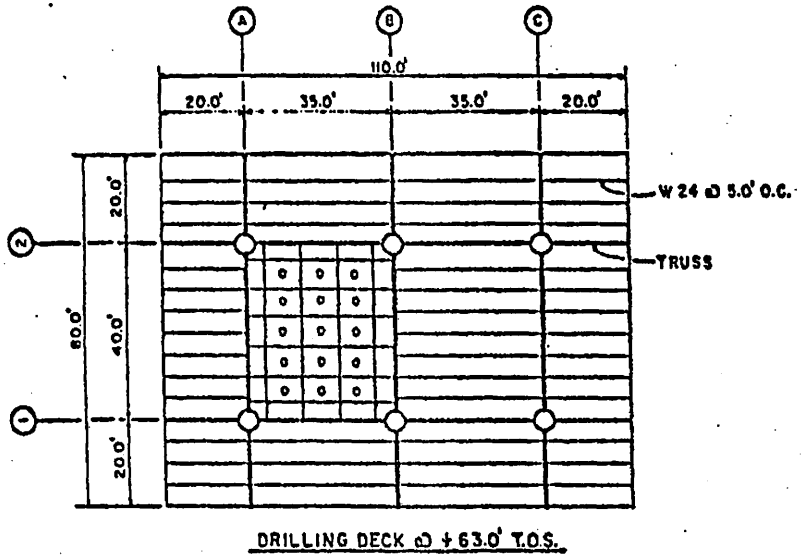
NOTE: BEARINGS, DISTANCES AND COORDINATES SHOWN ON THIS SKETCH CONFORM WITH THE CALIFORNIA COORDINATE SYSTEM (LAMBERT

LEWIS & LEWIS, INC.
surveyors
1600 Callens Road P. O. Box 820

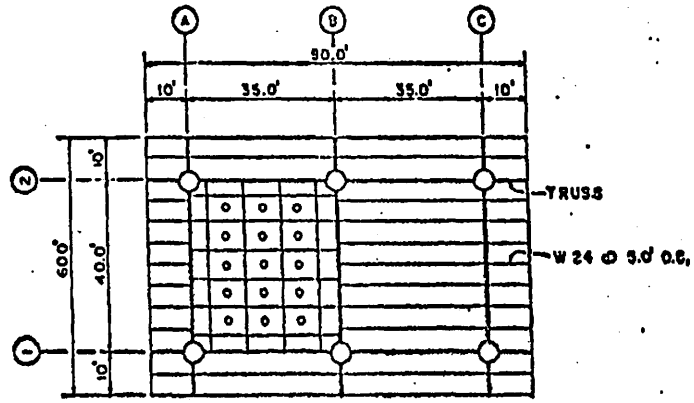
VI PLATFORM SPECIFICATIONS

Water Depth	95'
No. Piles	6
Drill Deck	96' x 80' +63' above MLLW
Production Deck	70' x 40' +43' above MLLW
Sub-Deck	40' x 16' +27' above MLLW
One Crane	North side center, 110' boom Max. load = 76 kips
Heliport	40' x 40' Max. 8,000# capacity
Clear Deck Space	10'
Well Slots	15
Max. load on drill deck	2900 Kips (Load is inside of piling perimeter)
Max. load on prod. deck	600 Kips
Wellhead Room	200#/sq.ft. in well area
Sub-deck	Designed for 85,000# total
South Boat Landing	2 Tier, small for emergency use
North Boat Landing	3 Tier, larger for primary use
Crane Pedestal	Equipped for fuel storage
Cargo Hatch	Near center of drill deck (±15'/sq.ft.)
Pipeline Risers	4 - clamped to jacket (size 2-10" 2-6")
Power Cable	2 - 6" from -85' to ±14'
Cutting Chute	2 - 12" from -80' to ±14'
Sewage Disposal Chute	1 - 4" from -80' to ±14'
Fire Water Source Cans	2 - 12" from -20' to ±14', slotted - closed ends
Pressure Main. Source	2 - 8" from -60" to ±14', slotted - closed ends
Sacrificial Anodes	Attached to jacket (designed and furnished by Union)
Decks	Shall be equipped with curbs and drains

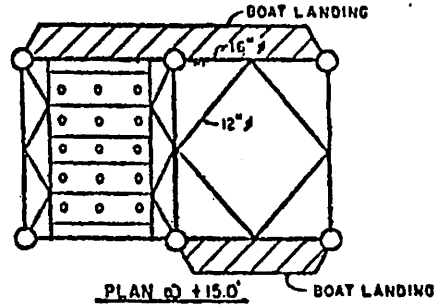
Drawings of the proposed platform are presented in Figures 4 and 5.



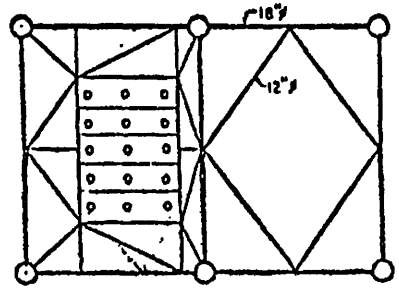
DRILLING DECK @ +63.0' T.O.S.



PRODUCTION DECK @ +43.0' T.O.S.



PLAN @ +15.0'



PLAN @ -40.0'

FIGURE 4

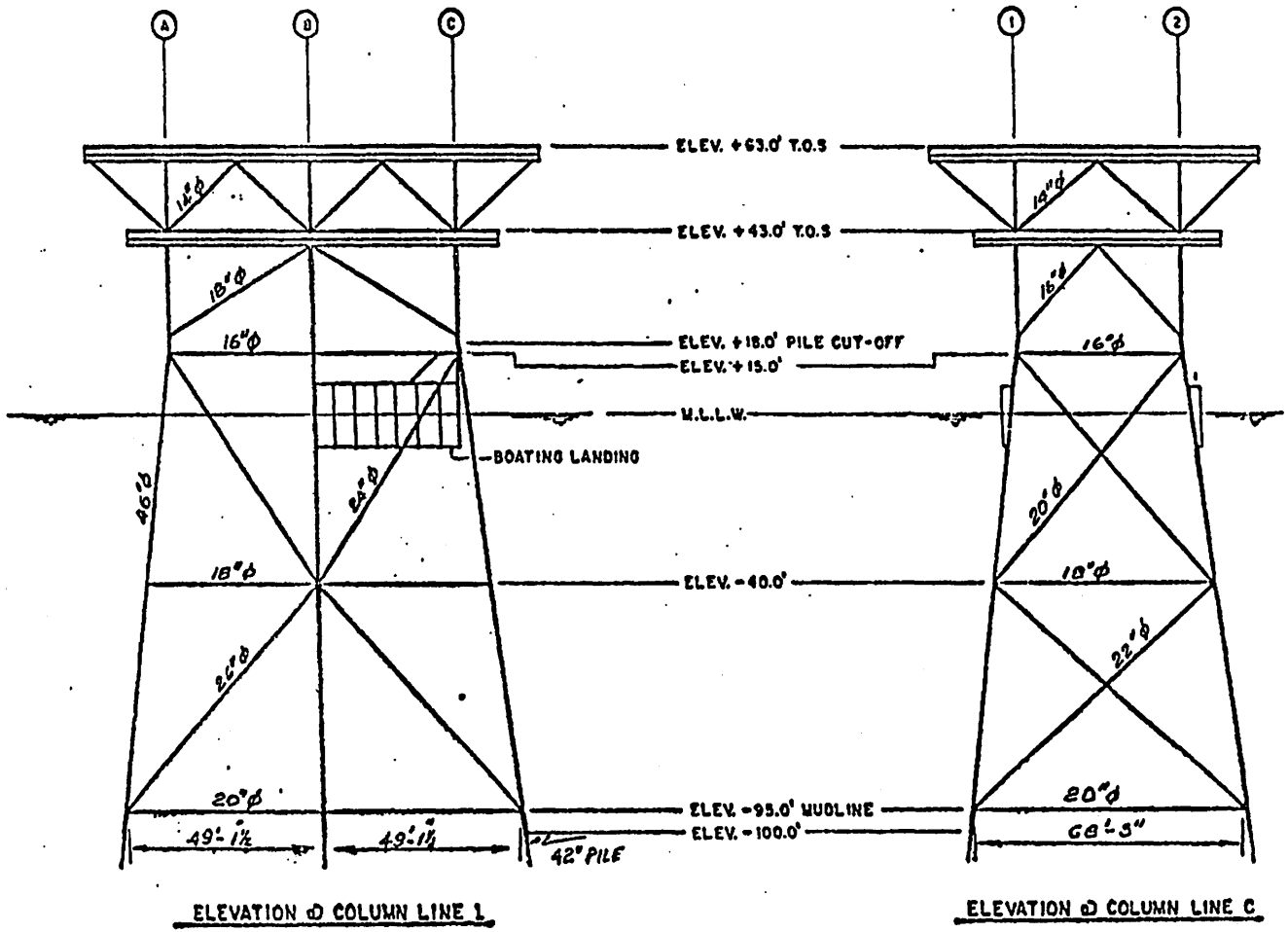

A
B
C
1
2
ELEV. +63.0' T.O.S
ELEV. +43.0' T.O.S
ELEV. +18.0' PILE CUT-OFF
ELEV. +15.0'
M.L.L.W.
BOATING LANDING
ELEV. -40.0'
ELEV. -95.0' MUDLINE
ELEV. -100.0'
42" PILE
49'-1½"
49'-1½"
66'-3"
ELEVATION ℄ COLUMN LINE 1
ELEVATION ℄ COLUMN LINE C

FIGURE 5

VI DESIGN CRITERIA

Earthquake	Use API RP-2A latest edition
Wave	
Maximum	42' (once every 100 years)
Period	15 seconds
Direction of approach	175°
Wind	50 knots sustained - 75 knot gusts from 165°

VII PLATFORM FACILITIES

Support Systems

The platform will be equipped with the following items which are considered support for the drilling and production operations.

1. 1 - Electrically driven fire water pump.
2. 1 - Diesel driven fire water pump.
3. 1 - Crane 70 ton on drill deck.
4. 1 - Crane 2.5 ton on production deck.
5. Deck drain collection and disposal system.
6. Potable water tank and pump.
7. Sewage disposal unit.
8. Public address system.
9. Alarm system.
10. Navigational aids (fog horn and lights).
11. Life saving and floatation equipment.
12. Oil containment and clean-up equipment.
13. Fire hose reels and monitors as required.
14. Direct telephone communications.
15. Radio communications.
16. Emergency generator (12.5 KVA for communications and navigational aids).
17. Gas detectors.
18. Flame detectors.

Pressure Maintenance System

The pressure maintenance system will be composed of the following items:

1. Seawater charge pump.
2. Vacuum tower for oxygen removal.
3. Sand filters.
4. Injection pumps.
5. Injection pumps for returned treated produced water.

Production System

Pumps will be installed in each well to deliver 1250 bbls. of fluid per day at a pressure of 2100 psig (bubble point is 2046 psig). Each well (6) will be equipped with a meter and cut monitor as well as all necessary safety devices. After measurement, the well effluent will go directly into the gathering system line for transport ashore. Metered data, as well as other pertinent information, will be telemetered to the onshore site.

Gathering System

The gathering system will consist of a 10.75" OD line, .500 wall thickness and have a design working pressure of 2160 psig. Produced gas, oil, and water will be transported. First separation will occur in the free water knockout at the onshore treating facility.

The second line (6-5/8" OD) will be installed to return the produced water to the platform for injection for pressure maintenance.

VIII SAFETY, POLLUTION PREVENTION, CONTROLS

The platform decks will be equipped with curbs to contain any spillage which might occur. The spillage will be collected in a tank on the sub-deck, then pumped into the pipeline for transportation ashore. The platform will have onboard such pollution control/containment equipment (booms, skimmers, etc.) as required by the U.S.G.S.

Aids to Navigation, as required and approved by the U.S. Coast Guard, will be installed and maintained in a manner acceptable to the U.S.C.G. U.S.C.G. approved life rafts and life preservers will be provided.

Hand rails, stairways, etc., shall all be installed and maintained to OSHA regulations.

All construction and design shall meet or exceed applicable codes and/or API recommended practices.

Production and drilling equipment shall be equipped with all safety and control devices as required by OCS Orders for the Pacific Area.

The onshore facility shall be constructed and operated to comply with the appropriate California, Cal OSHA, and Federal OCS regulations. A SPCC Plan will be prepared for the onshore facility.

Fire fighting equipment, both water and chemical, will be installed on the platform and at the onshore facility. Training in the use of this equipment will be provided for the operators.

Prior to the beginning of operations, the Oil Spill Contingency Plan will be updated. Thereafter, the Contingency Plan will be updated on a schedule consistent with U.S.G.S. procedures. It should be pointed out, however, that no treating or storage of hydrocarbons will occur on the platform. The maximum amount of hydrocarbons which will ever be on the platform at any one period of time is 10 barrels or less.

IX ONSHORE SITE

The onshore facility will be located on a leased parcel of approximately two acres adjoining on the southwest of the Mandalay generating plant. This parcel is owned by the County of Ventura and adjoins additional County property which will be developed as Mandalay Beach Park. The County has no plans for developing the proposed site. The site is in the existing onshore Montalvo oilfield. It will be landscaped and constructed in a manner acceptable to the City of Oxnard and the Ventura County Department of Parks.

The produced effluent will come to the onshore facility, through a pig receiver, at a temperature of 50°F. Using waste cooling water from the adjoining Mandalay power plant, the stream will be heated to a temperature of +80°F and passed into a FWKO (1000 barrel capacity) where gas and water will be removed. The oil will then go to a gas-fired heater treater for treating to pipeline specifications, thence to a shipping surge tank and a LACT unit to the pipeline. Approximately 2.5 MM BTU/Hr will be reclaimed from the waste water and an additional 3.5 MM BTU/Hr will be needed from the gas-fired heater treater.

All vessels will be under vapor recovery. Gas will be gathered, treated, and compressed for sale.

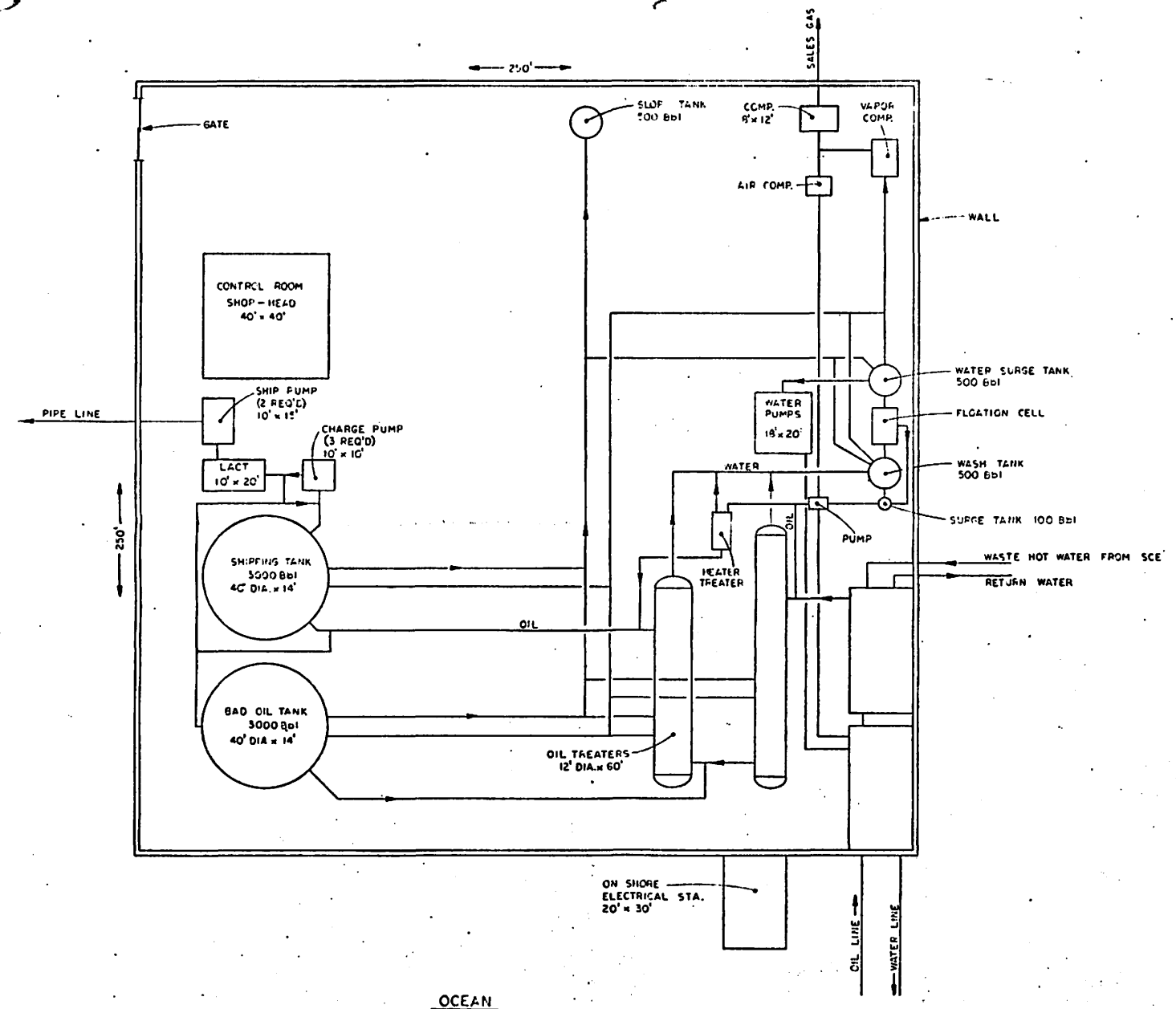
All water will be accumulated in a wash tank for further treatment through an induced gas flotation cell. From the cell, the water will

be pumped back to the platform for injection. Slop oil and water from the flotation cell and the wash tank will go to a small high-temperature heater treater for further treatment. Accumulated sand, sludge, and untreatable oil will go to a sump. From time to time, it will be necessary to haul the sump material to an approved Class I disposal site.

All platform data will be transmitted to the onshore site for direct readout. The onshore site will have the ability to exercise certain commands to the platform as deemed appropriate.

Oil and gas sales will be shipped through lines which presently exist at or near the onshore facility.

Figure 8 is a schematic drawing of the proposed onshore site.



Mc GRATH STATE BEACH

MANDALAY POWER PLANT
—PLOT N—

ASSOCIATED DESIGN

L. NEHUS

SCALE: 1/16" = 1'

1001

Drill Stem Test Data

Pursuant to the Freedom of Information Act (5 U.S.C. 552) and its implementing regulations (43 CFR Part 2) and as provided in 30 CFR 550.199(b), the information contained in this section is deleted from the public information copy of this submission.

Proprietary

Not for Public Release

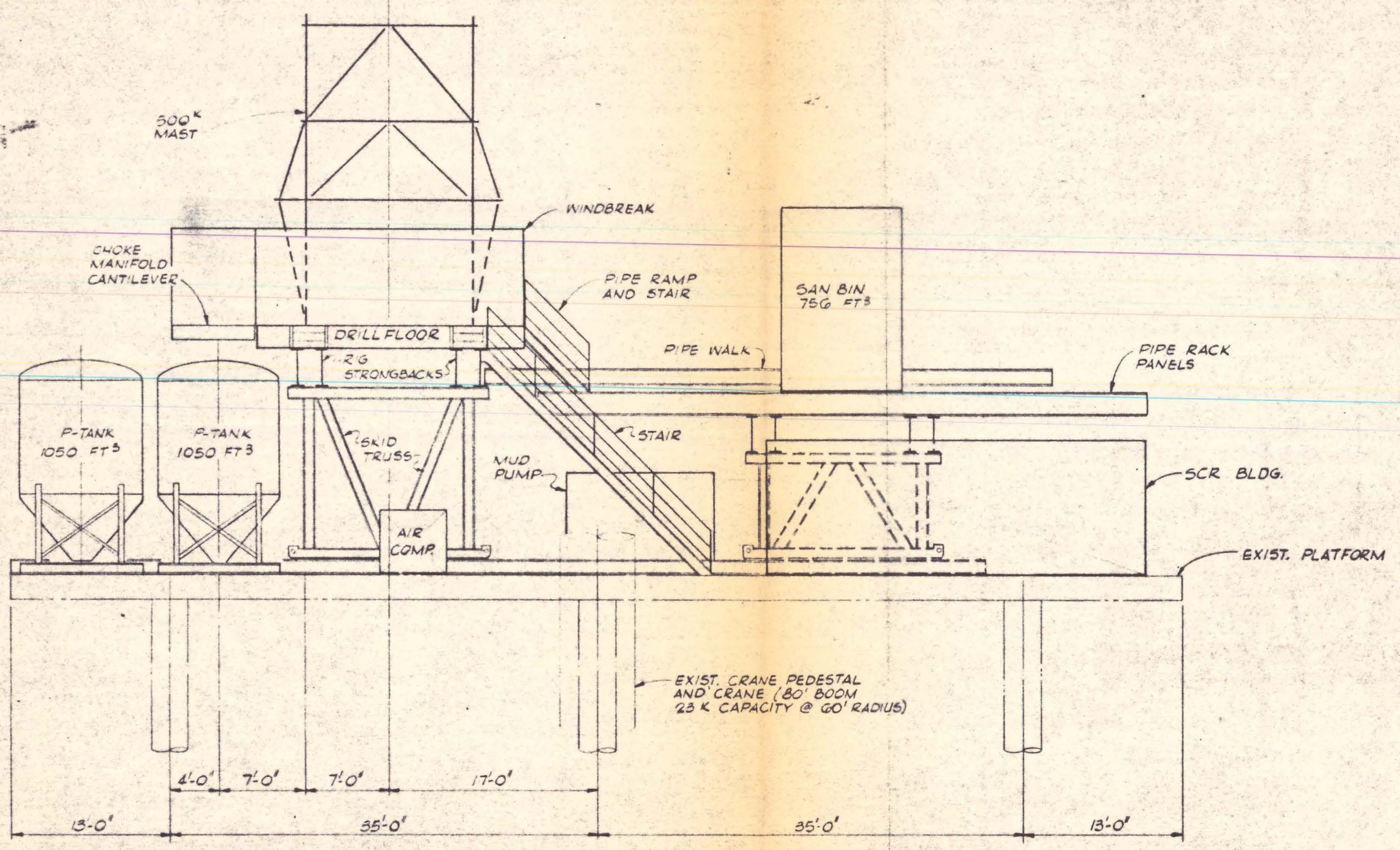
Forecast Data

Pursuant to the Freedom of Information Act (5 U.S.C. 552) and its implementing regulations (43 CFR Part 2) and as provided in 30 CFR 550.199(b), the information contained in this section is deleted from the public information copy of this submission.

Proprietary

Not for Public Release

ITEM NO	QTY REQ'D	PART NO	MATERIAL LIST DESCRIPTION	ITEM WEIGHT	TOTAL WEIGHT



SIDE ELEVATION

NO	REVISION	NAME	DATE

QTY	NEXT ASSEMBLY	USED ON

1000 HP DRILLING RIG
UNION OIL OF CALIFORNIA

POOL COMPANY
HOUSTON, TEXAS

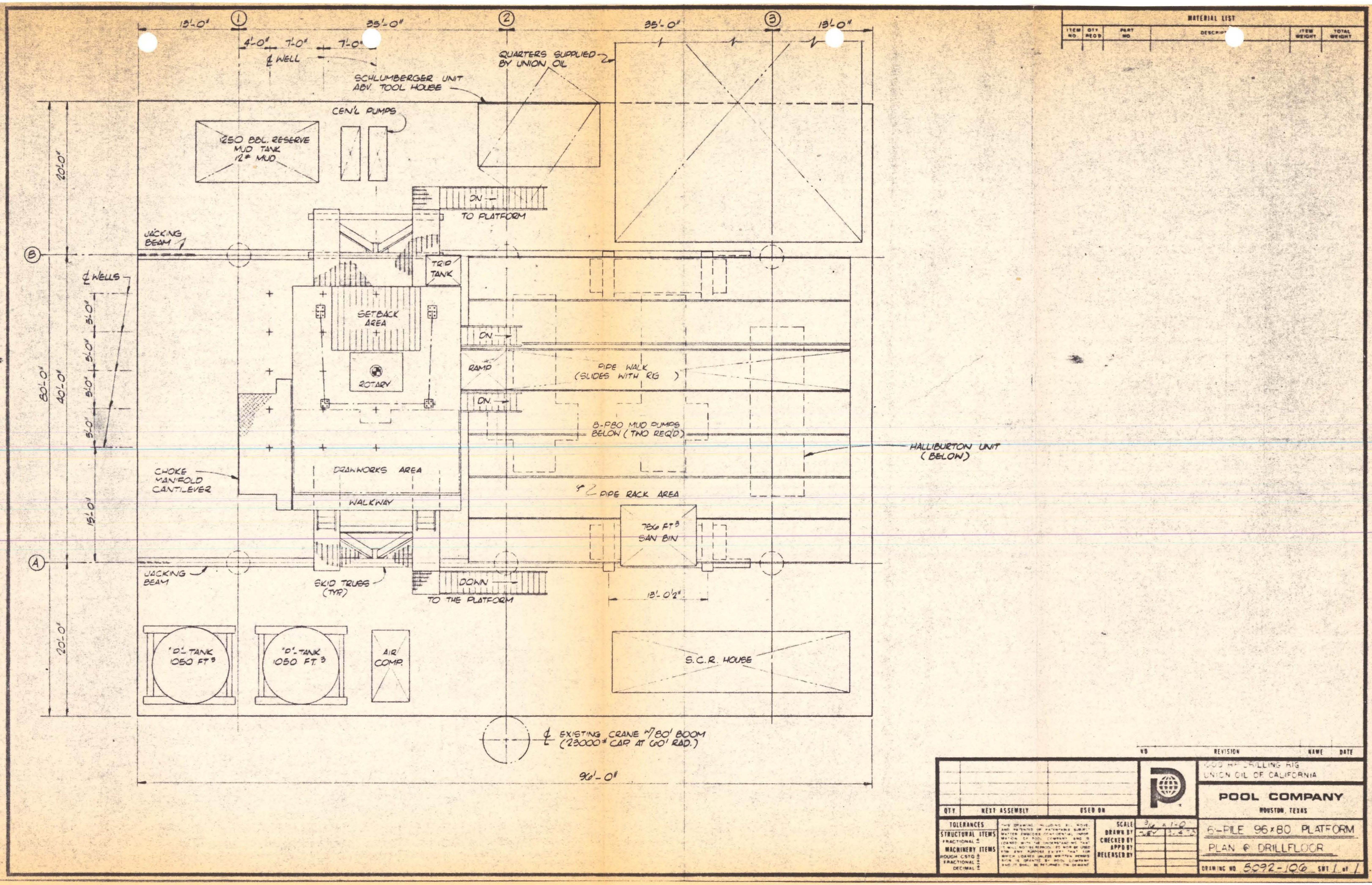
TOLERANCES
STRUCTURAL ITEMS
FRACTIONAL ±
MACHINERY ITEMS
ROUGH CSTG ±
FRACTIONAL ±
DECIMAL ±

THIS DRAWING, INCLUDING ALL NOVEL AND PATENTED OR PATENTABLE SUBJECT MATTER EMBODIES CONFIDENTIAL INFORMATION OF POOL COMPANY AND IS LOANED WITH THE UNDERSTANDING THAT IT WILL NOT BE REPRODUCED NOR BE USED FOR ANY PURPOSE EXCEPT THAT FOR WHICH LOANED UNLESS WRITTEN PERMISSION IS GRANTED BY POOL COMPANY AND IT SHALL BE RETURNED ON DEMAND

SCALE 1/8"=1'-0"
DRAWN BY BARKA 9-14-76
CHECKED BY
APPD BY
RELEASED BY

6 PILE 96'x80' PLATFORM
SIDE ELEVATION

DRAWING NO 8092-107 SHT 1 of 1



MATERIAL LIST
ITEM NO. | QTY REQ'D | PART NO. | DESCRIPTION | ITEM WEIGHT | TOTAL WEIGHT
13'-0" 35'-0" 35'-0" 13'-0"
4'-0" 7'-0" 7'-0"
℄ WELL
QUARTERS SUPPLIED BY UNION OIL
SCHLUMBERGER UNIT ABV. TOOL HOUSE
CEN'L PUMPS
250 BBL. RESERVE MUD TANK 12# MUD
DN — TO PLATFORM
JACKING BEAM
℄ WELLS
TRIP TANK
SETBACK AREA
ROTARY
DN
RAMP
PIPE WALK (SLIDES WITH RIG)
8-P80 MUD PUMPS BELOW (TWO REQ'D)
HALLIBURTON UNIT (BELOW)
CHOKE MANIFOLD CANTILEVER
DRAWWORKS AREA
WALKWAY
℄ PIPE RACK AREA
750 FT³ SAN BIN
SKID TRUSS (TYP)
DOWN — TO THE PLATFORM
13'-0½"
"D" TANK 1050 FT³
"D" TANK 1050 FT³
AIR COMP.
S.C.R. HOUSE
℄ EXISTING CRANE W/80' BOOM (23000# CAP AT 60' RAD.)
96'-0"
80'-0" 40'-0" 20'-0" 20'-0" 15'-0" 5'-0" 5'-0" 5'-0" 5'-0" 5'-0"
NO. | REVISION | NAME | DATE
UNION OIL OF CALIFORNIA
POOL COMPANY
HOUSTON, TEXAS
QTY | NEXT ASSEMBLY | USED ON
TOLERANCES
STRUCTURAL ITEMS FRACTIONAL ±
MACHINERY ITEMS ROUGH CSTG ± FRACTIONAL ± DECIMAL ±
SCALE 3/16 = 1'-0
DRAWN BY
CHECKED BY
APP'D BY
RELEASED BY
6-PILE 96x80 PLATFORM
PLAN @ DRILLFLOOR
DRAWING NO. 5092-106 SHT 1 of 1