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MINERALS MANAGEMENT SERVICE

EXPLORATION PLAN

BARTER ISLAND AREA (NR 7-3)
DIAPIR FIELD OCS LEASE SALE 87
BEAUFORT SEA, ALASKA

Serial Nos: OCS Y-0943, 0950

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Submitted to

Minerals Management Service
Alaska OCS Region
Anchorage, Alaska

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0943

EXPLORATION PLAN

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*This Appendix Contains Confidential Information for the Sole Use of
the Minerals Management Service.

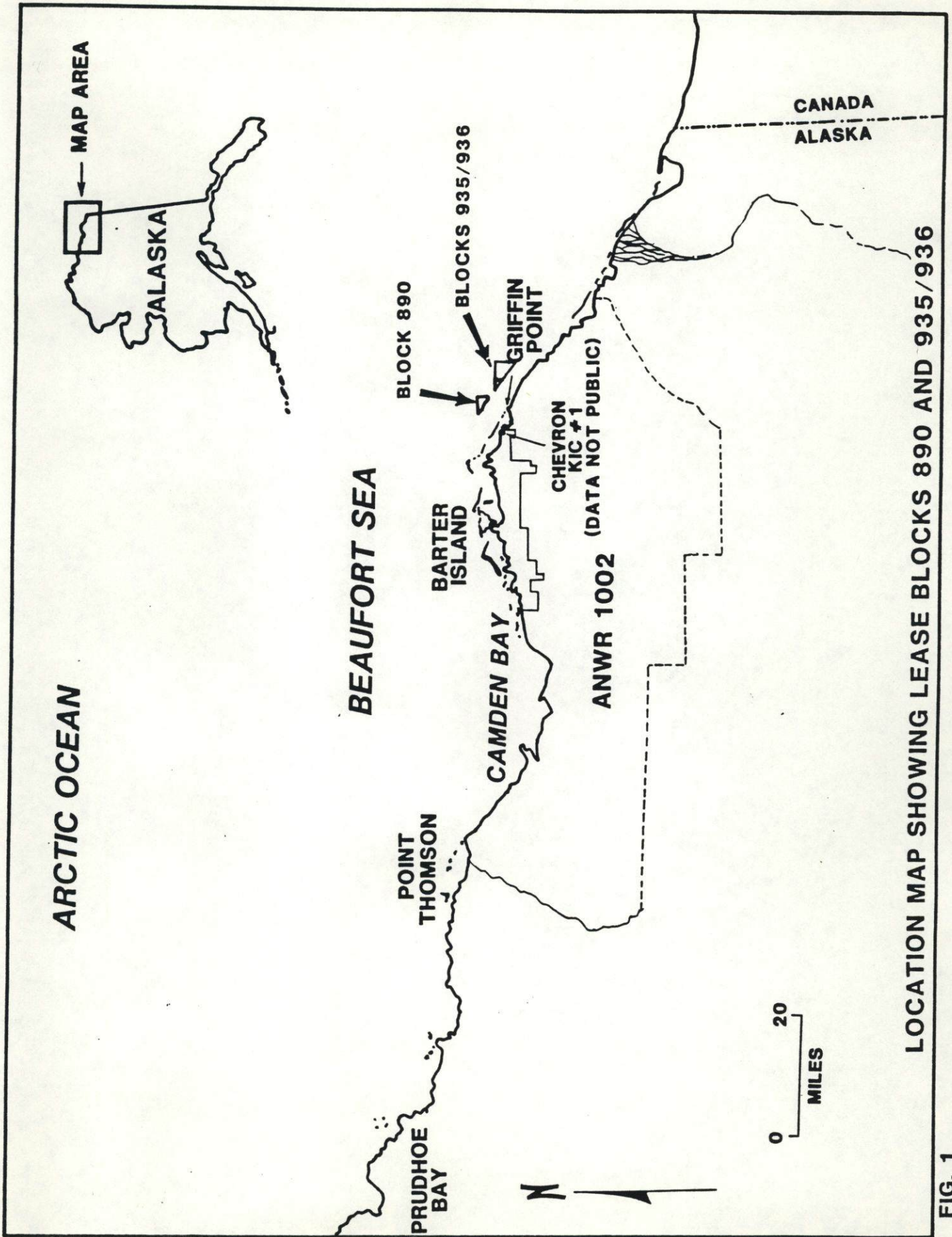
EXPLORATION PLAN

I. INTRODUCTION

Tenneco Oil Company (Tenneco), in conformance with 30 CFR 250.34 and NTL 80-2, submits this Exploration Plan for two Federal OCS leases located in the Barter Island area (Official Protraction Diagram NR 7-3) of the Alaskan Beaufort Sea (Figure 1). These leases were acquired in the Outer Continental Shelf Diapir Field Oil and Gas Lease Sale 87 (August 22, 1984) and are owned wholly by Arco Alaska, Inc. (Arco) (Table 1). Arco has designated Tenneco to serve as Operator for the lease evaluation efforts set forth in this Exploration Plan.

Analyses of extensive geophysical and geological data collected in the Barter Island area, combined with the large quantity of subsurface geologic information obtained from wells drilled along the northern Alaskan coast, indicate that these leases may contain hydrocarbon accumulations. Tenneco plans to explore and evaluate this possibility according to the procedures outlined in this Exploration Plan.

Tenneco intends to initiate exploratory drilling in the winter of 1987/88 by employing the Single Steel Drilling Caisson (SSDC), a Mobile Offshore Drilling Unit (MODU), owned and operated by Canadian Marine Drilling Ltd. (Canmar) of Calgary, Alberta, Canada. The SSDC has been successfully used to drill three



Tenneco Oil Company
Barter Island Area (NR 7-3)

Table 1

Lease Numbers, Block Numbers, and Ownership Interests

<u>OCS Serial Number</u>	<u>Block Number*</u>	<u>Sale Number</u>	<u>Lessee</u>	<u>Ownership Interest (%)</u>
Y-0943	890	87	Arco	100
Y-0950	935/936	87	Arco	100

*All blocks located on Official Protraction Diagram
Barter Island, NR 7-3

exploratory wells in the Beaufort Sea. Two of these wells were drilled in the Canadian Beaufort. The third well, Tenneco's Phoenix Prospect, OCS Y-0338 #1, was drilled during the 1986/87 season in the American Beaufort in Harrison Bay using operational procedures similar to those presented in this Exploration Plan.

The activity level attained under this Exploration Plan will necessarily vary depending on the success or failure of the initial well. A minimum activity level would be the drilling of one vertical well to approximately 16,500 ft from the single drill site. However, the success of this initial well could lead to a maximum effort that would lead to the drilling of at least one additional well (Table 2). Drilling and testing of the initial well is expected to take approximately seven months.

As stated above, Tenneco intends to utilize the SSDC during the winter of 1987/88. This Exploration Plan and accompanying documents are tailored for this specific purpose. If the drilling of the initial well is delayed and other drilling units and operational plans are considered, Tenneco will then submit the necessary revisions and documentation that may be required by the Minerals Management Service (MMS).

Tenneco Oil Company
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Table 2

LIST OF POSSIBLE DRILL SITES

Location	Block No.	OCS Serial No.	Lease Line Calls	UTM 6 Coordinates* X (m)	Y (m)	Latitude	Longitude
1	890	Y-0943	555 'FEL; 6994 'FNL	432,630.98	7,778,668.21	70°6'27.00"N	142°46'27.10"W
2	935/936	Y-0950	500 'FWL; 1000 'FNL	437,752.40	7,775,695.20	70°4'55.70"N	142°38'14.24"W

NOTE*: X and Y coordinates calculated using minus 141 Central Meridian.

II. EXPLORATORY DRILLING PLANS AND SCHEDULE

Exploratory drilling plans and schedules must allow considerable flexibility so the plans can be adjusted as new data is obtained. The harsh arctic environment, restricting the time of year in which drilling can be accomplished, and the limited types of drilling structures that can be used, are additional factors that impact heavily on drilling plans. Tenneco plans to initiate drilling on Block 890 during the winter of 1987-88. The decision to drill a second exploratory well is largely dependent on the geological information and test results obtained during the drilling of the initial well.

A. Initial Well

The initial well location in this Exploration Plan is as follows and as shown as location number 1 in Table 2 and Figure 2:

Well Location Coordinates

Lease Line Calls: 555' FEL; 6994' FNL

UTM 6 Coordinates: X = 432,630.98m; Y = 7,778,668.21m

Latitude and Longitude: 70°6'27.00"N; 142°46'27.10"W

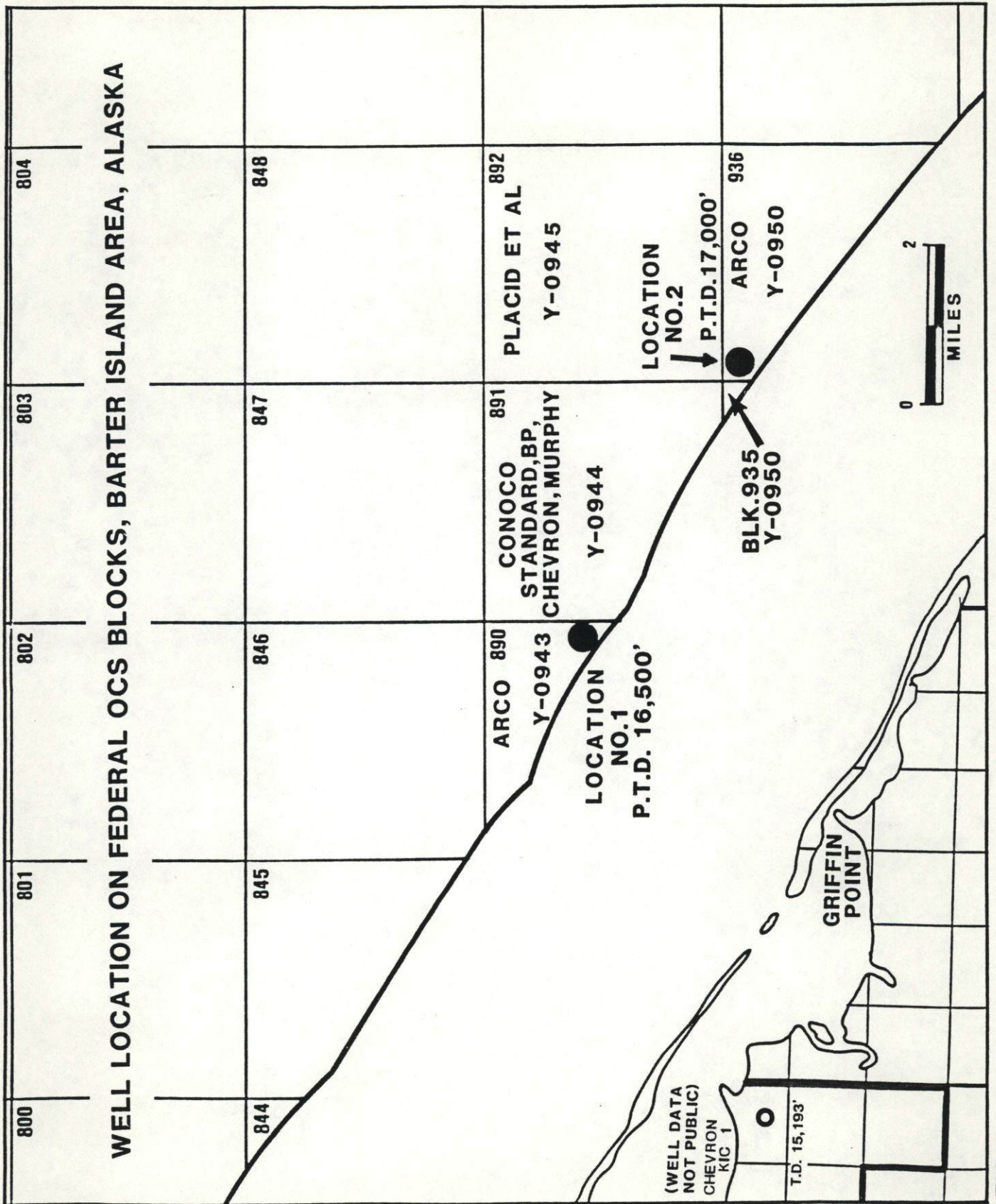


FIG.2

The water depth of this location is approximately 66 ft (Table 3). The initial well would be drilled as a straight hole to a depth of approximately 16,500 ft. Drilling would begin about November 1, 1987 with field operations continuing for 215 days to accomplish all drilling and testing activities.

The SSDC would be moved from its present location in Harrison Bay and onto location of the initial well site during open water conditions between August 30 and September 13, 1987. The optimum schedule calls for the operations to be completed by September 6, 1987. At the conclusion of the drilling operations, the structure would be maintained at the location for the balance of the winter and would be removed during open water conditions of the summer of 1988.

As stated above, if the drilling of the initial well is delayed and other drilling units and operational plans are considered, Tenneco will then submit the necessary revisions and documentation as may be required by the MMS.

B. Subsequent Well

A subsequent well may be drilled based on results from the initial well. The location of the second well is identified in Table 2 and Figure 2. The water depth and TVD for the subsequent well location are presented in Table 3.

Tenneco Oil Company
Barter Island Area (NR 7-3)

Table 3

List of water depths and well TVD's.

<u>WELL LOCATION</u>	<u>BLOCK NO.</u>	<u>WATER DEPTH (ft)</u>	<u>WELL TVD (ft)</u>
1	890	66 ft	16,500 ft
2	935/936	73 ft	17,000 ft

Decisions of whether or not, where, and when to drill a subsequent well will be made within a reasonable time following the evaluation of the geological data obtained from the initial well. Information obtained from wells drilled by other companies in the area and from additional seismic programs will impact upon future exploratory work. The schedule for drilling a subsequent well will be established at later dates as such information becomes available.

III. GENERAL DESCRIPTION OF DRILLING SYSTEM

The use of the SSDC at the Aurora Prospect will be subject to approval under Alaska OCS Order No. 2, part 2.2.

A. Structure

The SSDC was designed by Canmar in 1982 and an independent design check was performed by Swan Wooster Engineering Company of Vancouver, British Columbia, Canada. The drilling unit was constructed by modifying the forward section of an ocean-going, very large crude carrier ("VLCC"). The modifications were performed in the Hitachi Shipyards in Japan under the survey of Det Norske Veritas ("DNV"). The main body of the structure is approximately 531 ft long, 174 ft wide, and 83 ft high. The deck has been cantilevered to provide additional deck space. The stability of the system under ice loading is provided by water ballasting of the original cargo tanks. Shotcrete has been applied to the base of the unit to increase its coefficient of friction.

The SSDC is designed to carry out exploratory year-round drilling under Arctic environmental conditions. On its first two deployments in the Canadian Beaufort, the SSDC was supported by subsea gravel berms. For its third deployment, Tenneco's Phoenix Prospect in Harrison Bay, the MAT, a new steel component, was constructed to support the SSDC in lieu of the gravel berms. The new steel base configuration allows for deployment of the SSDC in water depths of 30-75 ft without bottom preparation.

The MAT was built in 1985/86 by Hitachi Zosen Corporation, Japan. It was designed to transmit to the seabed the ice loads which would impinge on the SSDC when the unit is operating in deeper water, as well as withstand the ice loads which would directly impact on the MAT when in shallower water depths. The base of the MAT has a system of skirts which penetrate the seabed, thereby engaging the soil to provide the necessary mechanism to transmit ice loads. The MAT structure was fabricated from low temperature steel and was designed for higher than the anticipated ice loads. The top of the MAT is coated with a layer of urethane foam providing a friction interface with the shotcrete coating on the bottom of the SSDC. A permanent ice-strengthened tower on the forward end of the MAT provides access from the SSDC to the ballast valves and deballast pumps which are located there. The MAT has a seafloor dimension of 531 by 361 feet and is 44 feet high, excluding skirts.

The completed MAT was towed from its construction site in Japan to its mating site in Harrison Bay. The tow began in early June, 1986, and the MAT arrived in Harrison Bay in late August 1986. The SSDC was concurrently towed from its location in Canadian waters and arrived at the mating site a few days after the MAT's arrival. The SSDC and MAT were then mated. The combined unit was then towed to and set down at Tenneco's Phoenix drill site (OCS Y-0338 #1) in Harrison Bay in early September, 1986. Exploratory drilling operations were then conducted from the SSDC during the 1986/87 winter season.

B. Drilling System

The SSDC has successfully completed drilling and evaluation operations for three wells over three winters in the Canadian and American Beaufort Sea. These three operating winters illustrate the SSDC's capability of operating in sub-freezing conditions and adverse Arctic conditions. Arctic design features such as windwall enclosed heated drill floor and monkey board areas, an enclosed heated cellar deck, a drill pipe and casing storage barn, and a heated rig utilities package using generator waste heat and steam heat, have added to the operational efficiency of the drilling unit.

A general summary of the drilling system follows. A more detailed description of the drilling system including figures and drawings is provided in Appendix A.

1. Drill Rig Equipment

The SSDC is equipped with a modern drilling rig--the Canmar Beaufort Island Rig #2 (CBIR #2) built by DRECO in 1982, and rated to 26,000 ft (8000 m). The derrick has a gross capacity of 650 tons (590 tonnes). The drawworks consist of a 3000 HP rated (2240 kW) National Model 1625-DE with electric brake. The capacity of the 49 1/2 in (1257 mm) rotary table is 800 tons (726 tonnes). The two National Model 12-P-160 triplex pumps are rated at 1600 HP

(1200 kW) each. Liquid mud storage capacity is 1920 bbls (305 m³) of which 410 bbls (65 m³) is "kill mud reserve." Solids control equipment includes a triple tandem shale shaker, desander, tandem mud cleaner, and a high capacity centrifuge. Two 1200-gpm (4.5 m³/min) mud coolers serve to reduce the mud temperature to avoid permafrost erosion and melting of gas hydrates.

2. BOP Systems

The blowout prevention equipment includes two stacks, a diverter system, a 240-gal (980-litre) accumulator, and a 10,000-psi (69-MPa) choke manifold with a Wagner automatic choke. The 20 3/4 in (527-mm) low pressure stack is comprised of a 2000-psi (14-MPa) annular preventer and a 3000-psi (21-MPa) double ram preventer. The 13 5/8 in (346 mm) high pressure stack is comprised of three 10,000-psi (69-MPa) single ram preventers and a 5000-psi (35-MPa) annular preventer. A 45 ton bridge crane is used to handle BOP stacks. Either stack can be pressure tested in advance on a test stump.

3. Rig Utilities Package

The rig package consists of two levels of ten modules, each 49 ft x 12.8 ft x 13 ft (15.0 m x 4.0 m x 4.2 m), lined up side by side.

The lower level modules house two boilers; cementing unit, surge tank and air compressor unit; four generator units; two triplex mud pumps, charge pumps; mud tanks; and the auxiliary centrifugal pumps for the centrifuge, mud coolers, desilter, and desander.

The second level modules house the storeroom, mechanical and electrical workshops, seawater and fresh water tanks, air compressor and air dryer, fuel tanks, water and fuel pumps, SCR room, BOP accumulator, waste-heat recovery unit and circulating pumps, mud storage, and mud handling equipment, i.e., mixing hoppers, agitators, desander, desilter, degasser, centrifuge, mud coolers and shale shakers.

A major feature of the layout of this rig is that the enclosed and insulated pipe rack area is on top of the second level to allow for efficient casing and tubular handling in a protected environment. This and other features significantly reduce the overall drilling equipment area.

4. Consumable Storage Capacity

The SSDC is capable of storing all fuel and consumables needed for two 16,400-ft (5000-m) wells, making the drilling unit self-sufficient throughout the winter.

The SSDC is equipped with twenty bulk storage silos built onto the main deck, each having a capacity of 10,000 ft³ (285 m³). Fourteen silos are used for barite storage, providing a capacity of 9470 tons. The remaining bulk silos are used for cement storage: four silos for permafrost cement, and two for Oilwell 'G' cement, providing capacities of 1570 tons permafrost cement and 950 tons Oilwell 'G' cement.

Fuel requirements are considerable in arctic operations. Despite the use of effective heat recovery systems, the daily consumption of diesel fuel is approximately 5280 gal/day (20 m³/day) during full drilling operations. The bulk diesel tanks on the SSDC have a total capacity of 34,500 bbls, providing fuel for approximately 365 days including standby time.

Other consumables are stored on deck in designated areas. Allowing for deck load rating, storage space is provided for over 1000 pallets (a total weight of 2200 tons).

Casing is racked on either side of the main deck aisle with a rated storage capacity of 2750 tons. Casing racks are capable of accepting all sizes and weights of casing which may be needed.

5. Accommodations

The accommodations on the SSDC consist of 93 beds with provision for 35 emergency beds. The SSDC is equipped with a medical room, galley and mess room to seat 50, recreation room, theatre, conference room, and offices. A separate package incorporates generators which can be connected, if necessary, as a backup to supply the rig package, water makers, and sewage treatment facilities.

C. Environmental Design Criteria

Design environmental loading for the SSDC at the initial site requires the consideration of oceanographic, meteorological and ice loading conditions.

1. Oceanographic and Meteorological

In all cases, oceanographic and meteorological loading conditions are less than ice loads and therefore do not govern design.

2. Ice

Detailed descriptions of design ice loading conditions and expected ice loads will be presented at a later date with the Platform Verification Plan. Safety against extreme events will be assured through appropriate alert procedures which will be submitted as part of the Application for Permit to Drill (APD).

IV. GEOLOGICAL/GEOTECHNICAL INFORMATION

Proprietary and confidential geologic data is included in Appendix C for the exclusive use of the MMS in pursuance of NTL 80-2 and will therefore be excluded from the public copies. Included in Appendix C are current structure maps, appropriate diagrammatic cross-sections, and a geological prognosis for the initial well.

A well site survey of potential shallow geological hazards and a well site geotechnical survey will be conducted for the proposed initial well site in accordance with existing MMS requirements. The results of this survey and an analysis of the potential geologic hazards will be submitted as a part of the APD for the subject well. The results of the geotechnical survey and analysis will also be submitted. Depending on the site-specific soil conditions, the MMS may require a third party review of the structure regarding its capability to maintain location under anticipated environmental loads.

Additional geohazard and geotechnical surveys will be initiated for the subsequent location at some future time and will subsequently be submitted as above.

V. SAFETY CONCERNS

A. Safety Meetings and Fire Drills

Weekly safety meetings will be attended by all rig personnel to discuss accident prevention, encourage safe work practices, and to review any accidents that may have occurred during the preceding week. Personnel will be actively and continually encouraged to identify unsafe practices and situations in their own work area and to correct them accordingly. Special attention will be given to high risk rig activities.

Fire drills will be conducted on a weekly basis for all rig personnel. Duty assignments and muster lists will be posted in the mess hall, living quarters, recreation facilities, drilling facilities, and other conspicuous places to provide for and help ensure adequate and correct fire responses.

B. Training for Drilling System Personnel

Company and contractor personnel will be trained and certified, where applicable, in MMS approved courses for Well Control, H₂S, Ice Alert Procedures, BOP drills and operations, first aid and general offshore operations, (i.e., helicopter procedures).

Training courses will also be conducted to ensure the safe evacuation of the drilling unit, should that unlikely event ever occur.

C. Pollution Prevention--Drills and Training

Drills and training will be carried out by the oil spill response team, as is outlined in the Oil Spill Contingency Plan (Appendix B) and as required by MMS Alaska Region OCS Orders.

D. Environmental Training Program

Tenneco intends to use the environmental training program prepared by Standard Alaska Production Company to brief the drilling and field operations personnel of the environmental, social, and cultural concerns of the North Slope arctic region as required by Lease Stipulation No. 2 (Sale 87). The Standard environmental training program has previously been reviewed and approved by the MMS.

VI. CONTINGENCY PLANNING

A. Oil Spill Contingency Plan

Tenneco has prepared an Oil Spill Contingency Plan for the Barter Island lease area in the Alaskan Beaufort Sea. The plan outlines provisions to ensure that both Tenneco's and contractor's full resource capabilities are known and committed during any spill incident. This includes inventory of applicable equipment, materials and supplies, time requirements for deployment of same, and training of key personnel. The plan also provides for varying degrees of response depending on the severity of an oil spill and for identifying and protecting areas of special biological sensitivity. The plan establishes procedures for early detection and timely notification of appropriate company personnel and governmental agencies in the event of an oil spill incident.

Tenneco's Oil Spill Contingency Plan is Appendix B of the Exploration Plan.

B. Critical Operations and Curtailment Plan

It is recognized that during the drilling of the proposed well certain operations will be more critical than others. Therefore, a Critical Operations and Curtailment Plan (COCP) will be submitted which addresses those areas as cited in MMS OCS No. 2, Section 9. The COCP will be submitted as part of the Application for Permit to Drill (APD) for the initial well. A COCP will also be submitted with the APD's for any subsequent well.

C. Emergency Operations Plan

The company and the contractor personnel will follow prudent practices throughout the entire offshore operation. The contractor has developed Alert Procedures based on ice and geotechnical parameters which will be modified to be site specific. For any given situation, the contractor is able to make an overall assessment of the environmental conditions, structural responses, geotechnical deformations and well drilling activities. From this assessment, a predetermined operations plan is followed. This ensures that the appropriate plan of action is always in place and that sufficient time will be available to execute the plan, if necessary. Should any conditions be predicted which may endanger personnel and/or environment, the appropriate alert level will dictate the necessary action. In the unlikely event that

evacuation is necessary, the company will secure the well, ensure that the contractor has secured the drilling vessel, and evacuate the rig in an orderly, predetermined manner. The appropriate equipment and infrastructure will be available at all times to safely evacuate the drilling vessel.

1. Relief Well Drilling

Relief well drilling plans, which include mobilization and logistics of supply and support, relief well location options, and relief well rig selection are contained in the Oil Spill Contingency Plan located in Appendix B.

2. Loss or Disablement of a Drilling Unit or a Drilling Rig

In the highly unlikely event that the drilling rig is lost or disabled, there are presently numerous rigs on the North Slope stacked and available for use as a replacement. The rig package on the SSDC would be removed and the replacement rig would be installed.

3. Loss of or Damage to Support Craft

Due to the large capacity of the SSDC and the ability to stockpile consumables, the drilling unit will require minimal support craft for continuing operations. Should damage or loss of support craft occur during the operation, a replacement unit from available resources in Prudhoe Bay will be deployed. The support craft requirements for emergency evacuation and support will always be maintained and plans will be modified accordingly to ensure continuous coverage.

4. Hazards Unique to the Site of Drilling Operations

Site-specific environmental design criteria, geohazards and geotechnical data will be submitted at a later date. This submittal will address the hazards unique to the site of drilling operations. The design of the drilling unit provides a sufficient factor of safety for the ice conditions anticipated in the planned operations. A comprehensive monitoring program will be utilized along with associated alert procedures outlined to respond to any situation. The monitoring program and alert procedures will be submitted at a later date as part of the APD for the initial well and subsequent well.

D. H₂S Contingency Plan

Although hydrogen sulfide gas is not expected to be encountered, a complete and detailed program will be implemented, as required, to insure the safety of all rig site personnel should H₂S be detected during drilling. The H₂S Contingency Plan will be submitted with the APD for the initial well and any subsequent well(s) and will address all rig and site specific details for drilling in a possible H₂S environment.

VII. COASTAL ZONE MANAGEMENT CERTIFICATION

The planned exploratory drilling activities outlined in this Exploration Plan comply with the appropriate portions of Alaska's Coastal Management Program. All activities will be conducted in a manner consistent with such program.

APPENDIX A

EXPLORATION PLAN

Barter Island Area, Diapir Field OCS

Lease Sale No. 87

DRILLING EQUIPMENT DESCRIPTION

CANMAR SSDC

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Submitted: July 22, 1987

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I. MAJOR DRILLING EQUIPMENT

A. Structure

- (1) Mast - Cantilever Type, 147 ft (44.8 m) clear working height, 34 ft (9.14 m) leg spread, 1,300,000 lb (580,000 daN) gross nominal capacity, 1,000,000 lbs. (445,000 daN) hook load with 12 lines 1-1/2 in (38 mm) strung, seven - 60 in (1.5 m) sheave 500 ton (454 tonne) crown block, racking board, ladders, core line and cat line sheaves, tigger sheaves, tong block sheaves, counter weights. Sling line and equalizer, shoes, dual standpipe clamps, mast climbing device, steel winterizing.

- (2) Substructure - Dreco posted vertical box consisting of 4 - 32 ft x 7 ft 10 in x 12 ft (9.73 m x 2.38 m x 3.65 m) vertical boxes, 2 x skid beams 55 ft x 7 ft 10 in x 3 ft (16.72 m x 2.38 m x 0.91 m), 38 ft (11.6 m) high floor, 800 ton (726 tonne) rotary capacity with 500,000 lbs. (222,000 daN) simultaneous set back area. 'A' leg mast elevator, drop in drawworks and set back sections. Substructure complete with skidding system with floor and mast in working position. Racking area designed for 240 stands of 5 in (127 mm) drill pipe plus 10 stands drill collars. Weather enclosure for substructure is steel with fiberglass insulation. Floor windwalls also of steel to 50 ft (15.2 m) above drill floor.

- (3) Rig Skidding - 2 x 220 Ton (200 tonne) Hydraulic cylinder type with substructure skid connections for X - Y motion.

B. Power

(1) Engines/Generators

(a) Diesel Generator Units consisting of:

Engine - Caterpillar D 399 turbo charged jacket water aftercooled, air starter, forward control, instruments alarms, flex coupling, and all accessories. 4 ea.

Generator - Kato 1500 KVA continuous, 1050 kW, 600 Volt, 3 Phase, 60 Hz, Class F insulation, for SCR service. 4 ea.

(2) Air System

- (a) Rig Air Compressors - 2 ea., Sullair Model 20-125H mounted, c/w 125 H.P. (93 kW) electric motors single stage, heavy duty, asymmetrical rotary screw compressors, each to deliver 445 SCFM (12.7 m³ (st)/d) of free air at 125 psig (860 kPa), complete with inlet silencer, filter, aftercooler, instrumentation, control panel and

enclosure. 2 - ea. Halliburton 465 SCFM at 125 psig rental units; see Contractor leased equipment.

- (b) Cold Start Compressor - 1 ea. Sully skid mounted, c/w Murphy Diesel engine Skid mounted, c/w diesel driving the reciprocating compressor, capacity 60 ft³ (1.7 m³) air receiver, fuel tank, electric start system.

- (c) Air Receivers - 2 ea. 125 ft³ (3.54 m³) air receivers rated for maximum working pressure of 150 psig (1030 kPa), in accordance with drgs. 80029-SK13 and 80029-SK14.

- (d) Alcohol Injection Pump - Stonebor model C-6 PR 1 qt./day to 16 gal./day (1.13 L/day to 72.6 L/day) with 1/2 in (12.7 mm) plunger at 60 S.P.M.

- (e) Air Dryer - 1 ea. Pure Aire Model PS1000 skid mounted, refrigerant type air dryer rated for 890 SCFM (1512 m³ (st)/hr) at 125 psig (860 kPa) and 93°F (34°C) c/w absorbent type prefilter.

(3) Electrical System

(a) SCR/Generator Control System

4 - Ross-Hill 1850 SCR cubicles rated 2000 Amps.

4 - Ross-Hill generator control cubicles c/w G.E. 1600 AF generator breakers and MCC feeder breakers.

1 - Synchronizing cubicle with auto-synch features. Generator 5 or 6 (camp utilities) can be synchronized to the main bus with the auto-synch.

2 - Tie Breaker cubicles (G.E. 1600 AF)

(b) 600 Volt Distribution

5 - Canadian General Electric motor control centers (different capacities) located in various areas of the rig. All braced for 65,000 Amps symmetrical fault current.

2 - Allen Bradley motor control centers (600 V and 208 V) to supply power to glycol heating fan motors.

2 - Westinghouse size 7 starters for ballast pumps.

(c) 480 Volt Distribution for production testing equipment -
45 KVA transformer - Federal Pioneer switchboard.

C. Hoisting Equipment

- (1) Drawworks - National 1625-DE electric driven rated 3000 H.P. (2240 kW) unitized, skid mounted, with accessories for operation including console panel for operating brake clutches, sand- line assembly, driven by two GE752 electric motors, air controlled cathead, cradle assembly for Elmagco 7838 brake and crown saver.
- (2) Drawwork Brake - Elmagco Model 7820 system capable of 100,000 ft-lb (135,000 joules) torque to 50 rpm - Model 7838 brake model PWM 20 electrical control system including model D39040 drillers control, model C39766-1 enclosure, and 6600-32-0157 power transformer.
- (3) Drilling Motors - 2 each, General Electric D.C. Model GE752 with air blower 10 HP (7.5 kW). Explosion Proof.
- (4) Hook/Block - National Type G500 API rated dead load capacity 500 tons (454 tonnes) including the following:
 - six 60 in (1524 mm) steel sheaves with API wireline grooves for 1-1/2 in (38 mm) drilling line, sheave bearings.
 - heavy steel sheave guards.

- (5) Drilling Line - 1-1/2 in (38 mm) x 7500 ft (2286 m) 6 x 9.9.1
OLTS IPS IWRC, mounted on steel reel.
- (6) Sandline - 9/16 in (14.5 mm) x 20,000 ft (6096 m) 6 x 7 IPS,
OTLS, Polycore mounted on drawworks drum.
- (7) Deadline Anchor - 1 ea. Dreco LDR - 100 C Anchor 1-1/2 in
(38 mm) line.
- (8) Drilling Instrumentation, Geolograph, and Control as follows:
- (a) Martin-Decker AWEG-1 Type "EB" weight indicator (console
mount) and sensor unit.
 - (b) Automatic driller (console mount) c/w control unit and
rate of penetration cutoff switch.
 - (c) Mud gauge assemblies, 6000 psi (0-40 MPa) (1 ea),
10,000 psi (0-69 MPa) (1 ea) range (console mount).
 - (d) Tong torque indicating system (console mount) c/w load
cylinder.

- (e) Rotary table tachometer system (console mount) c/w signal generator suitable for use in Class 1, Group D, Division 1 areas.
- (f) Pump stroke SPM tachometer system (console mount) c/w signal generators suitable for use in Class 1, Group D, Division 1 areas.
- (g) Rotary table electric torque meter c/w signal current transformer suitable for use in Class 1, Group D, Division 1 areas.

D. Mud System

- (1) H.P. Mud Pumps - 2 ea. National 12-P-160 triplex, 1600 H.P. (1200 kW) rating, max. discharge pressure of 5000 psi (35 MPa) at 567 GPM (35.8 L/s) and max. flow rate of 772 GPM (48.7 L/s) at 3200 psi (16.40 MPa) (calculated at 120 strokes per minute), max. piston diameter and stroke length 7-1/4 in x 12 in (184 mm x 305 mm) and including the following:

- 150 ANSI flanged 10 in (250 mm) suction manifold complete with suction dampener
 - 5000 psi (35 MPa) A.P.I discharge manifold unit
 - unitization for two top mounted General Electric D.C. motors model GE752 per pump.
 - chains and sprockets lubricated with explosion proof, 3 H.P. (2.2 kW) motor driven oiling system
 - liner spray pump, explosion proof, 3 H.P. (2.2 kW) electrically driven
- (2) Pulsation Dampener - 2 ea. Hydril K-20-5,000, 5000 psi (35 MPa) working pressure with 4 in (100 mm) 5000 psi (35 MPa) A.P.I. R.T.J. connection.
- (3) Safety Relief Valves - 2 ea. Cameron 3 in (76 mm) female N.P.T. connection 5000 psi (35 MPa) max. set pressure.
- (4) Pressure Gauges - 2 ea. Cameron 0 - 5000 psi (35,000 kPa) range, 2 in (50 mm) female N.P.T. connection.
- (5) Circulating Pumps

Charge Pumps - Mission Magnum

6 in x 5 in x 11 in (152 mm x 127 mm x 279 mm), 9-1/2 in (295 mm) impeller, with 75 H.P. (56 kW) 1750 RPM motors, unitized.
2 ea.

Mixing Pumps - Mission Magnum

6 in x 5 in x 11 in (152 mm x 127 mm x 279 mm), 10-1/4 in (257 mm) impeller with 75 H.P. (56 kW) 1750 RPM motors, unitized. 3 ea.

Transfer Pump - Mission Magnum

6 in x 5 in x 11 in (152 mm x 127 mm x 279 mm), 10-1/4 in (267 mm) impeller, 75 H.P. (56 kW) 1750 RPM motor, unitized. 1 ea..

Desander Pump - Mission Magnum

8 in x 6 in x 14 in (203 mm x 152 mm x 350 mm), 11-1/2 in (286 mm) impeller, with 125 H.P. (93 kW) 1750 RPM motor, unitized. 1 ea.

Desilter Pump - Mission Magnum

6 in x 5 in x 14 in (152 mm x 127 mm x 350 mm), 10-3/4 in (279 mm) impeller, with 100 H.P. (75 kW) 1750 RPM motor, unitized. 1 ea.

Hole Fill Pump - Mission Magnum

3 in x 2 in x 13 in (76 mm x 51 mm x 330 mm), 7-1/4 in (184 mm) impeller with 10 H.P. (7.5 kW) 1750 RPM motor, unitized. 1 ea.

Mud Cooling Pump - Mission Magnum

6 in x 5 in x 14 in (152 mm x 127 mm x 356 mm), 11 in (279 mm) impeller with 125 H.P. (93 kW) 1750 RPM motor, unitized. 1 ea.

(6) Agitators

Mud Agitators - Abcor 20 H.P. (15 kW) 1150 RPM electric motor c/w 44 in (1118 mm) impeller. 6 ea.

Mud Agitators - Abcor 10 H.P. (7.5 kW) 1150 RPM explosion proof electric motor c/w 36 in (914 mm) impeller. 5 ea.

Mud Agitators - Abcor 5 H.P. (3.7 kW) 1150 RPM explosion proof electric motor c/w 32 in (813 mm) impeller. 1 ea.

Mud Agitator - Abcor 5 H.P. (3.7 kW) 1150 RPM explosion proof electric motor c/w 28 in (711 mm) impeller. 1 ea.

Mud Guns - 3 in (75 mm) low pressure 150 psi (1030 KPa) Dreco bottom type. 14 ea.

(7) Mud Treatment

Mixing Hoppers - Geosource Sidewinder Mixer model 800 with sliding gate type valve, sack table, hopper, unitized. 3 ea.

Shale Shaker - Brandt triple tandem with screens, 5 H.P. (3.7 kW) explosion proof motors, 3 discharges, skid. 1 ea.

Desander - Brandt S3-12 (3x12 in (305 mm) Cones), capacity 1500 USGPM (5678 L/min) at 75 ft (23 m) head.

Desilter/Mud Cleaner - Shiffner Tandem Mudslinger (24x4 in (102 mm) cones), capacity 1200 USGPM (4542 L/min) at 75 ft (23 m) head.

Centrifuge - Wagner Sigma 150 GPM (568 L/min) c/w 50 H.P. (37.5 kW) explosion proof electric motor, unitized. Capacity 20-150 USGPM (75.7 - 570 L/m) unweighted mud c/w dual electrically driven extended shaft progressing cavity (Salamander) feed pumps. (3 HP (2.2 kW) ea.)

Degasser - Burgess Magna-Vac 20 HP (15 kW) vacuum degasser c/w 20 HP (15 kW) explosion proof motor, rated 211 USGPM (800 L/min)

Mud Gas Separator - cylindrical vessel. (fabricated).

Cuttings Washer System - Auger type system located at shale shaker.

(8) Tanks

Trip Tank - 50 bbl (8.0 m³) capacity, fabricated, with electronic drillfloor volume indicator. + Manual read out (weighted w/sheave cap read out).

Mud Tanks - 3 skids, 1930 bbl (306.5 m³) capacity as follows:

Settling tank capacity	=	37 bbl (5.9 m ³)
Suction tank capacity	=	203 bbl (32.3 m ³)
Suction tank capacity	=	197 bbl (31.4 m ³)
Reserve tank capacity	=	203 bbl (32.3 m ³)
Three Reserve tanks, capacity	=	197 bbl (31.4 m ³) ea.
Two Reserve tanks, capacity	=	208 bbl (33.2 m ³) ea.
Degasser tank capacity	=	112 bbl (17.9 m ³)
Desander tank capacity	=	121 bbl (19.3 m ³)
Mudcleaner tank capacity	=	121 bbl (19.3 m ³)
Underflow tank capacity	=	40 bbl (6.5 m ³)
Mud cooler tank capacity	=	121 bbl (19.3 m ³)
Active tank capacity	=	141 bbl (22.4 m ³)
Premix tank capacity	=	87 bbl (3.8 m ³)
Pill tank capacity	=	49 bbl (7.7 m ³)

Bulk Mud Surge Tank - Pneumatic vertical hopper bottom atmospheric tank, 70 ft³ (2.0 m³) capacity, c/w all associated piping and accessories. 2 ea.

(9) Mud Coolers - 2 ea. Plate & Frame Heat Exchangers, Alfa Laval utilizing sea water 1000 gpm (3.8 m³/min) at 100 psi (700 kPa) to cool drilling mud at 1200 gpm (4.54 m³/min) at 45 psi (315 kPa).

(10) Standpipe Manifold - Dreco dual manifold with Demco valves, misalignment unions and 160° goosenecks, 5 in (125 mm) 5000 psi (35 MPa) working pressure.

(11) Cementing Standpipe - Hammer Union at Rig Floor.

(12) Rotary Hose - 2 ea. 3-1/2 in (89 mm) x 75 ft (22.9 m) long with 4 in (100 mm) N.P.T. built in leak-proof male connections, test pressure 10,000 psi (69.0 MPa) c/w safety hobbles.

E. Rotary/Rig Floor Equipment

(1) Rotary Table - National Supply C-495, rated deadload capacity 800 tons (726 tonnes), 49-1/2 in (1257 mm) diameter table opening with 53-1/2 in (1353 mm) centerline space c/w mounts, coupling and accessories for General Electric D.C. Motor Model

GE 752. Independent Rotary Drive D1632, tool guard/all units are epoxy coated.

(2) Rotary Table Motor - 1 each General Electric D.C. Model GE 752 c/w air blower 10 HP (7.5 kW).

(3) Swivel - National Model P500, API rated dead load capacity 500 tons (454 tonnes) API bearing rating 367 tons (333 tonnes) at 100 R.P.M. including the following:

- swivel body with 6-5/8 in API regular left-hand box with thread protector.
- long radius gooseneck with 4 in (100 mm) NPT female threads and a 2 in (50 mm) NPT female thread wireline opening with plug installed.
- 6-5/8 in API regular left-hand double pin sub with thread protectors.

(4) (a) Hex Kelly - 2 ea. 5-1/4 in (133 mm), 7-3/4 in (197 mm) O.D. top up set 6-5/8 in reg. L.H. box up, 2-13/16 in (71 mm) I.D. and 6-1/4 in (159 mm) O.D. bottom upset with 4-1/2 in A.P.I. I.F. R.H. pin down, 42 ft (12.8 m) long.

(b) Hex Kelly - 1 ea. 4-1/4 in x 40 ft (108 mm x 12.2 m).

- (5) (a) Kelly Cock Upper - 1 ea. Hydril 1004880-5, 5-1/4 in (133 mm) NOM. 7-3/4 in (197 mm) O.D., 3-1/16 in (77.8 mm) I.D., 10,000 psi (69.0 MPa) working pressure with 6-5/8 in A.P.I. reg L.H. box and pin connections.
- (b) Kelly Cock Lower - 2 ea. Hydril 1001880-2, 4-1/4 in (108 mm) NOM. 6-5/8 in (168 mm) O.D., 2-13/16 in (71 mm) I.D., 10,000 psi (69.0 MPa) working pressure with 5 in XH box and pin connections.
- (6) (a) Float Valve - 1 ea. Baker 480-15-42,000 Model G, full flow, flapper type, size 4R for 6-3/4 in (171 mm) O.D. Collars.
- (b) Float Valve - 1 ea. Baker 480-15-5462 Model G, full flow, flapper type, size 5F-6R for 9 in (229 mm) O.D. collars.
- (7) (a) Float Valve Puller - 1 ea. Baker 480-90-4200 for use with 4R float valve.
- (b) Float Valve Puller - 1 ea. Baker 480-90-5462 for use with 5F-6R float valve.
- (8) Casing Stabbing Board - 20 ft (6.1 m) adjustable - Lamb or equal.

F. Drill String/Associated Equipment

- (2) (a) Drill Pipe - 22,000 ft (6700 m), 5 in (127 mm) O.D. x 19.50 lb/ft (29.07 kg/m) IEU Grade "G" Range 2 with 6-3/8 in (162 mm) O.D. x 3-1/2 in (89 mm) I.D. 18° Taper Hughes extra hole tool joints (4-1/2 IF), and internal plastic coating.
- (b) Drill Pipe - 1350 ft (412 m) 5 in (127 mm) O.D. Hevi-Wate Heavy Wall range 2, 30.5 ft (9.3 m) overall length with 6-1/2 in (165 mm) O.D. x 3-1/8 in (79 mm) I.D. 18° Taper Drilco extra hole tool joints (4 1/2 IF), internal plastic coating and hardbanding.
- (c) Drill Pipe - 350 joints of 5 in. O.D. x 19.5 lb/ft, Grade "E", Range II, with 4-1/2 IF extra hole tool joints, internal plastic coating and hardbanding.
- (d) Drill Pipe - 350 joints of 3-1/2 in O.D. x 15.5 lb/ft, Grade "E", Range II with 3-1/2 IF extra hole tool joints and internal plastic coating.
- (e) Drill Pipe - 45 joints of 3-1/2 in O.D. x 26 lb/ft (Heavy weight), Range II with 3-1/2 IF tool joint.

- (3) (a) Drill Collars - 10 ea. 4-3/4 in O.D. x 2 in I.D. with NC-35 connections with 12 in. hardband on each end.
- (b) Drill Collars - 30 ea. spiral grooved, 6-1/2 in (165 mm) O.D. x 2-13/16 in (71 mm) I.D. x 30 ft (9.1 m) approx. overall length, with 4-1/2 in I.F. box to pin connections, Drilco bore back on boxes and A.P.I. stress relief on pins, double zipped lift elevator and slip recesses.
- (c) Drill Collars - 30 ea. spiral grooved, 8 in (203 mm) O.D. x 2-13/16 in (71 mm) I.D. x 30 ft (9.1 m) approx. overall length, with 6-5/8 in Reg box to pin connections, Drilco bore back on boxes and A.P.I. stress relief on pins, single zip lift slip recess.
- (4) Casing Racks - mounted on the deck area are racks for casing and rotary tubulars. Storage capacities of these racks meet the requirements for two 16,400 ft (5000 m) Beaufort Sea wells.
- (5) Pipe Handling System - all sizes up to 42 in (1067 mm) casing handling capacity. Mereco Pipe Handler c/w single hydraulic power unit and two control consoles for racking area and drill floor.

(6) Derrick Floor Winches - Two pneumatic operated with automatic brake, Ingersoll Rand K6ULAB on drill floor.

(7) Racking Platform Winch - electrically operated with automatic brake.

G. Heaters/Boilers

(1) Boiler - 100 hp Boiler (981 kW) Lister automatic with chemical water treating pot for deionization. 2 ea.

(2) Air Heater - Lister, 4 x 106 Btu/h (1142 kW), indirect fired, skid mounted. 1 ea.

(3) (i) Waste Heat Recovery Circulating Skid -
1 ea. including 754 US. gal. (2.8 m³)
Tank, Tank Steam Heat Exchanger, and 3 ea. circulating pumps Armstrong series 4030 size 6E, 6 in x 4 in (152 mm x 102 mm), 13 in (229 mm) impeller, with one 25 H.P. (18 kW) and two 40 H.P. (30 kW), 600 volt, 1750 RPM explosion proof motors. NOTE: This unit used in conjunction with engine/ generator units waste heat recovery.

(ii) Waste Heat Recovery (Brake Cooling) Circulating System - 1 ea. including 951 US. gal. (3.6 m³) tank and 2 ea. circulating pumps - Armstrong series 40M, 4 in x 3 in x 8 in (102 mm x 76 mm x 203 mm), 7 in (180 mm) impeller, with 30 hp (22 kW), 600 volt, 1750 RPM explosion proof motors.

NOTE: This unit used in conjunction with drawworks brake and drill floor motors cooling waste heat recovery.

H. Auxiliary Systems

(1) Bulk System - Bulk silos are built as an appendage to the hull on the main deck. There are 20 bulk gravity silos for barite 140,000 ft³ (3990 m³), oil well 'G' cement 20,000 ft³ (570 m³) and permafrost cement 40,000 ft³ (1140 m³).

Each silo has a capacity of 10,000 ft³ (285 m³).

Surge tanks consisting of two bulk barite, pneumatic, vertical, hopper type, tank, 70 ft³ (2.0 m³) capacity and one cement surge tank which is part of the leased cement unit. Pressure tanks for the pneumatic system (five-1700 ft³ tanks

and two-2300 ft³ tanks) are supplied as part of the leased cement system).

Bulk material is transferred by means of a low pressure Vackonveyor (Model 36) system and two 800 cfm/10 psi bulk air blowers from the bulk silos to the pressure tanks. From there, the two 465 cfm air compressors of the leased cement unit transfer the bulk to the surge tanks for mixing.

(2) Water Makers - 3 ea. Aqua-Chem model S-600 Spec E, produced distilled water = 600 US gph (2268 L/h).

(3) Cranes

- 2 ea. API 1500 FMC - Diesel Hydraulic - 63 ton (57 tonne), 120 ft (36.6 m) boom
- 1 ea API 238A FMC - Diesel Mechanical - 35 ton (32 tonne), 120 ft (36.6 m) boom
- 1 additional pedestal for a "1500" is provided immediately ahead of the camp and adjacent to the camp utilities.
- all 3 pedestal cranes have 10 ft (3 m) boom extension.

(4) BOP Bridge Type Handling Crane - Beebe Bros. 50 ton (45.4 tonne), dual 25 ton (23 tonne) handling cranes, substructure mounted, including operating control console.

(5) Crane (J&B) - with trolley.

(6) Mobile Equipment

(a) Mobile Crane - 22 ton (20 tonne) FMC Link Belt 1 ea. API HSP-8022 c/w GM-4-53 diesel engine with section boom 91 ft long (28 m).

(b) Fork Lift - Caterpillar 930 - c/w pallet lifter, driven by Caterpillar diesel with 218 in (5.53 m) mast.

(c) Cement Mix Water Tanks (2) - c/w 8V-71 Diesel power (2), mixing hopper, 8 in x 6 in x 14 in (203 mm x 152 mm x 356 mm) Impeller transfer pumps (2), steam heated.

(7) Well Test Equipment

(a) Wire Line Unit - Abcor - Hydraulic drive motor, variable speed transmission, skidder brake, type "0" measuring device, 20,000 ft (6096 m) of 0.092 in (2.3 mm) regular wireline installed on drum, Neoprene cover and Hay pulley.

(b) High Pressure Piping - All oil, gas, water lines manifolded for treater, heater, testing and flare booms.

(c) Production Test Flare Booms - Two 75 ft (23 m) flare booms with king posts and piping.

(8) Accommodations

28 Unit Camp - Custom Structures suitable for accommodation of 93 people, and 35 on emergency bunk basis and including drilling supervisor's office, hospital, radio room, superintendent's office, conference room, company office, chief steward's office, general office, washrooms, geologist's office, change house, laundry/diner unit, kitchen/freezer unit, food storage unit, sleeping areas, and movie room, recreation room.

(9) Accommodation Utilities

Water Desalination - housing tankage, Aqua Chem S-600.

Capacity of Fresh Water 6600 USG (25 m³)

Capacity of Saltwater Tank 5800 USG (22 m³)

Sewage Disposal Plant - Two Red Fox 7500 with capacity for 120 people, cold start compressor and electrical distribution equipment.

Accommodations Generator - c/w Caterpillar engine model D399 turbo charged, jacket water after cooled, air starter, remote radiator, forward control, instruments, alarms, silencer, spark arrestors, flex coupling, block heaters and all accessories. Generator 1500 KVA continuous, 1050 kW, 600 volt, 3 Phase, 60 Hz, Class F insulation, Kato for SCR service. Allen Bradley controls and switchgear. 2 ea.

Heat Exchangers - Two parallel installations of 2 Young heat exchangers to provide jacket water cooling with sea water.

Garbage Compactor (2)

II. DRILLING SAFETY SYSTEMS

A. BOP Equipment

(1) Low Pressure Stack

Annular Preventer - One 21-1/4 in Hydril, MSP,(539 mm), 2000 psi (20.7 MPa), A.P.I, R.T.J. studded top and 21-1/4 in (539 mm), 3000 psi (13.8 MPa), A.P.I., R.T.J. Flanged bottom, stainless steel lined ring grooves, and packoff element.

Ram Preventers - One 20-3/4 in Hydril (539 mm), 3000 psi (20.7 MPa) A.P.I., R.T.J. Studded top double ram preventer, stainless steel lined ring grooves, side outlets, 1 set blind rams, 1 set pipe rams, automatic multiposition locks, handwheels, extensions, universal joints and wrenches. Four 3-1/16 in (77.8 mm) 5000 psi (34.5 MPa) flanged outlets.

Low Pressure Valves - One check valve, 3-1/8 in (79 mm), 3000 psi (20.7 MPa). Three gate valves, 3-1/8 in (79 mm), 3000 psi (20.7 MPa). One gate valve 3-1/8 in (79 mm), 3000 psi (20.7 MPa).

(2) High Pressure Stack

Annular Preventer - One 13-5/8 in Hydril GK (346 mm), 5,000 psi (34.5 MPa) A.P.I., R.T.J. studded top and 13-5/8 in (346 mm), 10,000 psi (69.0 MPa), Cameron clamped hub bottom, stainless steel lined ring grooves, and packoff element.

Ram Preventers - Three single ram preventers 13-5/8 in (346 mm), 10,000 psi (69.0 MPa). Cameron clamped hub top and bottom, stainless steel lined ring grooves, 2 side outlets each ram 3-1/16 in (77.8 mm), 10,000 psi (69 MPa) flanged, 1 set blind or shear rams, 2 sets pipe rams, automatic multiposition locks.

High Pressure Valves - Seven gate valves 3-1/16 in (78 mm), 10,000 psi (69.0 MPa) A.P.I., R.T.J. flanged, handwheel operated. One gate valve 3-1/16 in (78 mm), 10,000 psi (69.0 MPa) A.P.I., R.T.J. flanged, hydraulic operated. Two check valves 3-1/16 in (78 mm) 10,000 psi (69.0 MPa) A.P.I., R.T.J. flanged, swing type.

Drilling Spool

Drilling Spool - One 13-5/8 in (346 mm), 10,000 psi (69.0 MPa) Cameron clamped hub top and bottom c/w two 3-1/16 in (77.8 mm), 10,000 psi (69 MPa) flanged side outlets.

Adaptor Spool - One 13-5/8 in (346 mm) 10,000 psi (69.0 MPa)
Cameron clamp hub top and 13-5/8 in (346 mm) 10,000 psi
(69.0 MPa) API flanged bottom. c/w Starilex Steel lined ring
grooves.

(3) Control System

- (a) BOP Control Panel - (Hydril drill floor) 8 station electric, explosion proof c/w selected Diverter Control Functions. BOP actuation is via an electric/pneumatic/hydraulic system.
- (b) Accumulator - Hydril Valvcon 240 gal (908 litres) capacity twenty-two 15 US gal (57 litres) bottles with 8 station control manifold, 6 bottle Nitrogen emergency backup, electric drive triplex piston pump, 2 air pumps.
- (c) BOP Control Panel (Hydril) - Toolpush office - 9 station electric - non explosion proof.
- (d) Diverter Control Panel (Hydril) - sub mounted - 7 station manual control
- (e) Choke Control Panel - Wagner Master Choke - hydraulic operated 10,000 psi (69.0 MPa).

- (4) Choke and Kill Lines - fittings and valves downstream of the chokes are 10,000 psi (69.0 kPa).
- (5) Fill up Line - One 3 in (76 mm) fill up line.
- (6) Kill and Choke Manifold - Pacific Oilfield c/w Barton Valves, two each Willis Masterflo Chokes, 10,000 psi (69.0 MPa) one Wagner hydraulic adjustable choke, one HRC Gutline valve, valves, flanges fittings, spools, gauges, buffer chamber, target flanges and all necessary studs, nuts, and ring gaskets to assemble complete unit.
- (7) Freezing Conditions - The BOP, related control equipment, and choke and kill manifold are located in heated areas. Freeze depressed control fluids are also used ensuring operation should the heating system malfunction.
- (8) Testing - All BOP systems will be tested and maintained as per manufacturers specifications. Testing will be carried per OCS #2 and API RP53.

B. Safety Equipment

- (1) Inside BOP (Fleet Valve) - 1 ea. Gray 62035 assembly with 5 in XH pin and box connections.

- (2) Inside BOP Releasing Tool - 1 ea. Gray 62330 for Gray 62035 inside BOP with 5 in XH pin and box connectors.
- (3) TTV trip tank volume system with chart recorder and audible/visual alarm.
- (4) Combustible gas detectors.
- (5) Automatic driller with penetration rate cut off switch
- (6) Mud totalizing and flow system records cumulative volume of the six tanks, mud flow, cumulative pump stroke indicator, gain/loss gauge, chart recorder and alarm.

C. Diverter Assembly

- (1) 1 - Regan KFDJ 500 psi (3.5 MPa) W.P. Support Housing for 49 1/2 in (1257 mm) rotary table c/w 2 - 12 in (305 mm) 500 psi (3.5 MPa) ANSI flanged outlets, 1 - 3 in 500 psi (3.5 MPa) ANSI flanged outlet, and locking dog assembly. Min. Bore = 47 in (1194 mm).

- (2) 1 - Regan KFDJ 500 psi (3.5 MPa) W.P. diverter assembly for 49 1/2 in (1257 mm) Rotary table complete with flowline spool, two pressure energized packer seals. Solid Jay slot insert packer unit 28 in (711 mm) bore. Bottom connection is 39 in (991 mm) EC-6 pin with 36 1/2 in (927 mm) min. bore.

- (3) Spacer spools and an overshot provide the flow path for the mud from the BOP stack to the diverter. The overshot contains a seal which seals on a BOP stack mandrel.

III. FIREFIGHTING EQUIPMENT

A. Fire and Gas Detection/Alarm System

(1) Fire Alarm System

The fire alarm system consists of a main fire alarm panel which is a Pyrotronics System 3. The panel was custom built with individual zones for separate areas.

Each zone has a separate alarm and trouble indication. The panel is programmed such that suppression systems such as sprinklers and Halon 1301 systems can be monitored.

The overall fire detection system is arranged as follows:

- In areas where the hazard is electrical, smoke detectors are used for detection.
- In all class B areas, rate compensated detectors are used for alarm.
- In all areas protected by Halon 1301 Systems, a manual discharge switch located by all exit doors.
- Bells are located throughout the complex; tone generator in P.A. system.

- In areas where there is no suppression, breakglass stations are provided by all exit doors.
- A zonal graphic is provided by the control panel.

(2) Gas Alarm System

- MSA Model 516 main panel in SCR room.
- MSA gas detectors.
- Alarms set at 20% and 60% LEL (Lower Explosive Level).
- Trouble indication at main panel.

B. Fire Suppression System

(1) Viking sprinkler system with melting plugs.

- Two independent systems, one for each floor level. The systems is a dry pipe type.
- Two Dry Pipe Valves
- One Water Gong
- One Air Compressor
- Two Shut-off Valves
- Eighteen Auxiliary Drain Valves
- Two Inspection Valves
- Two Maintenance Valves
- Two Pressure Operated Switches
- Two Monitoring Switches.

- (2) Halon 1301 systems for water sensitive areas including caisson pumphoom with manual pull station releasing Halon after preset time delay for personnel evacuation.

The Halon 1301 Systems provide protection in the following areas:

- (1) - Camp Utilities, CU1, CU2, CU3
 - (2) - Generators, U2 and U3
 - Electrical, Room U6
 - Mud Areas, M7, M8 and M9
 - (3) - DA Trailers
 - (4) - Radio Room
 - (5) - Pumphoom
- (3) Hose reels, 30 lb (14 kg) and 20 lb (9 kg) Ansul extinguishers are located for easy access throughout the rig.
 - (4) Portable extinguishers (CO₂) are located for use within areas with sensitive electrical equipment.
 - (5) Two (2) wheeled 350 lb dry powder extinguishers are located onboard the SSDC. One is located in the welding shop and the other is located in the production testing area.

IV. POLLUTION PREVENTION EQUIPMENT

The disposal of wastes, drilling mud, and drilled solids will conform to the Environmental Protection Agency's procedures as laid down in the amended Federal Water Pollution Control Act. Training of the oil spill response team will be provided and oil spill response drills monitored.

The following is a list of Contractor provided oil spill cleanup equipment. Additional equipment is provided by the Operator (refer to the Oil Spill Contingency Plan, Section 6 which is located in Appendix B).

- (1) Boom - 1000 ft x 36 in (305 m x 0.91 m) Bennett Navy in two - 800 ft (244 m) containers c/w towing gear & repair kits.
- (2) Pump - One 3 in (76 mm) Komline Sanderson c/w 200 ft x 3 in (61 m x 76 mm) flexible oil resistant Arctic hose
- (3) Storage Bladder - 1 x 1200 gal (4 m³) including hose and recovery float and loading/discharge connectors.

V. LIFESAVING APPLIANCES

These appliances are provided to COGLA and/or USCG requirements taking into consideration features of the SSDC. These include:

- 2 - 50 man totally enclosed lifeboats (WATERCRAFT)
- 2 - 58 man totally enclosed lifeboats (FISKAR)
- 1 - rescue/pickup boat (WATERCRAFT)
- 5 - 25 man deck inflatable liferafts
- 240 - lifejackets
- 180 - exposure suits
- 120 - immersion suits
- 4 - scramble nets; and,
- 10 - life rings

VI. BEST AVAILABLE AND SAFEST TECHNOLOGIES (BAST)

The contractor is confident that the safety systems aboard the SSDC have been chosen from the safest technologies available. These systems meet or exceed the requirements of the standards, codes and practices referenced in the OCS Orders.

Thus, by complying with this Order we are sure that our safety systems have incorporated the Best Available and Safest Technologies.

VII. TRAINING REQUIREMENTS

Canmar personnel will be trained to meet requirements for operating in the American Beaufort Sea. Training certification additional to normal Canmar requirements will be as follows for each position:

<u>POSITION</u>	<u>CERTIFICATION</u>
Drilling Superintendent	MMS Well Control Certificate MMS Approved H ₂ S Certificate
Toolpusher	MMS Well Control Certificate MMS Approved H ₂ S Certificate
Driller, Assistant Driller	MMS Well Control Certificate MMS Approved H ₂ S Certificate
Pumpman, Derrickman, MotorMan, Floorhand	MMS Approved BOP Certificate MMS Approved H ₂ S Certificate

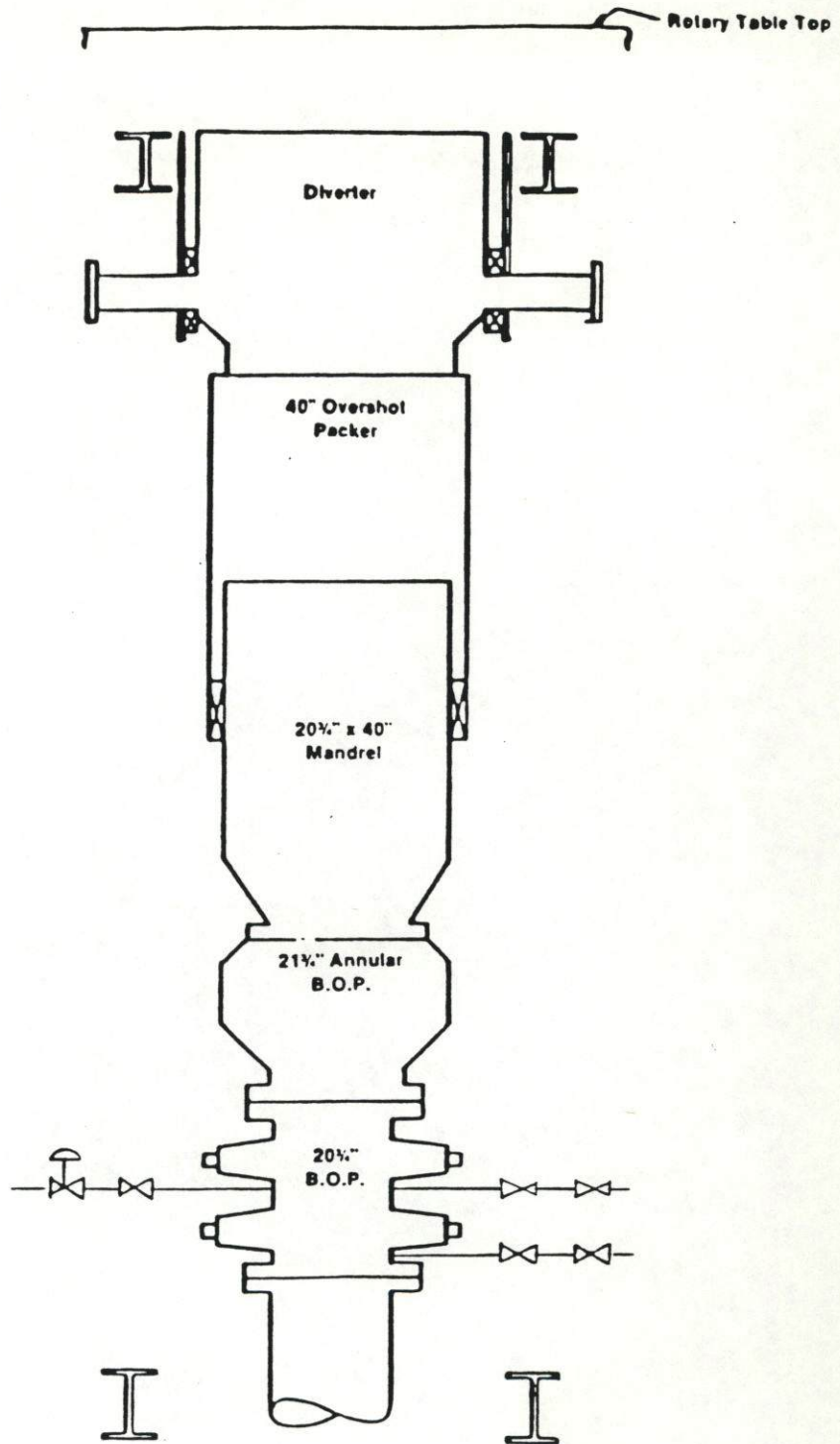


FIG. A-1

20 3/4" B.O.P.

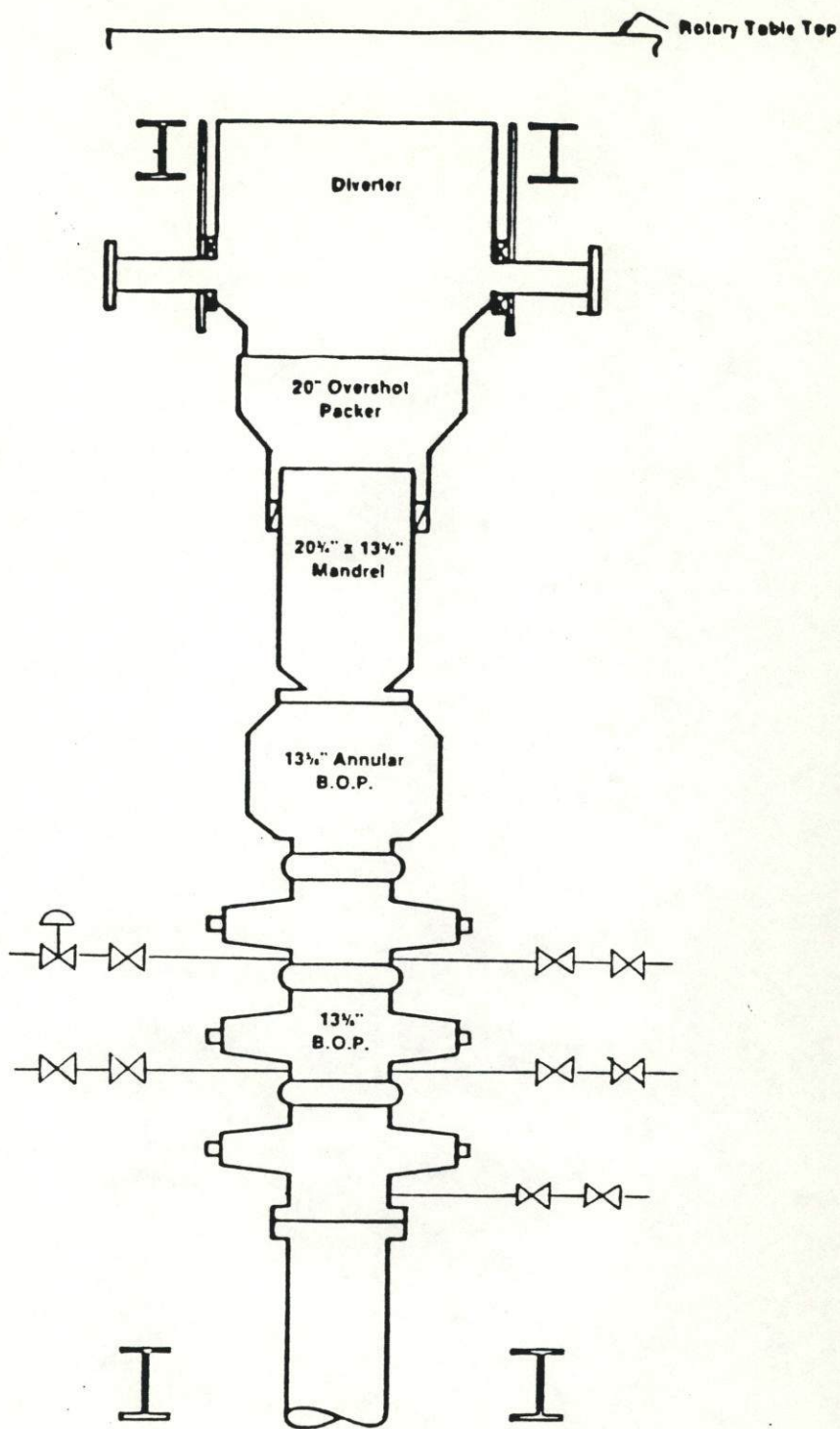


FIG. A-2

13 5/8" B.O.P.

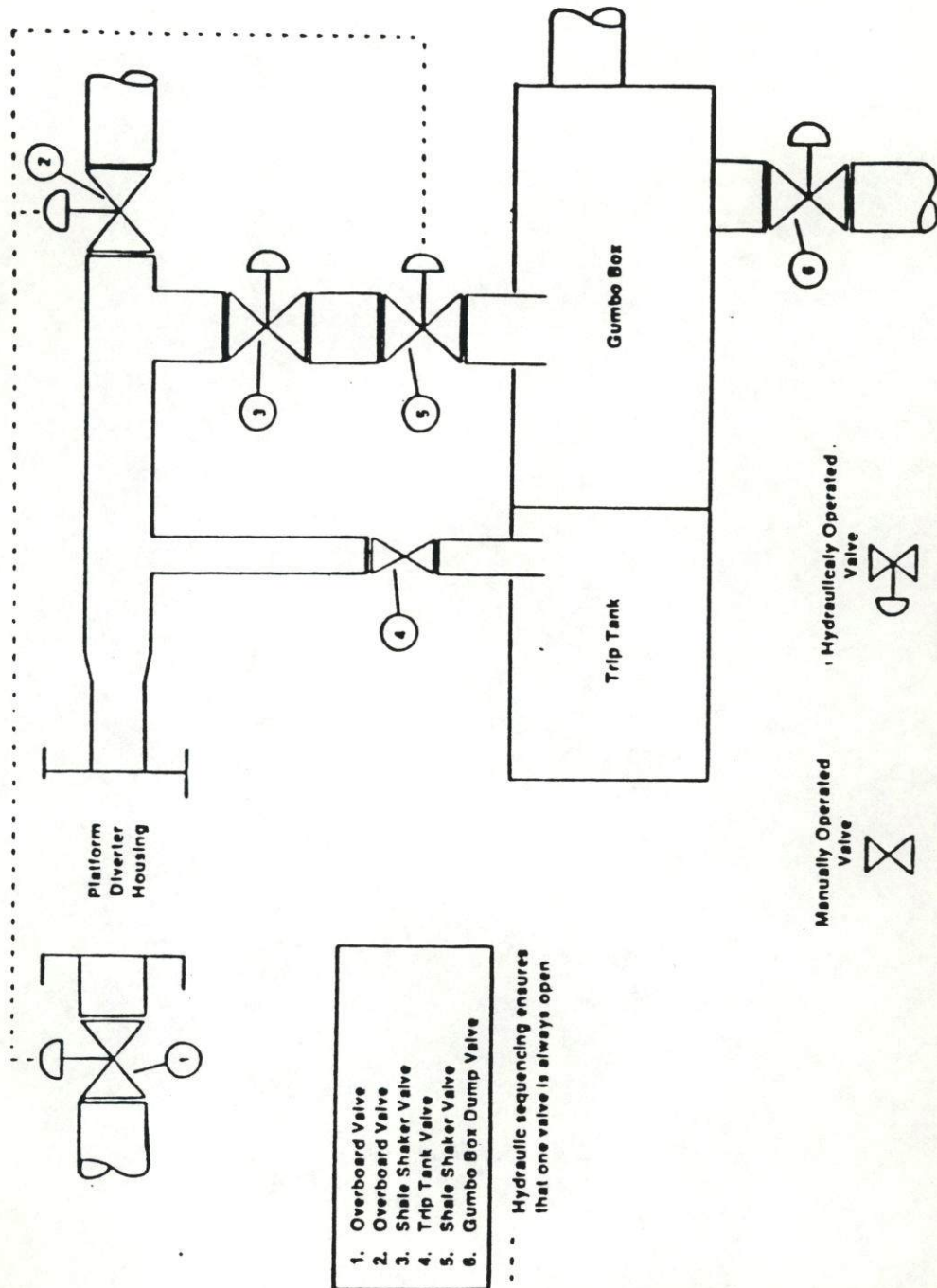


FIG. A-3

DIVERTER AND GUMBO BOX VALVING ARRANGEMENT

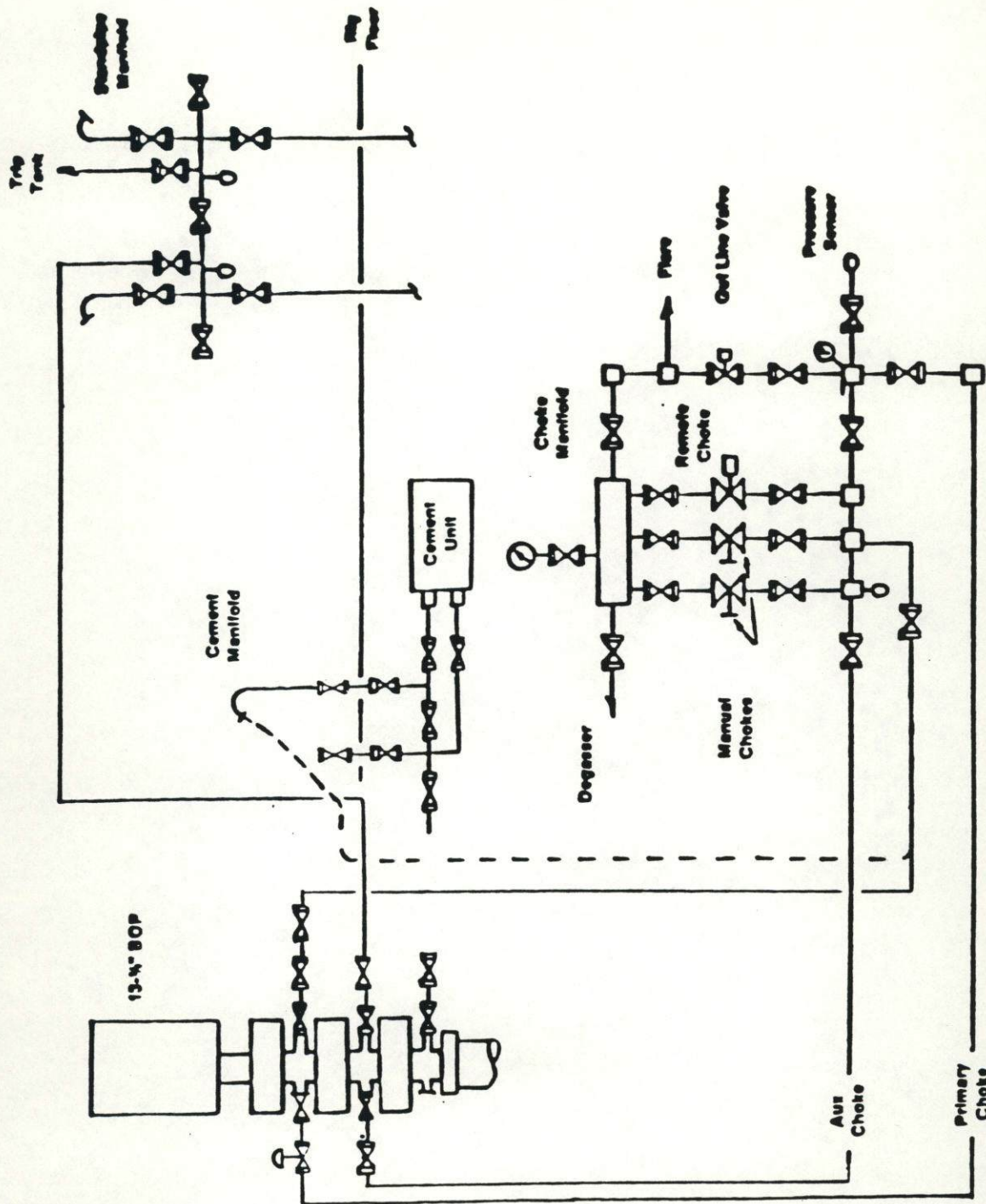
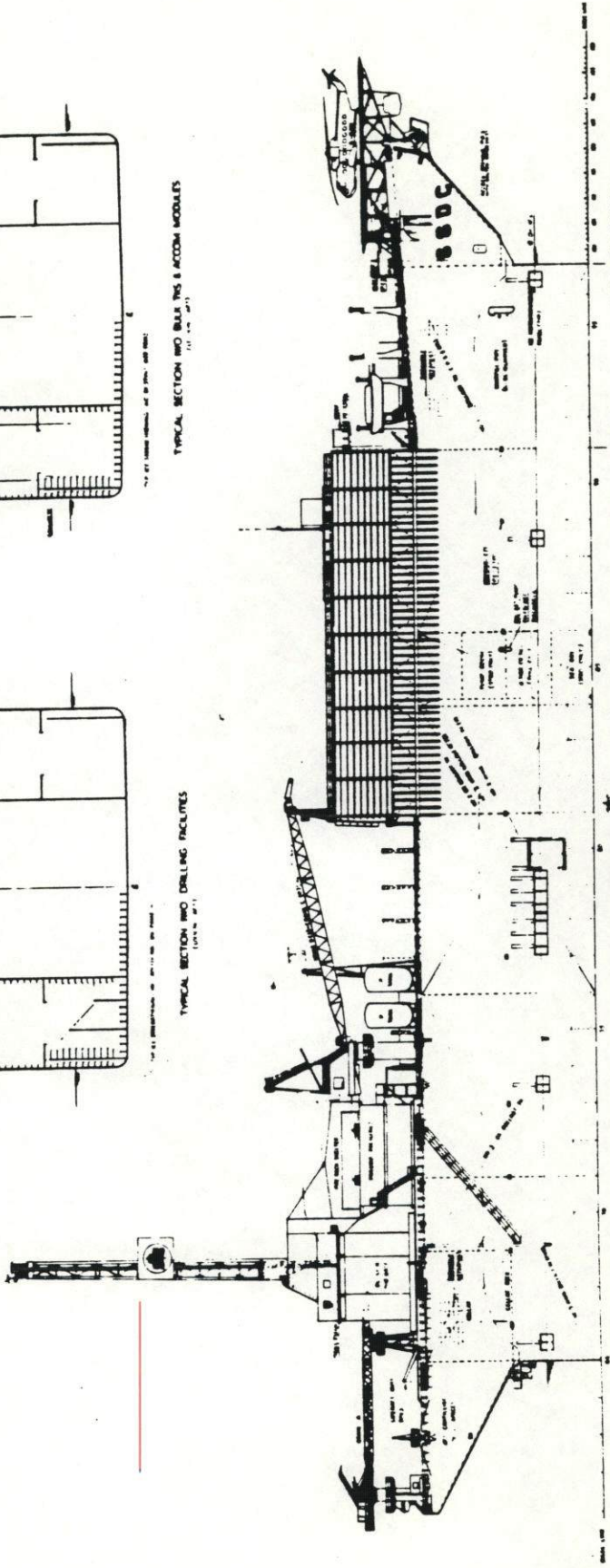
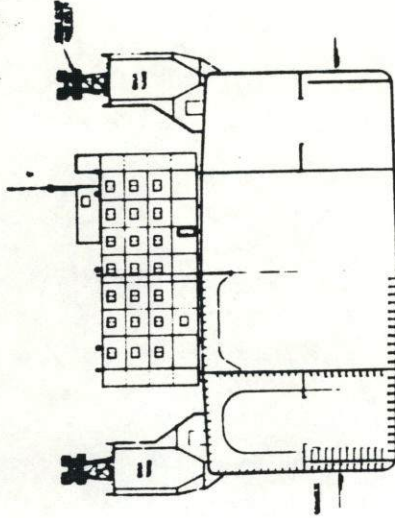
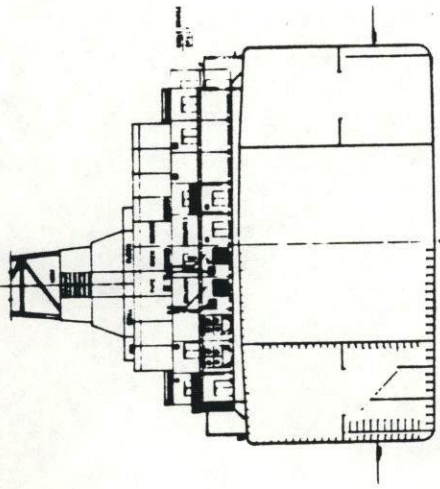


FIG. A-4

**WELL CONTROL
ARRANGEMENT**

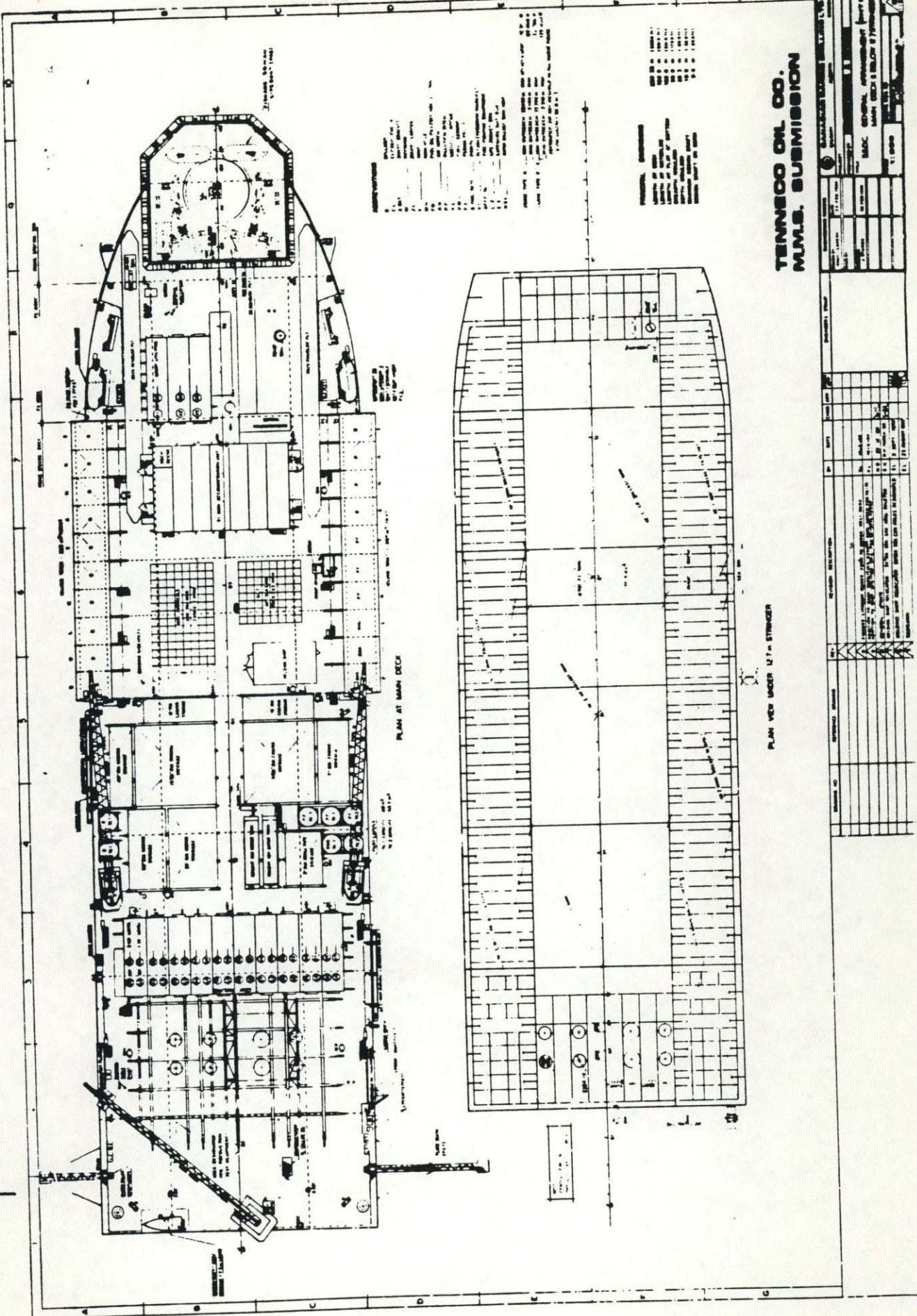


PROPERTY INFORMATION

NO. OF SHEETS	11
SHEET NO.	11
DATE OF SHEET	11/11/68
PROJECT NO.	11111
PROJECT NAME	OFFSHORE PLATFORM
DESIGNED BY	J. W. BERRY
CHECKED BY	J. W. BERRY
APPROVED BY	J. W. BERRY

**TENNOCO OIL CO.
M.M.S. SUBMISSION**

NO. OF SHEETS	11
SHEET NO.	11
DATE OF SHEET	11/11/68
PROJECT NO.	11111
PROJECT NAME	OFFSHORE PLATFORM
DESIGNED BY	J. W. BERRY
CHECKED BY	J. W. BERRY
APPROVED BY	J. W. BERRY
DATE OF APPROVAL	11/11/68
SCALE	1/8" = 1'-0"
PROJECT LOCATION	OFFSHORE
PROJECT DESCRIPTION	OFFSHORE PLATFORM
PROJECT OWNER	TENNOCO OIL CO.
PROJECT ENGINEER	J. W. BERRY
PROJECT MANAGER	J. W. BERRY
PROJECT SUPERVISOR	J. W. BERRY
PROJECT ASSISTANT	J. W. BERRY
PROJECT OPERATOR	J. W. BERRY
PROJECT MAINTENANCE	J. W. BERRY
PROJECT INSPECTION	J. W. BERRY
PROJECT COMPLETION	J. W. BERRY
PROJECT CLOSURE	J. W. BERRY
PROJECT ARCHIVE	J. W. BERRY
PROJECT RESTORE	J. W. BERRY
PROJECT REPAIR	J. W. BERRY
PROJECT REPLACE	J. W. BERRY
PROJECT REMOVE	J. W. BERRY
PROJECT DESTROY	J. W. BERRY

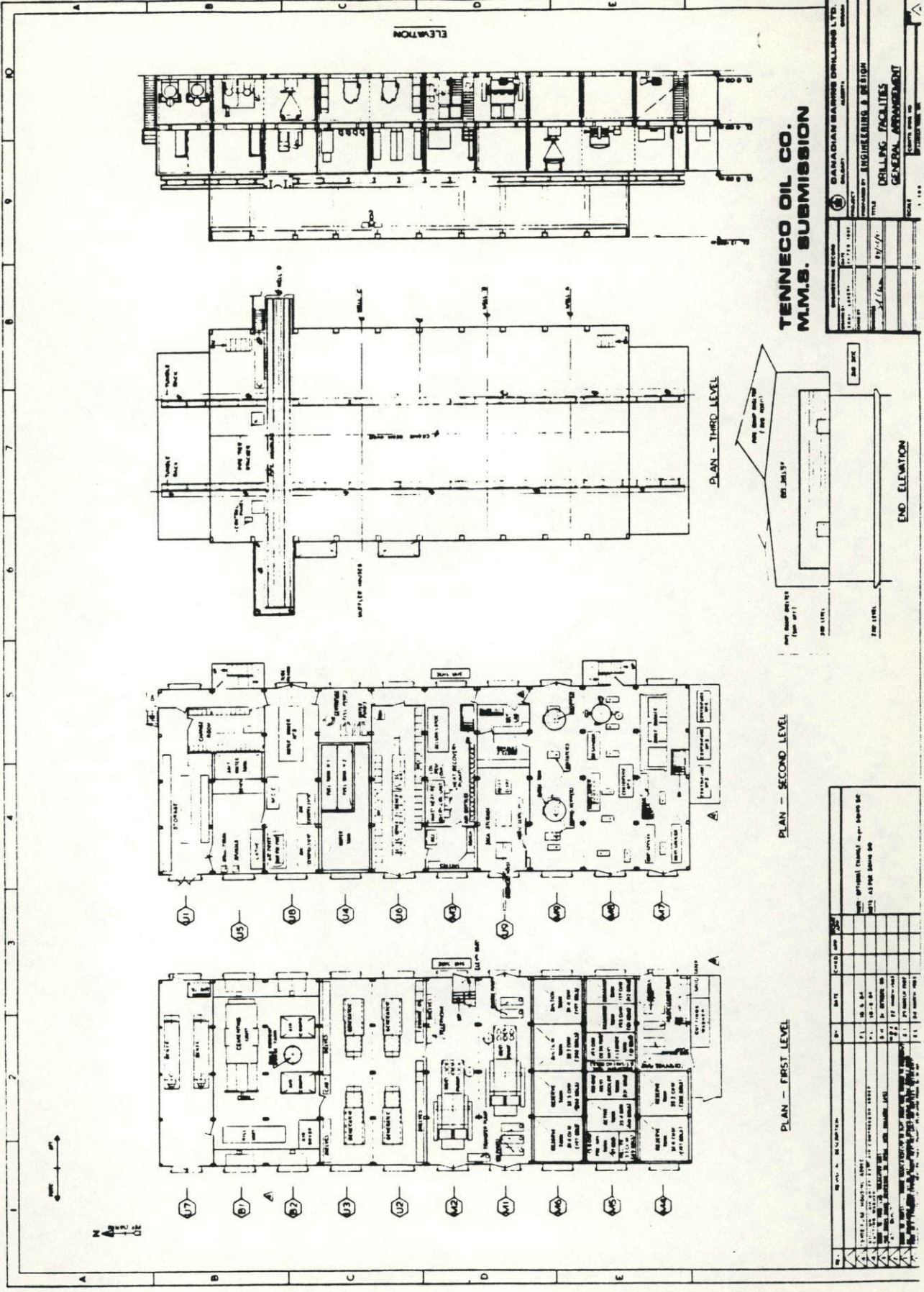


GENERAL NOTES:
 1. ALL DIMENSIONS ARE IN FEET AND INCHES.
 2. DIMENSIONS IN PARENTHESES ARE FOR REFERENCE ONLY.
 3. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.
 4. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
 5. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.
 6. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
 7. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.
 8. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
 9. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.
 10. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.

REVISIONS:
 NO. 1. 10/1/41
 NO. 2. 10/1/41
 NO. 3. 10/1/41
 NO. 4. 10/1/41
 NO. 5. 10/1/41
 NO. 6. 10/1/41
 NO. 7. 10/1/41
 NO. 8. 10/1/41
 NO. 9. 10/1/41
 NO. 10. 10/1/41

**TENNESSEE OIL CO.
 M.V.S. SUBMISSION**

NO.	DESCRIPTION	DATE	BY	CHKD.
1	ISSUED FOR CONSTRUCTION	10/1/41		
2	ISSUED FOR CONSTRUCTION	10/1/41		
3	ISSUED FOR CONSTRUCTION	10/1/41		
4	ISSUED FOR CONSTRUCTION	10/1/41		
5	ISSUED FOR CONSTRUCTION	10/1/41		
6	ISSUED FOR CONSTRUCTION	10/1/41		
7	ISSUED FOR CONSTRUCTION	10/1/41		
8	ISSUED FOR CONSTRUCTION	10/1/41		
9	ISSUED FOR CONSTRUCTION	10/1/41		
10	ISSUED FOR CONSTRUCTION	10/1/41		



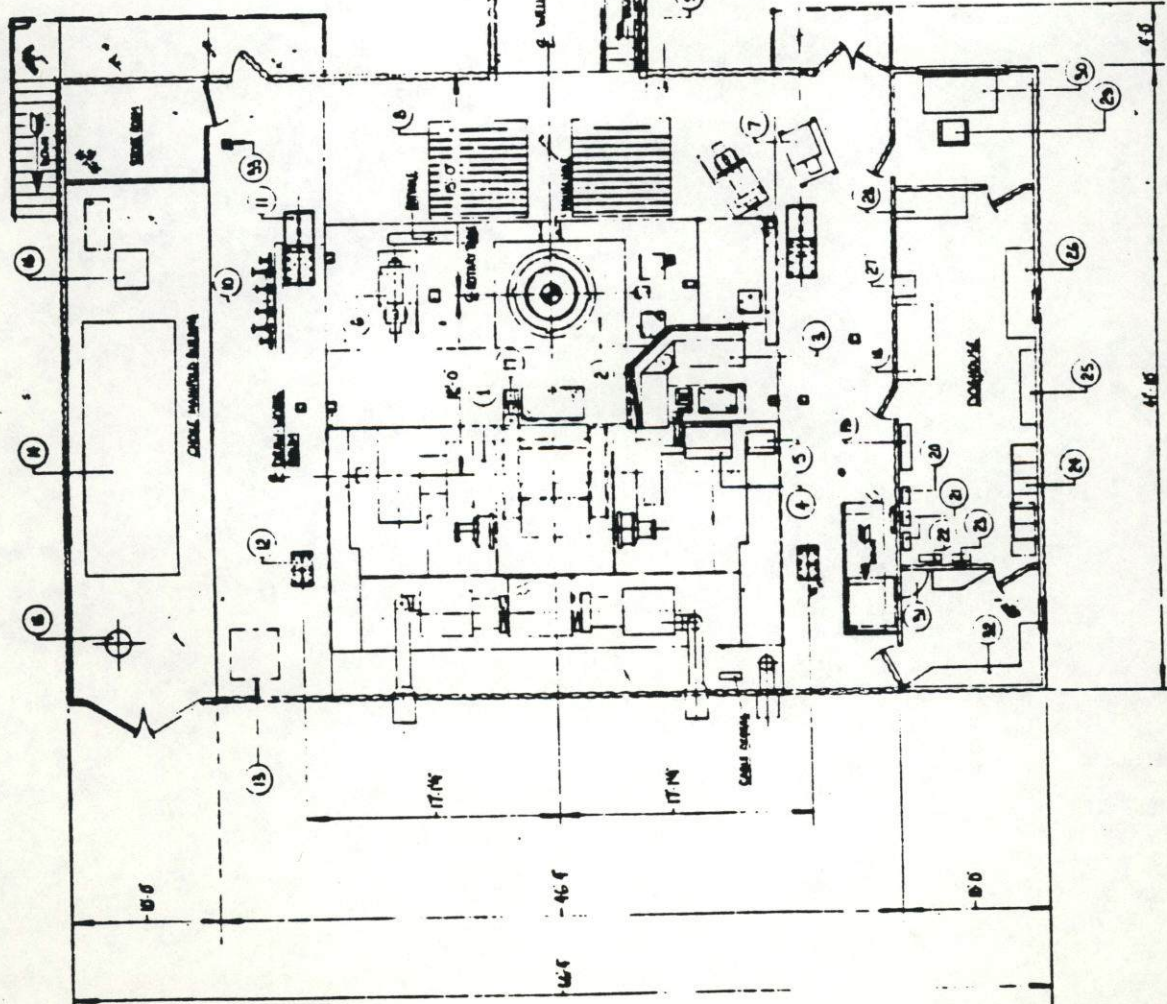
**TENNECO OIL CO.
M.M.B. SUBMISSION**

PROJECT NO.	1000
DATE	10/1/54
BY	J.L.H.
CHECKED BY	J.L.H.
APPROVED BY	J.L.H.
DESIGNED BY	J.L.H.
ENGINEERING & SURVEYING	
GENERAL ARRANGEMENT	
SCALE	1" = 10'

PLAN - SECOND LEVEL

PLAN - FIRST LEVEL

NO.	REVISION	DATE	BY	REASON
1	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT
2	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT
3	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT
4	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT
5	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT
6	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT
7	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT
8	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT
9	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT
10	AS SHOWN	10/1/54	J.L.H.	ISSUED FOR PERMIT



TENNECO OIL CO.
M.M.S. SUBMISSION

AS BUILT

PROJECT NO.	101-890-04
DATE	11/1/64
BY	W. J. ...
CHECKED BY	...
APPROVED BY	...
SCALE	AS BUILT
DRILLERS FLOOR EQUIPMENT LAYOUT	

1	1	DRILLERS CONTROL PANEL
2	1	DRILLERS CONTROL PANEL
3	1	DRILLERS CONTROL PANEL
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98	1	DRILLERS CONTROL PANEL
99	1	DRILLERS CONTROL PANEL
100	1	DRILLERS CONTROL PANEL

APPENDIX B

EXPLORATION PLAN

Barter Island Area, Diapir Field OCS

Lease Sale No. 87

OIL SPILL CONTINGENCY PLAN

Tenneco Oil Company
P. O. Box 2511
Milam Building, Suite 1430
Houston, Texas 77252

Submitted: July 22, 1987

OIL SPILL CONTINGENCY PLAN

Due to the size of the Oil Spill Contingency Plan, it is submitted under separate cover.

APPENDIX C

EXPLORATION PLAN

Barter Island Area, Diapir Field OCS

Lease Sale No. 87

PROPRIETARY GEOLOGIC DATA

Tenneco Oil Company
P. O. Box 2511
Milam Building, Suite 1430
Houston, Texas 77252

Submitted: July 22, 1987

PROPRIETARY GEOLOGIC DATA

Proprietary and confidential geologic data is included in Appendix C for the exclusive use of the Minerals Management Service in pursuance of NTL 80-2 and will therefore be excluded from the public copies. Included in Appendix C are current structure maps, appropriate diagrammatic cross-sections, and a geologic prognosis for the initial well.