In Reply Refer To: MS 5231 September 10, 1996

Shell Offshore Inc.
Attention: Mr. R. W. Robison, Jr.
Post Office Box 61933
New Orleans, Louisiana 70161

Gentlemen:

Reference is made to the following plan received August 19, 1996:

Type Plan - Unit Development Operations Coordination Document
Leases - OCS-G 5862, 5863, and 7954
Blocks - 686, 687, and 730
Area - Mississippi Canyon
Activities Proposed - Subsea Wells Nos. PD-1, PD-2, and PD-3

In accordance with 30 CFR 250.34, this plan is hereby deemed submitted and is now being considered for approval.

Your control number is N-5492 and should be referenced in your communication and correspondence concerning this plan.

Sincerely,

(Orig. Sgd.) Kent E. Stauffer

Donald C. Howard
Regional Supervisor
Field Operations

NOTED-SCHEXNAILDRE

bcc: Lease OCS-G 5862 POD File (MS 5032)
Lease OCS-G 5863 POD File (MS 5032)
Lease OCS-G 7954 POD File (MS 5032)
MS 5034 w/public info. copy of the plan
and accomp. info.

MTolbert:cic:09/03/96:DOCDCOM

Shell Offshore Inc.
An affiliate of Shell Oil Company

One Shell Square
PO Box 61933
New Orleans LA 70161-1933
(504) 588-6161

Exploration and Production
Deepwater Division

August 19, 1996

Regional Supervisor
Field Operations
Minerals Management Service
1201 Elmwood Park Blvd.
New Orleans, LA 70123-2394

Dear Sir:

SUBJECT: DEVELOPMENT OPERATIONS COORDINATION DOCUMENT (DOCD)
PROJECT MENSA
SOI ET AL OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI ET AL OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI ET AL OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
UNIT AGREEMENT NO. 754393015
OFFSHORE LOUISIANA AND MISSISSIPPI

Shell Offshore Inc. (SOI) herewith submits for your approval an Initial DOCD for the Mississippi Canyon Block 731 Unit. Your prompt review and approval of this plan will be greatly appreciated.

This Plan is submitted in accordance with Title 30 CFR 250.30 and subsequent guidelines and consists of a series of attachments describing details of our intended development operations. The attachments we desire to be exempted from disclosure under the Freedom of Information Act are marked "Confidential".

Should you require additional information, please contact Al Pickett at (504) 588-0198 in our New Orleans office.

Yours very truly,

For: R. W. Robison, Jr.
Contracts Manager

ARP:JRR

Attachments

jr621401.arp

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SOI ET AL OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

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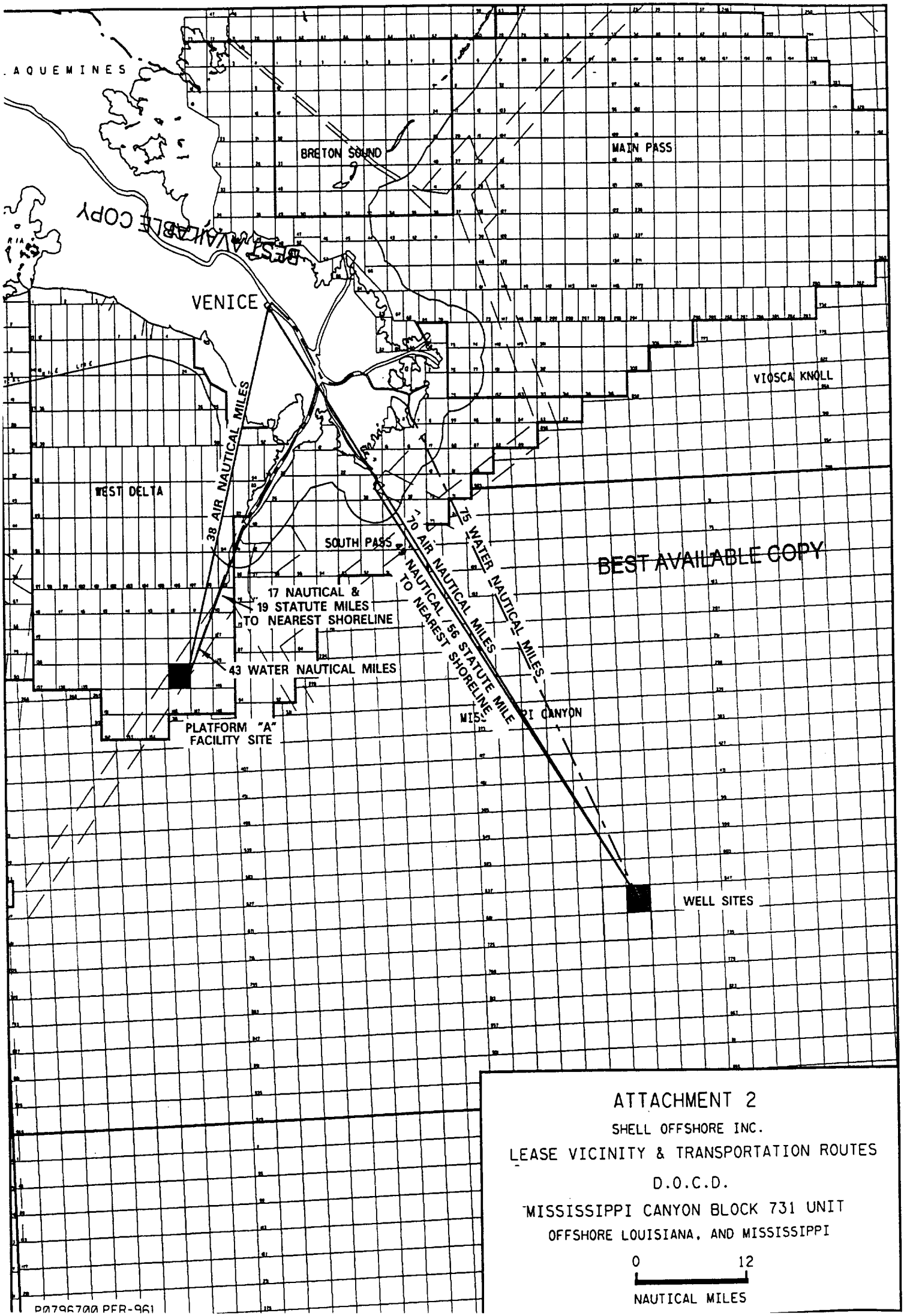
* Confidential



ATTACHMENT 2

SHELL OFFSHORE INC.

LEASE VICINITY & TRANSPORTATION ROUTES

D.O.C.D.

MISSISSIPPI CANYON BLOCK 731 UNIT

OFFSHORE LOUISIANA, AND MISSISSIPPI

0 12

NAUTICAL MILES

P0796700.PER-961

DOCD
DESCRIPTION OF ACTIVITIES
SOI ET AL OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI ET AL OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI ET AL OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

DESCRIPTION OF ACTIVITIES

SOI is currently in the process of executing the Mensa Project, a deepwater subsea gas development in Mississippi Canyon Block 731 Unit. The development is in approximately 5300 feet of water. The target reservoir is the Late Miocene "I" sand (99.5% methane) which is interpreted to be an aggradational sequence of amalgamated sheet and channel sands deposited in a mid to upper fan setting. The field development plan consists of three subsea wells with surface locations in Mississippi Canyon Block 687 and bottom hole locations in Mississippi Canyon Blocks 686, 687 and 730. Production from each well will flow through a 6 inch line to a subsea manifold 5 miles away in Mississippi Canyon Block 685 and from there through a 12 inch line (63 miles) to SOI's existing Platform "A" in West Delta Block 143.

Note:

- The drilling phase of the three wells in this plan has been previously approved by your office via POE on June 21, 1996. Well PD-2 will be deepened to approximately 20,000 feet subsea to test a deep pre-M2.8 (Late Miocene) structure. The well will then be plugged back and completed in the I sand.

- The three six inch flowlines from the planned wells in Mississippi Canyon Block 687 to the subsea manifold located in Mississippi Canyon Block 685 have been approved via Pipeline Right-of-Ways by your office.

- The 12 inch pipeline and subsea manifold located in Mississippi Canyon Block 685 have been approved via Pipeline Right-of-Way by your office.

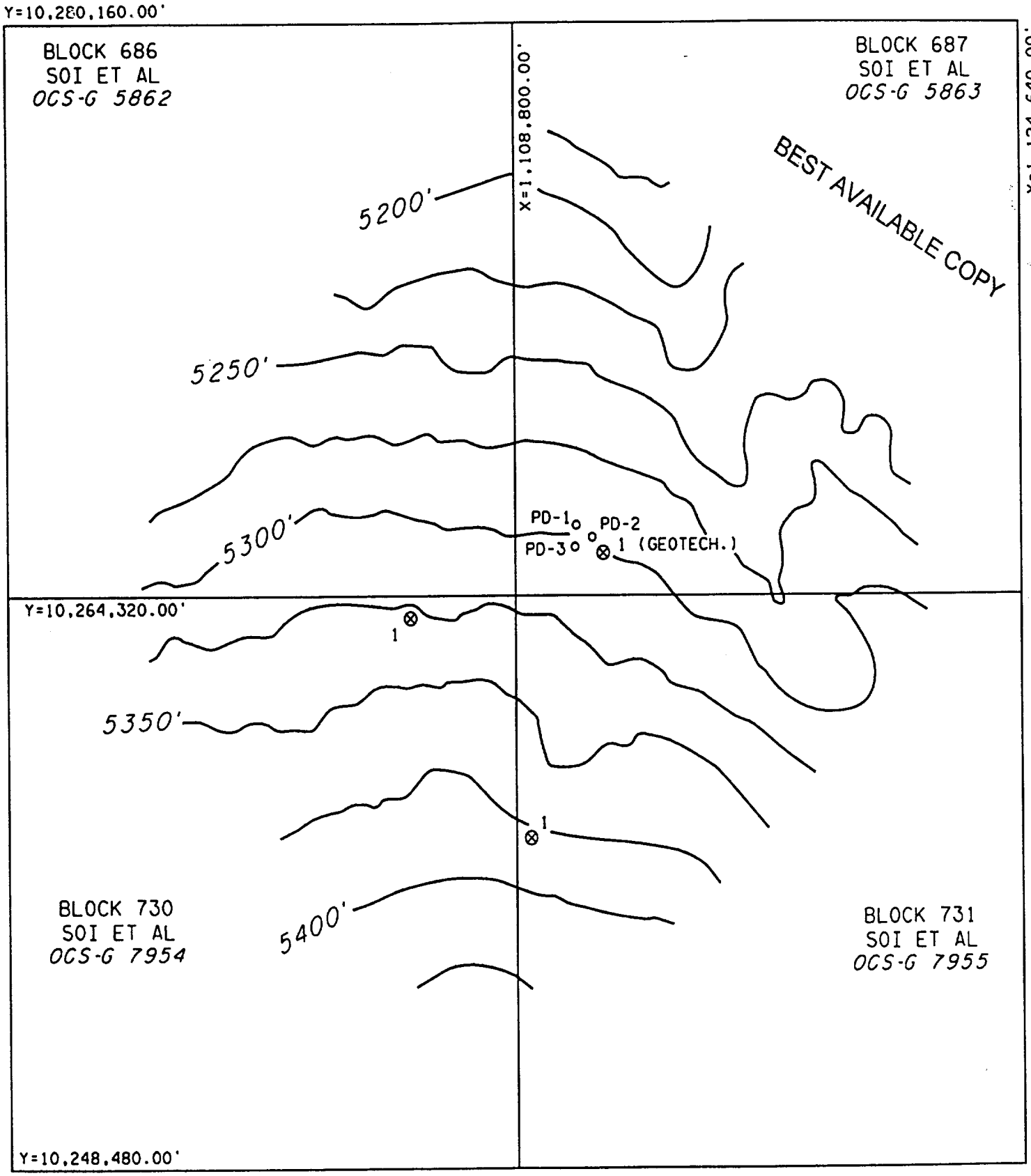
LEASE HISTORY

SOI acquired Mississippi Canyon Blocks 730 and 731 in Sale 98 (May 22, 1985). SOI acquired Mississippi Canyon Block 686 from Arco/Pennzoil and Mississippi Canyon Block 687 from Arco/Amoco/Pennzoil in 1993. SOI drilled OCS-G 7955 No. 1, Mississippi Canyon Block 731 in 1987 and OCS-G 7954 No. 1, Mississippi Canyon Block 730 in 1988. The MMS has determined both wells as capable of producing gas in paying quantities. The four block unit was approved with an effective date of June 1, 1993. The leases have a 12.5% royalty base.

DEVELOPMENT SCHEDULE

Commence Drilling Operations	August 1996
Install Production Manifold	December 1996
Commence Well Completion Operations	April 1997
Commence Production	June 1997

Peak production is estimated at 300 MMCFPD. Project life is estimated at 10 years.



○ PROPOSED SURFACE LOCATIONS

PD-1	1907' FWL & 1950' FSL OF BLK. 687	
	X=1,110,707.00'	Y=10,266,270.00'
PD-2	2406' FWL & 1616' FSL OF BLK. 687	
	X=1,111,206.00'	Y=10,265,936.00'
PD-3	1868' FWL & 1351' FSL OF BLK. 687	
	X=1,110,668.00'	Y=10,265,671.00'

⊗ EXISTING WELLS

687-1	2748' FWL & 1184' FSL OF BLK. 687	
	X=1,111,548.00'	Y=10,265,504.00'
730-1	3302' FEL & 619' FNL OF BLK. 730	
	X=1,105,498.00'	Y=10,263,701.00'
731-1	453' FWL & 6692' FNL OF BLK. 731	
	X=1,109,253.00'	Y=10,257,628.00'

ATTACHMENT 4

SHELL OFFSHORE INC.

PROPOSED SURFACE LOCATIONS

D.O.C.D.

SOI ET AL OCS-G 5862, BLOCK 686
SOI ET AL OCS-G 5863, BLOCK 687
SOI ET AL OCS-G 7954, BLOCK 730

MISSISSIPPI CANYON AREA
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA, AND MISSISSIPPI

0 4000'

SITE SPECIFIC
CHEMOSYNTHETIC ORGANISMS COMMENTS
DOCD
SOI, OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI, OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI, OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
SOI, OCS-G 7955, MISSISSIPPI CANYON BLOCK 731
MC731 UNIT
OFFSHORE, LOUISIANA AND MISSISSIPPI

Pre-drills

Proposed Location PD-1

x = 1,110,707	1950' FSL
y = 10,266,270	1907' FWL

Proposed Location PD-2

x = 1,111,206	1616' FSL
y = 10,265,936	2406' FWL

Proposed Location PD-3

x = 1,110,668	1351' FSL
y = 10,265,671	1868' FWL

Scientific investigations have discovered the presence of benthic communities thriving near active fluid expulsion zones on the seafloor in some areas of the Gulf of Mexico. For this reason, SOI examined deep-towed side-scan sonar and sub-bottom profiler data, as well as ESR (Enhanced Surface Renderings) technology. There is no evidence of fluid expulsion zones in the vicinity of proposed pre-drill locations PD-1 through PD-3.

Anchor Pattern

The anchor pattern for Proposed Location PD-1 through PD-3 has also been investigated. There is no evidence of fluid expulsion zones or faulting in the vicinity of this anchor proposed pattern.

The cable for Anchor R-3 will pass over 350 feet southwest of our previously drilled well MC730-1, over 1700 feet past the pick-up point for this cable. This cable will not cross over MC730-1. The nearest anchor and cable to MC731-1 will be the R-2, which will be over 1800 feet to the east.

SOI believes that the planned drilling activity within the captioned Mississippi Canyon Area will not disturb any chemosynthetic organisms.

D. S. Pfeiffer
Staff Geologist

A. C. Nunez
Shallow Hazards Interpreter

SITE SPECIFIC
SHALLOW HAZARDS COMMENTS
DOCD
SOI, OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI, OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI, OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
SOI, OCS-G 7955, MISSISSIPPI CANYON BLOCK 731
MC731 UNIT
OFFSHORE, LOUISIANA AND MISSISSIPPI

Pre-drills

Proposed Location PD-1

x = 1,110,707	1950' FSL
y = 10,266,270	1907' FWL

Proposed Location PD-1 is located in a water depth of approximately 5297 feet. The stratigraphy below Proposed Location PD-1 consists of 80 feet of undisturbed sediments overlaying 3 successive landslides. This unit is made of cohesive clay sediments. The next 100 feet is the upper sand unit, occurring 692-791 feet below the mud line. A core was taken of this interval in the boring MC-10. The core showed this unit to be a clean sand to inter-layered clay. Proposed Location PD-1 will then penetrate a section of hard clay from 791-1890 feet below the mud line. The lower sand bearing unit, consisting of granular soils divided by inter-bedded sands and clays will occur at 1890-3090 feet below the mud line. Clays occur below 3090 below the mud line.

Isolated amplitudes are identified at different intervals in the surveyed area. Amplitudes are seen near Proposed Location PD-1, 300 feet southeast and another 510 feet northwest of Proposed Location PD-1. These amplitudes are less than 200 feet in length, and occur approximately 2350 feet below the mud line. There are no other amplitudes within 500 feet of Proposed Location PD-1. Two casings will be set well before nearing this amplitude zone. The 26" will be set approximately 1100 feet below the mud line, while the 20" will be set approximately 1800 feet below the mud line.

Based on a high-resolution geophysical survey (side-scan sonar, subbottom profiler, frequency enhanced 3-D, multi-fold 2-D digital data, and Enhanced Surface Renderings), Proposed Location PD-1 appears suitable for the proposed activity.

Proposed Location PD-2

x = 1,111,206	1616' FSL
y = 10,265,936	2406' FWL

Proposed Location PD-2 is located in a water depth of approximately 5298 feet. The stratigraphy below Proposed Location PD-2 consists of 82 feet of undisturbed sediments overlaying 3 successive landslides. This unit is made of cohesive clay sediments. The next 120 feet is the upper sand unit, occurring 687-799 feet below the mud line. A core was taken of this interval in the boring MC-10. The core showed this unit to be a clean sand to inter-layered clay. Proposed Location PD-2 will then penetrate a section of hard clay from 799-1905 feet below the mud line. The lower sand bearing unit, consisting of granular soils divided by inter-bedded sands and clays will occur at 1905-3087 feet below the mud line. Clays occur below 3087 below the mud line.

Isolated amplitudes are identified at different intervals in the surveyed area. Amplitudes are seen near Proposed Location PD-2, 120 feet northeast and another 150 feet northwest of Proposed Location PD-2. These amplitudes are less than 250 feet in length, and occur approximately 2350 feet below the mud line. Another amplitude occurs 550 feet east of Proposed Location A-2. This amplitude also occurs 2035 feet below the mud line, and covers an area of 1150 feet by 625 feet. No other amplitudes occur within 500 feet of Proposed Location PD-2. Two casings will be set well before nearing this amplitude zone. The 26" will be set approximately 1100 feet below the mud line, while the 20" will be set approximately 1800 feet below the mud line.

Based on a high-resolution geophysical survey (side-scan sonar, subbottom profiler, frequency enhanced 3-D, multi-fold 2-D digital data, and Enhanced Surface Renderings), Proposed Location PD-2 appears suitable for the proposed activity.

Proposed Location PD-3

x = 1,110,668	1351' FSL
y = 10,265,671	1868' FWL

Proposed Location PD-3 is located in a water depth of approximately 5302 feet. The stratigraphy below Proposed Location PD-3 consists of 83 feet of undisturbed sediments, overlaying 3 successive landslides. This unit is made of cohesive clay sediments. The next 100 feet is the upper sand unit, occurring 691-791 feet below the mud line. A core was taken of this interval in the boring MC-10. The core showed this unit to be a clean sand to inter-layered clay. Proposed Location PD-3 will then penetrate a section of hard clay from 791-1890 feet below the mud line. The lower sand bearing unit, consisting of granular soils divided by inter-bedded sands and clays will occur 1890-3090 feet below the mud line. Clays occur below 3090 feet below the mud line.

Isolated amplitudes are identified at different intervals in the surveyed area. An amplitude is seen near Proposed Location PD-3, 450 feet to the northeast. This amplitude is less than 200 feet in length, and occurs 2350 feet below the mud line. There are no other amplitudes within 500 feet of Proposed Location PD-3. Two casing strings will be set well before nearing this amplitude zone. The 26" will be set approximately 1100 feet below the mud line, while the 20" will be set approximately 1800 feet below the mud line.

Based on a high-resolution geophysical survey (side-scan sonar, subbottom profiler, frequency enhanced 3-D, multi-fold 2-D digital data, and Enhanced Surface Renderings), Proposed Location PD-3 appears suitable for the proposed activity.

With reference to NTL 83-3 of September 7, 1983, paragraph II.I.5, a copy of data from the two lines closest to our proposed locations will be furnished if requested.

D. S. Pfeiffer
Staff Geologist

A. C. Nunez
Shallow Hazards Interpreter

X= 1,092,960.00'
Y=10,280,160.00'

X= 1,124,640.00'
Y=10,280,160.00'

BLOCK 686
SOI ET AL
OCS-G 5862

BLOCK 687
SOI ET AL
OCS-G 5863

X=1,108,800.00'

5200'

5250'

5300'

5350'

5400'

R-1
R-2
R-3
R-4
R-5
R-6
R-7
R-8

PD-1
RIG
PD-2
PD-3

Y=10,264,320.00'

1
1

BLOCK 730
SOI ET AL
OCS-G 7954

BLOCK 731
SOI ET AL
OCS-G 7955

ITEM	Coordinates X	Y
WELL PD-1	1,110,707'	10,266,270'
WELL PD-2	1,111,206'	10,265,936'
WELL PD-3	1,110,668'	10,265,671'

X= 1,092,960.00'
Y=10,248,480.00'

X= 1,124,640.00'
Y=10,248,480.00'

○ RIG
× CHAIN PICKUP POINTS
● ANCHOR LOCATIONS
⊗ EXISTING WELLS

#	Bearing	Coordinates X	Y	Length to Anchor	Length of Chain on Bottom
R-1	158.0°	1,114,364'	10,257,302'	9,339'	2,059'
R-2	202.3°	1,107,311'	10,257,314'	9,345'	2,029'
R-3	245.2°	1,102,376'	10,262,046'	9,343'	2,036'
R-4	294.5°	1,102,364'	10,269,834'	9,338'	2,036'
R-5	338.0°	1,107,357'	10,274,617'	9,340'	2,042'
R-6	22.3°	1,114,410'	10,274,604'	9,346'	2,040'
R-7	67.7°	1,119,506'	10,269,505'	9,345'	2,042'
R-8	111.8°	1,119,583'	10,262,478'	9,392'	2,065'

N

ATTACHMENT 9

SHELL OFFSHORE INC.
ANCHOR SITE LOCATIONS
D.O.C.D.
SOI ET AL OCS-G 5862, BLOCK 686
SOI ET AL OCS-G 5863, BLOCK 687
SOI ET AL OCS-G 7954, BLOCK 730
MISSISSIPPI CANYON AREA
MISSISSIPPI CANYON BLOCK 730 UNIT
OFFSHORE LOUISIANA, AND MISSISSIPPI

0 4000'

DOCD
SOI ET AL OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI ET AL OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI ET AL OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

LEASE STIPULATIONS

The captioned leases are not part of any Biological Sensitive Area, Shipping Fairway or Military Warning Area.

NEW OR UNUSUAL TECHNOLOGY TO BE EMPLOYED

No new or unusual technology will be employed in this development. Mensa is similar in general concept to SOI's Green Canyon Block 116 subsea system development.

HYDROGEN SULFIDE DETERMINATION

SOI drilled two wells (I sand) within the Mississippi Canyon Block 731 Unit. The wells did not encounter H2S in any of the operations associated with the drilling, logging and coring of these wells.

Based on [CFR 250.67(c)], we request that the Regional Supervisor determine the zones in the proposed drilling operations in this plan be classified as zones where the absence of H2S has been confirmed.

AREAWIDE BOND REQUIREMENT

SOI's areawide bond coverage is $3,000,000.

DOCD
SOI ET AL OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI ET AL OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI ET AL OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

DEVELOPMENT PLAN

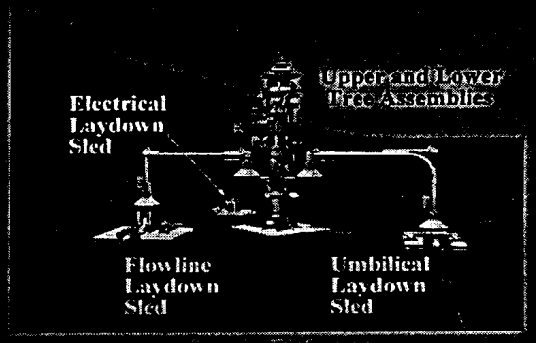
The field will be developed by tying back a subsea satellite development system to SOI's existing West Delta 143 Platform "A" (WD 143-A). Three wells will be directionally drilled from surface locations in Mississippi Canyon Block 687. The wells will be completed and flowed individually through five-mile flowlines to a manifold, where the production will be commingled. From the manifold the gas will be transported approximately 63 miles via a single 12 inch flowline to processing facilities at WD 143-A. The manifold also will distribute hydraulic control and chemical injection functions out to each of the wells. An Electrical Distribution Structure (EDS) adjacent to the manifold will distribute electrical power and communication to each tree and the manifold.

In 1996 and 1997 the wells will be drilled using a moored semisubmersible rig and guidelineless technology. The flowlines, umbilicals, EDS and manifold will be installed 4th quarter of 1996 and 1st quarter of 1997. Following the in-field flowline installation, the drilling rig will move back into the field and finish drilling and completing all wells. The flowline and umbilical jumpers (hydraulic and electric) between the trees and the laydown sleds will either be installed from the rig or another suitable vessel.

The production facilities to be installed on WD 143-A include processing and subsea chemical injection. The system will be designed for up to 350 MMCFPD. The in-field flowlines will be rated for full shut-in pressure (8970 psi @ seafloor), however the main 12" flowline will be rated for 6000 psi. Glycol will be used to suppress hydrate formation with chemical injection points at each subsea tree, and will be regenerated at the process facilities for re-injection subsea. Methanol can also be injected downhole above the SCSSV or at the tree.

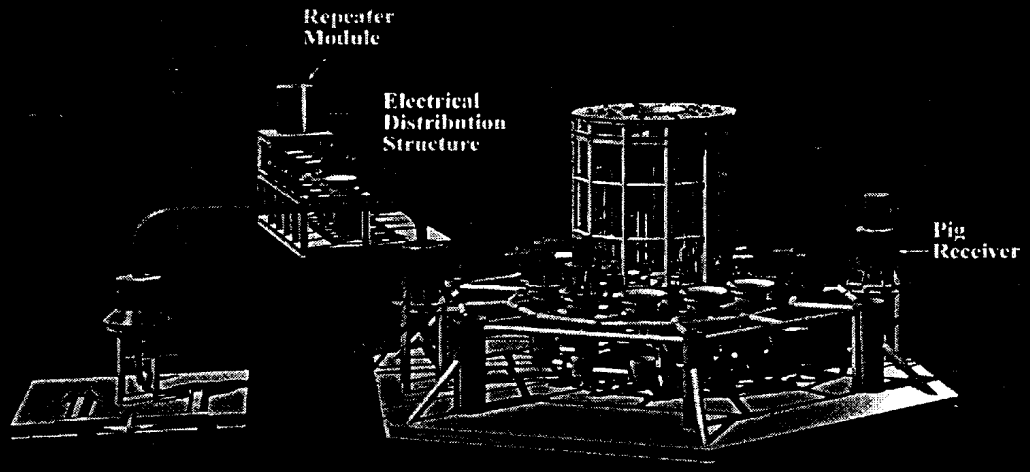
The planned Phase I subsea development concept is represented by computer model in Attachment 12.

MENSA SUBSEA DEVELOPMENT SYSTEM



Subsea Well (typ)

Inter-Field Lines (63 mi)
12" Flowline
3" Glycol Supply Line
Hydraulic Umbilical
Electrical Umbilical



12" FLowline Laydown Sled

Subsea Manifold/Template

In-Field Lines (5 mi) (typ)
6" Flowline
Hydraulic Umbilical
Electrical Umbilical

ATTACHMENT 12
SHELL OFFSHORE INC.
D.O.C.D.
SUBSEA DEVELOPMENT ARRANGEMENT
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

DOCD
SOI ET AL OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI ET AL OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI ET AL OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

DOWNHOLE COMPLETION

Wells A-1 and A-3 will be cased with 13 5/8" 88.2 #/ft, together with an 11 3/4" 65 #/ft liner and 7 5/8" 39 and 52.57 #/ft production liner. A production tieback of 9 5/8" 53.50 #/ft will be used. The wells will be completed as cased hole gravel packs over intervals of approximately 100 feet.

Well A-2 will be cased with 9 5/8" 53.5 #/ft and 7 5/8" 39.0 #/ft production casing and may be completed with a 1000-1500 ft horizontal section with a damage tolerant screen.

A surface-controlled subsurface safety valve (SCSSV) will be installed at a depth where the temperature is high enough to preclude hydrate formation (i.e., 3500 ft). Methanol can be injected above the SCSSV to prevent hydrate formation in the wellbore until flowing wellhead temperature is above hydrate formation temperature. The production tubing will be 4 1/2", 15.1 #/ft, 13 chrome tubing with premium thread connections. No permanent downhole pressure and temperature monitoring system will be installed.

WELLHEAD AND TREE SYSTEM

The wellhead system will be a shallow-water-flow 18 3/4", 10,000 psi wellhead. The completion guidebase, which provides the guidance, orientation, and termination for the tree and flowline/umbilical jumpers, will be a guidelineless structure locked to the tubing head. The tubing head in turn will be locked to the wellhead.

The subsea tree will be a nominal 4" x 2" split block guidelineless design, with a vertical flow piping connection mandrel for mating with the flowline bridge in the completion guidebase (see Attachment 13-A). The tree will have an erosion detection capability in the form of a probe attached to a pressure sensor. Dual production master valves will be included in the lower tree, both designed as USV's. All valves on the tree will have a water depth rating of 7500 ft. A retrievable, remote-adjustable subsea choke will be incorporated in the tree flow piping. Tree-mounted pressure and temperature sensors will permit remote monitoring from the platform.

MANIFOLD/TEMPLATE

The manifold/template will have the capability to connect four subsea wells (2 slots each, for flowline and hydraulic umbilical) and three interfield lines. The template base, which locates and supports the manifold and S&HO (Stab and Hinge Over) funnels, will be a gravity-based-type structure with shear skirts around its perimeter. It will have a mudmat diameter of 70 ft. and weigh about 200 tons. Although installed initially with the template, the manifold will be a separate moonpool-retrievable assembly about 17 ft. tall and 18 ft. in diameter and weighing about 50 tons (250 tons total for manifold/template). All piping within the manifold will be carbon steel, and all valves will be ROV operable (see Attachment 13-B).

IN-FIELD FLOWLINES/UMBILICALS

The in-field flowlines and umbilicals will connect the manifold to laydown sleds adjacent to each wellhead. The trees will be connected to the laydown sleds using well jumpers. The flowline will be a nominal 6" carbon steel pipe, rated for full well shut-in pressure. The hydraulic umbilical will be constructed from 7 x 1" carbon steel tubes (see Attachment 13-C) and the electrical umbilical will consist of power and communication cables (see Attachment 13-D). The flowlines will be laid in an "S" configuration from a dynamically positioned pipelay vessel.

WELL JUMPERS

The subsea wells will be connected to the in-field flowlines and hydraulic umbilicals with a nominal 5" carbon steel jumper and 7 x 1" duplex stainless steel tubing jumper, respectively. The jumpers will be inverted "U" type construction and will be installed from a dedicated installation vessel or the drilling rig (see Attachments 13-E and 13-F). The subsea wells will be connected to the in-field electrical umbilicals with flying lead electrical jumpers. These will be deployed from the drilling rig and connected using a Remote Operated Vehicle (ROV).

INTERFIELD LINES

The interfield lines consist of the following:

- A 3.5" OD glycol supply line
- A 12.75" OD gas transportation flowline

The 3.5" X-56 grade carbon steel line will be used to transport glycol to the subsea manifold. Installation will be initiated at the manifold using a S&HO assembly. The line will be connected to the platform using a diver-installed spool piece to a pre-installed riser. The glycol line will be designed for 10,000 psi.

The 12.75" X-70 grade carbon steel flowline will be used to transport gas from the manifold to the WD 143-A facilities. Installation of the flowline will initiate at the platform and terminate in a sled adjacent to the manifold. The flowline will be connected to the platform using a spool piece installed by divers to a pre-installed riser on the jacket. The flowline sled termination will be connected to the manifold using an inverted "U" spool and connected with the assistance of the ROV (see Attachment 13-G).

The flowline is NOT rated for shut-in pressure of the wells and its Maximum Allowable Operating Pressure (MAOP) is 6000 psi. Safety systems on the trees, manifold and the platform will ensure that the pressure in the flowline never exceeds the MAOP. As a contingency, a relief valve set at 3500 psi will be placed in the inlet piping at the platform.

INTERFIELD UMBILICALS

The interfield umbilicals, that is hydraulic and electrical, will connect the manifold and EDS to the WD 143-A facilities. The hydraulic umbilical will consist of 3 x 1" carbon steel tubes rated for a design pressure of 10,000 psi. It will be installed by initiating at the manifold using a S&HO assembly and terminating at the platform through a J-tube (see Attachment 13 H). The tubes within the umbilical are used for high pressure and low pressure hydraulics and for annulus vent/methanol injection. The tubes will be bundled together and covered with polypropylene rovings.

The electrical umbilical will be installed by initiating its lay from the EDS using a S&HO assembly and terminating at the platform through a J-tube. The electrical umbilical will be a double armored cable consisting of two triads for power transmission and a quad for communications. It will transmit electric power and signal between the platform-based Master Control Station (MCS) and the control pod on each tree. Due to the long offset distance between the MCS and the control pods, a repeater module for the communication signals will be positioned on the EDS adjacent to the manifold. The same electrical cable design will be used between the EDS and each tree.

CONTROL SYSTEM

The production control system will be a multiplexed electro hydraulic design. It will consist of a retrievable control pod on each tree, a repeater pod located on the EDS, a hydraulic distribution system within the subsea manifold, a filter pod on the umbilical laydown sled adjacent to each tree, and a MCS with a hydraulic power unit on WD 143-A platform (see Attachment 13-I).

Electrical power to the subsea production system will be provided using an electrical umbilical from WD 143-A to the EDS and out to the wellheads. The ROV will connect electrical cables from the main umbilical to the repeater module and to the in-field umbilicals. The in-field umbilicals will terminate in sleds adjacent to each tree. Electrical flying leads will connect between the laydown sleds and the subsea control pod on each tree. Positioned on each tree will be parking places for the electrical connectors in the event that the tree and/or control pod is retrieved during the life of the field.

Electrical flying leads will also be used to connect the EDS to the manifold. The flying leads will be deployed with the EDS and an ROV used to connect the leads between the two structures.

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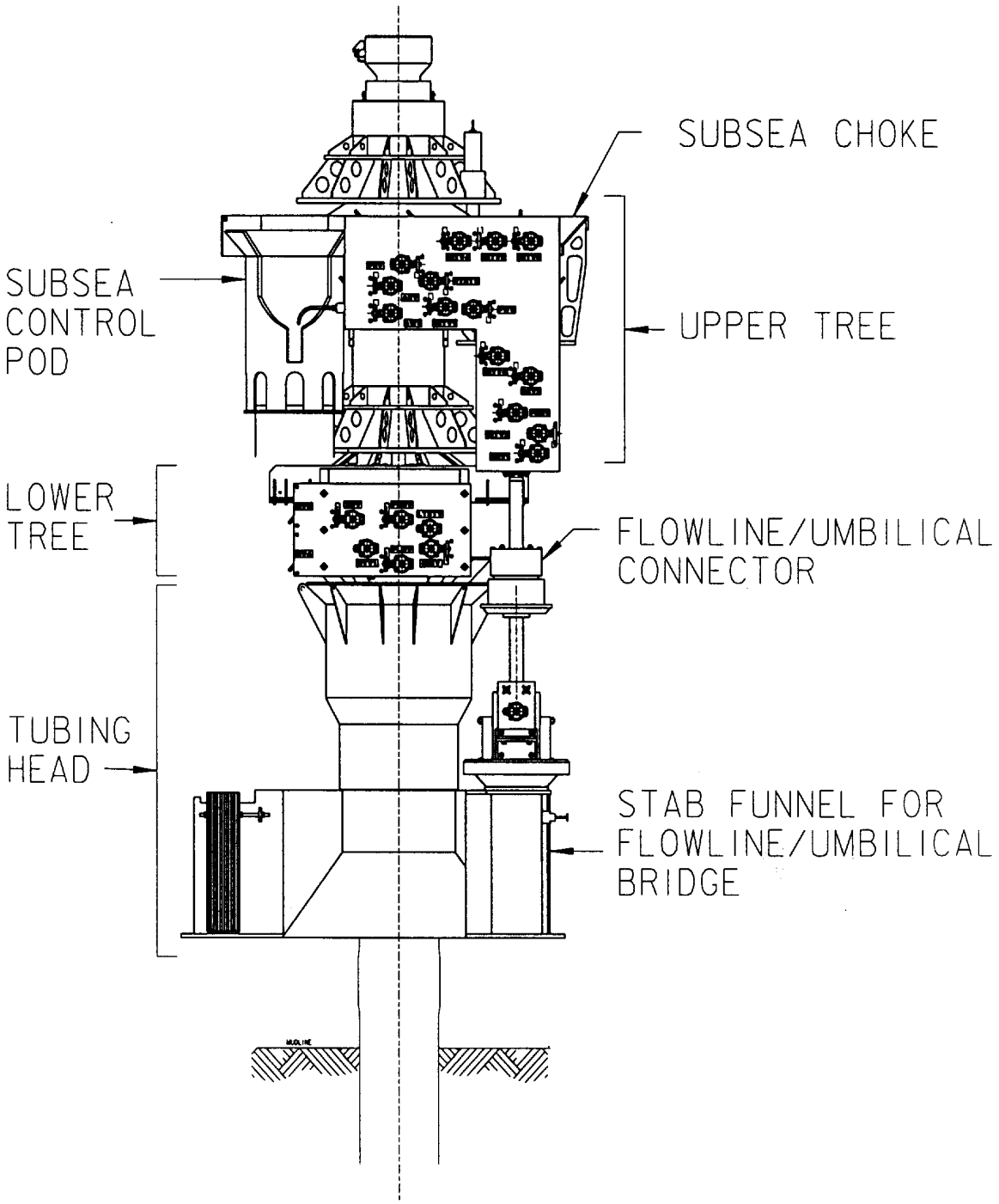
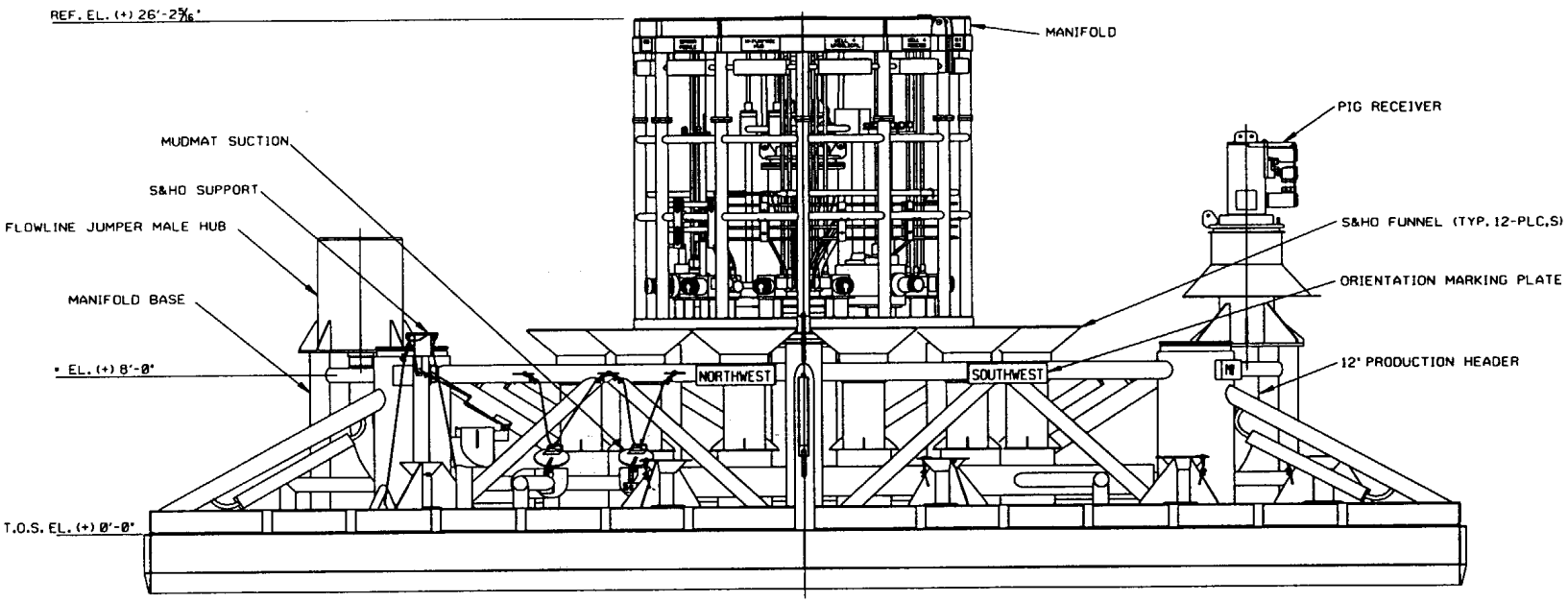


ATTACHMENT 13-A
SHELL OFFSHORE INC
D.O.C.D.
TREE-FRONT ELEVATION
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA
AND MISSISSIPPI



ATTACHMENT 13-B
SHELL OFFSHORE INC
D.O.C.D.
MANIFOLD BASE / MANIFOLD
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA
AND MISSISSIPPI

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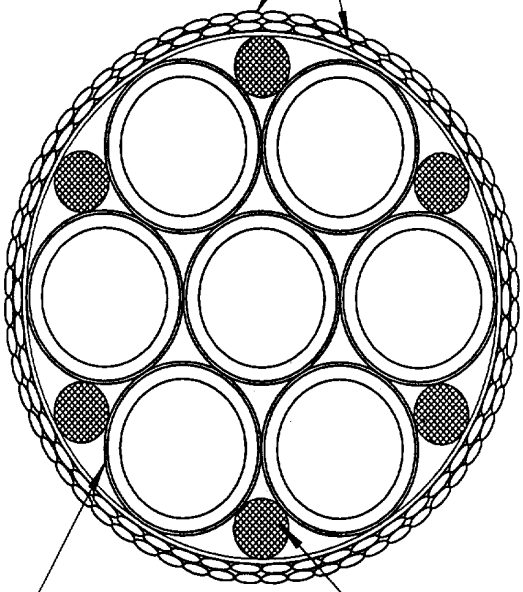
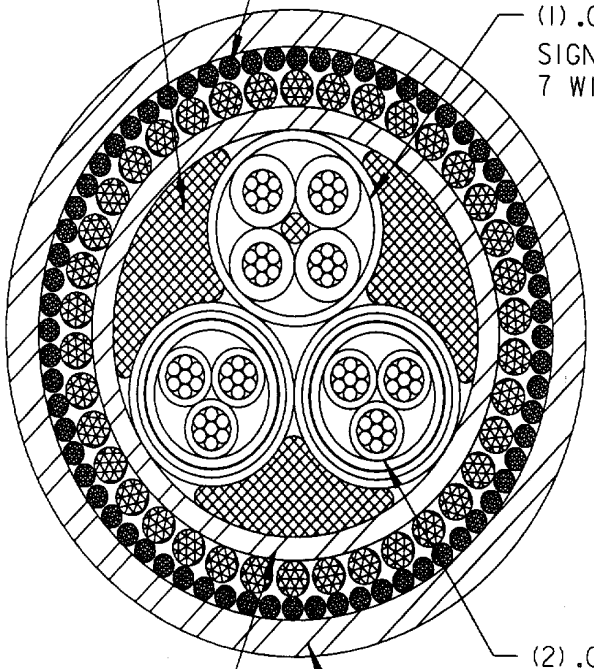
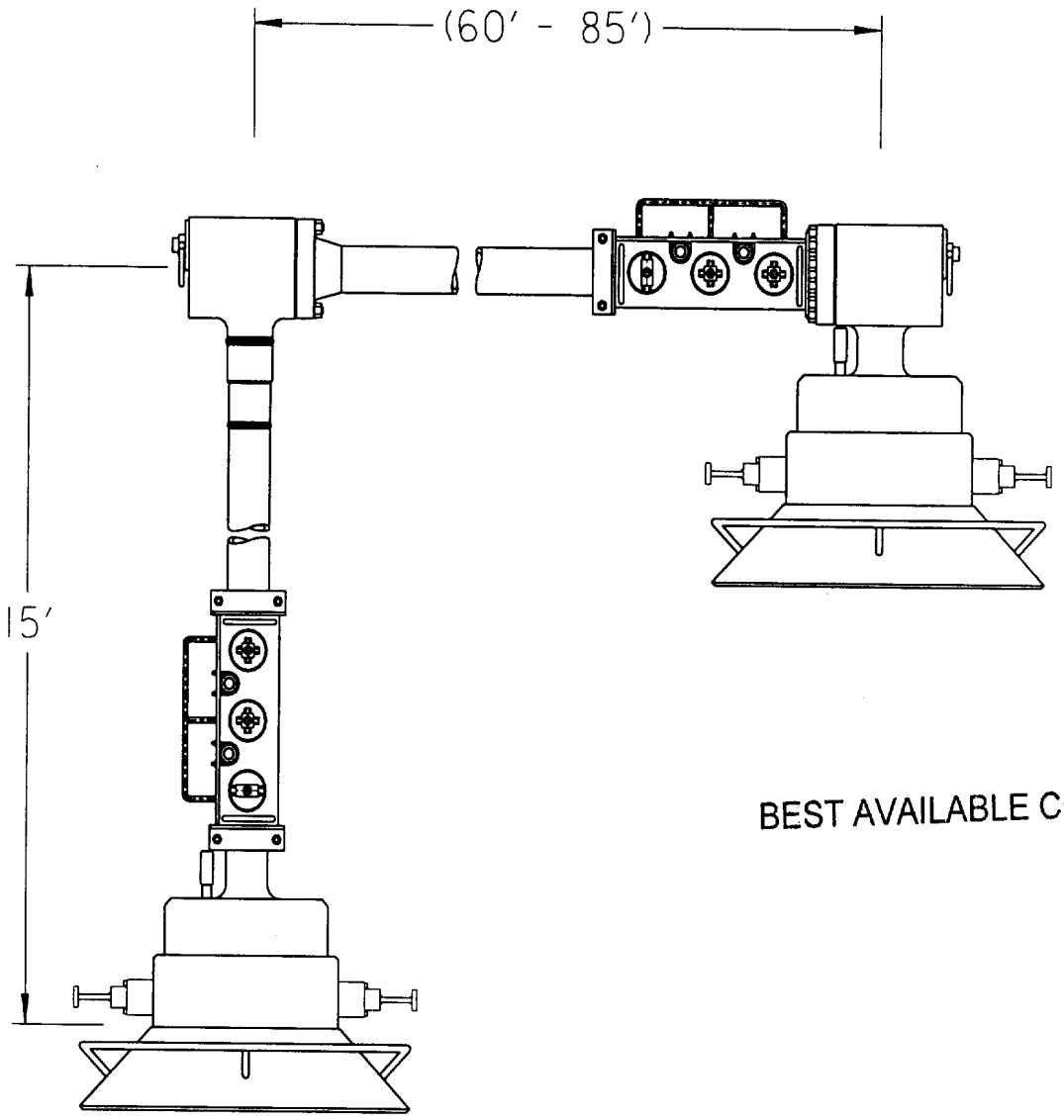


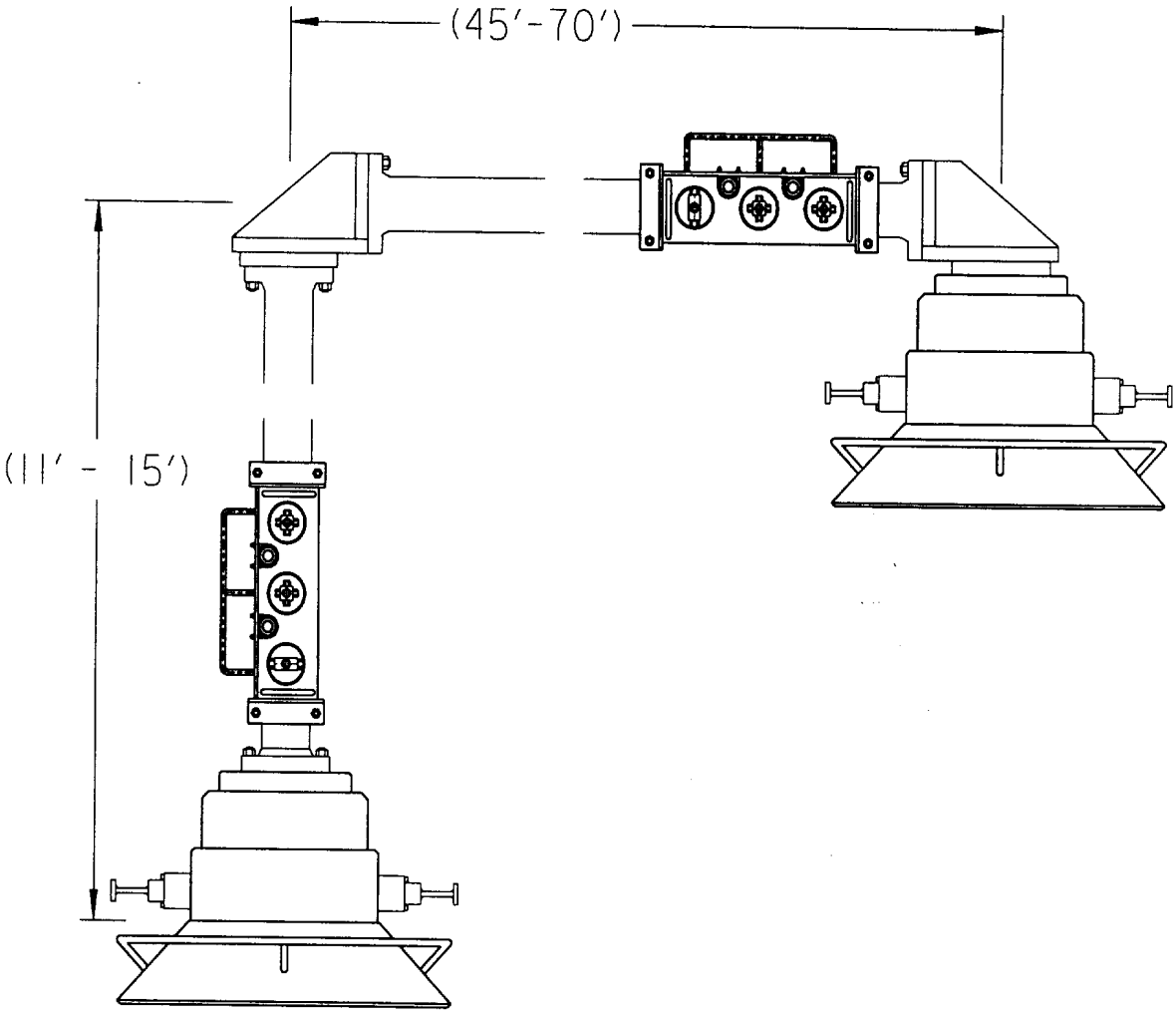
ATTACHMENT 13-C
SHELL OFFSHORE INC
D.O.C.D.
SEVEN TUBE UMBILICAL
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA
AND MISSISSIPPI



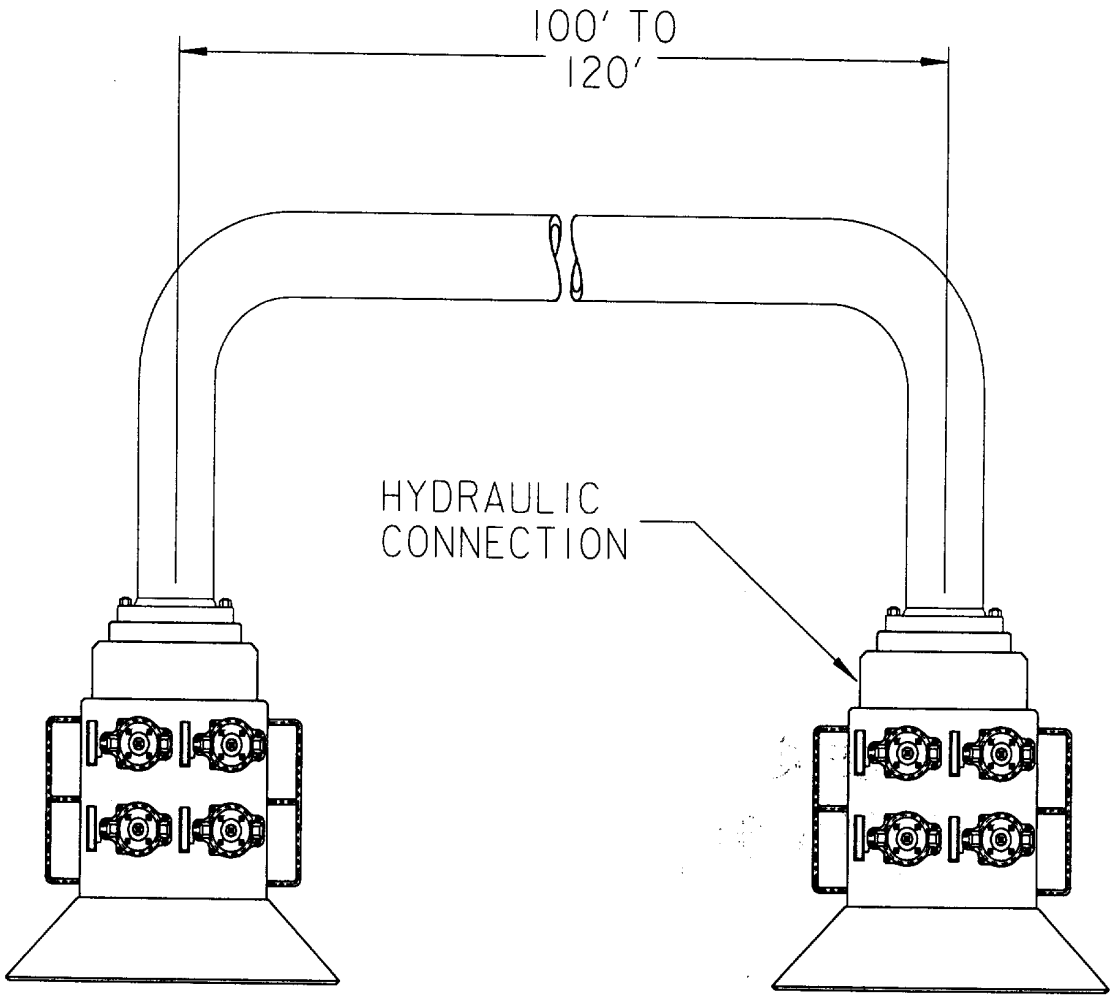
ATTACHMENT 13-D
SHELL OFFSHORE INC
D.O.C.D.
ARMORED ELECTRICAL UMBILICAL
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA
AND MISSISSIPPI



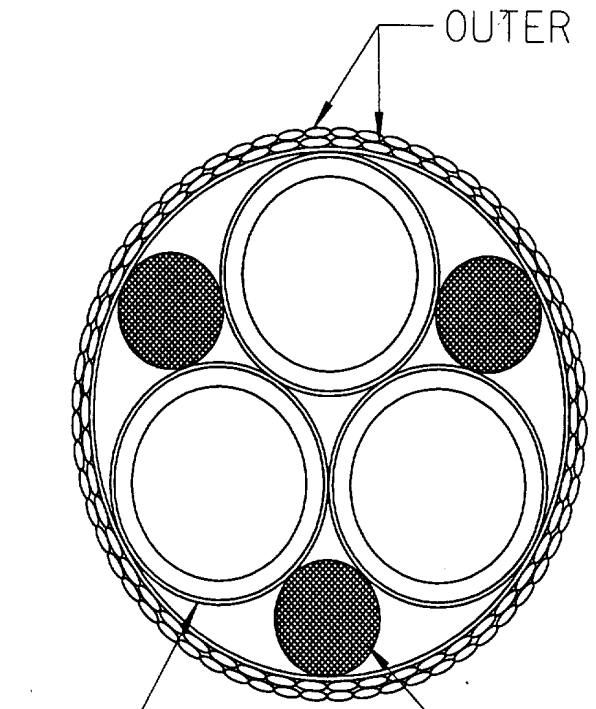
ATTACHMENT 13-E
SHELL OFFSHORE INC
D.O.C.D.
FLOWLINE JUMPER ASSEMBLY
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA
AND MISSISSIPPI



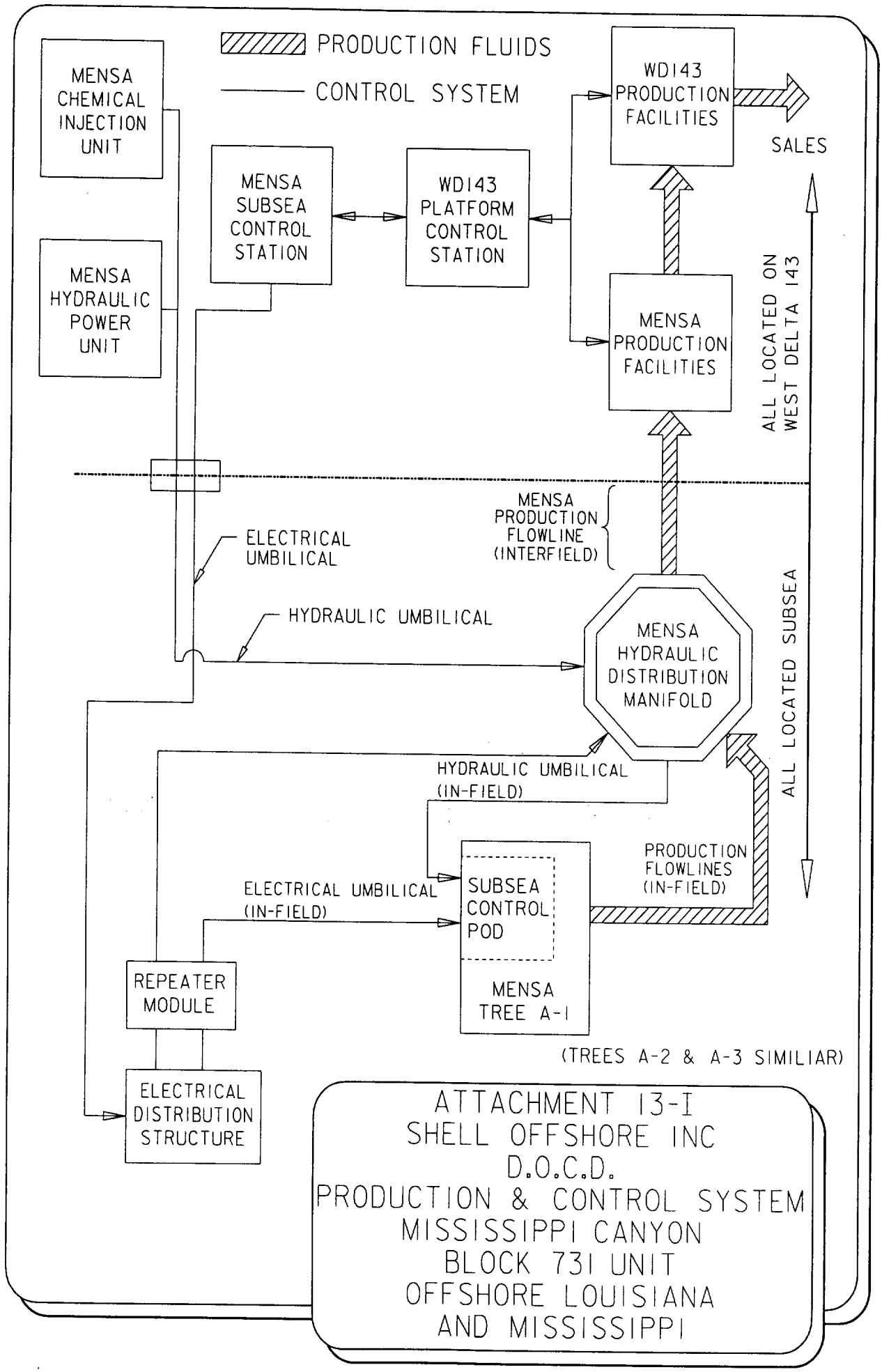
ATTACHMENT 13-F
SHELL OFFSHORE INC
D.O.C.D.
UMBILICAL JUMPER ASSEMBLY
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA
AND MISSISSIPPI

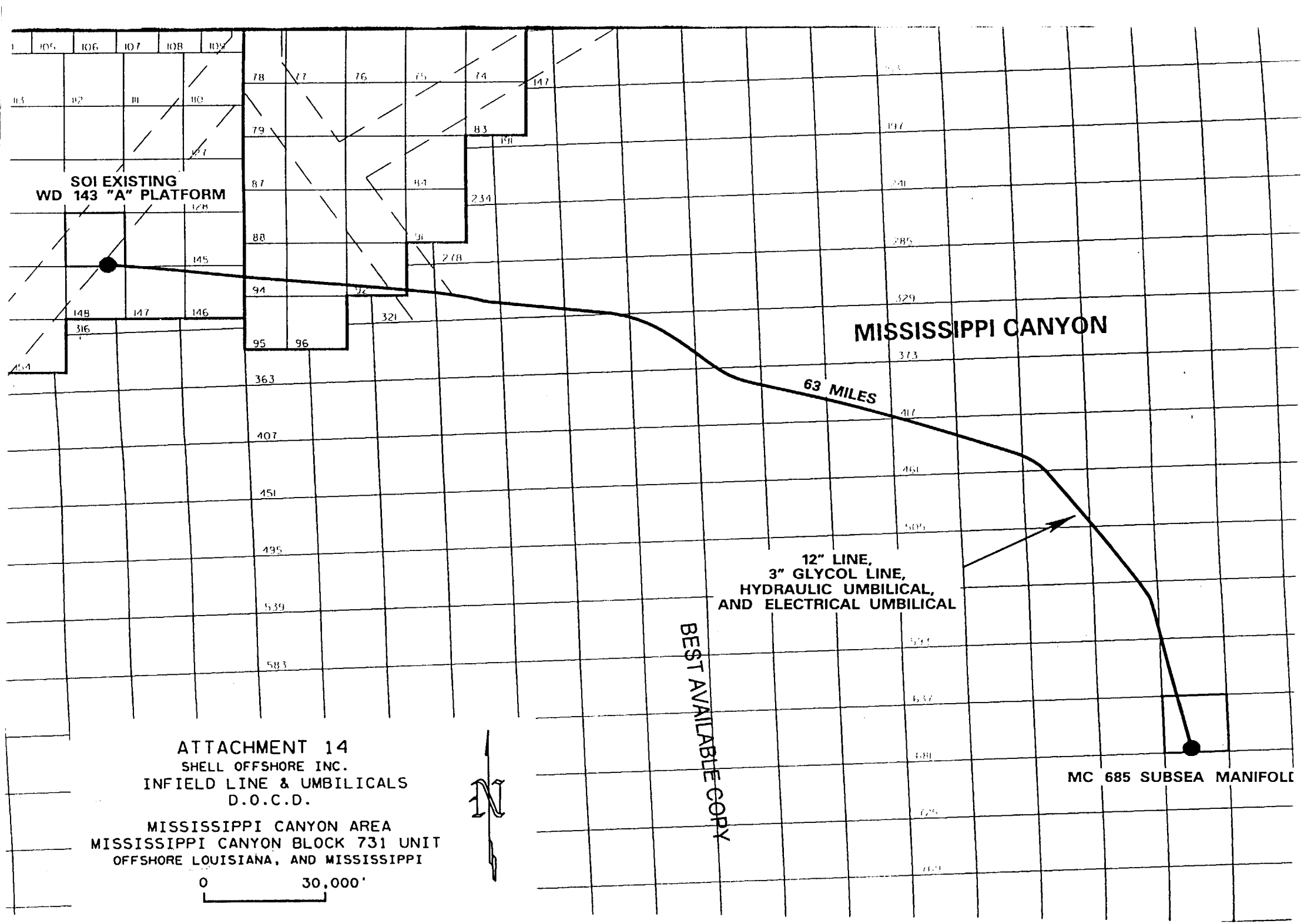


ATTACHMENT 13-G
SHELL OFFSHORE INC
D.O.C.D.
12" FLOWLINE JUMPER ASSEMBLY
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA
AND MISSISSIPPI



ATTACHMENT 13-H
SHELL OFFSHORE INC
D.O.C.D.
THREE TUBE UMBILICAL
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA
AND MISSISSIPPI

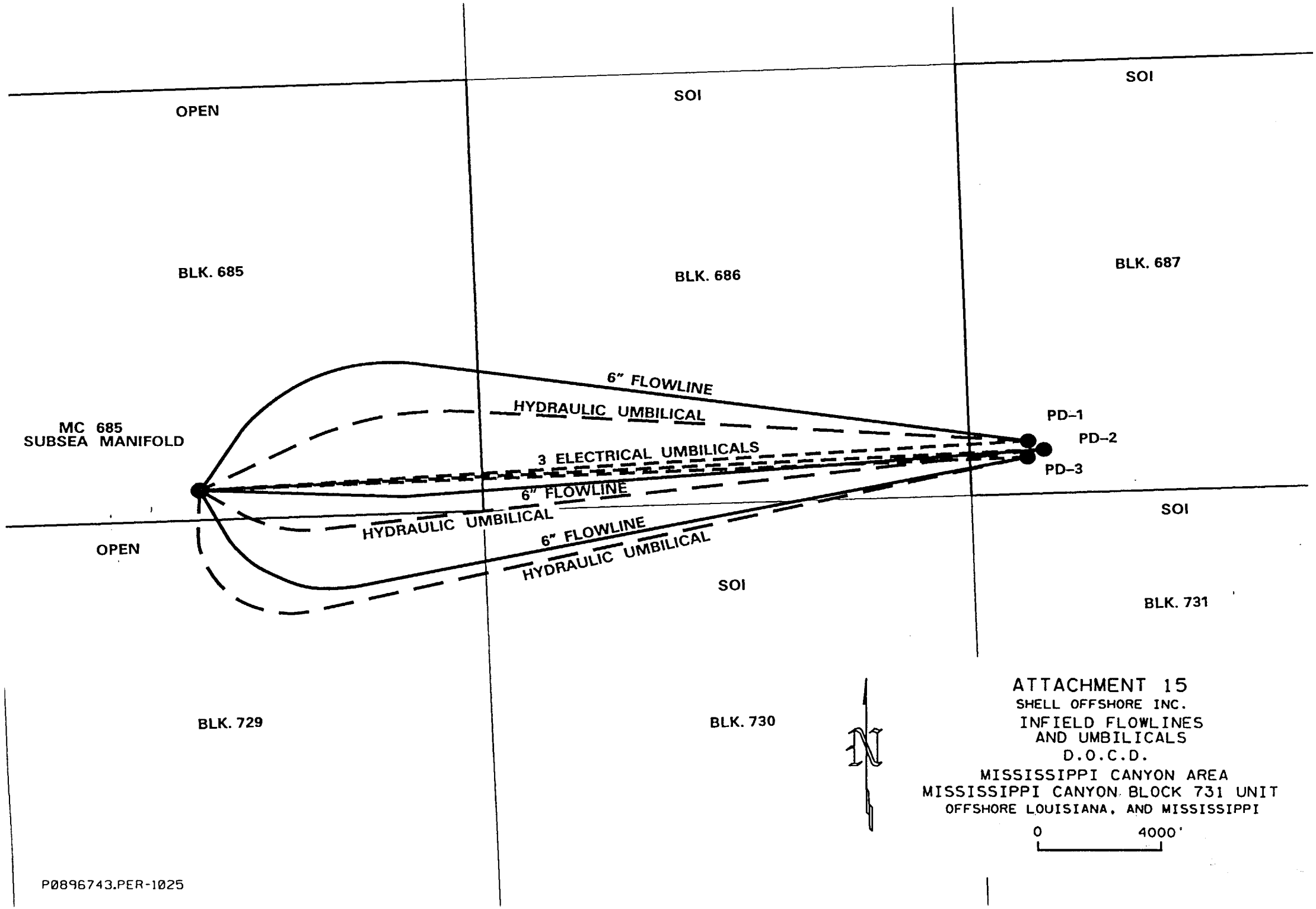

PRODUCTION FLUIDS
CONTROL SYSTEM
MENSA CHEMICAL INJECTION UNIT
MENSA HYDRAULIC POWER UNIT
MENSA SUBSEA CONTROL STATION
WD143 PLATFORM CONTROL STATION
WD143 PRODUCTION FACILITIES
SALES
MENSA PRODUCTION FACILITIES
ALL LOCATED ON WEST DELTA 143
MENSA PRODUCTION FLOWLINE (INTERFIELD)
ELECTRICAL UMBILICAL
HYDRAULIC UMBILICAL
MENSA HYDRAULIC DISTRIBUTION MANIFOLD
ALL LOCATED SUBSEA
HYDRAULIC UMBILICAL (IN-FIELD)
PRODUCTION FLOWLINES (IN-FIELD)
ELECTRICAL UMBILICAL (IN-FIELD)
SUBSEA CONTROL POD
MENSA TREE A-1
REPEATER MODULE
ELECTRICAL DISTRIBUTION STRUCTURE
(TREES A-2 & A-3 SIMILIAR)
ATTACHMENT 13-I
SHELL OFFSHORE INC
D.O.C.D.
PRODUCTION & CONTROL SYSTEM
MISSISSIPPI CANYON
BLOCK 731 UNIT
OFFSHORE LOUISIANA
AND MISSISSIPPI



ATTACHMENT 14
SHELL OFFSHORE INC.
INFIELD LINE & UMBILICALS
D.O.C.D.

MISSISSIPPI CANYON AREA
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA, AND MISSISSIPPI

0 30,000'



ATTACHMENT 15
SHELL OFFSHORE INC.
INFIELD FLOWLINES
AND UMBILICALS
D.O.C.D.
MISSISSIPPI CANYON AREA
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA, AND MISSISSIPPI

0 4000'

P0896743.PER-1025

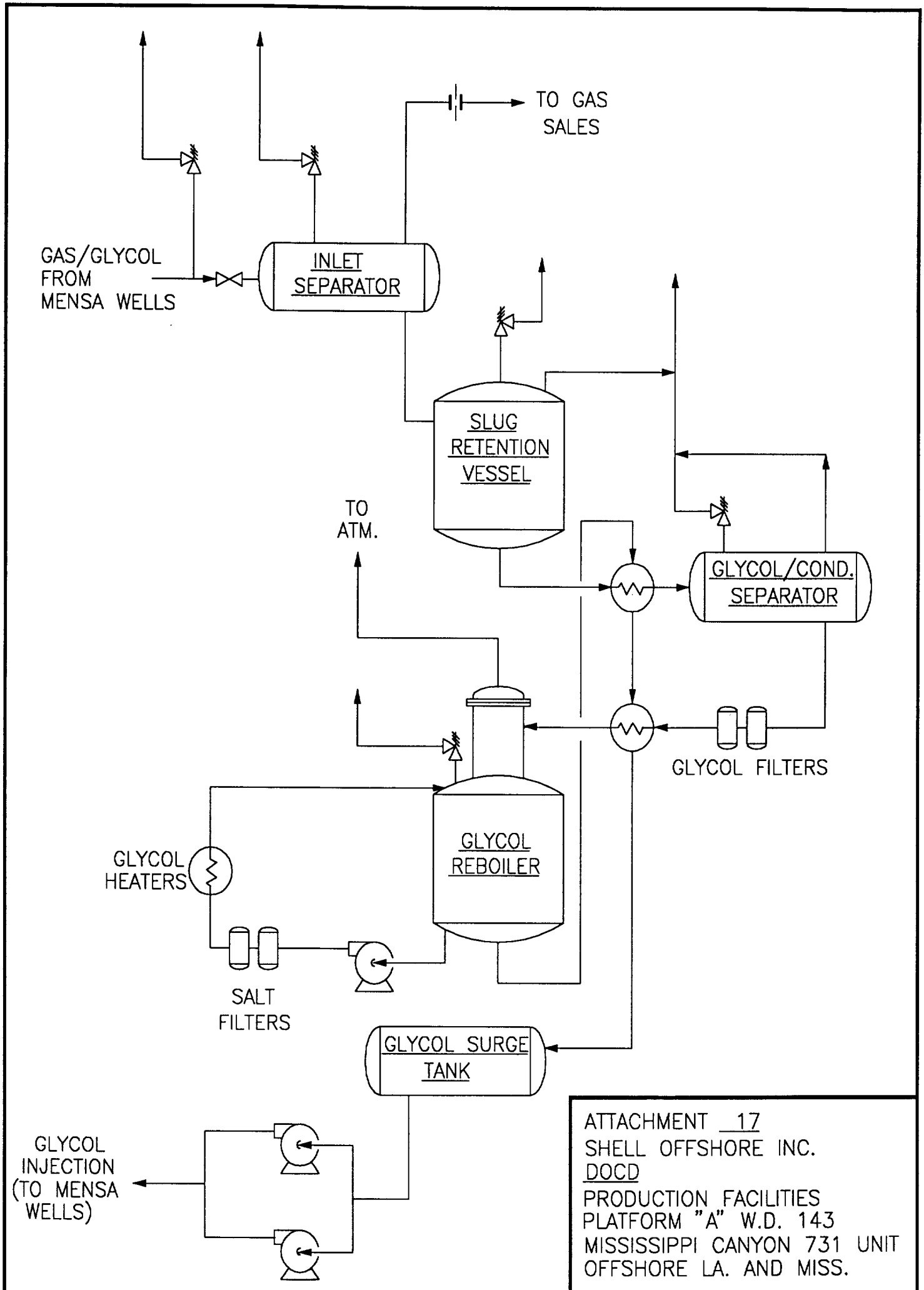
DOCD
SOI ET AL OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI ET AL OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI ET AL OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

PRODUCTION FACILITIES

The production facilities (Attachment 17) serving the Mensa subsea wells will be located at WD 143-A. The production stream, consisting of dehydrated produced gas and injected Triethylene glycol, will arrive at the platform via a nominal twelve inch diameter flowline. Primary two phase separation will occur at the inlet separator operating at approximately 1200 psig. Gas from the separator will be metered and flowed into the gas distribution system on WD 143-A.

The glycol (TEG)/water mixture from the inlet separator will flow into the glycol regeneration system. The regenerated glycol will be stored in the glycol surge tank ready for re-injection into the Mensa flowlines. The desired concentration of TEG is 98%.

Process heating for the Mensa glycol regeneration will be provided by electric immersion heaters powered by the existing generator station at WD 143-A. There will be no internal combustion engines added to existing facilities at WD 143-A.



ATTACHMENT 17
SHELL OFFSHORE INC.
DOCD
PRODUCTION FACILITIES
PLATFORM "A" W.D. 143
MISSISSIPPI CANYON 731 UNIT
OFFSHORE LA. AND MISS.

COMPLETION FLUIDS, COMPONENTS AND ADDITIVES
DOCD
SOI ET AL OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI ET AL OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI ET AL OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

I. COMPLETION FLUID

Seawater will be used to flush the mud from the casing and rig piping before clean 12.9 ppg CaCL2-CaBr2 completion brine is installed for well control. The completion brine will be filtered and reused during the completion phase. Gelled (HEC) pills will be used for fluid loss after perforating and sweeps to carry solids from downhole. Sized salt pills will be used for fluid loss control after gravel packing if the mechanical fluid loss device fails to hold. The 12.9 ppg CaCL2-CaBr2 completion brine left in the marine riser and in the rig pits will be discharged once the well completion is finished.

II. WELL COMPLETION, TREATMENT AND WORKOVER FLUIDS AND ADDITIVES

GENERIC NAME	COMMON NAMES (S) TRADE NAMES	DISTRIBUTING COMPANY
ALKYL PHOSPHATE	TETRA DEFOAM HB	TETRA, NL BAROID
AMINE/GLYCOL	HEC STABLILZER 310	TETRA, NL BAROID
AMMONIUM CHLORIDE	AMMONIUM CHLORIDE	TETRA, NL BAROID, IMCO
CALCIUM BROMIDE	CALCIUM BROMIDE	TETRA, NL BAROID, IMCO
CALCIUM CARBONATE	TETRACARB F, M, C, BARACARB	TETRA, NL BAROID, IMCO
CALCIUM CHLORIDE	CALCIUM CHLORIDE	TETRA, NL BAROID, IMCO
CATIONIC POLYAMINE	TETRA STAY	TETRA, NL BAROID
ETHOXYLATED ORGANIC	TETRA D111	TETRA, NL BAROID
FRESH WATER	FRESH WATER	
FORMIC ACID	FORMIC ACID	VARIOUS SUPPLIERS
HYDROCHLORIC ACID	HYDROCHLORIC ACID	VARIOUS SUPPLIERS
HYDROGEN PEROXIDE	HYDROGEN PEROXIDE	TETRA
HYDROFLUORIC ACID	HYDROFLUORIC ACID	VARIOUS SUPPLIERS
INORGANIC SULFITE	TETRA OXBAN, COAT 777, ASP-400 02 SCAVENGER	TETRA
MAGNESIUM HYDROXIDE	BARA BUF	NL BAROID
MAGNESIUM OXIDE	MAGNESIUM OXIDE	TETRA
NON-IONIC SURFACTANT	BARABRINE DEFOAM	NL BAROID
ORGANIC PHOSPHONATES	SURFLO-H35, DEQUEST 2000, 2010, 2060	NL TREATING MONSANTO
PARAFORMALDEHYDE	BIOCIDE, ALDACIDE	VARIOUS SUPPLIERS

GENERIC NAME	COMMON NAMES (S) TRADE NAMES	DISTRIBUTING COMPANY
PHOSPHATE ESTER BLEND	TETRAHIB, BARACOR 100	TETRA, NL BAROID, NL TREATING
POLYSACCHARIDE	TETRA X, XC POLYMER	TETRA, NL BAROID
POTASSIUM BROMIDE	POTASSIUM BROMIDE	TETRA, NL BAROID, IMCO
POTASSIUM CHLORIDE	POTASSIUM CHLORIDE	TETRA, NL BAROID, IMCO
SEAWATER	SEAWATER	
SODIUM BROMIDE	SODIUM BROMIDE	TETRA, NL BAROID, IMCO
SODIUM CARBONATE	SODA ASH LIGHT VWR	TETRA
SODIUM CHLORIDE	SODIUM CHLORIDE	TETRA, NL BAROID, IMCO
SODIUM HYDROXIDE	CAUSTIC SODA	VARIOUS SUPPLIERS
TETRASODIUM SALT	TETRA CHEL	TETRA, NL BAROID
THIOCARBAMATE	TETRA BIOCIDE, NALCO ASP-744 MICROBICIDE	TETRA
GLUTALDEHYDE	TETRABACTERICIDE	TETRA
INORGANIC FILM FORMER	TETRAHIB PLUS	TETRA
BLEND POLYMER, STARCH, SIZE SALT	THIIXSAL PLUS	TBC
BLEND POLYMER, STARCH, SIZE SALT	HYSAL	TBC
SODIUM CHLORIDE	WATESAL F M C	TBC
WATER SOLUBLE SURFACTANT	CC 1200	RIG CHEM
MACRO POLYMERIC FLOCULANT	VERSAFLOC	RIG CHEM
SPECIALTY SURFACTANT	HOGWASH	WELLFLOW TECH
SURFACTANT BLEND	RINSE AID	WELLFLOW TECH

III. DRILLING MUD

12.9 CaCl2-CaBr2 Based (Bromacarb) mud will be made and used to drill the cement plugs and drill the horizontal section on MC 687 Well A-2.

A 12.9 ppg CaCL2-CaBr2 completion brine will be used to displace the 12.9 ppg horizontal drilling fluid.

MC 686 Well A-1 will be temporarily abandoned with 15.0 ppg XCD polymer mud.

MC 730 Well A-3 will be filled with 13.0 ppg XCD polymer mud before it is displaced with the 12.9 ppg completion fluid.

IV. ITEMS USED ON A ROUTINE BASIS

BAROID	M-I	MILPARK	DESCRIPTION
BARITE/BAROID	M-I BAR	BARITE/MILBAR	BARITE (BARIUM SULFATE)
AQUAGEL	M-I GEL	MILGEL	BENTONITE
CARBONOX	TANNATHIN	LIGCO	LIGNITE
Q-BROXIN	SPERSENE & RVC-10	UNI CAL	BLENDED LIGNOSULFONATE
CAUSTIC SODA	CAUSTIC SODA	CAUSTIC SODA	SODIUM HYDROXIDE
ALUMINUM STEARATE	ALUMINUM STEARATE	ALUMINUM STEARATE	ALUMINUM STEARATE
LIME	LIME	LIME	CALCIUM HYDROXIDE
CC-16	CAUSTILIG	LIGCON	BLENDED LIGNITE/CAUSTIC
SODA ASH	SODA ASH	SODA ASH	SODIUM CARBONATE
BICARB	BICARB	BICARB	BICARBONATE OF SODA
BARANEX	RESINEX II	CHEMTROL-X/FILTREX	SELECTED POLYMER BLEND
CON DET.	DD	M.D.	DETERGENT
BARA-DEFOAM 1	DEFOAM-X	W.O. DEFOAM LD-8	DEFOAMER (USUALLY ALCHOHOL BASED)
AKTAFLOS	DMS	-	NONIONIC MUD SURFACTANT
CMC OR CELLEX	CMC	CMC	SODIUM CARBOXY METHYL CELLULOSE
SALT	SALT	SALT	SODIUM CHLORIDE
IMPERMEX	MY-LO-JEL	MILSTARCH	PREGELATINIZED STARCH
CYPAN, WL-100, POLYPAC	SP-101	CYPAN OR WL-100	SODIUM POLYACRYLATE
DEXTRID	POLY SAL	PERM-LOSE	ORGANIC POLYMER
DRISPAC OR PAC	POLY-PAC	DRISPAC	POLYANIONIC CELLULOSE
GYP	GYP	GYP	GYPSUM (PLASTER OF PARIS)
HME/SUPERDRILL	HME/SUPERDRIL	HME/SUPERDRIL	GILSONITE (TREATED) - NATURAL
BLACK MAGIC SUPERMIX (SFT)	PIPE-LAX W	BLACK MAGIC SUPERMIX (SFT)	MUD CONCENTRATE FOR SPOTTING FLUID
ENVIRO-TORQ	LUBE-167	LUBRISAL	ORGANIC LUBRICANT
MICA TEX	MICA (C OR F)	MIL-MICA	MICA-FLAKES
WALL-NUT	NUT PLUG (C, M, OR F)	MIL PLUG	GROUND WALNUT OR OTHER NUT SHELLS

BAROID	M-I	MILPARK	DESCRIPTION
SODIUM CHROMATE	SODIUM CHROMATE	SODIUM CHROMATE	SODIUM CHROMATE
IRONITE	IRONITE	IRONITE	SYNTHETIC IRON OXIDE, H_2S SCAVENGER
NO-SULF	SULF-X	MIL GARD	H_2S SCAVENGER (ZINC CARBONATE)
E-Z MUD	POLY-PLUS	SEPARAN	POLYACRYLAMIDE POLYMER
SAPP	SAPP	SAPP	SODIUM ACID PYROPHOSPHATE
KOH	KOH	KOH	POTASSIUM HYDROXIDE
KCL	KCL	KCL	POTASSIUM CHLORIDE (POTASSIUM)
MF-1, BORUFLOC	MF-1	MF-1	SELECTIVE FLOCULANT
BEN-EX	GELEX	BEN-EX	CLAY EXTENDER
SOLTEX	SOLTEX	SOLTEX	WATER SOLUBLE SULFONATED ASPHALT
EZ MUD	POLYPLUS	NEWDRILL-HP	POLYACRRRYLAMIDE (PHPA)
-	MY-LO-GEL	MILSTARCH	POTATO STARCH FLUID LOSS AGENT
THERMATHIN	TACKLE	NEWTHIN	POLYMERIC DISPERSANT
-	TACKLE-S	MILTEMP	SULFONATED VINYLIC POLYMER
BHC	MMH	MMH	MIXED METAL HYDROXIDE VISCOSIFIER
THERMACHEK	-	-	STARCH-DERIVED FLUID LOSS AGENT

V. NONROUTINE ADDITIVES

TRADE NAME	SUPPLIER	DESCRIPTION
HF-100	HYDRA FLUIDS	POLYALCHOL/WATER BLEND - LUBRICANT
A-25	CESCO CHEMICAL	SURFACTANT/WATER BLEND FOR STUCK PIPE
BIOSPOT	MILPARK	SURFACTANT/WATER BLEND FOR STUCK PIPE
XC POLYMER	KELCO	XANTHAM GUM (POLYSACCHARIDE)
ACETIC ACID	MILPARK	GLACIAL ACETIC ACID SOLUTION
IDCIDE-P	IDF	BIOCIDE
KD-40	PETROLITE	CORROSION INHIBITOR
EMI-1267	M-I	SURFACTANT/WATER BLEND FOR STUCK PIPE
HP-007	AQUALON	SUGAR BEET PULP

Revised 05/18/92 TCA

VI. METHOD OF DISPOSAL:

MUD

All water base mud and mud additives will be disposed of overboard into the Gulf of Mexico provided the material to be discharged meets the toxicity limit specified in the USEPA NPDES General Permit No. GMG290103. Any fluid containing free oil will be transported to a 29 B site for disposal. Diesel will not be used in muds to be discharged, except for spotting to free stuck pipe in accord with Part I.A.1(c) of the permit. All drill cuttings, sand, and other well solids from drilling with water-based muds will be discharged overboard. Cuttings from drilling with oil-based mud and diesel pills and buffers will be hauled to a 29 B site for disposal.

COMPLETION BRINE

All completion brine and brine additives will be disposed of overboard into the Gulf of Mexico provided the material to be discharged meets the GMG290103 and is not a hazardous material.

PROJECTED AIR EMISSIONS

TITLE

COMPANY	Shell Offshore Inc.
AREA	Central GOM
BLOCK	Mississippi Canyon Blocks 686, 687, 730
LEASE	OCS-G 5862, 5863, 7954
PLATFORM	MODU Sonat George Richardson
WELL	
LATITUDE	28 deg. 16' 41"
LONGITUDE	88 deg. 38' 37"

DISTANCE TO LAND IN STAT. MILES:	56
1997 WELL COMPLETION DAYS	60
1998 WELL COMPLETION DAYS	30

COMPANY CONTACT	R. Meyer
TELEPHONE NO.	(504) 588-6391

REMARKS:
This plan only covers completion for three wells. Drilling Operations were previously submitted under POE approved by MMS on June 21, 1996.

PROJECTED AIR EMISSIONS

SUMMARY

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL
Shell Offshore Inc.	Central GOM	Mississippi Canyon Blocks 686, 687, 730	OCS-G 5862, 5863, 7954	MODU Sonat George Richardson	

Year	Emitted Substance				
	TSP	SOx	NOx	HC	CO
1997	5.92	36.70	271.02	8.14	59.13
1998	2.96	18.35	135.51	4.07	29.57
Allowable	1865	1865	1865	1865	50439

PROJECTED AIR EMISSIONS

EMISSIONS-1997

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	LATITUDE	LONGITUDE	CONTACT	PHONE	REMARKS
Shell Offshore Inc.	Central GOM	Mississippi Canyon Blocks 686, 687, 730	OCS-G 5862, 5863, 7954	MODU Sonat George Richardson		28 deg. 16' 41"	88 deg. 36' 37"	R. Meyer	(504) 588-6391	

OPERATIONS	EQUIPMENT		MAX. FUEL	ACT. FUEL	RUN TIME		POUNDS PER HOUR					TONS PER YEAR				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Boilers	MMBTU/H	SCF/HR	SCF/D	HR/D	DAYS	TSP	SOx	NOx	VOC	CO	TSP	SOx	NOx	VOC	CO
DRILLING	PRIME MOVER (>600hp diesel)	6,000	290	6,955	24	60	3.17	19.69	145.37	4.36	31.72	2.28	14.18	104.67	3.14	22.84
	PRIME MOVER>600hp diesel	6,000	290	6,955	24	60	3.17	19.69	145.37	4.36	31.72	2.28	14.18	104.67	3.14	22.84
	PRIME MOVER>600hp diesel	6,000	290	6,955	8	60	3.17	19.69	145.37	4.36	31.72	0.76	4.73	34.89	1.05	7.61
	AUXILIARY EQUIP<600hp diesel	120	6	139	1.00	60	0.26	0.25	3.70	0.30	0.80	0.01	0.01	0.11	0.01	0.02
	EMER. GENERATOR>600hp diesel	1,200	58	1,391	0.25	60	0.63	3.94	29.07	0.87	6.34	0.00	0.03	0.22	0.01	0.05
	STANDBY VESSELS>600hp diesel	3120	150.696	3616.70	1	60	1.65	10.24	75.59	2.27	16.49	0.05	0.31	2.27	0.07	0.49
	SUPPLY VESSEL>600hp diesel	3120	150.696	3616.70	4	60	1.65	10.24	75.59	2.27	16.49	0.20	1.23	9.07	0.27	1.98
	SUPPLY VESSEL @ idle	1040	50.232	1205.57	20	60	0.55	3.41	25.20	0.76	5.50	0.33	2.05	15.12	0.45	3.30
1997 YEAR TOTAL							14.26	87.15	645.29	19.54	140.78	5.92	36.70	271.02	8.14	59.13
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											1864.80	1864.80	1864.80	1864.80	50438.82
	56.0															

PROJECTED AIR EMISSIONS

EMISSIONS-1998

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	LATITUDE	LONGITUDE	CONTACT	PHONE	REMARKS
Shell Offshore Inc.	Central GOM	Mississippi Canyon Blocks 686, 687, 730	OCS-G 5852, 5863, 7954	MODU Sonat George Richardson		28 deg. 16' 41"	88 deg. 38' 37"	R. Meyer	(504) 588-6391	

OPERATIONS	EQUIPMENT	MAX. FUEL	ACT. FUEL	RUN TIME		POUNDS PER HOUR					TONS PER YEAR				
	Diesel Engines	HP	GAL/HR	GAL/D											
	Nat. Gas Engines	HP	SCF/HR	SCF/D											
	Burners	MMBTU/H	SCF/HR	SCF/D	HR/D	DAYS	TSP	SOx	NOx	VOC	CO	TSP	SOx	NOx	VOC	CO
DRILLING	PRIME MOVER (>600hp diesel)	6,000	290	6,955	24	30	3.17	19.69	145.37	4.36	31.72	1.14	7.09	52.33	1.57	11.42
	PRIME MOVER>600hp diesel	6,000	290	6,955	24	30	3.17	19.69	145.37	4.36	31.72	1.14	7.09	52.33	1.57	11.42
	PRIME MOVER>600hp diesel	6,000	290	6,955	8	30	3.17	19.69	145.37	4.36	31.72	0.38	2.36	17.44	0.52	3.81
	AUXILIARY EQUIP<600hp diesel	120	6	139	1.00	30	0.26	0.25	3.70	0.30	0.80	0.00	0.00	0.06	0.00	0.01
	EMER. GENERATOR>600hp diesel	1,200	58	1,391	0.25	30	0.63	3.94	29.07	0.87	6.34	0.00	0.01	0.11	0.00	0.02
	STANDBY VESSELS>600hp diesel	3120	150.696	3616.70	1	30	1.65	10.24	75.59	2.27	16.49	0.02	0.15	1.13	0.03	0.25
	SUPPLY VESSEL>600hp diesel	3120	150.696	3616.70	4	30	1.65	10.24	75.59	2.27	16.49	0.10	0.61	4.54	0.14	0.99
	SUPPLY VESSEL @ idle	1040	50.232	1205.57	20	30	0.55	3.41	25.20	0.76	5.50	0.16	1.02	7.56	0.23	1.65
1998 YEAR TOTAL							14.26	87.15	645.29	19.54	140.78	2.96	18.35	135.51	4.07	29.57
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											1864.80	1864.80	1864.80	1864.80	50438.82
	56.0															

PROJECTED AIR EMISSIONS

FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		REF.	DATE
	SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0483	AP42 3.2-1	4/76 & 8/84
Equipment/Emission Factors	units	TSP	SOx	NOx	VOC	CO	REF.	DATE
NG Turbines	gms/hp-hr		0.00247	1.3	0.01	0.83	AP42 3.2-2	4/93
NG 2-cycle lean	gms/hp-hr		0.00185	11	0.43	1.5	AP42 3.2-2	4/93
NG 4-cycle lean	gms/hp-hr		0.00185	12	0.72	1.6	AP42 3.2-2	4/93
NG 4-cycle rich	gms/hp-hr		0.00185	10	0.14	8.6	AP42 3.2-2	4/93
Diesel Recip. < 600 hp.	gms/hp-hr	1	0.931	14	1.12	3.03	AP42 3.3-1	4/93
Diesel Recip. > 600 hp.	gms/hp-hr	0.24	1.49	11	0.33	2.4	AP42 3.4-1	4/93
NG Heaters/Boilers/Burners	lbs/mmscf	5	0.6	140	2.8	35	AP42 1.4-1/2/3	4/93
NG Flares	lbs/mmscf		0.57	71.4	60.3	388.5	AP42 11.5-1	9/91
Liquid Flaring	lbs/bbl	0.42	6.6	2.3	0.01	0.21	AP42 1.3-1	4/93
Tank Vapors	lbs/bbl				0.03		E&P Forum	1/93
Fugitives	lbs/hr/comp.				0.000025		API Study	12/93
Glycol Dehydrator Vent	lbs/mmscf				6.6		La. DEQ	1991
Gas Venting	lbs/scf				0.0034			

PROJECTED AIR EMISSIONS

INSTRUCTIONS
GULF OF MEXICO AIR EMISSION CALCULATIONS

General

This document (MMS.XLW) was prepared through the cooperative efforts of those professionals in the oil industry including the API/OOC Gulf of Mexico Air Quality Task Force, who deal with air emission issues. This document is intended to standardize the way we estimate an air emission inventory for Plans of Exploration (POE) and Development, Operations, Coordination Documents (DOCD) approved by the Minerals Management Service (MMS). It is intended to be thorough but flexible to meet the needs of different operators.This first file gives the basis for the emission factors used in the emission spreadsheet as well as some general instructions.
The following files, Title Sheet, Factors Sheet,Emissions Spreadsheet,and Summary Sheet will describe and calculate emissions from an activity.

Title Sheet

The Title Sheet requires input of the company's name, area, block, OCS-G number, platform and/or well(s) in the necessary lines. This data will automatically be transferred to the spreadsheet and summary sheet.

Factor Sheet

The emission factors were compiled from the latest AP-42 references or from industry studies if no AP-42 reference was available. Factors can be revised as more data becomes available. A change to this Factor Sheet will be automatically changed in Emission Spreadsheet.

The basis for the factors is as follows:

1. NG Turbines — Fuel usage scf/hr = HP X 9.524 (10,000 btu/HP-hr / 1050 btu/scf)
2. NG Engines — Fuel usage scf/hr = HP X 7.143 (7,500 btu/HP-hr / 1050 btu/scf)
3. Diesel — Fuel usage gals/hr = HP X 0.0483 (7,000 btu/HP-hr / 145,000 btu/gal)

Emission Factors

Natural Gas Prime Movers

1. TNMOC refers to total non-methane organic carbon emissions and these can be assumed equivalent to VOC emissions.

3. The sulfur content assumed is 2000 grains /mmscf (3.33 ppm). If your concentration is different then ratio your emission factor up or down.

PROJECTED AIR EMISSIONS

INSTRUCTIONS

Diesel-Fired Prime Movers

1. Diesel sulfur level 0.4% by wt

2. For boats use > 600 HP factors based on AP-42 Vol. II, Table II-3-3.
   Those figures closely match the above values. Include only the emissions from the boats within 25 mile radius of the well/platform.

3. For diesel engines <600 HP VOC emissions equal total HC emissions; for diesel engines>600 HP VOC emissions equal non-methane HC emissions.

Heaters/Boilers/Firetubes/NG-Fired

1. NG Sulfur content is 2000 grains per million cu ft

2. VOCs emissions based on total non-methane HCs

Gas Flares

1. Flare is non-smoking

2. 1050 btu/cu. ft. for NG heating value

3. The sulfur content assumed is 2000 grains /mmscf (3.33 ppm). If your concentration is different then ratio your emission factor up or down or you may use the following formula:

   H2S flared (lbs/hr) = Gas flared (cu ft/hr) X ppm H2S X 10E-06 X 34/379

   SOx emis (lbs/hr) = H2S flared (lbs/hr) X 64/34

Liquid Flares

1. Assume 1% by wt Sulfur maximum in the crude oil.

2. VOC equals non-methane HCs

3. Particulate emissions assumes Grade 5 oil.

Tanks

1. Tank emissions assumes uncontrolled fixed roof tank.

Fugitives

1. Fugitives are based on the 1993 Star Environmental Report. It requires that you count or estimate your components.

PROJECTED AIR EMISSIONS

INSTRUCTIONS

Glycol Dehydrator Vent

1. The dehydrated gas rate in SCF/HR must be entered in the spreadsheet. The emission factor is from the compilation of the Louisiana Survey and an average emissions per gas rate.

Gas Venting

1.The emission factor is based on venting unburned natural gas of average weight.

Emissions Spreadsheet

The emissions from an operation should be presented for a calendar year (1994, 1995, etc.). The operation may include drilling only or drilling in conjunction with other activities such as pipeline installation or production operations. For additional years the Emissions Spreadsheet is renamed Emissions 2, 3, etc.The different operating parameters for each year should entered to calculate revised emissions for that year. The spreadsheet will calculate maximum fuel usage (UNIT/HR) using the known horsepower. It will assume maximum fuel usage is equal to actual fuel (UNIT/DAY) usage unless the actual fuel usage is known. If so, insert actual fuel usage in appropriate column. The emissions will be calculated as follows:

Emission rate (lb/hr) = (HP or fuel rate) X Emission Factor (Potential to emit)

Emissions (tpy)=Emission rate (lb/hr) X load factor(Act Fuel/Max Fuel) X hrsX daysX ton/2000 lbs (Actual emissions)

To customize the spreadsheet for your application it is possible to delete lines for non-applicable equipment/activities or copy/insert an entire line if more than one similiar type of equipment is present.

Also, the production equipment can be customized further by adding the use of the equipment behind each type of engine, i.e.,

Turbine
Turbine - Gas Compressor

Burner
Burner - Line Heater

Summary Sheet

The Summary Sheet is designed to show a proposed estimate of emissions from an activity over a future period of time. In this example ten years was chosen. The first line (Row 7-1994) of the summary sheet is linked to the yearly totals in the Emissions Spreadsheet. The second line (Row 8-1995) is referenced to Emissions2 Spreadsheet. The third line (Row 9- 1996) is referenced to Emissions3 Spreadsheet. If more years of calculations are necessary to reach a constant then the spreadsheet can be copied and linked to the summary sheet for years 1997,1998 etc. Once emissions are constant the values are carried to the end of the ten year period.

PROJECTED AIR EMISSIONS

TITLE

COMPANY	Shell Offshore Inc.
AREA	Central GOM
BLOCK	West Delta Block 143
LEASE	
PLATFORM	Platform "A"
WELLS	
LATITUDE	
LONGITUDE	
WD143 PLATFORM DISTANCE TO LAND (STAT. MILES):	19

WEST DELTA 143:	
1997 PRODUCTION DAYS	210
1998-2008 PRODUCTION DAYS	365

COMPANY CONTACT	R. Meyer
TELEPHONE NO.	(504) 588-6391

REMARKS:

- Platform "A" is an existing platform; no additional internal combustion engines will be added.
- No additional wet or dry oil tanks are planned.
- Calculations cover added emissions from glycol heater vent and fugitive emission points.

PROJECTED AIR EMISSIONS

SUMMARY

MAIN PASS BLOCK 252 Platform "B"

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL
Shell Offshore Inc.	Central GOM	West Delta Block 143	0	Platform "A"	

Year	Emitted Substance				
	TSP	SOx	NOx	HC	CO
1996	0.0	0.0	0.0	207.9	0.0
1997-2011	0.0	0.0	0.0	361.4	0.0
Allowable	633	633	633	633	24,448

PROJECTED AIR EMISSIONS

EMISSIONS (1997)

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	LATITUDE	LONGITUDE	CONTACT	PHONE	REMARKS
Shell Offshore Inc.	Central GOM	West Delta Block 143	0	Platform "A"	0	0	0	R. Meyer	(504) 588-6391	

OPERATIONS					RUN TIME		POUNDS PER HOUR					TONS PER YEAR				
1997																
	Facility ID	MMBTU/H	SCF/HR	SCF/D	HR/D	DAYS	TSP	SOx	NOx	VOC	CO	TSP	SOx	NOx	VOC	CO
	MISC.	BPD	SCF/HR	COUNT												
	TANK-DRY OIL	0			0	0				0.00					0.00	
	TANK-WET OIL	0			0	0				0.00					0.00	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			200		210				0.0050					0.01	
	GLYCOL STILL VENT-		12,500,000		24	210				82.50					207.90	
DRILLING	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
1997 YEAR TOTAL							**0.00**	**0.00**	**0.00**	**82.51**	**0.00**	**0.00**	**0.00**	**0.00**	**207.91**	**0.00**
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											**633**	**633**	**633**	**633**	**24,448**
	19.0															

PROJECTED AIR EMISSIONS

EMISSIONS (1998-2008)

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	LATITUDE	LONGITUDE	CONTACT	PHONE	REMARKS
Shell Offshore Inc.	Central GOM	West Delta Block 143	0	Platform "A"	0	0	0	R. Meyer	(504) 588-6391	

OPERATIONS					RUN TIME		POUNDS PER HOUR					TONS PER YEAR				
1998-2008																
					HR/D	DAYS	TSP	SOx	NOx	VOC	CO	TSP	SOx	NOx	VOC	CO
	MISC.	BPD	SCF/HR	COUNT												
	TANK-DRY OIL	0			0	0				0.00					0.00	
	TANK-WET OIL	0			0	0				0.00					0.00	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			200		365				0.0050					0.02	
	GLYCOL STILL VENT-		12,500,000		24	365				82.50					361.35	
DRILLING	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
1998-2008	YEAR TOTAL						0.00	0.00	0.00	82.51	0.00	0.00	0.00	0.00	361.37	0.00
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											633	633	633	633	24,448
	19.0															

PROJECTED AIR EMISSIONS

FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		REF.	DATE
	SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0483	AP42 3.2-1	4/76 & 8/84
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Tank Vapors	lbs/bbl				0.03		E&P Forum	1/93
Fugitives	lbs/hr/comp.				0.000025		API Study	12/93
Glycol Dehydrator Vent	lbs/mmscf				6.6		La. DEQ	1991
Gas Venting	lbs/scf				0.0034			

PROJECTED AIR EMISSIONS

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PROJECTED AIR EMISSIONS

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PROJECTED AIR EMISSIONS

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OIL SPILL CONTINGENCY PLAN
DEVELOPMENT OPERATIONS COORDINATION DOCUMENT
SOI OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
SOI OCS-G 7955, MISSISSIPPI CANYON BLOCK 731
OFFSHORE LOUISIANA AND MISSISSIPPI

In accordance with the requirements specified in 30 CFR 250 Subpart C of the Operating Regulations we submit for approval the following information:

30 CFR 250.42 (a) Oil Spill Trajectory Analysis

Reference: Oil Spill Risk Analysis: Central and Western Gulf of Mexico, Outer Continental Shelf, Lease Sales 157 and 161 (OCS Report, MMS 95-0026, page 99)

This report shows the following probabilities of a major oil spill from the subject lease block (Launch Area C-59) striking major land segment within ***Ten*** days.

PROBABILITIES	LAND SEGMENT
01%	**17**
02%	**19**
<0.5%	**any other land segment**

Section III of our OSCP summarizes our strategies for protecting any environmentally sensitive areas.

30 CFR 250.42(b) Equipment Identification and Response Times

The drilling plans proposed rely primarily on the Clean Gulf Associates (CGA) spill response equipment stored at the CGA sea base at South Pass 62 and at the CGA land base in Venice, La. Specific response equipment available is detailed in the Clean Gulf Associates Response Specifications Manual. Contractors available to operate CGA equipment include Allwaste/Thompson Environmental in Belle Chase and Venice. Both offices can be reached through the 1-800-797-2992 Emergency Response phone number.

Sea Based Response Steps and Times (in Hours) for the Erika Lynn at SP 62

SOI Spill Management Team Notification	0.50
Contractor Notification	0.50
Boat Procurement	1.00
Crew Procurement (Allwaste in Venice)	(2.00)
Dispatched to SOI Heliport in Venice for Air Transport to Spill Site	
Open Water Travel Time	5.50
(56.1 Statute Miles at 10 Miles per Hour SP 62 to MC 687)	
Deployment	0.50
Total Estimated time to Respond	8.00

30 CFR 250.42(b) Equipment Identification and Response Times (continued)

Land Based Response Times (in Hours)

SOI Spill Management Team Notification	0.50
Contractor Notification	0.50
Boat Procurement	3.00
Crew Procurement (Allwaste in Venice)	(1.00)
Dispatched to Halliburton Dock in Venice	
Equipment Transit to Dock (Truck, Crane, etc.)	(1.00)
(Equipment is on skids in Haliburton Yard)	
Load Equipment on Boat	1.00
Inland Travel Time	4.00
Venice to South West Pass Sea Buoy at 28 52.65 X 89 25.92 (34 Statute Miles at 8 Miles Per Hour)	
Open Water Travel Time	6.50
Sea Buoy to MC 687 (63.2 Statute Miles at 10 Miles per Hour)	
Deployment	0.50
Total Estimated time to Respond	16.00

* ( ) denotes not in critical path and not included in response time.

30 CFR 250.42(c) Dispersant-Use Plan

Our dispersant use plan and discussion of dispersant application methods and toxicity is outlined in Section VII of our OSCP. Also included is an outline for procedures to be followed to obtain approval for dispersant use. Mississippi Canyon 687 is a ***Good*** candidate for ***Dispersant Application*** according to the Region 6 FOSC Pre-Approved Dispersant Use Manual (greater than 10 Meters deep and further than 3 nautical miles from shore.) Shell Offshore has access to Airborne Support Inc. out of Bourg, Louisiana for dispersant application.

30 CFR 250.42(d) Response Equipment Inspection and Maintenance

Halliburton Services has been contracted as a third party to maintain and inspect the equipment supplied by CGA. Details of their responsibilities are outlined in Section V of our OSCP.

30 CFR 250.42(e) Spill Detection and Notification Procedures

Procedures for early detection include daily visual observations. Also, all employees are instructed to report all sightings of oil on the water to their supervisor immediately. Procedures for timely notification including names and phone numbers of persons to contact are outlined in Sections II and IV of our OSCP.

30 CFR 250.42(f) Equipment, Materials and Supplies Inventory

The drilling plans proposed rely primarily on the Clean Gulf Associates (CGA) spill response equipment stored at the CGA sea base at South Pass 62 and at the CGA land bases in Venice, La. Specific response equipment available is detailed in the Clean Gulf Associates Response Specifications Manual.

30 CFR 250.42(g) Specific Response Procedures

Procedures to follow upon discovery of an oil spill are detailed in Section III of the SOI Oil Spill Contingency Plan. Membership of SOI's oil spill response team are outlined in Section IV. Training and drills conducted for oil spill response team members is outlined in Section X of the OSCP. SOI will establish an operation center in accordance with the procedure in Section III of the OSCP, page 5. These facilities have adequate communications, hand-held radios and walkie-talkies to support the response team efforts. Also, we will make every attempt to reduce our projected response time by giving consideration to transporting oil spill response cleanup equipment from a Clean Gulf Associates base by the fastest available means to a vessel-loading location as close as practical to our proposed operations.

30 CFR 250.42(h) Oil Recovery Information

SOI has a Blanket Service Agreement with Newpark Services Inc. that includes the disposal of oil-contaminated material and soil.

30 CFR 250.42(i) Monitoring and Predicting Spill Movement

Through an agreement with Clean Gulf Associates, SOI has access to SpillNet, a computerized oil spill trajectory and response resource database.

30 CFR 250.42(j) Alaska Provisions for Ignition of an Uncontrolled Spill Source are Not applicable

OIL SPILL CONTINGENCY PLAN
DEVELOPMENT OPERATIONS COORDINATION DOCUMENT
WEST DELTA BLOCK 143
OFFSHORE LOUISIANA

In accordance with the requirements specified in 30 CFR 250 Subpart C of the Operating Regulations we submit for approval the following information:

30 CFR 250.42 (a) Oil Spill Trajectory Analysis

Reference: Oil Spill Risk Analysis: Central and Western Gulf of Mexico, Outer Continental Shelf, Lease Sales 157 and 161 (OCS Report, MMS 95-0026, page 99).

This report shows the following probabilities of a major oil spill from the subject lease block (Launch Area C-51) striking major land segment within ***Ten*** days.

PROBABILITIES	LAND SEGMENT
01%	**13**
01%	**14**
10%	**16**
18%	**17**
10%	**18**
23%	**19**
<0.5%	**any other land segment**

Section III of our OSCP summarizes our strategies for protecting any environmentally sensitive areas.

30 CFR 250.42(b) Equipment Identification and Response Times

The drilling plans proposed rely primarily on the Clean Gulf Associates (CGA) spill response equipment stored at the CGA sea base at South Timbalier 26 and at the CGA land base in Venice, La. Specific response equipment available is detailed in the Clean Gulf Associates Response Specifications Manual. Contractors available to operate CGA equipment include Allwaste/Thompson Environmental in Belle Chase and Venice. Both offices can be reached through the 1-800-797-2992 Emergency Response phone number.

Sea Based Response Steps and Times (in Hours) for the at ST 26:

SOI Spill Management Team Notification 0.50
Contractor Notification 0.50
Boat Procurement 1.00
Crew Procurement (Allwaste in Venice) ..... (2.00)
Dispatched to SOI Heliport in Venice for Air Transport to Spill Site
Open Water Travel Time 4.50
(43.2 Statute Miles at 10 Miles per Hour ST 26 to WD 143)
Deployment 0.50
Total Estimated time to Respond 7.00

30 CFR 250.42(b) Equipment Identification and Response Times (continued)

Land Based Response Times (in Hours)

SOI Spill Management Team Notification	0.50
Contractor Notification	0.50
Boat Procurement	3.00
Crew Procurement (Allwaste in Venice)	(1.00)
Dispatched to Halliburton Dock in Venice	
Equipment Transit to Dock (Truck, Crane, etc.)	(1.00)
(Equipment is on skids in Haliburton Yard)	
Load Equipment on Boat	1.00
Inland Travel Time	4.00
Venice to South West Pass Sea Buoy at 28 52.65 X 89 25.92 (34 Statute Miles at 8 Miles Per Hour)	
Open Water Travel Time	1.50
Sea Buoy to WD 143 (16.3 Statute Miles at 10 Miles per Hour)	
Deployment	0.50
Total Estimated time to Respond	11.00

* ( ) denotes not in critical path and not included in response time.

30 CFR 250.42(c) Dispersant-Use Plan

Our dispersant use plan and discussion of dispersant application methods and toxicity is outlined in Section VII of our OSCP. Also included is an outline for procedures to be followed to obtain approval for dispersant use. West Delta 143 is a ***Good*** candidate for ***Dispersant Application*** according to the Region 6 FOSC Pre-Approved Dispersant Use Manual (greater than 10 Meters deep and further than 3 nautical miles from shore.) Shell Offshore has access to Airborne Support Inc. out of Bourg, Louisiana for dispersant application.

30 CFR 250.42(d) Response Equipment Inspection and Maintenance

Halliburton Services has been contracted as a third party to maintain and inspect the equipment supplied by CGA. Details of their responsibilities are outlined in Section V of our OSCP.

30 CFR 250.42(e) Spill Detection and Notification Procedures

Procedures for early detection include daily visual observations. Also, all employees are instructed to report all sightings of oil on the water to their supervisor immediately. Procedures for timely notification including names and phone numbers of persons to contact are outlined in Sections II and IV of our OSCP.

30 CFR 250.42(f) Equipment, Materials and Supplies Inventory

The drilling plans proposed rely primarily on the Clean Gulf Associates (CGA) spill response equipment stored at the CGA sea base at South Timbalier 26 and at the CGA land bases in Venice, La. Specific response equipment available is detailed in the Clean Gulf Associates Response Specifications Manual.

30 CFR 250.42(g) Specific Response Procedures

Procedures to follow upon discovery of an oil spill are detailed in Section III of the SOI Oil Spill Contingency Plan. Membership of SOI's oil spill response team are outlined in Section IV. Training and drills conducted for oil spill response team members is outlined in Section X of the OSCP. SOI will establish an operation center in accordance with the procedure in Section III of the OSCP, page 5. These facilities have adequate communications, hand-held radios and walkie-talkies to support the response team efforts. Also, we will make every attempt to reduce our projected response time by giving consideration to transporting oil spill response cleanup equipment from a Clean Gulf Associates base by the fastest available means to a vessel-loading location as close as practical to our proposed operations.

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30 CFR 250.42(j) Alaska Provisions for Ignition of an Uncontrolled Spill Source are Not applicable

DOCD
SOI OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

ONSHORE SUPPORT FACILITY

The onshore support base for this activity will be SOI's existing Venice Terminal. This facility is located on the Mississippi River near Venice, Louisiana, approximately 35 miles upriver from the Gulf of Mexico. The physical plant covers 14 acres and includes 1,000 linear feet of waterfront, 3,000 square feet of office space, 3,200 square feet of personnel quartering space and 7,200 square feet of covered warehouse area. One 45-ton crane and two fork trucks are used for material handling operations. No expansion of the Venice terminal will be required for this activity. Also, while personnel transported by helicopter will be picked up and returned to SOI's Venice Terminal, both Air Logistics and PHI operate bases at Venice for refueling and maintenance.

SUPPORT VESSELS

ITEM	SIZE OR MODEL	USE	TRIPS PER WEEK
Boat	190 ±	Cargo	3 or 4
Boat	190 ±	Standby	N. A.
Helicopter	Bell 214 or 412 Boelkow 105 Sikorsky S-76	Crew Change and Misc.	18 to 22

COASTAL ZONE MANAGEMENT
CONSISTENCY CERTIFICATION

PLAN OF DEVELOPMENT-DEVELOPMENT OPERATION COORDINATION DOCUMENT
Type of Plan

MISSISSIPPI CANYON BLOCKS 686, 687 and 730
Area and Blocks

OCS-G 5862, 5863 and 7954
Lease Numbers

The proposed activities described in detail in this Plan comply with Louisiana's approved Coastal Resources Program and will be conducted in a manner consistent with such program.

Such findings are summarized on the final page of the attached Environmental Report (ER).

A request is being made to the official state journal, the State Times, published in Baton Rouge, for publication on August 23, 1996 of our notice of development plans. Additionally, arrangements have been made with the Plaquemines Gazette in Plaquemines Parish, Louisiana, for publication on August 23, 1996 of our notice of development plans.

SHELL OFFSHORE INC. (SOI)
Operator

Al Pickett
Certifying Official

August 19, 1996
Date

MISSISSIPPI
COASTAL ZONE MANAGEMENT
CONSISTENCY CERTIFICATION

PLAN OF EXPLORATION
Type of Plan

MISSISSIPPI CANYON BLOCKS 686, 687 and 730
Area and Blocks

SOI OCS-G 5896, 5897 and 7954
Lease Numbers

The proposed activities described in detail in this Plan comply with Mississippi's approved Coastal Resources Program and will be conducted in a manner consistent with such programs.

Such findings are summarized on the final page of the attached Environmental Report (ER).

SHELL OFFSHORE INC. (SOI)
Operator

Al Pickett
Certifying Official

August 19, 1996
Date

DOCD
SOI ET AL OCS-G 5862, MISSISSIPPI CANYON BLOCK 686
SOI ET AL OCS-G 5863, MISSISSIPPI CANYON BLOCK 687
SOI ET AL OCS-G 7954, MISSISSIPPI CANYON BLOCK 730
MISSISSIPPI CANYON BLOCK 731 UNIT
OFFSHORE LOUISIANA AND MISSISSIPPI

PUBLIC NOTICE

Public Notice of Federal Consistency review of a Proposed Development Plan by the Coastal Management Section/Louisiana Department of Natural Resources for the Plan's consistency with the Louisiana Coastal Resources Program.

Applicant:	Shell Offshore Inc. E&P Deepwater Division P. O. Box 61933 New Orleans, LA 70161
Location:	OCS-G 5862, 5863 and 7954, Mississippi Canyon Blocks 686, 687 and 730
Lease Offering Date:	May 25, 1983 and May 22, 1985
Description:	Proposed DOCD for the above area provides for the development and production of hydrocarbons. Support activities are to be conducted from an onshore base located at Venice, Louisiana. No ecologically sensitive species or habitats are expected to be located near or affected by these activities.

A copy of the plan described above is available for inspection at the Coastal Management Section Office located on the 10th Floor of the State Lands and Natural Resources Building, 625 North 4th Street, Baton Rouge, Louisiana. Office hours: 8:00 a.m. to 5:00 p.m. Monday through Friday. The public is requested to submit comments to the Coastal Management Section, Attention OCS Plans, P. O. Box 44487, Baton Rouge, Louisiana 70804-4487. Comments must be received within 15 days of the date of this notice or 15 days after the Coastal Management Division obtains a copy of the plan and it is available for public inspection. This public notice is provided to meet the requirements of the NOAA Regulations on Federal Consistency with approved Coastal Management Programs.

1. TITLE PAGE
ENVIRONMENTAL REPORT (DEVELOPMENT OPERATIONS COORDINATION DOCUMENT) GULF OF MEXICO: OFFSHORE LOUISIANA AND MISSISSIPPI MISSISSIPPI CANYON AREA BLOCK 686 (OCS-G 5862), BLOCK 687 (OCS-G 5863), AND BLOCK 730 (OCS-G 7954)

30 July 1996

Prepared for:

Mr. Richard B. Meyer
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One Shell Square
701 Poydras Street, Room 3242
New Orleans, Louisiana 70161
Telephone: (504) 588-6391

Prepared by:

Continental Shelf Associates, Inc.
759 Parkway Street
Jupiter, Florida 33477
Telephone: (407) 746-7946

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2. DESCRIPTION OF THE PROPOSED ACTION

2.a DESCRIPTION OF PROPOSED TRAVEL MODES AND ROUTES AND FREQUENCY FOR MOVING SUPPLIES AND PERSONNEL TO AND FROM THE OFFSHORE ACTIVITY SITE AND THE ONSHORE BASES

Shell Offshore Inc. plans to conduct development/production activities in Mississippi Canyon Area Blocks 686, 687, and 730. Helicopters and boats will move supplies and personnel to and from the offshore and onshore locations. Helicopters will make approximately 18 to 22 round trips per week and boats will make approximately 3 to 5 round trips per week. If servicing only the proposed lease area, helicopters and boats will normally take the most direct route, weather and traffic conditions permitting (see **Figure 1**).

2.b IDENTIFICATION OF SUPPORT BASES AND NUMBER AND TYPES OF NEW WORKERS ASSOCIATED WITH THE PROPOSED ACTIVITIES

The support base will be located in Venice, Louisiana. The base is capable of providing the services necessary for the proposed activities. No new facilities or workers will be needed for the proposed activities. The initial Outer Continental Shelf (OCS) Socioeconomic Data Base Report will be developed after the Minerals Management Service (MMS) and the States of Alabama, Louisiana, and Mississippi have identified the specific parameters to be addressed in these semiannual reports.

2.c IDENTIFICATION OF THE NUMBER, LOCATION, AND SIZE OF ANY NEW SUPPORT FACILITIES THAT WILL NEED TO BE PROVIDED FOR THE PROPOSED ACTIVITIES

No new support facilities will be needed for the proposed activities.

2.d DESCRIPTION OF ANY NEW TECHNIQUES OR UNUSUAL TECHNOLOGY THAT MAY AFFECT COASTAL WATERS

No new techniques or unusual technology will be used during the proposed activities.

2.e MAPS SHOWING LOCATION OF THE PROPOSED ACTIVITIES IN RELATION TO EACH OF THE AFFECTED STATES' COASTAL ZONES

Figure 1 shows the location of the proposed activities in relation to each of the affected States' coastal zones. The proposed activities will take place in waters adjacent to the States of Louisiana and Mississippi.

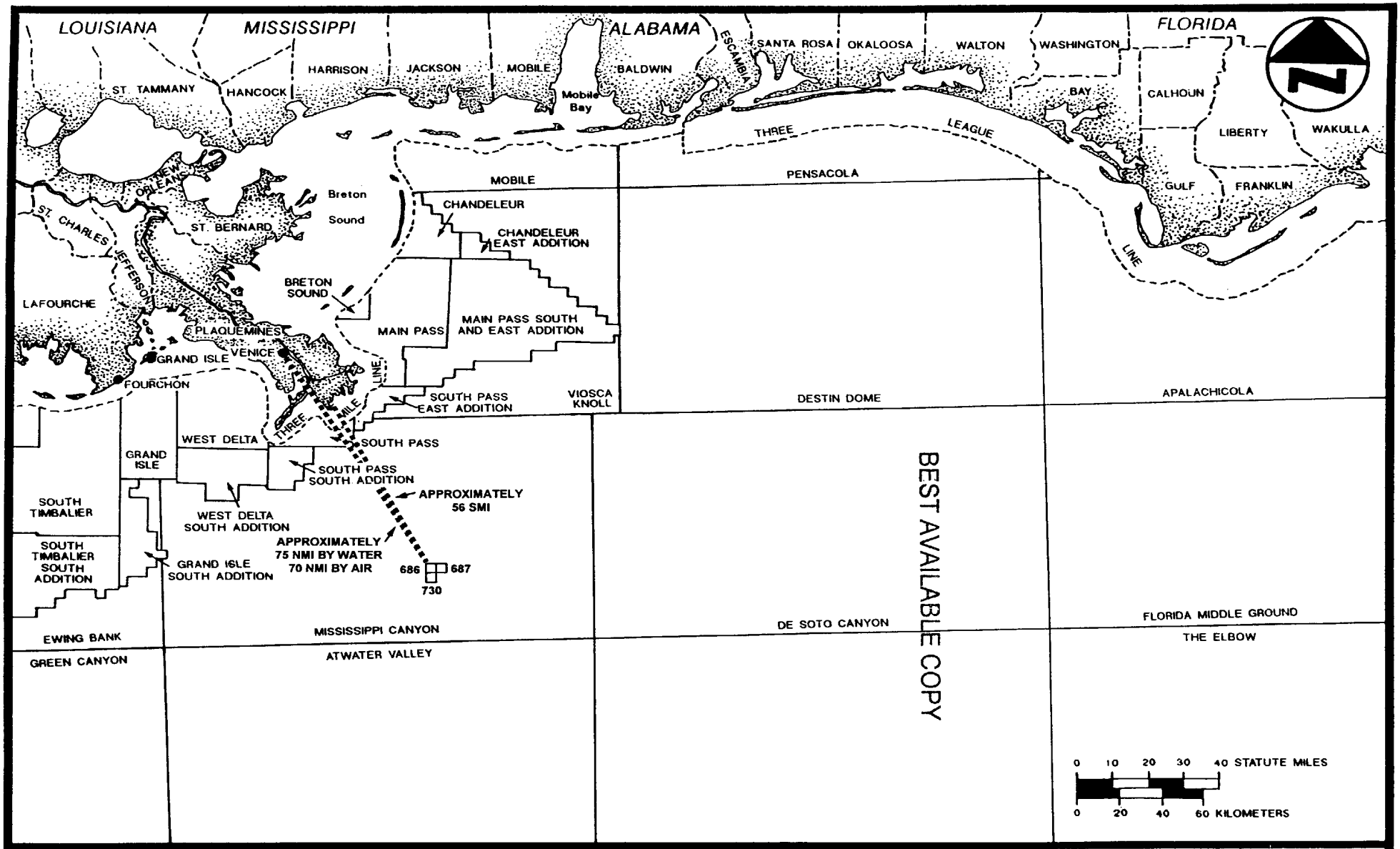

Figure 1. Location of Mississippi Canyon Area Blocks 686, 687, and 730 relative to the Louisiana and Mississippi coastal zones (Adapted from: USDOI, MMS, 1984).

2.f **FOR DEVELOPMENT OPERATIONS COORDINATION DOCUMENTS, THE MEANS PROPOSED TO TRANSPORT OIL AND GAS TO SHORE FROM THE LEASE AREA, THE ROUTES TO BE FOLLOWED AND THE ESTIMATED QUANTITIES OF OIL AND GAS TO BE MOVED ALONG SUCH ROUTES**

From three new subsea wells installed in Mississippi Canyon Block 687, gas production will flow west through three 6-inch flowlines to a production manifold in Mississippi Canyon Block 685 and then through a 12-inch pipeline to Shell's existing Platform "A" in West Delta Block 143. The gas production will then flow into 1) a 30-inch MCGGS gathering line to Gas Plant site in Venice, Louisiana; and 2) a 12-inch Shell pipeline to Texas Eastern's 20-inch line.

The development is expected to produce at 300 MMCFPD with a 10 year expected life.

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT AND IMPACTS

3.a PHYSICAL AND ENVIRONMENTAL

3.a(1) Commercial Fishing

The proposed activities are located south of some of the most productive fishing grounds in the Gulf of Mexico. National Marine Fisheries Service Zone 11, which is located approximately 76 km (41 nmi) north of the lease area, accounted for approximately 10% of the commercial fisheries harvest from the western and central Gulf of Mexico (U.S. Department of the Interior [USDOI], MMS, 1986a, Visual Nos. 2 and 2-E; U.S. Department of Commerce [USDOC], National Marine Fisheries Service [NMFS], 1991). Gulf waters account for 40% of the total annual U.S. fisheries harvest (USDOC, NMFS, 1989a).

The Gulf fishery is dominated by estuary-dependent species (USDOI, MMS, 1991a). Menhaden are the most important Gulf species in quantity landed, whereas shrimp represent the most important species in value (USDOC, NMFS, 1989a). Other significant Gulf commercial fisheries include oysters, blue crabs, and an assortment of finfish. Life history and fishery information for economically important species in the Gulf has been provided by the USDOI, MMS (1987a, 1990a).

A total of nine species of penaeid shrimp contribute to the Gulf of Mexico commercial shrimp fishery (USDOI, MMS, 1991a). Brown (*Penaeus aztecus*), white (*P. setiferus*), and pink (*P. duorarum*) shrimp constitute the bulk of the harvest (USDOI, MMS, 1991a) and are taken almost exclusively by trawls in depths ranging from approximately 2 to 73 m (6 to 240 ft). These shrimp are estuarine-dependent species which spawn in the open ocean, go through a series of larval phases in the plankton, migrate during the post-larval phase to the estuarine nursery areas, and then return to the open Gulf as adults. Royal red (*Pleoticus robustus*) and rock (*Sicyonia brevirostris*) shrimp are also commercially important species. The USDOI, MMS (1986a, Visual Nos. 2 and 2E) indicates the fishing grounds for each of these species. The lease area is located outside the major shrimp spawning grounds and migratory routes in the northern Gulf (USDOI, MMS, 1986a, Visual No. 2). Planktonic eggs and larval stages of all commercially important shrimp species may occur periodically in the lease area (USDOI, MMS, 1991a).

The blue crab (*Callinectes sapidus*) makes up 98% of the crab harvest in the Gulf of Mexico (Riley, 1970) and 40% of the national total, valued at $31 million (USDOC, NMFS, 1989a). Its life cycle is similar to the shrimps' in that it has planktonic, estuarine, and open ocean phases. Adults spend most of their lives in the estuaries; thus, the blue crab harvest is taken primarily inshore of the lease area. Gravid females migrate to the open Gulf to release their eggs during spring and summer. Consequently, gravid females and planktonic larvae may occur seasonally in the lease area.

The proposed activities are located outside commercially important finfish fishing grounds (USDOI, MMS, 1986a, Visual No. 2-E). Three species of menhaden known from the Gulf make up the major finfish tonnage taken. These are *Brevoortia patronus*, *B. gunteri*, and *B. smithii*. *Brevoortia patronus* constitutes most of the Gulf

catch. Purse seining is the major capture method used in this fishery (Lindall et al., 1972; Vaughan, 1987). In addition to menhaden, at least 10 species of finfish are commercially significant. In decreasing order of value, they are yellowfin tuna, groupers, mullet, red snapper, swordfish, bluefin tuna, black drum, shark, spotted seatrout, and vermilion snapper (USDOC, NMFS, 1989a).

The yellowfin tuna (*Thunnus albacares*) is a fast-swimming oceanic fish, generally taken with hook-and-line within deep waters south of the central and western Gulf area. Yellowfin tuna exhibits schooling behavior, and seasonally moves into the northern Gulf as water temperatures rise (USDOC, 1985; Taniguchi, 1987; Power and May, 1991).

The red snapper (*Lutjanus campechanus*), vermilion snapper (*Rhomboplites aurorubens*), and various species of grouper are taken over irregular bottom areas or reefs in depths of 2 to 305 m (5 to 1,000 ft) (TerEco Corporation, 1976). Historically, red snapper has been the most valuable species in the Gulf reef fish fishery, but its relative importance has declined. This has been offset by the growth of the grouper fishery (Waters, 1988; South Atlantic Fishery Management Council [SAFMC], 1991).

The striped, or black mullet (*Mugil cephalus*) is generally found in nearshore areas such as harbors, estuaries, bays, and along beaches. It is a schooling fish and is generally taken with seines and gill nets.

The swordfish (*Xiphias gladius*) is a pelagic and widely distributed billfish. It is apparently solitary, except when spawning, and is taken on longline (Palko et al., 1981; SAFMC, 1985).

The bluefin tuna (*Thunnus thynnus*) ranges worldwide in temperate and subtropical seas. It is a schooling species, seeking prey throughout the water column, and undergoes trans-oceanic migrations. It is generally taken on longline (USDOC, 1985).

Black drum (*Pogonias cromis*) occurs within estuaries and nearshore waters. It is generally taken with gill nets (Beckman et al., 1990).

Several species of sharks are harvested commercially as a by-catch of the longline fishery. Catches are marketed for food, hides, and other by-products (USDOC, NMFS, 1989b; Anderson, 1990).

Seatrouts, including the spotted (*Cynoscion nebulosus*), the silver (*C. nothus*), and the sand (*C. arenarius*), are important to the bottom fish fisheries in the northern Gulf (Lindall et al., 1972; Lassuy, 1983; Sutter and McIlwain, 1987). They are usually taken in offshore areas with bottom trawls.

TerEco Corporation (1976) describes some additional fish species of the northern Gulf which are important to commercial and/or sport fishermen. Most of the northern Gulf fishes are temperate, with some incursions from Caribbean fauna. They exhibit seasonal distribution and abundance fluctuations related to oceanographic conditions (USDOI, MMS, 1984). The life history of estuary-dependent species (e.g., the croaker, *Micropogonias undulatus*) involves spawning on the continental shelf; transport

of eggs, larvae, or juveniles to the estuarine nursery grounds; growth and maturation in the estuary; and migration of the young adults back to the shelf for spawning. After spawning, the adult individuals generally remain on the continental shelf (Darnell, 1988). Rogers (1977) postulated a net inshore-offshore movement for many demersal shelf fish species. Thus, it is probable that many of these species may occur in the lease area at some phase of their life cycles.

Eggs and larvae (ichthyoplankton) of various commercially important fish species are present in the lease area on occasion (USDOI, MMS, 1991a). Larvae of approximately 200 coastal and oceanic fishes from 61 families were recorded from unpublished plankton surveys and other published studies from throughout the northern Gulf of Mexico (Ditty et al., 1988). The 16 most abundant families of larval fishes (ranked on number of individuals collected) include the Engraulidae (anchovies), Gobiidae (gobies), Bregmacerotidae (codlets), Clupeidae (herrings), Sciaenidae (croakers), Carangidae (jacks), Bothidae (lefteye flounders), Synodontidae (lizardfishes), Myctophidae (lanternfishes), Serranidae (sea basses), Cynoglossidae (tonguefishes), Scombridae (mackerels and tuna), Ophidiidae (cusk-eels), Labridae (wrasses), Gonostomatidae (lightfishes), and Mugilidae (mullets) (Ditty et al., 1988). Because ichthyoplankton are at the mercy of water movements, their distributions vary considerably with space and time. The primary factors influencing ichthyoplankton in the northern Gulf are the Loop Current, the Mississippi River, and local runoff. Ichthyoplankton samples collected about the Mississippi River plume were found to be greater by a factor of 10, and sometimes by several orders of magnitude, at the plume front than they were within or outside of the plume (Govoni et al., 1989; Grimes and Finucane, 1991). Due to patchiness in distributions, presence and abundance of ichthyoplankton at any given instance cannot be predicted.

Environmental impacts of proposed oil and gas activities have been analyzed in detail in various MMS Environmental Impact Statements for the Central and Western Gulf of Mexico Planning Areas (e.g., USDOI, MMS, 1990a, 1991a). The conclusion of the MMS has been that future activities resulting from lease sales would not have a significant impact on the marine or coastal environments.

The National Research Council (1983) conducted a comprehensive study of the fate and effect of drilling discharges in the marine environment. Based upon this authoritative report, the USDOI, MMS (1990a) concluded that drilling fluids used on the OCS are unlikely to cause any significant ecological damage beyond 1,000 m from the discharge point either in the short term or long term. The proposed activities probably will temporarily degrade the water quality in the immediate vicinity of the drillsite due to discharges of drilling muds and cuttings. This may cause certain fish species to avoid the area temporarily. The situation should revert to normal as soon as drilling is completed. Effects on the commercial fishing industry should be at a low level.

Wetlands in the Gulf of Mexico occur as swamps, marshes, and seagrass beds throughout the coastal zone. Because coastal wetlands serve as nursery habitat for many shelf fishery species, damage to these habitats could eventually be reflected in the fisheries biology of the continental shelf (Darnell and Phillips, 1988). Wetland loss has been attributed to several factors, including natural succession, sediment deprivation, erosion, subsidence, sea-level rise, hydrologic changes, residential-commercial development, and construction of pipeline and navigation canals through wetlands (Turner

and Cahoon, 1988; USDOI, MMS, 1991a). Impact producing factors resulting from OCS oil and gas activities that could adversely affect wetlands include oil spills, pipeline placements, dredging of new navigation channels, maintenance dredging, and vessel usage of existing navigation channels, and construction of onshore facilities in wetlands areas. The level of impact to coastal wetlands within the potentially affected area is expected to be very low (USDOI, MMS, 1991a).

An oil spill would temporarily degrade water quality and introduce toxins into the water. Ichthyoplankton could be killed or functionally impaired. However, most adult fishes encountering a spill probably would exhibit avoidance behavior (Patten, 1977; Davis et al., 1984). This effect would be temporary and fishes should return to the area after dispersal of the spill. No significant or persistent direct effects from an oil spill on fish populations would be expected. Recruitment from surrounding areas should replenish any affected ichthyoplankton populations once the spill was dispersed.

An oil spill that reaches the seafloor could conceivably kill benthic organisms such as shrimp or cause a variety of sublethal effects. Effects may include smothering, acute toxicity, and chronic and sublethal effects (behavioral, morphological, cellular, and histopathological abnormalities). No effects on benthos were detected on the South Texas shelf in the aftermath of the Ixtoc-I blowout (Boehm, 1982).

Oil spills rarely occur during exploratory drilling. From 1971 through 1985, over 15,000 new wells were drilled on the U.S. OCS, with only 61 drilling blowouts (USDOI, MMS, 1987b). None of the 33 blowouts during exploratory drilling from 1971 through 1985 resulted in a spill of crude oil or condensate. If a spill did occur in the lease area, it would be handled according to an oil spill contingency plan approved by the MMS.

The MMS Environmental Studies Program has sponsored a series of studies where OCS oil and gas activities have occurred in the past or may occur in the future. These studies have demonstrated that the impacts resulting from the operations are localized and, except in areas where there are extreme concentrations of activity, are unlikely to have regional significance (NRC, 1985; Boesch and Rabalais, 1987). While most research results agree that the acute impacts from operational discharges from OCS oil and gas facilities are minor or resolvable, there is less certainty regarding any chronic, sublethal effects (Boesch et al., 1987; Aurand, 1988). With these concerns the MMS Environmental Studies Program has now shifted its focus to studies of the chronic, sublethal environmental stresses which may be associated with offshore oil and gas activities (Aurand, 1988; Ahlfeld, 1990; Kendall, 1990). The MMS Gulf of Mexico Offshore Operations Monitoring Experiment (GOOMEX) is intended to elucidate and assess the effects of any chronic, sublethal perturbations which may be associated with long-term OCS production sites in the Gulf of Mexico, particularly in highly developed OCS areas (USDOI, MMS, 1991b).

Cumulative impacts refer to the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. Cumulative impacts for oil and gas activities in the Central and Western Gulf of Mexico Planning Areas have

been discussed in detail by the USDOI, MMS (1991a). The proposed activities are generally short-term in nature and are not expected to contribute significantly to the cumulative impacts from previous, ongoing, or reasonably anticipated future human activities in the area.

Cumulative effects of increasing oil and gas activities off the northern Gulf coast on annual fish catches are unknown. Recent data analyses indicate a major change in characteristics of the finfishery during the interval from 1981 through 1987 (Linton, 1988). The number of commercial species landed increased significantly from 27 in 1981 to 82 in 1987. In addition, the number of species with a value over $1 million has tripled from 3 in 1981 to 9 in 1987. The vast majority of this catch is harvested from the north-central and northwestern Gulf, where hard substrate added by numerous offshore petroleum platforms which serve as artificial reefs is thought to be a positive contributing factor (Linton, 1988).

3.a(2) Shipping

Growth of offshore oil and gas activities has led to the establishment of a series of safety fairways or vessel traffic separation schemes, and anchorages to provide unobstructed approach for vessels using U.S. ports (USDOI, MMS, 1990b, Visual No. 2). Shipping safety fairways are lanes or corridors in which no fixed structure, whether temporary or permanent, is permitted. Fairway anchorages are areas contiguous to and associated with a fairway, in which fixed structures may be permitted within certain spacing limitations (33 CFR 166). All offshore structures are required to be adequately marked and lighted. After a structure is in place, it often becomes a landmark and an aid to navigation for vessels that operate in the area on a regular basis (USDOI, MMS, 1990a).

The proposed activities are located approximately 68 km (37 nmi) southeast of a fairway (USDOI, MMS, 1990b, Visual No. 2). The offshore structure will be equipped with all safety equipment required by the U.S. Coast Guard and the MMS to alert ships of its presence in all weather conditions.

Most oil and gas resources discovered in the Gulf of Mexico will be transported via pipelines to shore (USDOI, MMS, 1991a). The majority of pipeline spills of domestic oil have occurred due to anchor damage. In contrast, accidental spills from tankers normally result from collisions or groundings. Less than 1% of the oil produced in the Central Gulf of Mexico Planning Area and 11% in the Western Gulf of Mexico Planning Area will be transported by tankers. However, one of the most significant contributions of marine transportation to cumulative impacts in the Gulf of Mexico is from tankering of imported crude oil and refined products into the Gulf. The USDOI, MMS (1991a) reported spill rates (1,000 bbl or greater per billion bbl produced and transported) from OCS operations. The spill rate from tankers (1.30) was approximately twice the spill rate from platforms (0.60) and pipelines (0.67). Reduced spill rates for platforms and pipelines were attributed to improved safety practices in the oil industry (USDOI, MMS, 1991a). Additional information indicates that for every 100,000 bbl of oil produced on the OCS, only 3 bbl are spilled, whereas for every 100,000 bbl of oil transported by foreign tanker, 17 bbl are spilled (Offshore, 1992). Studies have shown that 45% of ocean hydrocarbon pollution comes from tankers, while 1.5% comes from OCS production worldwide (Offshore, 1992).

3.a(3) Small Craft Pleasure Boating, Sport Fishing, and Recreation

The major recreational activity occurring on the OCS is offshore marine recreational fishing and diving. A substantial recreational fishery, including scuba diving, is directly associated with oil and gas production platforms, and stems from the fact that platforms beneficially function as high-profile, artificial reefs that attract fish. Witzig (1986) indicates that a majority of the offshore recreational fishing in the Central Gulf of Mexico Planning Area is directly associated with oil and gas structures. At least 46 different fish species are caught by recreational anglers fishing near oil and gas platforms in the central Gulf of Mexico (Stanley and Wilson, 1990). Interest is high throughout the Gulf of Mexico region to acquire, relocate, and retain selected oil and gas structures in the marine environment to be used as dedicated artificial reefs to enhance marine fisheries when the structures are no longer useful for oil and gas production (Reggio, 1989).

Negative effects of the presence of offshore oil and gas structures are the increased probability of vessel collisions with structures in inclement weather, and the risk of overfishing of some reef fish stocks, particularly red snapper (*Lutjanus campechanus*), as a result of the concentrated fishing effort (Gallaway et al., 1981).

Ditton and Graefe (1978) determined that oil and gas structures are the most popular offshore recreation destination areas, attracting 87% of the boats that fished offshore in their study area. Certain pleasure boats (i.e., sailboats, pleasure yachts, and/or open ocean racing power boats) may be slightly inconvenienced by having to maneuver around the offshore structure and its support vessels. This inconvenience is considered minor as offshore structures can be avoided and ample maneuvering room is available.

Any sport fishing which might occur in the lease area could be temporarily affected by degradation of water quality during drilling. Such a change in water quality could cause some desirable species to avoid the immediate lease area. However, any such effects are expected to be temporary and localized and should not affect any fishery potential in the area as a whole. Populations should return to normal once drilling is completed.

3.a(4) Cultural Resources

Archaeological resources are any objects or features that are man-made or modified by human activity, and classified as historic or prehistoric. Most historic archaeological resources on the OCS are shipwrecks. A resource baseline study for the northern Gulf of Mexico (Coastal Environments, Inc., 1977) indicates that less than 2% of pre-20th century ships reported lost in the Gulf have known locations. Texas A&M University completed a study for the MMS that upgraded and expanded the list of historic shipwrecks developed by Coastal Environments, Inc. (Garrison et al., 1989). This recent investigation identified nearly 3,500 potential shipwreck locations in the Gulf, nearly 1,500 of which occur on the OCS.

According to the sea level curve proposed for the northern Gulf by Coastal Environments, Inc. (1982), sea level would have been approximately 45 m (148 ft) below the present sea level at 12,000 B.P. Therefore, the continental shelf shoreward of the 45-m (148-ft) bathymetric contour would possess potential for prehistoric sites dating

subsequent to 12,000 B.P. Although many specific areas in the Gulf have been identified through lease block surveys as having high potential for prehistoric sites, these areas generally have been avoided by oil and gas development rather than investigated (USDOI, MMS, 1990a).

The proposed activities are located outside the Historic and Prehistoric Cultural Resources High Probability Lines (USDOI, MMS, 1989, Visual No. 1) and therefore are in a large offshore area where historic and prehistoric resources are unlikely to be found. An Archaeological Survey was not required for this lease area.

3.a(5) Ecologically Sensitive Features

Several areas of environmental concern are located onshore of the lease area. Louisiana and Mississippi have developed Coastal Zone Management Programs to regulate the significant land and water activities between the outer limit of each State's coastal waters and land up to the Intracoastal Waterway and/or the 3-m (10-ft) contour. Land uses which are regulated are those that have a direct and significant impact on the coastal areas requiring a State permit, and those which are required by Federal law to be consistent with the management programs (USDOC and LDNR, 1980; Mississippi Department of Wildlife Conservation [MDWC] and USDOC, 1980). The programs provide for the protection of beaches, dunes, wetlands, submerged grass beds, barrier islands, oyster reefs, cultural resources, water quality, air quality, biological resources, and wildlife habitat. Unique ecological features include zoological, botanical, and geological formations characteristic of coastal processes (Burk and Associates, Inc., 1975; MDWC and USDOC, 1980; USDOC and LDNR, 1980). Biologically sensitive areas of the north-central Gulf area include estuarine and coastal ecosystems consisting of salt marshes, oyster beds, grass beds, barrier beaches, and dunes (Coastal Environments, Inc., 1980). These coastal ecosystems contain nursery areas for many species of economic importance as well as habitat, rookeries, major overwintering sites, and nesting areas for many endangered and threatened species, such as the southern bald eagle, brown pelican, golden eagle, osprey, red cockaded woodpecker, American peregrine falcon, and various marine turtles (USDOI, MMS, 1986a, Visual No. 2; Coastal Environments, Inc., 1980; MDWC and USDOC, 1980; USDOC and LDNR, 1980).

There are two existing "Special Management Areas" designated by the Louisiana Coastal Management Program (USDOC and LDNR, 1980). These areas are the "Louisiana Offshore Oil Port" (LOOP or Superport) and the "Marsh Island Wildlife Refuge and Game Preserve." The lease area is located away from both of these areas (USDOI, MMS, 1990b, Visual No. 2). None of the proposed activities in the lease area should have any effect upon either area.

Mississippi designated three types of areas as current or proposed Special Management Areas: (1) industrial and port areas, (2) shorefront access areas, and (3) urban waterfront (MDWC and USDOC, 1980). Current Mississippi Special Management areas are depicted by the MDWC and USDOC (1980).

Conspicuous areas of environmental concern for Louisiana and Mississippi are noted by the USDOI, MMS (1990b, Visual No. 2; 1989, Visual No. 1), the MDWC and USDOC (1980), and the USDOC and LDNR (1980).

The coastal zone area is also of recreational importance to residents and tourists. Most recreational activities focus on the area's water resources, which include beaches, boating areas, and fishing areas. Offshore terrestrial areas of particular ecological significance to both Louisiana and Mississippi are the barrier islands of Breton National Wildlife Refuge and Gulf Island National Seashore. Submerged areas of critical concern are the extensive oyster grounds off Plaquemines and St. Bernard Parishes, and the remnant coastal banks, which are located off Mobile, Alabama (USDOI, MMS, 1986b, Visual No. 4; 1986c, Visual No. 5).

Accidental discharge of oil can occur during almost any stage of exploration, development, or production on the OCS. Of the various potential spill sources, the great majority of accidental discharges have resulted from production activities (NRC, 1985; USDOI, MMS, 1986d). Oil fouling in any coastal area could directly or indirectly affect a variety of species, including threatened or endangered species or species important to commercial and sport fisheries. Although effects on benthic organisms of the open shelf may occur, none were detected on the south Texas shelf following the Ixtoc-I well blowout (Boehm, 1982). The main concern is for oiling of beaches and coastal wetlands. Effects may include smothering, acute toxicity, and chronic and sublethal effects (behavioral, morphological, cellular, and histopathological abnormalities). Damage or alterations to coastal habitats could result in effects on continental shelf populations and communities, as estuarine areas function as nursery habitat for many shelf species (Darnell and Phillips, 1988).

Oil fouling of the coastal area could also have adverse socioeconomic effects. Tourism is an important part of Gulf coast economies. Removal of beach or other coastal areas from recreational use by significant oil fouling could decrease tourism in the affected area, causing loss of income and a variety of ripple effects in local economies.

Any spill would be handled according to an oil spill contingency plan approved by the MMS. If a spill did occur during operations, it is unlikely that it would affect any nearshore or onshore areas or resources.

3.a(6) Existing Pipelines and Cables

There are no existing pipelines or cables in the lease area (USDOI, MMS, 1989, Visual No. 1).

3.a(7) Other Mineral Uses

Other than potential oil and gas reserves, there are no known mineral resources in the lease area.

3.a(8) Ocean Dumping Activities

The proposed activities are not located in an area designated for ocean dumping activities (USDOI, MMS, 1990b, Visual No. 2).

3.a(9) Endangered or Threatened Species

The USDOI, MMS (1990a, 1991a) considers possible impacts on endangered and threatened species. It has been determined that the direct and indirect proposed activities are unlikely to jeopardize the continued existence of endangered and threatened species or to result in the destruction or adverse modification of their critical habitats. Onshore facilities are located in a previously developed area and pose no new or additional threat to endangered or threatened species.

Six endangered species of whales have been reported in the Gulf of Mexico. They are the blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), right whale (*Eubalaena glacialis*), sei whale (*Balaenoptera borealis*), and sperm whale (*Physeter catodon*). Generally, most of these larger cetaceans occur in continental slope and deep oceanic waters. The population, distribution, and migratory patterns of these species in the Gulf of Mexico are unknown (J. Lehman, 1992, personal communication, USDOI, MMS, Gulf of Mexico OCS Office, Metairie, LA), although healthy individuals or small pods are occasionally sighted nearshore (Schmidly, 1981; Lohoefener, 1988).

Several endangered or threatened species of sea turtles, including the Kemp's ridley (*Lepidochelys kempi*), hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), and green (*Chelonia mydas*), may occasionally visit the lease area. A number of potential effects on sea turtles are of concern. Oil spills can affect the turtles by coating, toxicity, and reduction of food supplies. Many species prefer shallow, coastal waters, which increase their vulnerability to dredging activities, boat collisions, and pollution -- especially oil spills (Fritts et al., 1983). Explosions during platform removal may result in mortality, injury, or behavioral interference. Solid and semi-solid debris may result in mortality through ingestion and entanglement (Darnell and Phillips, 1988).

3.b SOCIOECONOMIC

The initial OCS Socioeconomic Data Base Report will be developed after the MMS and the States of Alabama, Louisiana, and Mississippi have identified the specific parameters to be addressed in these semiannual reports. No new personnel will be needed for the proposed activities.

4. UNAVOIDABLE ADVERSE IMPACTS

4.a SUMMARY OF THE UNAVOIDABLE ADVERSE IMPACTS

Offshore structures will result in minimal navigational interference to ships using established fairways. However, during times of reduced visibility, vessels have the greatest potential to deviate from established fairways and impact offshore structures. Discharge of drilling muds and cuttings and air emissions during drilling operations will adversely affect marine organisms, water and air quality, and commercial fishing as described by the USDOI, MMS (1991a). These impacts are temporary, however, and will be limited to a small area. During the development/production operations, all discharges will comply with all applicable MMS and Environmental Protection Agency requirements. No significant adverse impacts are expected. The proposed activities covered by this Development Operations Coordination Document (DOCD) should not result in unavoidable impacts on wetlands, cultural resources, recreational activities, shoreline aesthetics, or other land uses.

4.b STATEMENT CONCERNING THE UNAVOIDABLE ADVERSE IMPACTS

None of the environmental consequences expected during normal operations should produce significant or cumulative adverse environmental effects. The effects of a possible oil spill should have no overall cumulative or long-term effect on the environment, except in the possible event of contamination of endangered marine species. A spill would be handled according to an oil spill contingency plan approved by the MMS. Thus, it is unlikely that a spill would occur during operations and affect any nearshore or onshore areas or resources. The proposed activities should have no significant impact on endangered species or critical habitat. The information presented in this Environmental Report indicates no clear or present reason not to proceed with the proposed activities. Withdrawal of the DOCD would result in the loss of potential hydrocarbon production from this area.

5. REFERENCES

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6. FINAL STATEMENT

To the best of our knowledge, the set of findings included in the Environmental Report and Plan indicates that each of the proposed activities, their associated facilities, and effects are all consistent with and comply with the provisions and guidelines of the Louisiana- and Mississippi-approved Coastal Zone Management Programs. The proposed activities will be conducted in a manner consistent with the Coastal Zone Management Program as outlined in MDWC and USDOC (1980) and USDOC and LDNR (1980).

The proposed activities will be carried out and completed with the guarantee of the following items:

1) The best available and safest technologies will be utilized throughout the project. This includes meeting all applicable requirements for equipment types, general project layout, safety systems, and equipment and monitoring systems.

2) All operations will be covered by an oil spill contingency plan approved by the MMS.

3) All applicable Federal, State, and local requirements regarding air emissions, water quality, and discharge for the proposed activities, as well as any other permit conditions, will be complied with.