

UNITED STATES GOVERNMENT
MEMORANDUM

October 21, 2002

To: Public Information (MS 5034)
From: Plan Coordinator, FO, Plans Section (MS
5231)

Subject: Public Information copy of plan
Control # - N-07602
Type - Initial Exploration Plan
Lease(s) - OCS-G19084 Block - 197 Garden Banks Area
Operator - Kerr-McGee Oil & Gas Corporation
Description - Wells A through D
Rig Type - . SEMISUBMERSIBLE

Attached is a copy of the subject plan.

It has been deemed submitted as of this date and is under review for approval.


Robert Strainfellow
Plan Coordinator

Site Type/Name	Botm Lse/Area/Blk	Surface Location	Surf Lse/Area/Blk
WELL/A	G19084/GB/197	3205 FSL, 3685 FEL	G19084/GB/197
WELL/B	G19084/GB/197	3205 FSL, 3685 FEL	G19084/GB/197
WELL/C	G19084/GB/197	2150 FSL, 5650 FEL	G19084/GB/197
WELL/D	G19084/GB/197	2150 FSL, 5650 FEL	G19084/GB/197

ISS 00123702PM 2:33

Mated/PC



KERR-McGEE OIL & GAS CORPORATION

16666 Northchase · Houston, Texas 77060

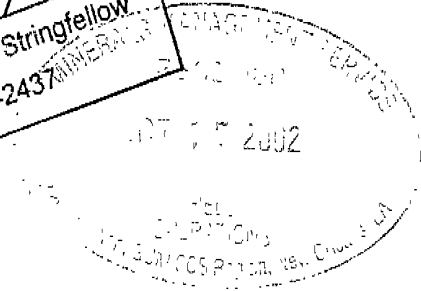
Cary V. Bradford
Manager of Regulatory Affairs
GOM and North America Region

Phone: 281/618-6338
Fax: 281/618-6046

October 16, 2002

Mr. Donald C. Howard
Regional Supervisor
Office of Field Operations
U.S. Department of the Interior
Minerals Management Service
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

CONTROL No. *N-7602*
REVIEWER: Robert Stringfellow
PHONE: (504) 738-2437



Attention: Mr. Nick Wetzel

RE: Initial Exploration Plan for Lease OCS-G 19084, Garden Banks Block 197, OCS
Federal Waters, Gulf of Mexico, Offshore, Louisiana

Gentlemen:

In accordance with the provisions of Title 30 CFR 250.204 and that certain Notice to Lessees (NTL 2000-G21), Kerr-McGee Oil & Gas Corporation (Kerr-McGee) hereby submits for your review and approval nine (9) copies of an Initial Exploration Plan for Lease OCS-G 19084, Garden Banks Block 197, Offshore, Louisiana. Five (5) copies are "Proprietary Information" and four (4) copies are "Public Information".

Excluded from the Public Information copies are certain geologic discussions, depth of wells and structure maps.

Kerr-McGee Oil & Gas Corporation anticipates activities will commence under this proposed Initial Exploration Plan on approximately December 15, 2002.

Should additional information be required, please contact the undersigned at (281) 618-6338.

Sincerely,

C. V. Bradford

CVB:JAD:tmp
Enclosures

PUBLIC INFORMATION

KERR-MCGEE OIL & GAS CORPORATION

INITIAL EXPLORATION PLAN

LEASE OCS-G 19084

GARDEN BANKS BLOCK 197

SECTION A	<i>Contents of Plan</i>
SECTION B	<i>General Information</i>
SECTION C	<i>Geological, Geophysical & H2S Information</i>
SECTION D	<i>Biological Information</i>
SECTION E	<i>Wastes and Discharge Information</i>
SECTION F	<i>Oil Spill Response and Chemical Information</i>
SECTION G	<i>Air Emissions Information</i>
SECTION H	<i>Environmental Report</i>
SECTION I	<i>CZM Consistency</i>

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CONTENTS OF PLAN

SECTION A

Description
Objectives
Schedule
Plan Information
Location
Production
Facilities
Drilling Unit

LEASE DESCRIPTION/ACTIVITY

Lease OCS-G 19084 was acquired by Kerr-McGee Oil & Gas Corporation and Amerada Hess Corporation at the Central Gulf of Mexico Lease Sale No. 168 held on August 27, 1997. The subject lease was issued with an effective date of January 1, 1998 and primary term ending date of December 31, 2002.

Kerr-McGee is the designated operator of the subject oil and gas lease.

OBJECTIVE/SCHEDULE

This Initial Exploration Plan provides for the drilling and potential completion of four (4) exploratory wells in Garden Banks Block 197 to test the target sands as detailed in Section C of this plan.

The following schedule details the proposed drilling and potential completion of the locations provided for in this plan.

<i>Activity</i>	<i>Estimated Start Date</i>	<i>Estimated Completion Date</i>
Drill and Complete Well Location A and temporarily abandon at seafloor	12-15-02	02-01-03
Drill and Complete Well Location B and temporarily abandon at seafloor	02-02-03	03-22-03
Drill and Complete Well Location C and temporarily abandon at seafloor	03-23-03	05-10-03
Drill and Complete Well Location D and temporarily abandon at seafloor	05-11-03	06-28-03

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PLAN INFORMATION/LOCATIONS

Included in this section as *Attachments A-1 through A-3* is a Plan Information Form, well location plat and bathymetry map prepared in accordance with Appendix J of that certain Notice to Lessees (NTL 2000-G21).

It should be emphasized that this schedule is tentative in the meaning of Title 30 CFR 250.203-1. Additional exploratory drilling must be predicated upon the need to further define the structures and/or reservoir limitations.

Included in the activity schedule shown above are other activities which may be conducted under this Plan, including installation of a minimal well protector structure or net guard.

DESCRIPTION OF DRILLING UNIT

Offshore exploratory activities are carried out from mobile drilling rigs. The five most common types of mobile rigs employed for exploratory drilling offshore are submersible drilling rigs, semi-submersible drilling rigs, jack-up drilling rigs, drillships, and drill barges.

The proposed wells will be drilled and completed with a typical semi-submersible rig. When a rig is selected, the rig specifications will be made a part of the appropriate Applications for Permit to Drill.

Safety features on the MODU will include well control, pollution prevention, welding procedure, and blowout prevention equipment as described in Title 30 CFR Part 250, Subparts C, D, E, G and O; and as further clarified by MMS Notices to Lessees, and current policy making invoked by the MMS, Environmental Protection Agency and the U.S. Coast Guard. The appropriate life rafts, life jackets, ring buoys, etc., as prescribed by the U. S. Coast Guard will be maintained on the facility at all times.

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In accordance with Title 30 CFR Part 250, Subpart O, an operator is to ensure Well Control Training is provided for personnel engaged in oil and gas operations in the OCS Gulf of Mexico. Supervisory and certain designated personnel on-board the facility will be familiar with the effluent limitations and guidelines for overboard discharges into the receiving waters, as outlined in the NPDES General Permit GMG290000.

The operator is charged with the responsibility to not create conditions that will pose unreasonable risk to the public health, life, property, aquatic life, wildlife, recreation, navigation, commercial fishing, or other uses of the ocean. Some of these measures include installation of curbs, gutters, drip pans, and drains on drilling deck areas to collect all contaminants and debris.

The MMS is required to conduct onsite inspections of offshore facilities to confirm operators are complying with lease stipulations, operating regulations, approved plans, and other conditions; as well as to assure safety and pollution prevention requirements are being met. The National Potential Incident of Noncompliance (PINIC) List serves as the baseline for these inspections. The MMS also inspects the stockpiles of equipment listed in the operator's approved Oil Spill Response Plan that would be used for the containment and cleanup of hydrocarbon spills.

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OCS PLAN INFORMATION FORM
(USE SEPARATE FORM FOR EACH LEASE)

EXPLORATION PLAN	X	DEVELOPMENT OPERATIONS COORDINATION DOCUMENT	DEVELOPMENT & PRODUCTION PLAN
OPERATOR:	KERR-MCGEE OIL & GAS CORPORATION		ADDRESS: 16666 NORTHCHASE DRIVE, HOUSTON, TX 77060
MMS OPERATOR NO.:	02219		
CONTACT PERSON:	JUDY DAVIDSON		PHONE NO. (281) 578-3388
PROPOSED START DATE:	12-15-02	RIG TYPE. SS	DISTANCE TO CLOSEST LAND (IN MILES): 125
NEW OR UNUSUAL TECHNOLOGY	YES	NO X	ONSHORE SUPPORT BASE(S): FOURCHON, LOUISIANA
BRIEF NARRATIVE DESCRIPTION PROPOSED ACTIVITIES: DRILL AND COMPLETE FOUR EXPLORATORY WELLS.			
			PROJECT NAME, IF APPLICABLE: N/A

PROPOSED WELL/STRUCTURE LOCATIONS

WELL / STRUCTURE NAME	SURFACE LOCATION				BOTTOM-HOLE LOCATION (FOR WELLS)	
Platform _ or Well X Name: A	CALLS:	3205'	F S	Land 3685'	F E	LOF
	LEASE OCS BLOCK	G 19084		GARDEN BANKS	AREA.	
	X:	1,673,835				
	Y:	10,077,922				
	LAT:	27.77173				
	LONG.	-92.89045				
	TVD (IN FEET):			MD (IN FEET):		WATER DEPTH (IN FEET): 732'
Platform _ or Well X Name: B	CALLS:	3205'	F S	Land 3685'	F E	LOF
	LEASE OCS BLOCK	G 19084		GARDEN BANKS	AREA.	
	X:	1,673,835				
	Y:	10,077,922				
	LAT:	27.77173				
	LONG.	-92.89045				
	TVD (IN FEET):			MD (IN FEET):		WATER DEPTH (IN FEET): 732'
Platform _ or Well X Name: C	CALLS:	2150'	F S	Land 5650'	F E	LOF
	LEASE OCS BLOCK	G 19084		GARDEN BANKS	AREA.	
	X:	1,673,390				
	Y:	10,076,390				
	LAT:	27.76750				
	LONG.	-92.89802				
	TVD (IN FEET):			MD (IN FEET):		WATER DEPTH (IN FEET): 797'
Platform _ or Well X Name: D	CALLS:	2150'	F S	Land 5650'	F E	LOF
	LEASE OCS BLOCK	G 19084		GARDEN BANKS	AREA.	
	X:	1,673,390				
	Y:	10,076,390				
	LAT:	27.76750				
	LONG.	-92.89802				
	TVD (IN FEET):			MD (IN FEET):		WATER DEPTH (IN FEET): 797'

Marathon
OCS-G-07447



12,350'

Y= 10,090,080

KERR-McGEE
OCS-G-19084
197

KERR-McGEE
OCS-G-23274
198

PROP SL "A", "B"
3205' FEL, 3685' FSL
X= 1,675,835
Y= 10,077,925
Lat= 27.77173 N
Lon= -92.89045 W

PROP SL "C", "D"
5650' FEL, 2150' FSL
X= 1,673,390
Y= 10,076,390
Lat= 27.76750 N
Lon= -92.89802 W

241

X= 1,679,040

Y= 10,074,240

242

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KERR MCGEE OIL & GAS CORPORATION

1666 Northchase Dr. Houston, Texas 77060

Garden Banks Blocks 197 & 198

Location Plat for Locations

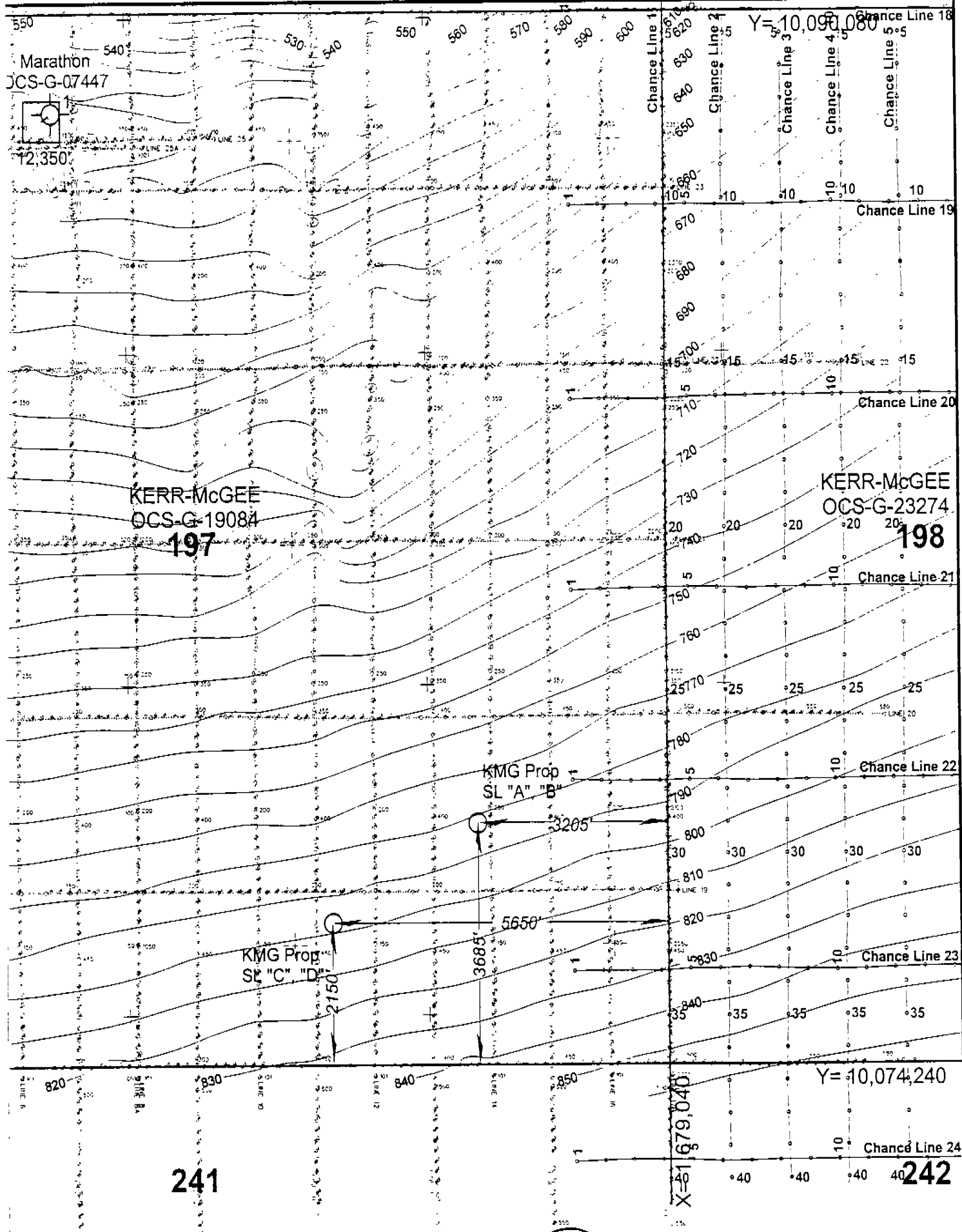
"A", "B", "C" & "D"

Public Document

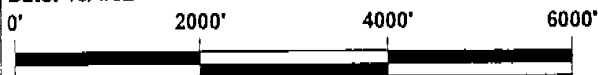
Geology: J. Kamm
Date: 10/4/02



Attachment A-2



Geology: J. Kamm
Date: 10/4/02



Attachment A-3



KERR MCGEE OIL & GAS CORPORATION
16666 Northchase Dr. Houston, Texas 77060
Garden Banks Blocks 197 & 198

Reference Track
Bathymetry (Single Beam) Map

Public Document

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241

242

SECTION B

*Contact
New or Unusual
Technology
Bonding
Onshore Support
Base
New Onshore
Construction or
Expansion of
Support
Facilities
Lease Stipulations
Special Conditions*

GENERAL

CONTACT

Inquiries may be made to the following authorized representative:

Judy Davidson
J. Connor Consulting, Inc.
16225 Park Ten Place, Suite 700
Houston, Texas 77084
(281) 578-3388
e-mail address: judy@jccteam.com

NEW OR UNUSUAL TECHNOLOGY

Kerr-McGee does not propose utilizing any new or unusual technology during the proposed drilling and potential completion operations.

BONDING

In accordance with NTL N2000-G16 which implements the requirements for general lease surety bonds contained in 30 CFR 256, Subpart I, Kerr-McGee has submitted to the Minerals Management Service a \$3,000,000 Areawide Development Bond.

Additionally, NTL 98-18N addresses how MMS has the authority to require additional security to cover full plugging, site clearance and other associated lease liabilities which may be in excess of the general lease surety bonds. These activities are reviewed on a case-by-case basis, and if deemed warranted, Minerals Management Service will provide such notification to Kerr-McGee.

ONSHORE SUPPORT BASE

Garden Banks Block 197 is located approximately 125 miles from the nearest Louisiana shoreline and approximately 190 miles from the onshore support base located in Fourchon, Louisiana. A

Vicinity Plat showing the location of Garden Banks Block 197 relative to the shoreline and onshore base is included as *Attachment B-1*.

Kerr-McGee will utilize onshore facilities located in Fourchon, Louisiana, which will serve as a port of debarkation for supplies and crews. No onshore expansion or construction is anticipated with respect to the proposed activities.

This base is capable of providing the services necessary for the proposed activities. It has 24-hour service, a radio tower with a phone patch, dock space, equipment, and supply storage base, drinking and drill water, etc. The base will also serve as a loading point for tools, equipment and machinery to be delivered to the MODU, crew change and transportation base, and temporary storage for materials and equipment. The facilities typically include outdoor storage, forklift and crane service, dock, trailer facilities, and parking, as well as 24-hour service, and a radio tower with a phone patch.

Support vessels and travel frequency during drilling and potential completion activities are as follows:

Support Vessel	Drilling and Completion Trips Per Week
Crew Boat	7
Supply Boat	3
Helicopter	3

Personal vehicles will be the main means of transportation to carry rig personnel from various locations to the Fourchon Area. They will then be transported to the MODU by the crew boat. A helicopter will be used to transport small supplies, and on occasion, personnel. The most practical, direct route permitted by the weather and traffic conditions will be utilized.

NEW ONSHORE CONSTRUCTION OR EXPANSION OF SUPPORT FACILITIES

The proposed operations do not mandate any immediate measures for land acquisition or expansion of the existing onshore base facilities.

Dredging and filling operations will not be required for the operations, nor will any new construction or expansion of onshore facilities be involved for the operations proposed in this Initial Exploration Plan.

LEASE STIPULATIONS

Oil and gas exploration activities on the OCS are subject to stipulations developed before the lease sale and would be attached to the lease instrument, as necessary, in the form of mitigating measures. The MMS is responsible for ensuring full compliance with stipulations.

MILITARY WARNING AREA

The Military Warning Area Stipulation has been applied to the subject oil and gas lease to mitigate potential multiple-use conflicts. The stipulation reduces potential impacts, primarily those associated with safety, by curtailing OCS operations and support activities in areas where military operations are being conducted. One of the requirements of this stipulation is that the operator notify the military prior to conducting oil and gas activities; and if required, enter into an agreement to provide for positive control of boats, ships, and aircraft operating into the warnings areas.

Garden Banks Block 197 is located within the designated Military Warning Area W-147AB. Therefore, in accordance with the requirements of the referenced stipulation, Kerr-McGee will contact the 147th Fighter Wing in order to coordinate and control the electromagnetic emissions during the proposed operations.

TOPOGRAPHIC FEATURES

Lease Stipulation No. 1 minimizes the likelihood of damage to the biota of the designated banks from routine OCS oil and gas activities. The topographic features provide habitat for coral reef community organisms. Through consultation and coordination between various Federal, State and local agencies, many such activities and their associated impacts are minimized by establishing "no activity" zone, "1000-meter zone", "1-mile zone" and "3-mile zone".

The activities proposed in this plan are within the "3-mile zone" of the Elvers Bank, thereby requiring that all drill cuttings and drilling fluids be shunted through a downpipe which terminates an appropriate distance, but no more than 10 meters from the bottom.

SPECIAL CONDITIONS

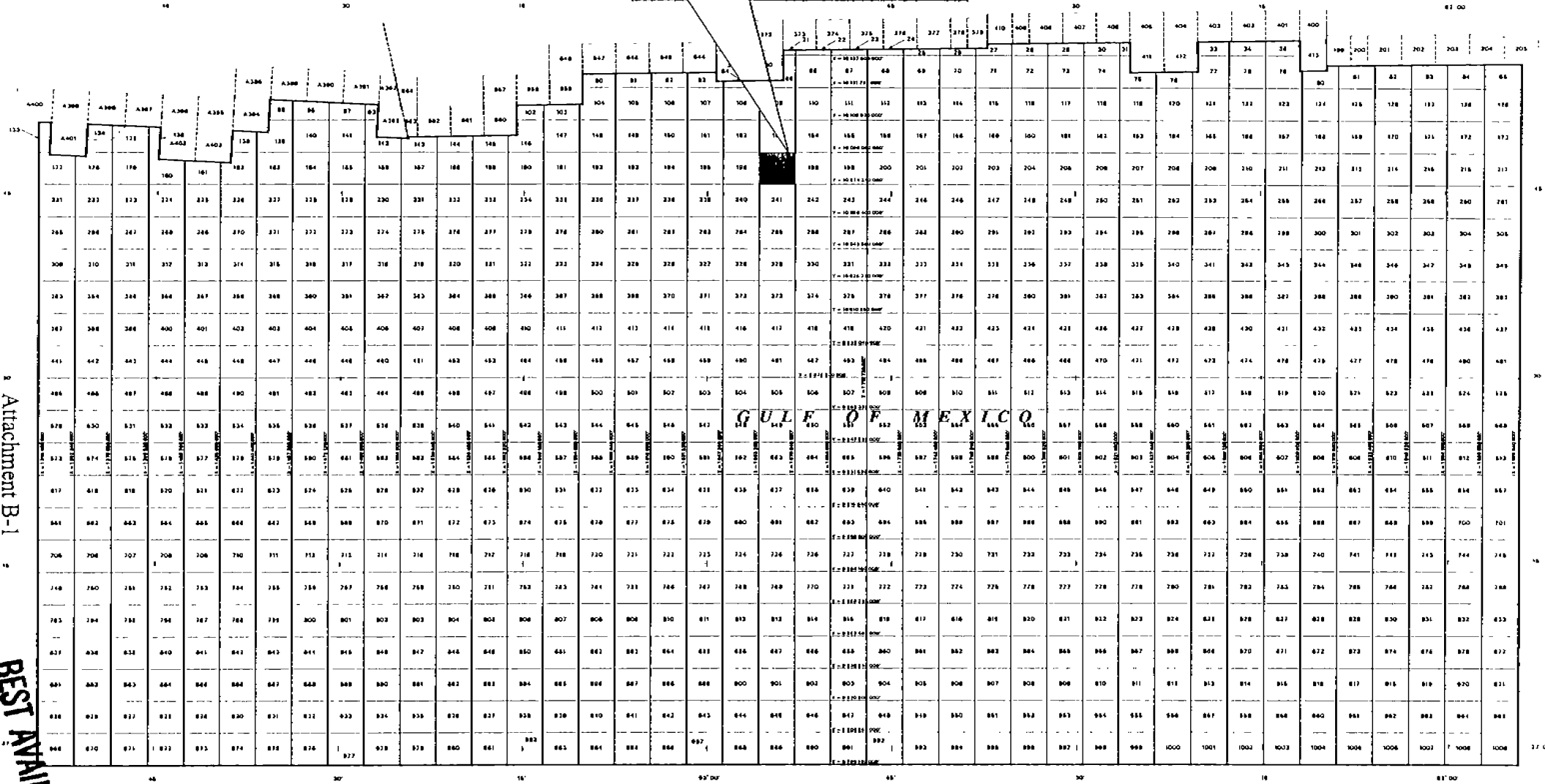
Pursuant to NTL No. 2001-G04, operators may be required to conduct remote operated vehicle (ROV) surveys during pre-spudding and post-drilling operations for the purpose of biological and physical observations.

Kerr-McGee is familiar with the ROV survey and reporting provisions of this NTL; and if required, will conduct surveys immediately prior to commencing drilling operations on Well Location A with an anticipated spud date of December 15, 2002, and following the completion of drilling operations approximately 196 days later.

Kerr-McGee will utilize a semi-submersible rig based ROV equipped with video imaging capabilities. The survey pattern will consist of six transects centered on the well location with tracks extending approximately 100 meters away from the well on bearings of 30 degrees, 90 degrees, 150 degrees, 210 degrees, 270 degrees and 330 degrees. The seafloor will be videotaped continuously along each track.


Kerr-McGee will make biological and physical observations as described in the subject NTL and Form MMS-141 prior to commencing drilling operations and also following the completion of drilling operations, but prior to moving the rig off location. The observations will be documented using Form MMS-141 or a facsimile and submitted to the MMS within 60 days after the second survey is completed.

**Garden Banks Block 197
OCS-G-19084**



Attachment B-1

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KERR MCGEE OIL & GAS CORPORATION
 16666 Northchase Dr. Houston, Texas 77060
Garden Banks Block 197
OCS-G-19084
POE
Area Map

SECTION C

*Structure Contour
Maps
Trapping Features
Depth of Geopressure
Shallow Hazards and
Interpreted Seismic
Lines
Geological Structure
Cross Section
Shallow Hazards
Report
Shallow Hazards
Analysis
High Resolution
Seismic Lines
Stratigraphic Column
Time Versus Depth
Tables
Hydrogen Sulfide*

G & G INFORMATION

STRUCTURE CONTOUR MAPS

A current structure map drawn to the top of the prospective hydrocarbon accumulation showing the surface and bottom hole locations of the subject wells is included in this section as *Attachment C-1*.

SHALLOW HAZARDS AND INTERPRETED SEISMIC LINES

Included as *Attachment C-3* is a copy of the letter being submitted under separate cover on this date depicting the high resolution geophysical shallow hazards lines, and the migrated and annotated deep seismic lines within 500 feet of the surface locations being proposed in this plan.

GEOLOGICAL STRUCTURE CROSS SECTION

Interpreted geological cross sections depicting the proposed well locations and the geologic name and age of the anticipated structure are included as *Attachments C-4 and C-5*. Such cross sections correspond to each seismic line being submitted under separate cover.

SHALLOW HAZARDS REPORT

Gardline Surveys, Inc. conducted a survey across Garden Banks Block 197 during March 2002 on behalf of Kerr-McGee. The purpose of the survey was to evaluate geologic conditions and inspect for potential hazards or constraints to lease development.

Copies of the report are being submitted to the Minerals Management Service under separate cover.

SHALLOW HAZARDS ANALYSIS

A shallow hazards analysis has been prepared for the proposed surface locations, evaluating seafloor and subsurface geologic and manmade features and conditions, and is included as *Attachment C-6*.

STRATIGRAPHIC COLUMN

Generalized biostratigraphic/lithostratigraphic columns from the seafloor to the total depth of the proposed wells are included as *Attachments C-7 through C-10*.

TIME VERSUS DEPTH TABLES

Kerr-McGee has determined that there is existing sufficient well control data for the target areas proposed in this plan; therefore, tables providing seismic time versus depth for the proposed well locations are not required.

HYDROGEN SULFIDE

In accordance with Title 30 CFR 250.417, Kerr-McGee requests that Garden Banks Block 197 be classified by the Minerals Management Service as an area where the absence of hydrogen sulfide has been confirmed.

The basis for this determination is through the evaluation of leases and wells included as *Attachment C-11*.

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October 15, 2002

Mr. Donald C. Howard
Regional Supervisor
Office of Field Operations
U.S. Department of the Interior
Minerals Management Service
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

Attention: Roger Corbeille

RE: Initial Exploration Plan for Lease OCS-G 19084, Garden Banks Block 197, OCS
Federal Waters, Gulf of Mexico, Offshore, Louisiana

Gentlemen:

Enclosed please find one (1) set of the migrated and annotated deep seismic lines and shallow hazard lines for the proposed well locations in Lease OCS-G 19084, Garden Banks Block 197.

Please be advised that Kerr-McGee Oil & Gas Corporation has submitted an Initial Exploration Plan on this date for Lease OCS-G 19084, Garden Banks Block 197 under separate cover.

Should additional information be required, please contact the undersigned, or our regulatory consultant, J. Connor Consulting, Inc., Attention: Judy Davidson at (281) 578-3388.

Sincerely,

KERR-MCGEE OIL & GAS CORPORATION

C. V. Bradford
Manager of Regulatory Affairs

CVB:JAD:tmp

BIOLOGICAL

CHEMOSYNTHETIC INFORMATION

The seafloor disturbing activities proposed in the Plan are in water depths less than 400 meters (1312 feet).

MAPS

Included as *Attachments D-1 and D-2* are the maps prepared using high resolution seismic information and/or 3-D seismic data to depict bathymetry, seafloor and shallow geological features, surface location of each proposed well, positions of anchors and chains relative to the proposed operations, and a radius circle of 500 feet around each such location.

TOPOGRAPHIC FEATURES INFORMATION

MMS and the National Marine Fisheries Service (NMFS) have entered into a programmatic consultation agreement for Essential Fish Habitat that requires that no bottom disturbing activities, including anchors or cables from a semi-submersible drilling rig, may occur within 500 feet of the no-activity zone of a topographic feature. If such proposed bottom disturbing activities are within 500 feet of a no activity zone, the MMS is required to consult with the NMFS.

Kerr-McGee is proposing to drill the proposed wells from surface locations that are located within the 3-Mile Zone of the Elvers Bank, as indicated in *Attachments D-3 and D-4*. Therefore, we will be required to shunt all drill cuttings and drilling fluids to the bottom through a downpipe, which terminates at an appropriate distance, but no more than 10 meters, from the bottom.

LIVE BOTTOM INFORMATION

Certain leases are located in areas characterized by the existence of live bottoms. Live bottom areas are defined as seagrass communities; those areas that contain biological assemblages

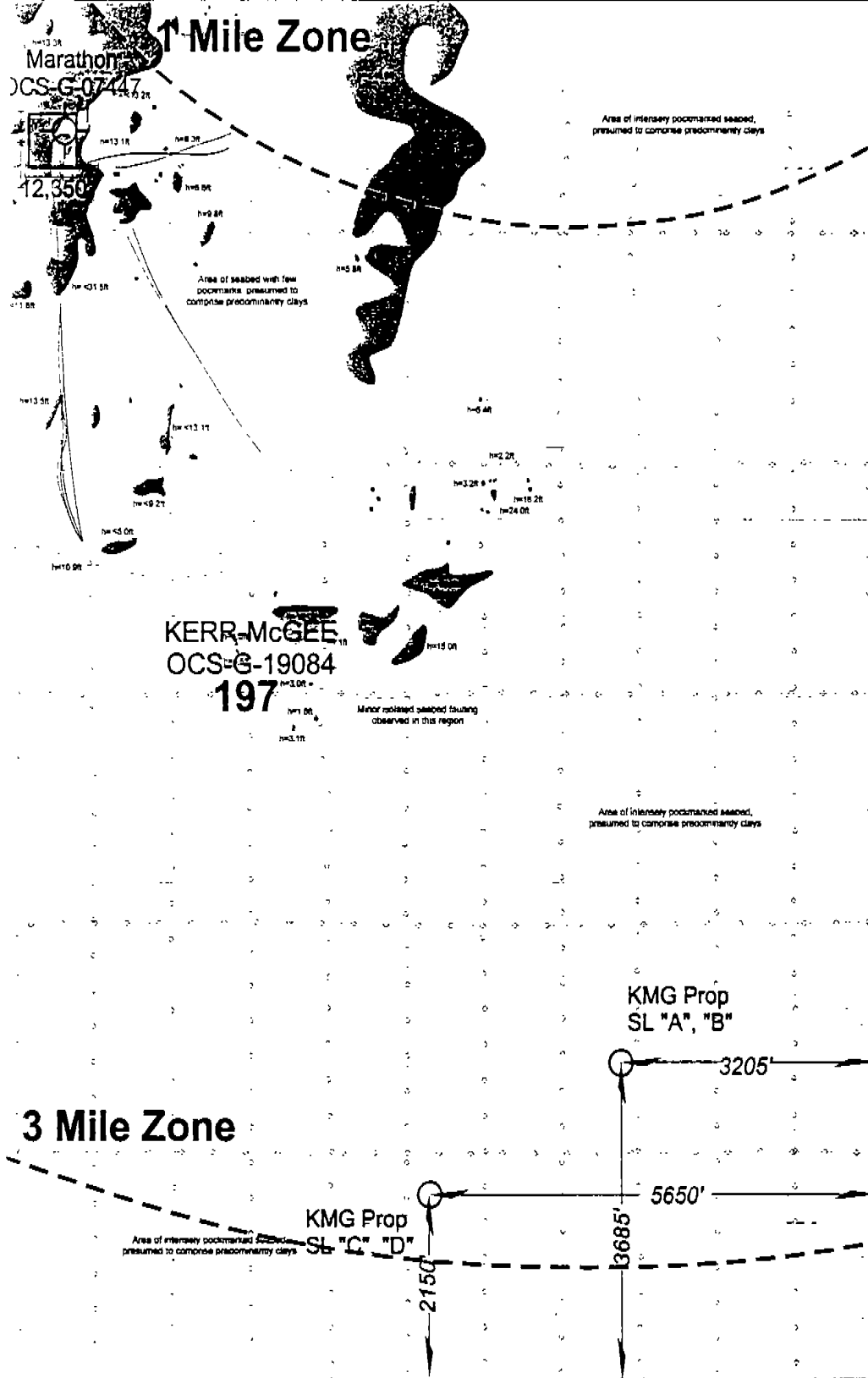
consisting of sessile invertebrates living upon and attached to naturally occurring hard or rocky formations with rough, broken, or smooth topography; and areas where the lithotope favors the accumulation of turtles, fishes, or other fauna. These leases contain a Live Bottom Stipulation to ensure that impacts from nearby oil and gas activities on these live bottom areas are mitigated to the greatest extent possible.

For each affected lease, the Live Bottom Stipulation requires that you prepare a live bottom survey report containing a bathymetry map prepared by using remote sensing techniques. This report must be submitted to the Gulf of Mexico OCS Region (GOMR) before you may conduct any drilling activities or install any structure, including lease term pipelines in accordance with NTL 99-G16.

Garden Banks Block 197 is not located within the vicinity of a live bottom area.

1 Mile Zone

Y=10,090,080



3 Mile Zone

KMG Prop SL "A", "B"

3205'

KMG Prop SL "C", "D"

5650'

2150'

3685'

241

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242

X= 1,679,040

Y= 10,074,240

Limit Surrounding Elvers Bank

Kerr KERR MCGEE OIL & GAS CORPORATION
16666 Northchase Dr. Houston, Texas 77060

Garden Banks Blocks 197 & 198
Proposed Locations "A", "B", "C" & "D"

Seabed Features

Public Document

Geology: J. Kamm
Date: 10/4/02



ATTACHMENT D-4

SECTION E

Discharges

WASTES AND DISCHARGES

DISCHARGES

All discharges associated with drilling and potentially completing and testing the subject wells will be in accordance with regulations implemented by Minerals Management Service (MMS), U. S. Coast Guard (USCG) and the U.S. Environmental Protection Agency (EPA).

The disposal of oil and gas operational wastes is managed by USEPA through regulations established under three Federal Acts. The Resource Conservation and Recovery Act (RCRA) provides a framework for the safe disposal of discarded materials, regulating the management of solid and hazardous wastes. The direct disposal of operational wastes into offshore waters is limited by USEPA under the authority of the Clean Water Act. And, when injected underground, oil and gas operational wastes are regulated by USEPA's third program, the Underground Injection Control program. If any wastes are classified as hazardous, they are to be properly transported using a uniform hazardous waste manifest, documented, and disposed at an approved hazardous waste facility.

A National Pollutant Discharge Elimination System (NPDES) permit, based on effluent limitation guidelines, is required for any discharges into offshore waters. The major discharges from offshore oil and gas exploration and production activities include produced water, drilling fluids and cuttings, ballast water, and uncontaminated seawater. Minor discharges from the offshore oil and gas industry include drilling-waste chemicals, fracturing and acidifying fluids, and well completion and workover fluids; and from production operations, deck drainage, and miscellaneous well fluids (cement, BOP fluid); and other sanitary and domestic wastes, gas and oil processing wastes, and miscellaneous discharges.

All offshore discharges associated with Kerr-McGee's proposed operations will be conducted in accordance with the NPDES permit covering the subject lease.

Kerr-McGee has requested coverage under EPA Region VI NPDES General Permit GMG290000 for discharges associated with exploration and development activities.

The types of discharges included in the permit application and the estimated average flow volumes are detailed in the attached Environmental Report.

Wastes not discharged overboard will be transported to an appropriate treatment or disposal site, in accordance with all Federal, State and Local rules and regulations.

Included as *Attachments E-1 and E-2* are the typical mud components used in the proposed activities, and the estimated quantity and rates of discharges applicable to the drilling fluids/cuttings based on hole size interval and washout.

Solid domestic wastes will be transported to shore for proper disposal at an authorized disposal site, and sewage will be treated on location by U. S. Coast Guard approved marine sanitation devices.

The major operational solid waste in the largest quantities generated from the proposed operations will be the drill cuttings, drilling and/or completion fluids. Other major wastes generated will include waste chemicals, cement wastes, sanitary and domestic waste, trash and debris, ballast water, storage displacement water, rig wash and deck drainage, hydraulic fluids, used oil, oily water and filters, and other miscellaneous minor discharges.

These wastes are generated into categories, being solid waste (trash and debris), nonhazardous oilfield waste (drilling fluids, nonhazardous waste including cement and oil filters), and hazardous wastes (waste paint or thinners).

MARPOL 73/78, implemented by the U.S. Coast Guard, requires preparation, monitoring and record keeping requirements for garbage generated on floating and fixed facilities in OCS Federal

Waters. The drilling contractor will maintain a Waste Management Plan, in addition to preparation of a Daily Garbage Log for the handling of these types of waste. MODU's are equipped with bins for temporary storage of certain garbage. Other types of waste, such as food, may be discharged overboard if the discharge can pass through 25-millimeter type mesh screen. Prior to off loading and/or overboard disposal, an entry will be made in the Daily Garbage Log stating the approximate volume, the date of action, name of the vessel, and destination point.

**DRILLING FLUID ADDITIVES
PRODUCT CROSS REFERENCE**

MILPARK	BAROID	M-I	DESCRIPTION
WEIGHT MATERIALS			
MIL-BAR	BAROID	M-I BAR	API bante, 4.2 specific gravity
DENSIMIX	BARODENSE	FER-OX	Macaceous nematite
W.O. 30	BARACARB	LO-WATE	Caicum carbonate
VISCOSIFIERS			
MILGEL	AQUAGEL	M-I GEL	API-grade Wyoming bentonite
MILGEL NT	AQUAGEL GOLD SEAL		Untreated Wyoming bentonite
SALTWATER GEL	ZEOGEL	SALT GEL	API-grade attapulgit
SUPER-COL	QUIK-GEL	KWIK-THIK	High-yield bentonite, treated
NEW-VIS			Organic polymer blend
XCD POLYMER	XCD POLYMER	XCD POLYMER	XC Dispersible
MIL-BEN	SHUR-GEL		Bentonite-OCMA Spec. DFCP4
DEFLOCCULANTS			
MIL-TEMP	THERMA-THIN DP	MELANEX-T	High-temperature deflocculant
NEW-THIN	THERMA-THIN	TACKLE (Liquid)	Polymeric deflocculant
UNI-CAL	Q-BROXIN	SPERSENE	Chrome lignosulfonate
UNI-CAL CF	Q-B II	SPERSENE CF	Chrome-free lignosulfonate
MIL-KEM	LIGNOX	RD 2000	Lime mud thinner
SAPP	SAPP	SAPP	Sodium acid pyrophosphate
OILFOS	BARAFOS	PHOS	Sodium tetraphosphate
MIL-THIN	THERMA-THIN	THIN X (Liquid)	Anionic copolymer thinner
FILTRATION CONTROL AGENTS			
BIO-LOSE			Modified polysacchande
CHEMTROL X	DURENEX	RESINEX	Polymer blend, high-temperature
FILTREX	BARANEX	RESINEX	Polyanionic lignin resin
LIGCO	CARBONOX	TANNATHIN	Lignite
LIGCON	CC-16	CAUSTILIG	Causticized lignite
MILSTARCH	IMPERMEX	MY-LO-GEL	Pregelatinized starch
NEW-TROL	POLYAC	SP-101	Sodium polyacrylate
PERMA-LOSE HT	DEXTRID	POLY-SAL	Nonfermenting starch, high-temp.
PYRO-TROL	THERMA-CHEK	POLY RX	Polymeric, high-temperature
KEM-SEAL	THERMA-CHEK		Copolymer, high-temperature
MIL-PAC	PAC R	POLYPAC	Polyanionic cellulose
MIL-PAC LV	PAC L	POLYPAC	Low-viscosity polyanionic cellulose
MILPARK CMC HV	CELLEX (High Vis)	CMC HV	Sodium carboxymethylcellulose
MILPARK CMC LV	CELLEX	CMC LV	Sodium carboxymethylcellulose
CORROSION CONTROL CHEMICALS			
MIL-GARD	NO-SULF	SULF-X	Basic zinc carbonate
MIL-GARD R	BARASCAV-L	SULF-X ES	Chelated zinc
NOXYGEN	COAT-888	OXYGEN	Oxygen scavenger
	BARACOR 113	SCAVENGER	
SCALE-BAN	SURFLO-H35	SI-1000	Scale inhibitor
	BARACOR 129		
AMI-TEC	BARA FILM	CONQOR 202	Film-forming amine
	BARACOR 300	CONQOR 101	
	COAT-B1400	CONQOR 303	
	COAT-C1815		
CARBO-DRILL OIL MUD ADDITIVES			
CARBO-MUL	INVERMUL NT	VERSAWET	Emulsifier (and wetting agent) primarily
	VERSACOAT		
CARBO-MUL HT	EZ MUL NT		High-temperature emulsifier and wetting agent
CARBO-TEC	INVERMUL	VERSAMUL	Emulsifier
CARBO-GEL	GELTONE II	VERSAGEL	Organophilic clay nectonte
CARBO-VIS	GELTONE II	VERSAMOD	Organophilic clay
CARBO-TROL		VERSATROL	Filtration control agent
CARBO-TROL A-9	DURATONE HT	VERSALIG	Nonasphatic filtration control, high-temperature
SURF-COTE	DRILTREAT or OMC	VERSAWET	Oil wetting agent for oil muds
CARBO-MIX	DRILTREAT		Nonionic emulsifier, high-activity
CARBO-TEC HW			HW oil mud emulsifier

**DRILLING FLUID ADDITIVES
PRODUCT CROSS REFERENCE**

MILPARK	BAROID	M-I	DESCRIPTION
SHALE CONTROL ADDITIVES			
ALPLEX			Aluminum complex
BIO-DRILL 1402			Oil mud alternative
NEW-DRILL	EZ MUD	POLY-PLUS	PHPA liquid
NEW-DRILL HP			Powdered PHPA
NEW-DRILL PLUS	EZ MUD OP		Powdered PHPA
SHALE-BOND	SHALE-BAN	HOLECOAT	Resinous shale stabilizer
PROTECTOMAGIC			Oil-soluble blown asphalt
PROTECTOMAGIC M	AK-70	STABIL-HOLE	Water-dispersants. Blown asphalt
SPOTTING FLUIDS			
BLACK MAGIC			Oil-base spotting fluid
BLACK MAGIC LT	EX SPOT		Low toxicity oil-base spotting fluid
BLACK MAGIC SFT		OIL-FAZE	Oil-base spotting fluid concentrate
MIL-FREE	SCOT-FREE/ ENVIRO-SPOT	PIPE-LAX	Liquid spotting fluid
BIO-SPOT	ENVIRO-SPOT		Nontoxic water-base spotting fluid
BIO-SPOT II			Nontoxic water-base spotting fluid
MIL-SPOT 2	SCOT-FREE	PIPE-LAX W	Weighted (oil-base) spotting fluid concentrate
LUBRICANTS			
AQUA-MAGIC			Low-toxicity lubricant
LUBRI-FILM	EP MUDLUBE	E.P LUBE	Extreme-pressure lubricant
MIL-LUBE		LUBE-106	General lubricant
DETERGENTS/FOAMERS			
AMPLI-FOAM	DRILFOAM	FOAMER 80	Mist and stiff foaming agent
MIL CLEAN	BAROID RIG WASH BARA-KLEAN	KLEEN-UP	Biodegradable detergent
MILPARK MD	CON-DET	DD	Drilling detergent
DEFOAMING AGENTS			
LD-8	BARA DEFOAM	DEFOAM-X	Hydrocarbon-base defoamer
W.O. DEFOAM	BARA BRINE DEFOAM	DEFOAM-A	Alcohol-base, saltwater muds
ALUMINUM STEARATE	Aluminum Stearate	Aluminum Stearate	Aluminum Stearate
LOST-CIRCULATION MATERIALS			
CHEK-LOSS			Seepage loss control differential sticking preventative
MIL-CEDAR FIBER	PLUG-GIT	M-I CEDAR FIBER	Cedar fiber
MIL-FIBER	FIBERTEX	M-I FIBER	Fiber blend
MILFLAKE	JELFLAKE	FLAKE	Shredded cellophane flake
MILMICA	MICATEX	MICA	(Muscovite) mica graded
MIL-PLUG		NUT PLUG	Ground pecan shells
MIL-SEAL	BARO-SEAL	KWIK SEAL	Blended lost-circulation material
COTTONSEED HULLS	Cottonseed Hulls	Cottonseed Hulls	Cottonseed Hulls
PAPER			Ground paper
WALNUT SHELLS	WALL-NUT		Ground walnut shells
MAGNE-SET			Acid-soluble cement
WORKOVER AND COMPLETION FLUID ADDITIVES			
MUD-PAC	COAT-44 & 45	CONQOR 404 X-CORE	Corrosion (packer fluid) inhibitor
BRINE-PAC	BARACOR-A		Corrosion inhibitor clean brine fluids
W.O. 21L	LIQUI-VIS	VIS-L	Liquid HEC polymer
PRESERVATIVES			
DRYOCIDE			Dry (biodegradable) biocide
X-CIDE 207	BARA B466	BACBAN II & III	Biocide

X-CIDE 207 is a registered trademark of Petrotite Corporation.
 DRYOCIDE is a registered trademark of Nalco Chemical Company
 XCD (in XCD POLYMER) is a registered trademark of Marck & Co., Inc.
 OILFOS is a registered trademark of Monsanto Company.

SECTION F

**Oil Spill Response
Chemical Response**

OIL SPILL RESPONSE AND CHEMICAL

Kerr-McGee Oil & Gas Corporation is the only entity covered in their Regional Oil Spill Response Plan (OSRP) approved on January 31, 2000, with an update on January 30, 2002. Activities proposed in this Exploration Plan will be covered by the Regional OSRP.

Kerr-McGee' primary equipment provider is Clean Gulf Associates (CGA). The Marine Spill Response Corporation's (MSRC) STARS network will provide closest available personnel, as well as an MSRC supervisor to operate the equipment.

In the event of a spill, mechanical response equipment located in CGA's bases located in Houma would be transported to a staging area in Fourchon, Louisiana.

Category	Regional OSRP WCD	EP WCD
Type of Activity (1)	Production	Drilling
Spill Location (Area/Block)	EB 602	GB 197
Facility Designation (2)	Platform A	Semi-Submersible
Distance to Nearest Shoreline (miles)	175	125
Volume (3)	13,771 bbls	1600 bbls
Type of Oil (crude, condensate, diesel)	Crude Oil	Condensate
API Gravity (4)	28°	46°

Since the proposed exploratory operations are temporary and speculative in nature, Kerr-McGee will not modify their Regional OSRP to change the worst-case discharge.

Since Kerr-McGee has the capability to respond to the WCD spill scenario included in its Regional OSRP approved on January 31, 2000, with an update on January 30, 2002, and since the WCD scenario determined for our EP does not replace the WCD scenario in our Regional OSRP, I hereby certify that Kerr-McGee has the capability to respond, to the maximum extent practicable, to a WCD resulting from the activities proposed in our EP.

SECTION G

***Air Emissions
Information***

AIR EMISSIONS

AIR EMISSIONS INFORMATION

Offshore air emissions related to the proposed activities result mainly from the drilling rig operations, helicopters and service vessels. These emissions occur mainly from combustion or burning of fuels and natural gas and from venting or evaporation of hydrocarbons. The combustion of fuels occurs primarily on diesel-powered generators, pumps or motors and from lighter fuel motors. Other air emissions can result from catastrophic events such as oil spills or blowouts.

Primary air pollutants associated with OCS activities are nitrogen oxides, carbon monoxide, sulphur oxides, volatile organic compound, and suspended particulate.

Included as *Attachment G-1* is the Projected Air Quality Emissions Report prepared in accordance with Appendix H of that certain Notice to Lessees (No. 2000-G21) addressing drilling and potential completion operations.

**EXPLORATION PLAN (EP)
AIR QUALITY SCREENING CHECKLIST**

OMB Control No. XXX-XXX
Expiration Date: Pending

COMPANY	KERR-MCGEE OIL & GAS CORPORATION
AREA	GARDEN BANKS
BLOCK	197
LEASE	OCS-G 19084
PLATFORM	
WELL	A, B, C, D
COMPANY CONTACT	JUDY DAVIDSON
TELEPHONE NO.	(281) 578-3388
REMARKS	DRILL AND COMPLETE FOUR EXPLORATORY WELLS.

"Yes"	"No"	Air Quality Screening Questions
	X	1. Are the proposed activities east of 87.5° W latitude?
	X	2. Are H ₂ S concentrations greater than 20 ppm expected?
	X	3. Is gas flaring proposed for greater than 48 continuous hours per well?
	X	4. Is produced liquid burning proposed?
	X	5. Is the exploratory activity within 25 miles of shore?
	X	6. Are semi-submersible activities involved and is the facility within 50 miles of shore?
	X	7. Are drillship operations involved and is the facility within 120 miles of shore?
	X	8. Will the exploratory activity be collocated (same surface location) on a production facility?

If ALL questions are answered "No":

Submit only this coversheet with your plan; a full set of spreadsheets is not needed.

If ANY of questions 1 through 7 is answered "Yes":

Prepare and submit a full set of EP spreadsheets with your plan.

If question number 8 is answered "Yes":

Prepare and submit a full set of DOCD spreadsheets showing the cumulative emissions from both the proposed activities and the existing production platform.

SECTION H

***Environmental
Report***

ENVIRONMENTAL

ENVIRONMENTAL REPORT

Included in this section as *Attachment H-1* is the Environmental Report prepared in accordance with Appendix H of that certain Notice to Lessees (NTL 2000-G21).

KERR-MCGEE OIL & GAS CORPORATION

ENVIRONMENTAL REPORT

FOR PROPOSED

INITIAL EXPLORATION PLAN

GARDEN BANKS BLOCK 197

WILDCAT FIELD

LEASE OCS-G 19084

OFFSHORE, LOUISIANA

Prepared by:

J. Connor Consulting, Inc.
16225 Park Ten Place, Suite 700
Houston, TX 77084
(281) 578-3388

October 14, 2002

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II. DESCRIPTION OF PROPOSED ACTION

Kerr-McGee Oil & Gas Corporation (Kerr-McGee) proposes to drill and potentially complete four (4) exploratory wells in Garden Banks Block 197.

At this time, the planned commencement date for proposed activities is December 15, 2002.

A. PROPOSED TRAVEL MODES, ROUTES AND FREQUENCY

Support vessels will be dispatched from a support base located in Fourchon, Louisiana. The boats will normally move to the block via the most direct route from Fourchon, Louisiana, however, boats operating in the field may travel from other facilities nearby. Following is an estimate of trips to the proposed operation.

Drilling/Completion

Crew Boat	7 Trips Per Week
Supply Boat	3 Trips Per Week
Helicopter	3 Trips Per Week

B. ONSHORE SUPPORT BASE

The proposed activities will utilize a support base located at Fourchon, Louisiana. This base provides 24-hour service, a radio tower with phone patch, dock space, office space, parking lot, equipment and supply storage space, drinking and drill water, etc. The proposed exploratory activities will help to maintain this base at its present level of activity. No expansion of the physical facilities or the creation of new jobs is expected to result from the work planned in conjunction with this block.

The first socioeconomic data base report will be submitted when the MMS and the States of Alabama, Louisiana, and Mississippi identify the specific parameters to be addressed in these semi-annual reports.

Vessels currently under charter to Kerr-McGee are expected to support the proposed operations. No additional manpower is anticipated.

It is estimated that additional employees will be required for supply boat, crew boat and standby operations. The vessel crews will not require local housing as they will usually live on their respective vessels while working in the area and will return to their residence upon completion of each tour of duty. Some deck hands may be hired from the local labor pool. Some of the service firm employees may be hired locally. Most of these employees will return to their places of residence on their days off.

C. *NEW ONSHORE CONSTRUCTION OR EXPANSION OF SUPPORT FACILITIES*

The proposed operations do not mandate any immediate measures for land acquisition or expansion of the existing onshore base facilities.

Dredging and filling operations will not be required for the operations, nor will any new construction or expansion of onshore facilities be involved for the operations proposed in the Initial Exploration Plan.

D. *New Techniques or Unusual Technology*

No new techniques or unusual technology will be required for these operations.

E. *MAPS*

Field Layout Drawings depicting the location of the proposed wells are included in the proposed Initial Exploration Plan.

III. *DESCRIPTION OF AND IMPACTS TO THE AFFECTED ENVIRONMENT*

A. *PHYSICAL ENVIRONMENT*

1. *Commercial Fishing*

The Gulf of Mexico provides nearly 20% of the commercial fish landings in the continental United States. During 1995, commercial landings of all fisheries in the Gulf totaled nearly 1490 million pounds valued at about \$787 million.

Fishery Management Plans (FMP's) are developed by the Gulf of Mexico Fishery Management Council (GMFMC) to assess and manage commercial species of fish that are harvested from Federal waters and in need of conservation. Since 1981, nine FMP's have been implemented for the following species in the Gulf of Mexico: (1) shrimp, (2) stony crab, (3) spiny lobster, (4) coastal pelagics, (5) coral, (6) reef fish (7) swordfish, (8) red drum, and (9) sharks.

The GOM shrimp fishery is the most valuable in the United States accounting for 71.5 percent of the total domestic production (USDOC, NMFS, 1996). Three species of shrimp "brown, white, and pink" dominate the landings.

The major concern of the stone crab fishery is whether harvest has reached or exceeded maximum sustainable yield. The total harvest has declined steadily over the past several years. The GMFMC is considering limitations on the number of fishermen and traps in the stone crab fishery.

Spiny lobster is practiced exclusively in the Eastern GOM. Mortality of spiny lobster is high due to the large number of undersized lobsters used to bait lobster fishing traps and the number of traps in the fishery exceed by far the number required to harvest the present yield. The GMFMC is considering limitations on the number of fishermen and traps in the spiny lobster fishery.

The coastal pelagic FMP addresses a number of species. Two of the more important species are king and Spanish mackerel. Both species have been extensively over fished and are now under a managed rebuilding program.

The taking of stony corals and gorgonian sea fans is prohibited. Fishing for soft coral is presently below the limits of maximum yield. There is significant concern that butterfly trawlers allegedly destroy coral reef habitat and take a large number of snappers and groupers as by-catch.

Red snapper resources in the GOM are believed to be severely over fished from both directed and by-catch fisheries. Red snapper is the most important species in the reef complex managed under a FMP in terms of value and historical landings.

Commercial landings of swordfish have increased steadily over the past several years. The percentage of older fish and spawning biomass has declined significantly.

The red drum fishery was closed to all harvest in Federal waters of the GOM on January 1, 1988. Stock assessment concluded that red drum were heavily fished prior to moving offshore to spawn and that those fish less than 12 years of age were poorly represented in the offshore spawning population.

A strong market for shark has resulted in soaring catches over the past several years. Shark stocks are unable to sustain the present heavy fishing pressure, and without management, the fishery is expected to collapse in the near future.

Blue marlin and white marlin are believed to be at or near the point of full exploitation. There is concern about the increasing mortality of marlin as by-catch associated with the escalating yellow fin tuna long-

line fishery (Sports Fishing Institute, 1989b). The tuna fishing industry has expanded at an alarming rate in the GOM over the past five years.

The present concern with the condition of the black drum fishery stems directly from the closure of the red drum fishery. Almost immediately after closure, black drum were accepted as a substitute for red drum with the commercial market. As a result, stocks of black drum are believed to be fast approaching a seriously depleted condition.

As issues and potential problems from OCS development arise, MMS, NMFS and GMFMC coordinate on all aspects of fishery management and conservation.

Impacts on Commercial Fishing

Effects on commercial fisheries from activities associated with the proposed action could come from coastal environmental degradation, emplacement of production platforms, underwater OCS obstructions, production platform removals, seismic surveys, oil spills, subsurface blowouts, pipeline trenching, and offshore discharges of drilling fluids and produced waters.

Since approximately 92 percent of commercially harvested species are estuary dependent, coastal environmental degradation resulting from the proposed action, although indirect, has the potential to adversely affect commercial fisheries. The environmental deterioration and effects on commercial fisheries result from the loss of Gulf wetlands as nursery habitat and from the functional impairment of existing habitat through decreased water quality (Chambers, 1992; Stroud, 1992). The conversion of wetlands into open water may initially cause an appreciable increase called the "edge effect" in the population of a commercially harvested shellfish, such as shrimp (Keithly and Baron-Mounce, 1993; Louisiana Dept. Of Wildlife and Fisheries, 1992).

The major impact-producing factors are related to the proposed action and include coastal environmental degradation, production platform emplacement, underwater OCS obstructions, production platform removal, seismic surveys, oil spills, subsurface blowouts, pipeline trenching and OCS discharge of drilling fluids and produced waters.

Wetlands and estuaries may be affected by OCS-related activities resulting from the proposed action including construction of new onshore facilities in wetland areas; pipeline placement in wetland areas; vessel usage of navigation channels and access canals; maintenance of navigation channels; inshore disposal of OCS-

generated, oil-field wastes and oil and chemical spills from both coastal and offshore OCS-support activities.

Water quality in coastal estuarine areas adjacent to the central planning area may be altered by OCS-related activities resulting from activities including construction of new onshore support facilities; routine point and non point-source discharges from inshore facilities; discharges from associated support vessel traffic; canal maintenance dredging and pipeline emplacement actions; inshore disposal of OCS-generated, oil-field wastes; oil and chemical spills from both coastal and offshore OCS support activities; and OCS-related trash and debris.

The emplacement of production platform, with a surrounding 100-m navigation safety zone, in water depths less the 1252 m, results in the loss of approximately 6 ha of bottom trawling area to commercial fishermen and causes space-use conflicts. Underwater OCS obstructions, such as pipeline, cause gear conflicts that result in losses of trawls and shrimp catch, business downtime, and vessel damage. Although Gulf fishermen are experiencing some economic loss from gear conflicts, the economic loss fro a fiscal year has historically been less the 0.1 percent of the values of that same fiscal year's commercial fisheries landing. In addition, most financial losses from gear conflicts are covered by the Fishermen's Contingency Fund (FCF).

Lessees are required to remove all structures and underwater obstructions from their leases in the Federal OCS within one year of the lease relinquishment or termination of production. Approximately 123 and 118 structures were removed from the GOM in 1994 and 1995, respectively. Seventy percent of multi-leg platform in waters depths less than 156 m are removed by severing their pilings with explosives place 5 m below the seafloor. The concessive force is lethal to fish that have internal air chambers (swim bladders), are demersal, and are in close proximity to the platform being removed (Scarborough-Bull and Kendall, 1992; Young, 1991). Preliminary information suggests that less than 1 percent of the annual harvest of red snapper from the GOM can be attributed to explosive platform removals.

Air guns generate the acoustical pulses used in seismic surveys. Air guns have little effect on even the most sensitive fish eggs at distances of 5 m from the discharge (Chamberlain, 1991; Falk and Lawrence, 1973). Available scientific information concerning the effects of acoustic air gun sources on fish eggs and larvae indicates that commercial fishery resources are little disturbed by seismic surveys.

BEST AVAILABLE COPY

The most significant potential effects on commercial fisheries would come from an accidental hydrocarbon release. The direct effects of spilled oil on fish occur through the ingestion of oil or oiled prey, through the uptake of dissolved petroleum products through the gill and epithelium by adults and juveniles, and through death of eggs and decreased survival of larvae (NRC, 1985). Upon exposure to spilled oil, liver enzymes of fish oxidize soluble hydrocarbons into compounds that are easily excreted in urine (Spies et al.1982).

The effects on and the extent of damage from an oil spill to Gulf commercial fisheries is restricted by time and location. Oil spills that contact coastal bays, estuaries, and waters of the Gulf when pelagic eggs and larvae are present have the greatest potential to affect commercial fishery resources. Migratory species, such as mackerel, cobia, and crevalle could be impacted if oil spills contact near shore open waters. An oil spill contacting a low-energy inshore area would affect localized populations of commercial fishery resources such as menhaden, shrimp and blue crabs. Chronic oiling in an inshore area would affect all life stages of a localized population of sessile fishery resource such as oysters.

For OCS-related oil spills to have an effect on a commercial fishery resource, whether estuary dependent or not, eggs and larvae would have to be abnormally concentrated in the immediate spill area. Oil components also would have to be present in highly toxic concentrations when both eggs and larvae are in the pelagic stage (Longwell, 1977). There is no evidence at this time that commercial fisheries in the Gulf have been adversely affected on a regional population level by spills or chronic oiling.

Benthic disturbance from subsurface blowouts of both oil and natural gas wells in waters depths less than 152 m and trenching (burial) of pipelines in water depths less than 61 m may be detrimental to commercial fisheries. Trenching and blowouts can re-suspend sediments, and the loss of oil well control can release varying amounts of hydrocarbons into the water column (USDOJ, MMS, 1987c). Re-suspended sediments may clog gill epithelia of both finfish and shellfish with resultant smothering. Settlement of re-suspended sediments may directly smother invertebrates or cover borrows of commercially important shellfish. However, sandy sediments are quickly re-deposited within 400 m of the blowout site. Finer sediments are widely dispersed and re-deposited over a period of 30 days or longer within a few thousand meters. Released hydrocarbons are diluted to background levels within a few thousand meters of the blowout site and degrade quickly without major biological effect. Gas-well blowouts are even less of an environmental risk, resulting in little re-suspended sediments and increased levels of natural gas for a

few days very near the source of the blowout. Natural gas consists mainly of nontoxic methane, which rapidly disperses into the air (Van Buren, 1984). Loss of well control and resultant subsurface blowouts seldom occur on the GOM OCS. Only 0.6 percent of all wells experience an uncontrolled loss of pressure and no more than 23 percent of those results in the release of some oil (Fleury, 1983).

Drilling fluids contain materials toxic to commercial fishery resources; however, the plume disperses rapidly and is usually undetectable at distances greater than 1,000 m. No effects beyond 100 m are expected. In addition to toxic trace elements and hydrocarbons in produced water, there are additional components and properties, such as hypersalinity and organic acids, which have a potential to affect commercial fishery resources adversely. Produced waters that are discharged offshore are diluted, dispersed, and undetectable at a distance of 1,000 m from the discharge point, and no detectable effects on water column organisms are encountered (Harper, 1986; Rabalais et al., 1991).

2. *Shipping*

The Ports and Waterways Safety Act (Section 33 USC 1223) authorizes the Coast Guard (USCG) to designate safety fairways, fairway anchorages, and traffic separation schemes (TSS's) to provide unobstructed approaches through oilfields for vessels using Gulf of Mexico ports. The USCG provides listings of designated fairways, anchorages, and TSS' in Title 33 CFR Parts 166 and 167, along with special conditions related to oil and gas production in the Gulf of Mexico. In general, no fixed structures, such as platforms, are allowed in fairways. Temporary underwater obstacles, such as anchors and attendant cables or chains attached to floating or semi-submersible drilling rigs may only be placed in a fairway under certain conditions. Fixed structures may be placed in anchorage areas, but the number of structures is limited.

A traffic separation scheme is a designated routing measure that is aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes (33 CFR 167.5). The Galveston Bay approach traffic separation scheme and precautionary areas is the only TSS established in the Gulf of Mexico.

Fairways play an important role in the avoidance of collisions on the OCS, particularly in the case of the larger oceangoing vessels, but not all vessels stay within the fairways. Many others, such as fishing boats and OCS support vessels, travel through areas with high concentration of fixed structures. In such cases the most important mitigation factor is the requirement for adequate marking and

lighting of structures. After a structure has been in place for a while, it often becomes a landmark and an aid to navigation for vessels that operate in the area on a regular basis. Most ocean going vessels are equipped with radar capable of aiding navigation in all weather conditions. This has contributed to safe navigation on the OCS.

The rig and each marine vessels servicing these operations will be equipped with all U.S. Coast Guard required navigational safety aids to alert ships of its presence in all weather conditions.

The proposed operations in Garden Banks Block 197 are clear of any designated shipping fairways and anchorage areas.

Impacts on Navigation

Kerr-McGee will utilize a supply boat, crew boat and helicopter to support the proposed drilling and completion operations. Vessels will use the most practical, direct routes to the site from the shore base. This minimal vessel traffic is insignificant when compared with the marine traffic in the Fourchon, Louisiana.

3. *Recreation/Tourism*

The northern Gulf of Mexico coastal zone is one of the major recreational regions of the United States, particularly for marine fishing and beach activities. Gulf Coast shorelines offer a diversity of natural and developed landscapes and seascapes. Major recreational resources include publicly owned and administered areas, such as national seashores, parks, beaches, and wildlife lands, as well as designated preservation areas, such as national seashores, parks, beaches, and wildlife lands, as well as designated preservation areas, such as historic and natural sites land landmarks, wilderness areas, wildlife sanctuaries, and scenic rivers. Gulf Coast residents and tourists from throughout the nation, as well as from foreign countries, use these resources extensively and intensively for recreational activity. Commercial and private recreational facilities and establishments, such as resorts, marinas, amusement parks, and ornamental gardens, also serve as primary-interest areas.

The Gulf States from Texas to Alabama account for about 1.3 million registered motorboats and over 3.5 million paid fishing license holders. The two major recreational areas most directly associated with the offshore leasing and potentially affected by it are the offshore marine environment and the coastal shorefront of the adjoining states. The major recreational activity occurring on the OCS is offshore marine recreational fishing and diving. Studies, reports, and conference proceedings published by MMS and others have

documented a substantial recreational fishery, including scuba diving, directly associated with oil and gas production platforms. The recreational fishing associated with oil and gas structures stems from their function as high profile artificial fishing reefs. The NMFS Marine Recreational Fisheries Statistics Survey for the Gulf and Atlantic Coasts (USDOC, NMFS, 1990a) and a special report by Schmied and Burgess (1987) indicates there are about 4 million resident participants in marine recreational fishing and over 2 million tourists who angle for Gulf marine species. According to NMFS, over 40 percent of the nation's marine recreational fishing catch comes from the Gulf of Mexico, and marine anglers in the Gulf made over 15 million fishing trips in 1991, exclusive of Texas.

These parks, reserves, and recreational areas provide recreational and sporting opportunities for residents and visitors to the area. Recreational fishing is important to the GOM coastal residents, visitors and economy.

Impacts on Recreation/Tourism

Even though existing regulations and orders prohibit littering of the marine environment with trash, offshore oil and gas operations involving men, machines, equipment and supplies may result in some littering of the ocean. Accidents associated with offshore operations can contribute some floatable debris to the ocean environment; this debris may eventually come ashore on major recreational beaches. Accidents can lead to oil spills, which are difficult to contain in the ocean; therefore, it may be unavoidable that some recreational beaches become temporarily soiled by weathered crude oil.

The primary impact producing factors associated with offshore oil and gas exploration and development, and most widely recognized as major threats to the enjoyment and use of recreational beaches, are oil spills and trash and debris. Additional factors such as the physical presence of platforms and drilling rigs can affect the aesthetics of beach appreciation, and noise from OCS-related aircraft can adversely affect a beach-related recreation experience. All of these factors, either individually or collectively, may adversely affect the number and value of recreational beach visits.

The proposed operations are located approximately 125 miles offshore and are temporary in nature. Aesthetic impacts are therefore not expected to be significant. Impacts to recreational fisheries are also expected to be insignificant due to both distance from shore and the temporary nature of the activities.

In the unlikely event of a diesel spill with land contact occurring, differential effects on recreation and tourism would be expected. These differential effects would relate to (1) the amount of beach which was impacted, (2) the duration of the cleanup efforts, and (3) the season in which the spill occurred.

4. *Archaeological Resources*

Archaeological resources are any prehistoric or historic site, building, structure, object, or feature that is manmade or modified by human activity. Significant archaeological resources are defined in 36 CFR 800, Section 60.6. The MMS has previously contacted the State Historic Preservation Officers for all Gulf Coast States and requested them to provide a list of that National Register of Historic Places that are in their State's coastal zones and that could potentially be affected by OCS leasing activities.

With the exception of the Ship Shoal Lighthouse, historic archaeological resources on the OCS consist of shipwrecks. A 1977 MMS archaeological resource baseline study for the northern Gulf of Mexico indicated that 2 percent of the pre-20th century shipwrecks and 10 percent of all wrecks reported lost between 1500 and 1945 have known and/or verified locations (CEI, 1977). Management of this resource was accomplished by establishing a high-probability zone for the occurrence of historic shipwrecks. Using geographic and cultural factors as indicators of high shipwreck potential delineated this zone. An MMS-funded study by Texas A&M University (Garrison et al, 1989) updated the shipwreck database. Statistical analysis of over 4,000 potential shipwrecks in the northern Gulf indicated that many of the OCS shipwrecks occur in clustered patterns related mainly to navigation hazards and port entrances.

Remote sensing surveys required by MMS have recorded evidence of approximately 69 potential shipwrecks. Most have been identified on side-scan sonar. In addition, defined areas of clustered magnetic anomalies (reminiscent of magnetic patterns associated with buried historic shipwrecks) have been noted and recommended for avoidance.

Geomorphic features that have a high probability for associated prehistoric sites in the Central and Western Gulf include barrier islands and back-barrier embayments, river channels and associated floodplains and terraces, and salt dome features. Recent investigations in Louisiana and Florida indicate that mound building activity by prehistoric inhabitants may have occurred as early as 6200 B.P. Therefore, man-made features, such as mounds, may also exist in the shallow inundated portions of the OCS.

There is no evidence for early mound building in the Western Gulf. The western portion of the WPA contains Holocene deltaic deposits of the Colorado and Brazos Rivers. Lease-block surveys have recorded geomorphic features with a high probability for the occurrence of preservation of prehistoric archaeological sites.

Regional geological mapping studies by MMS allow interpretations of specific geomorphic features and assessments of archaeological potential in terms of age, the type of system the geomorphic features also be considered as an integral part of the predictive model. In general, sites protected by sediment overburden have a high probability for preservation from the destructive effects of marine transgression. The same holds true for sites submerged in areas subjected to low wave energy and for sites on relatively steep shelves during periods of rapid rise in sea level. Though lease-block surveys have identified many specific areas in the Gulf as having a high potential for prehistoric sites, oil and gas exploratory has generally avoided rather than investigated these high-probability areas for archaeological content.

Garden Banks Block 197 is not located within a high probability area for prehistoric cultural resources; therefore an Archaeological Report is not required.

Impacts on Archaeological Resources

A high-resolution geophysical hazard survey was conducted across all of Block 197, Garden Banks Area by Gardline Surveys, Inc. in March 2002.

It is possible that shipwreck remains may exist within the area that may not be recorded by the geophysical instrumentation. If any wooden planking or other cultural materials that could represent shipwreck remains are encountered during the proposed exploratory, the USDI MMS archaeologists should be contacted to provide an assessment of these artifacts.

Should cultural resources be encountered, the operator is required to report such to the Regional Director, MMS, and makes every reasonable effort to preserve and protect that resource.

5. *Ecologically Sensitive Features*

Coastal barriers of the Western and Central Gulf Coast consist of relatively low landmasses that can be divided into several interrelated environments. The beach consists of the foreshore and backshore. The non-vegetated foreshore slopes up from the ocean to the beach

berm-crest. The backshore may occasionally be absent due to storm activity. If present, the backshore is found between the beach berm-crest and the dunes and may be sparsely vegetated. The dune zone of the barrier landform can consist of a single dune ridge, several parallel dunes ridges, or a number of curving dune lines that are stabilized by vegetation. These elongated, narrow landforms are composed of sand and other unconsolidated, predominantly coarse sediments that have been transported and deposited by waves, currents, storm surges, and winds.

When Gulf water levels are elevated by storms, water will over-wash a coastal barrier. This action will create over-wash fans or terraces behind and between the dunes. With time, these terraces will be vegetated by opportunistic species. Along more stable barriers, the area behind the dunes consists of broad flats that support scrubby woody vegetation. Saline or freshwater ponds may be found among the dunes or on the landward flats. Landward, these flats may grade into wetlands and intertidal mud flats that fringe the shore of lagoons, islands, and embayments. In areas where no bay or lagoon separates barrier landforms from the mainland, the barrier vegetation grades into scrub or forest habitat of the mainland.

Habitats found among the coastal barrier landforms provide a variety of niches that support many avian, terrestrial, aquatic and amphibian species, some of which are endangered or threatened.

Habitat stability is primarily dependent upon rates of geodynamic change for each coastal area. The major sources of pressure causing barrier landforms to change along the Gulf coast are storms, subsidence, delta abandonment, deltaic sedimentation, and human activity. Configurations of barrier landforms continually adjust in response to prevailing or changing environmental conditions. Landform changes can be seasonal and cyclical, such as seen with the transitional movement of sand onshore during the summer and offshore during the winter, due to seasonal wave energy differences.

Accumulations and movements of the sediments that make up barrier landforms are often described in terms of transgressive and regressive sequences. Transgressions and regressions are related to local relative sea-level change and rates of sedimentation and erosion. A transgressive sequence is one in which the shore moves landward and marine deposits form on terrestrial sediments. In contrast, a regressive sequence is one in which terrestrial sediments is deposited over marine deposits as the land builds out into the sea. Both transgressive and regressive barriers occur in the Central and Western Gulf of Mexico. Transgressive coastal landforms have a predominantly low-profile morphology. These barriers are

characterized by narrow widths; low, sparsely vegetated and discontinuous dunes; and numerous, closely spaced, active wash-over channels. Transgressive barriers are usually being actively eroded. Landward retreat of a shoreline may be caused by subsidence, sea-level rise, storm erosion, or removal of sediment from the long-shore drift by channels, groin, or jetties. The passage and intensity of cold fronts and tropical storms do not occur at a steady rate. Hence, coastal retreat is not a steady process.

Regressive barriers, in contrast, have high and broad dune morphologies. Such sand dunes are continuous and well vegetated with few, if any, wash-over channels. These thick accumulations of sand form parallel accretion ridges. Seaward advance of a shoreline may be caused by geologic uplift of deltaic land-building processes, which transport sediments into coastal waters where they are deposited.

Interruptions of long-shore sediment transport will cause a localized accumulation of sediments on the up-drift side of the obstruction, causing an accretion and seaward building of the shoreline. Because sediments down-drift of the interruption do not stop moving and new sediment is prevented from adequately replacing this departing sediment, interruptions of sediment drift cause or accelerate shoreline retreat down-drift of the obstruction. Man-made obstructions include jetties, groins, breakwaters, and bulkheads.

From east to west, headlands found on the barrier coasts of the Western and Central Gulf include Baldwin County Headland in Alabama, the barrier islands of Mississippi Sound, the Chandeleur Islands, the Modern Mississippi River Delta and its developing barrier islands, the Bayou Lafourche Headland and accompanying barrier islands, Isles Dernieres, the Chenier Plain of Louisiana and Texas, Trinity River Delta, Brazos-Colorado River Delta and its accompanying barrier islands, barrier islands of Espiritu Santo Bay and Laguna Madre, and the Rio Grande Delta.

The Mississippi Sound barrier islands are relatively young, having formed some three to four thousand years ago as a result of shoal-bar degradation. The islands are well vegetated by a southern maritime climax forest of pine and palmetto. The islands generally are regressive with high beach ridges and prominent sand dunes. These islands are generally stable, with no trend toward erosion or thinning, although they do migrate westwardly in response to predominantly westward-moving long-shore currents. An exception to this general rule is Dauphin Island, Alabama, which is essentially a low-profile transgressive barrier island, except for a small Pleistocene core at its eastern end. The western end is a Holocene spit that is characterized

by small dunes and wash-over fans with marsh deposits and tree stumps exposed in the surf zone.

Tidal inlets with deep, wide channels separate the Mississippi Sound Islands from each other. These channels have associated ebb and flood tidal deltas. Shoals are adjacent to all the barriers. The barriers are separated from the mainland by the Mississippi Sound.

Louisiana has the most rapidly retreating beaches in the nation. Recent analyses reveal that Louisiana shorelines are retreating at an average rate of 4.2 m/yr, ranging from a gain of 3.4 m/yr to a loss of 15.3 m/yr (U.S. Geological Survey, 1988). In comparison, the average shoreline retreat rates for the Gulf of Mexico, Atlantic seaboard, and Pacific seaboard were reported at 1.8, 0.8 and 0.0 m/yr, respectively.

In Louisiana, the highest reported rates of coastal retreat occurred along the coastal plain of the Mississippi River. The sand beach formed between the Gulf and Bay Marchand retreated landward at rates of 18-23 m/yr between 1887 and 1978 (Penland and Suter, 1988).

The average retreat rate for Fourchon Beach between the 1880's and 1980's has ranged from 10 to 20 m/yr (Boyd and Penland, 1988). The Isles Dernieres retreated landward at an average rate of 16.8 m/yr during the period of 1890 through 1988 (Williams et al., 1992). Whiskey Island, part of the Isle Dernieres, retreated at an average rate of 26.3 m/yr during the same period.

Barrier beaches along the deltaic plain in Louisiana fit into one of three categories, depending on the stage of the deltaic cycle that the nearby landmass is experiencing. When a major distributary of the Mississippi River is abandoned, submergence due to subsidence and sea-level rise transforms the abandoned delta into an erosional headland with flanking arcs of barrier sand spits that generates barrier islands as washover channels occur. The Bayou Lafourche Headland is an example of a transgressive headland. Isles Dernieres is a more advanced example of a transgressive headland where subsidence has caused the barrier arc of islands to separate from the headland (Penland and Suter, 1988). With continued subsidence and no source of sediment, Isles Dernieres will eventually submerge and form a submarine inner-shelf shoal (Penland and Boyd, 1985).

Sand beaches and coastal mudflats front the coast of the Chenier Plain. The source of the mud is discharge of the Mississippi and Atchafalaya Rivers. Their fine sediments drift westward with prevailing near-shore currents. Fluid mud extends from the seaward edge of the marsh grasses to a few hundred meters offshore. The mud is an extremely effective wave-energy absorber. Consequently, the mainland shore is rarely exposed to effective wave action except

during storms. Although only these sand beaches occur along the Chenier Plain, resting against the marsh, much of the Chenier coast is fairly stable.

The Texas coast between Louisiana and Rollover Pass is a physiographic continuation of the Chenier Plain. Here, thin accumulations of sand, shell, and caliche nodules make up beaches that are migrating poorly developed sand dunes. The barrier islands and spits of the rest of the Texas Coast were formed and are maintained by sediments supplied from the three deltaic headlands listed above.

Wetland habitat types occurring along the Gulf Coast include fresh, brackish, and saline marshes; forested wetlands; and small areas of mangroves. Wetland habitats occur as narrow bands or broad expanses. They can support sharply delineated botanical zones of monotonous stands of single species or mixed communities of plants. The importance of coastal wetlands to the coastal environment has been well documented. High organic productivity, high detritus production, and efficient nutrient recycling characterize coastal wetlands. They provide habitat for a great number and wide diversity of invertebrates, fish, reptiles, birds, and mammals. Wetlands are particularly important as nursery grounds for juvenile forms of many important fish species.

The Louisiana coastal wetlands support over two-thirds of the Mississippi Flyway wintering waterfowl population, including 20-25 percent of North America's puddle duck population. The region supports the largest fur harvest in North America, producing 40 to 65 percent of the nation's total each year (Olds, 1984).

Louisiana contains most of the Gulf coastal wetlands. These wetlands occur in two physiographic settings--the Mississippi River Deltaic Plain and the Chenier Plain. Wetlands on the deltaic plain are situated on a series of overlapping river terrain deltas that have extended on the continental shelf over the past 6000 years. The alluvial and organically rich sediments found on these areas are subject to high, natural-subsidence rates. The effects of subsidence are compounded by sea-level rise, both of which have been occurring during the past several millennia.

The deterioration of coastal wetlands, particularly in Louisiana, is an issue of concern. In Louisiana, the annual rate of wetlands loss has been measured at 130 km² for the period 1955-1978. A recent study has shown that the current rate of land loss on the Deltaic Plain area of the Louisiana coast has decreased to about 90 km² per year for the period of 1972 to 1988 (Britsch and Kemp, 1990).

Several factors contribute to wetlands loss in coastal Louisiana. The suspended-sediment load of the Mississippi River has been reduced by 50 percent since the 1950's, due to channelization and farmland soil conservation efforts. However, the primary cause of reduced sedimentation rates is levee construction. Levees exclude river-borne sediment from the flanking deltaic wetlands. Subsidence and sea-level rise have caused submergence of lower wetland areas. Construction of rig levees have allowed drainage and exploratory of extensive wetlands. Exploratory activities in low areas, outside levee areas, have caused the filling of wetlands. Construction of canals converts wetlands to open water and upland spoil banks. Canals and subsidence have also contributed to increased tidal influence and salinities in freshwater and low-salinity wetlands, which in turn increase erosion and sediment export.

In Mississippi and Alabama, the mainland marshes behind Mississippi Sound occur as discontinuous wetlands associated with estuarine environments. The most extensive wetland areas in Mississippi occur east of the Pearl River delta near the western border of the State and in the Pascagoula River delta area near the eastern border of the State. The wetlands of Mississippi seem to be more stable than those in Louisiana, reflecting the more stable substrate and more active sedimentation per unit of wetland area. Also, there have been only minor amounts of canal dredging in the Mississippi wetlands.

Most of the wetlands in Alabama occur on the Mobile River delta or along northern Mississippi Sound. Between 1955 and 1979, fresh marshes and estuarine marshes declined in these areas by 69% and 29%, respectively. Major causes of non-fresh wetland losses were industrial exploratory and navigation, residential and commercial exploratory, natural succession, erosion and subsidence. The loss of fresh marsh was mainly attributable to commercial and residential exploratory and silviculture (Roach et al., 1987).

In Texas, coastal marshes occur along bays, on rivers and their deltas, and on the inshore side of barrier islands. Salt marshes consisting primarily of smooth cordgrass occur at lower elevations and at higher salinities. Brackish marshes occur in less saline areas inward of salt marshes. Broad expanses of emergent wetland vegetation do not commonly occur south of Baffin Bay, at the northern edge of Kennedy County, because of the arid climate and hypersaline waters. Dominant salt-marsh plants there include more salt-tolerant species such as *Batis Maritima* and *Salicornia sp.* (White et al., 1986).

Wetland changes observed in Texas during the past several decades appear to be driven by subsidence and sea-level rise. Open-water areas are appearing in wetlands along their seaward margins, while new wetlands are encroaching onto previously non-wetland habitat along the landward margin of wetland areas on the mainland, on the back side of barrier islands, and onto spoil banks. In addition, wetlands are being affected by human activities including canal dredging, impoundments, and accelerated subsidence caused by fluid withdrawals. The magnitude of these wetland acreage changes in most of Texas has not been determined at the present time. In the Freeport, Texas area, along the Louisiana border, wetlands loss is occurring at rates similar to those occurring in adjacent parts of the Louisiana Chenier Plain. In the Sabine Basin area of coastal Texas, for example, 20548 ha of wetlands were lost between 1952 and 1974 (Gosselink et al., 1979).

A recent study funded by MMS entitled "Causes of Wetland Loss in the Coastal Central Gulf of Mexico", examined coastal ecosystems of the Northern Gulf of Mexico region and how wetland habitats have changed as a result of natural processes and man's activities thereon. The study's primary focus was on assessing and quantifying the direct and indirect impacts of OCS-related activities on wetland areas. Canal construction for pipelines and navigation has been the major OCS-related impacting factor.

Direct impacts were defined as those physical alterations that are the direct result of canal construction. Direct impacts include wetlands resulting from the actual dredging of the canal, the disposal of dredged spoil and any subsequent widening of the canal as a result of channel-bank erosion. Based on the study's findings, OCS-related direct impacts have accounted for 16 percent of all the direct impacts that have occurred in Louisiana's wetlands. Direct OCS impacts account for only 4-5 percent of the total wetlands loss during the period 1955/1956 to 1978. In recent years, more stringent construction regulations have required that pipelines installed across wetlands be backfilled with spoil material immediately after the pipeline is emplaced in its ditch. Direct impacts per unit length of OCS-related navigation canals are about 20 times greater than OCS pipeline canals. Indirect impacts are those that occur as a result of hydrologic changes (salinity and drainage regimes) brought on by canal construction. Indirect impacts from canals associated with the OCS program have been estimated as accounting for 4-13 percent of the total amount of wetland loss that occurred in coastal Louisiana between 1955/56 to 1978.

Three million hectares of submerged seagrass beds are estimated to exist in exposed, shallow coastal waters of the northern Gulf of Mexico. An additional 166,000 ha are found in protected, natural embayments and are not considered exposed to OCS impacts. The area of Florida contains approximately 98.5 percent of all coastal seagrasses in the northern Gulf of Mexico. Texas and Louisiana contain approximately 0.5 percent. Mississippi and Alabama have the remaining 1 percent of seagrass beds.

Seagrass beds grow in shallow, relatively clear and protected waters with predominantly sand bottoms. Their distribution depends on an interrelationship among a number of environmental factors that include temperature, water depth, turbidity, salinity, turbulence, and substrate suitability. Primarily because of low salinity and high turbidity, robust seagrass beds and the accompanying high diversity of marine species are found only within a few scattered, protected locations in the Central and Western Gulf of Mexico. Inshore seagrasses provide important habitat for immature shrimp, black drum, spotted seatrout, juvenile southern flounder, and several other fish species; and they provide a food source for several species of wintering waterfowl.

Seagrasses dominate the aquatic floral habitat of low-salinity, inshore estuarine communities along the Texas coast. Dominant species include shoalgrass and widgeongrass. Laguna Madre and Copano-Aransas estuaries account for the major portion of seagrass populations in Texas. Seagrasses are less common in Corpus Christi Bay due to greater water depth. These species occur in abundance due to their tolerance of salinity variations.

Turbid waters and soft highly organic sediments of Louisiana's estuaries and offshore areas limit widespread distribution of higher salinity seagrass beds. Consequently, only a few areas in offshore Louisiana support seagrass beds. The most extensive beds occur in Chandeleur Sound. In Mississippi and Alabama, seagrasses occur within Mississippi Sound.

The distribution of seagrass beds in the Central and Western Gulf have diminished during recent decades. Primary factors believed to be responsible include hurricanes, dredging, dredged material disposal, trawling, water quality degradation, a combination of flood protection levees that have directed freshwater away from wetlands, saltwater intrusion that moved beds closer inland, and freshwater diversions from the Mississippi River into coastal areas during flood stage.

The term sensitive offshore resources refer both to the water column and the seafloor. Seafloor (benthic) habitats are the most likely to be adversely affected by offshore oil and gas operations, especially live-bottom areas, deep-water benthic communities, and topographic features.

The benthos has both floral and faunal components; the floral representatives being bacteria, algae, and seagrasses. The abundance of benthic algae is limited by the scarcity of suitable substrates and light penetration. In exceptionally clear waters, benthic algae, especially coralline red algae, are known to grow in water depths to at least 180 m. Offshore seagrasses are not conspicuous in the Central and Western Gulf; however, fairly extensive beds may be found in estuarine areas behind the barrier islands throughout the Gulf. Seagrasses would be continuous around the entire periphery of the Gulf if it were not for the adverse effects of turbidity and low salinity of the Mississippi River effluent from the delta to Galveston (Humm, 1973).

The vast majority of bottom substrate available to benthic communities in the Central and Western Gulf consists of soft, muddy bottoms; the benthos here is dominated by polychaetes. Benthic habitats on the continental shelf at most risk to potential impacts from oil and gas operations are topographic features and the pinnacle trend live bottom.

The northeastern portion of the Central Gulf of Mexico exhibits a region of topographic relief, the "pinnacle trend," found at the outer edge of the Mississippi-Alabama shelf between the Mississippi River and Desoto Canyon. The pinnacles appear to be carbonate, reef structures in an intermediate stage between growth and fossilization. The region contains a variety of features from low to major pinnacles, as well as ridges, scarps, and relict patch reefs. It has been postulated that these features were built during lower stands of the sea during the rise in sea level following the most recent ice age. The heavily inundated pinnacles provide a surprising amount of surface area for the growth of sessile invertebrates and attract large numbers of fish.

Additional hard bottom features, which are located outside the actual pinnacle trend, have been described nearby on the continental shelf. Several hard-bottom areas on the Alabama-Northwest Florida inner-shelf; these areas are located in water depths ranging from 20 to 35 m.

Continental Shelf Associates, Inc. (CSA, 1992a) investigated another portion of the Mississippi-Alabama continental shelf. They found three types of hard bottom features that were identified for biological characterization. These were (1) pinnacle features present in

approximately 80 to 90 m water depths; (2) deepwater pinnacles and associated hard bottom located in approximately 110-130 m water depths; and (3) suspected low-relief, hard-bottom features in the central and eastern portions of the upper Mississippi-Alabama shelf in water depths shallow than 75 m.

The pinnacles are found at the outer edge of the Mississippi-Alabama shelf between the Mississippi River and Desoto Canyon. The bases of the pinnacles rise from the seafloor between 50 and 100 m with vertical relief occasionally in excess of 20 m. These features exist in turbid water and contain limited biotal coverage. Pinnacles photographed in 1985 showed biota similar to the transitional antipatharian-zone assemblage described by Rezak (CSA, 1985). These pinnacles may provide structural habitat for pelagic fish.

With the exception of the region defined as the pinnacle-trend areas, the substrate in waters shallower than 67 m of the Central Gulf is a mixture of mud and/or sand. The live-bottom survey required by MMS and conducted in the eastern portions of the area has also revealed sand or mud substrate. These areas are not conducive to "live-bottom" community growth since a hard substrate is needed for epifaunal attachment. As the substrate grades to carbonate sand in the Eastern Gulf, the potential for "live bottoms" increases.

Chemosynthetic clams, mussels, and tube worms, similar to the hydrothermal vent communities of the eastern Pacific have been discovered in association with hydrocarbon seeps in the northern Gulf of Mexico. Initial discoveries of cold-water seep communities indicated that they are primarily associated with seismic wipeout zones and hydrocarbon and H₂S seep areas (Kennicutt and Gallaway, 1985; Brooks et al., 1986a). The occurrence of chemosynthetic organism dependent on hydrocarbon seepage has been documented in water depths as shallow as 290 m (Robert et al., 1990), but the densest aggregations of these organisms have been found at water depths of around 500 m and beyond.

Among various community types, chemosynthetic communities are distributed across a wide range of environmental conditions, but in all cases, their presence strongly indicates active localized seepage (MacDonald, 1992). Submersible data analyzed by researchers from Texas A&M University indicates a characteristic aggregation size of about 100 m for vestimentiferan and mytilid communities and 100-300 m for clam communities. This has led them to speculate that communities separated by less than 300 m probably share a common hydrocarbon reservoir. Analysis of multi-channel seismic data indicates that communities separated by greater than 1 m are not supported by seepage from a common reservoir.

To date, there are 43 sites across the northern Gulf of Mexico continental slope where the presence of chemosynthetic metazoans (dependent on hydrocarbon seepage) has been definitively documented. The envelope of occurrence suggests that the potential number of communities is much larger than those found to date. Preliminary results indicate extensive natural oil seepage in the Gulf, especially in water depths greater than 1000 m. This preliminary evidence considerably increases the area where chemosynthetic communities dependent on hydrocarbon seepage may be expected, and suggests a useful approach for studying natural oil seepage in the future.

The shelf and shelf edge of the Central and Western Gulf are characterized by topographic features, which are inhabited by benthic communities. The habitat created by the topographic features is important because they support hard-bottom communities of high benthia, high diversity, and high numbers of plant and animal species; they support, either as shelter, food, or both, large numbers of commercially and recreationally important fishes; they are unique to the extent that they are small isolated areas of communities in the vast Gulf of Mexico; they provide a relatively pristine area suitable for scientific research; and they have an aesthetically attractive intrinsic value.

Seven distinct biotic zones on the banks of the Gulf have been identified. None of the banks contain all of the seven zones. The zones are divided into four categories dependent upon the degree of reef-building activity in each zone.

The Central Gulf of Mexico lists 16 topographic features and the western Gulf of Mexico lists 23 topographic features.

Operations conducted under the proposed plan will be conducted in accordance with Subparts C, D, E, G and O of Title 30 CFR Part 250, which address drilling and completion operations. To ensure compliance, Kerr-McGee's company representative and contractor personnel assigned to this project will be familiar with the current regulations and policies of MMS, EPA and the USCG.

Impacts on Ecologically Sensitive Features

The major impact-producing factors associated with the proposed operations that could affect barrier beaches include oil spills, pipeline emplacements, navigation canal dredging and maintenance dredging, and support infrastructure construction. This section considers impacts to the physical shape and structure of barrier beaches.

Most inland spills are assumed to occur as a result of coastal transport accidents largely during transfer operations at terminals. Onshore, OCS operations and most OCS-related waterway segments related to this activity are located away from barrier beaches and dunes.

When transporting fuel to an offshore location, barges will use interior waterways to get to the open Gulf. These waterways are usually remote from barrier beaches. A typical inland vessel accident could result in spilled hydrocarbons contacting inland shores of barrier islands, but will unlikely adversely impact barrier beaches or dunes. For an inland barge accident to affect a barrier beach significantly, the accident would have to occur in offshore state waters, on a barrier landform in close proximity to a beach, or inshore in the vicinity of a tidal inlet.

The trajectory for a "worst case" scenario presents descriptions, probabilities, and estimates for offshore spills that may occur as a result of the proposed operations. Because of the low probabilities and mitigative measures imposed on the operator, an offshore spill related to the proposed operations is not expected to contact a coastal barrier beach or dunes.

Biological stipulations or comparable mitigation are typically made a part of appropriate leases resulting from the OCS Program. The stipulations force the operators to locate the individual pinnacle features and associated communities that may be present in the block. Stipulation would protect pinnacle trend live bottoms potentially impacted by OCS activities by requiring appropriate mitigative measures.

The placement of drilling rigs and platforms on the seafloor crushes the organism directly beneath the legs or mat used to support the structure; anchoring has the same effects. The areas affected by the placement of the platforms and rigs would predominantly be soft-bottom regions where the infaunal and epifaunal communities are not unique. The presence of conventional platform structures can cause scouring of the surficial sediments (Caillouet et al., 1981).

Structure placement and anchor damage from support boats and ships, floating drilling units and pipeline-laying vessels disturb areas of the seafloor. Such disturbance is considered as the most important threat to live-bottom areas at these depths. The size of the areas affected by chains would depend on the water depth, chain length, sizes of anchor and chain, method of placement, wind and current. The biological stipulations limit the proximity of new activities to pinnacle features, thus anchoring events should not impact the resource.

The greatest potential for adverse impacts to occur to the deepwater chemosynthetic communities would come from those OCS-related, bottom-disturbing activities associated with pipeline and platform emplacement, associated anchoring activities and seafloor blowout accidents.

Oil spills would not impact chemosynthetic communities because the communities are often seen growing among oil-saturated sediments and natural gas bubbles, using these hydrocarbons as an energy source.

The majority of these deepwater communities is of low density and is widespread throughout the deepwater areas in the Gulf. Physical disturbance to a small area would not result in a major impact to the ecosystem. The frequency of such impact is expected to be low. Such impacts are expected to result in minor disturbance to ecological function of the community, with no alteration of ecological relationships with the surrounding benthos.

6. *Existing Pipelines and Cables*

Pipelines are the primary method used to transport liquids and gases between OCS production sites and onshore facilities where any combination of metering, distribution and processing may occur. A variety of products are transported by pipe in the GOM. These products include unprocessed bulk oil and bulk gas; mixtures of gas and condensate; mixtures of gas and oil; processed condensate, oil or gas; produced water; methanol; liquid propane; fuel oil and a variety of chemicals used by the OCS industry offshore.

As of February 1997, a total of 87 oil pipeline systems were operating in the Gulf, 72 of which were in the Central Planning Area and 15 of which were in the Western Planning Area. In the Eastern Gulf, pipelines are projected to be constructed to support future oil and gas activities from the Destin Dome area; however, no pipelines currently exist.

Impacts on Existing Pipelines and Cables

There are no existing pipelines or cables located in the vicinity of the proposed operations in Garden Banks Block 197.

As a prudent operator, Kerr-McGee will conduct its operations in accordance with the provisions specified in Minerals Management Service Notice to Lessees 98-06 in order to avoid all pipelines and/or cables in the vicinity of the proposed operations.

7. *Other Mineral Uses*

Kerr-McGee is not aware of any other planned mineral uses in Garden Banks Block 197.

Impacts on Other Mineral Uses

Since the MMS is not aware of any other planned mineral uses within the area of the proposed operations, no environmental effects are anticipated to or from the proposed operations.

8. *Ocean Dumping*

The Marine Pollution Research and Control Act of 1987 (MARPOL), implements Annex V of the International Convention for the Prevention of Pollution from Ships. Most of the law's regulatory provisions became effective on December 31, 1988. Under provisions of the law, all ships and watercraft, including all commercial and recreational fishing vessels, are prohibited from dumping plastics at sea. The law also severely restricts the legality of dumping other vessel-generated garbage and solid waste items both at sea and in U.S. navigable waters. The USCG is responsible for enforcing the provisions of this law and has developed final rules for its implementation, calling for adequate trash reception facilities at all ports, docks, marinas, and boat launching facilities.

Final rules explicitly state that fixed and floating platforms, manned production platforms, and support vessels operating under a Federal oil and gas lease are required to develop Waste Management Plans and to post placards reflecting MARPOL, Annex V dumping restrictions. Waste Management Plans will require oil and gas operators to describe procedures for collecting, processing, storing, and discharging garbage and to designate the person who is in charge of carrying out the plan. These rules also apply to all oceangoing ships of 40 ft or more in length that are documented under the laws of the U. S. or numbered by a State and that are equipped with a galley and berthing. Placards noting discharge limitations and restrictions, as well as penalties for noncompliance, apply to all boats and ships 26 ft or more in length. Furthermore, the Shore Protection Act of 1988 requires ships transporting garbage and refuse to assure that the garbage and refuse is properly contained on board so that it will not be lost in the water from inclement wind or water conditions.

The disposal of oil and gas operational wastes is managed by USEPA through regulations established under three Federal Acts. The Resource Conservation and Recovery Act (RCRA) provides a framework for the safe disposal of discarded materials, regulating the

management of solid and hazardous wastes. The USEPA has exempted many oil and gas wastes from coverage under hazardous wastes regulations under Subtitle C of RCRA. If covered, such wastes would be more stringently regulated under hazardous waste rules, i.e., industry would be responsible for the wastes from their generation to their final disposal. Exempt wastes include those generally coming from an activity directly associated with the drilling, production, or processing of a hydrocarbon product. Nonexempt oil and gas wastes include those not unique to the oil and gas industry and used in the maintenance of equipment.

The direct disposal of operational wastes into offshore waters is limited by USEPA under the authority of the Clean Water Act. And, when injected underground, oil and gas operational wastes are regulated by USEPA's third program, the Underground Injection Control program.

An NPDES discharge permit, based on effluent limitation guidelines, is required for direct disposal of operational wastes into offshore waters. The major discharges from offshore oil and gas exploration and production activities include produced water, drilling fluids and cuttings, ballast water, and storage displacement water. Minor discharges from the offshore oil and gas industry include drilling-waste chemicals, fracturing and acidifying fluids, and well completion and work-over fluids; and from production operations, deck drainage, and miscellaneous well fluids (cement, BOP fluid); and other sanitary and domestic wastes, gas and oil processing wastes, and miscellaneous discharges.

Kerr-McGee currently has coverage under EPA's Region VI General NPDES GMG290000 Permit for discharges associated with drilling and production activities. The types of discharges included in the permit application and the estimated average flow volumes are listed below.

Drilling Fluids - Although drilling fluid is generally recycled, excess fluid is sometimes discharged overboard. The volume and rate of discharge depend upon down-hole conditions. Volume is estimated from both pump rate and length of time, or from tank capacity if a bulk discharge occurs. The discharge of drilling fluids is classified as an intermittent discharge, with an estimated average flow of 250 barrels a day. Constituents of the mud are described in the list of mud additives included with the Initial Exploration Plan.

Drill Cuttings - The drill cuttings are separated from the mud through the use of solids control equipment. Cuttings discharge rates and volumes will vary during the duration of the well, and are measured

by estimating the volume of hole drilled. Constituents of drill cuttings include sand, shale and limestone from the wellbore. The discharge of drilling cuttings is classified as an intermittent discharge, with an estimated average flow of 100 barrels a day.

Excess Cement - Occasionally, excess slurry will be generated while cementing casing strings. The volume of cement discharges is calculated by subtracting the volume inside the well from the total volume pumped down hole.

Well Treatment, Completion or Work-Over Fluids - These fluids (primarily seawater that has been circulated down-hole) are sometimes discharged when in excess. The discharge of work-over, treatment and completion fluids is classified as an intermittent discharge, with an estimated average flow of 300 barrels a day. The volume is calculated as for excess cement.

Sanitary and Domestic Waste - The discharge of sanitary and domestic waste is classified as an intermittent discharge, with an estimated average flow of 40 barrels a day. The rate of discharge from the marine sanitation unit is approximately 25 gallons/man/day. An equal amount of domestic waste (from sinks, galleys, showers and laundries) is normally discharged.

Deck Drainage - Consisting of rainwater and wash water with no free oil, the volume of deck drainage is calculated by multiplying average rainfall by exposed deck area.

Uncontaminated Water - This included non-contact cooling water, discharges from the firewater system, and freshwater maker blow-down. Ballast water, which is sometimes used to maintain the stability of a drilling rig, might also be discharges. These discharges are classified as miscellaneous discharges in the NPDES permit application.

Produced Water from Well Testing - This discharge would occur during the production test conducted after drilling the wells. Much of the produced water would be vaporized as the gas is burned. Excess water would be processed in a gravity separator and discharged in accordance with the limitations and conditions of the applicable NPDES General Permit.

Wastes, which cannot be discharged overboard, will be transported to an appropriate treatment or disposal site, in accordance with all Federal, State and Local rules and regulations.

All wastes will be manifested and records kept for the life of the field. In order to better manage the disposal of offshore waste, Kerr-McGee has developed a waste management plan that provides information to lease operators on regulatory requirements, source reduction, recycling and disposal. In general, oil field wastes are exempt from RCRA Subtitle C and disposal is regulated under each state's statutes. Nonhazardous industrial waste disposal is regulated under RCRA Subtitle D and again depends on state controls. Solid wastes will be taken to the service base, picked up by municipal landfill. Nonhazardous oil field wastes (NOW) will be taken to the service base and then to an approved NOW facility located in either Texas or Louisiana. If any wastes are classified as hazardous, they are to be properly transported using a uniform hazardous waste manifest, documented, and disposed at an approved hazardous waste facility

Impacts on Ocean Dumping

The MMS's regulations prohibit the disposal of objects overboard (Title 30 CFR 250.300). These regulations also require the marking of equipment and other large items prior to shipment offshore. In addition, operators must remove all obstructions and clear the drill site (Title 30 CFR 250.500).

9. *Endangered, Threatened and/or Protected Species*

Sea Turtles - Five species of sea turtles may be found in the waters of the GOM: Kemp's ridley, loggerhead, green, leatherback and hawksbill. The Endangered Species Act protects all.

The green turtle is the largest hard-shelled sea turtle. The green turtle has a circumglobal distribution in tropical and subtropical waters. Reports of nesting in the northern Gulf are isolated and infrequent; along the northwest Gulf coast of Florida on Eglin Air Force Base lands and Gulf Islands National Seashore, Snata Rosa and Okaloosa Counties; Walton County and St. Joseph Peninsula, Gulf County and from Pinellas County through Collier County on the Southwest Gulf coast of Florida (Meylan et al., 1995).

The leatherback is the largest of the sea turtles. This species is also the most pelagic and most wide-ranging of sea turtles, undertaking extensive migrations following depth contours for hundreds even thousands of kilometers (Morreale et al. 1993). Florida is the only site in the continental United States where the leatherback regularly nests (Meylan et al., 1995). The leatherback sea turtle nesting and hatching season for the Florida Panhandle extends from May 1 through September 30.

The hawksbill is a small to medium-sized sea turtle. This turtle is a solitary nester. The six-month nesting season of the hawksbill is longer than that of other sea turtles; nesting occurs between July and October (USDOC, NMFS, 1993). Commercial exploitation is the major cause of the continued decline of the hawksbill sea turtle (USDOC, NMFS, 1993).

The Kemp's ridley is the smallest of all living sea turtles. The Kemp's ridley sea turtle is the most imperiled of the world's sea turtles. Nesting in the United States occurs infrequently on Padre and Mustang Islands in south Texas from May to August (Thompson, 1988). A NMFS hatchling and rearing program on Padre Island National Seashore (PINS) (Klima and McVey, 1982) supplemented natural nesting.

The loggerhead sea turtle occurs worldwide in habitats ranging from estuaries to the continental shelf (Dodd, 1988). In the GOM, recent surveys indicate that the Florida Panhandle accounts for approximately one-third of the nesting on the Florida Gulf Coast. In the Central Gulf, loggerhead nesting has been reported on Gulf Shores and Dauphin Island, Alabama; Ship Island, Mississippi; and the Chandeleur Islands, Louisiana (Fuller et al., 1987). Nesting in Texas occurs primarily on North and South Padre Islands, although occurrences are recorded throughout coastal Texas (Hildebrand, 1982).

Potential Impacts to Sea Turtles - Generic impacts of noise from OCS-related activities are discussed in USDO, MMS (1994). Sea turtles may be injured or killed after being entangled in plastic debris (USDO, MMS, 1994). Jellyfish are eaten by all five species of sea turtles, especially leatherbacks. The five species may ingest plastic debris that resembles jellyfish such as six-pack rings. Lethal and sublethal impacts may follow (USDO, MMS, 1994). However, the proposed action is not expected to result in impacts from ingestion of plastic debris or entanglement in it by sea turtles. No impacts should occur because the MMS prohibits disposal of debris into offshore waters by lessees.

Potential impacts of coastal facility construction on turtle nesting beaches are discussed in USDO, MMS (1984). No impacts from construction are expected.

Potential impacts to sea turtles from detonation of explosives used during structure removal operations include lethal injurious incidental take, as well as physical or acoustic harassment. Injury to the lungs and intestines and/or auditory system could occur. It is expected that structure removals will cause primarily sublethal effects

on sea turtles as a result of the implementation of the MMS guidelines for explosive removals (USDOJ, MMS, 1990b, Appendix B). Sea turtles are widely distributed in the Gulf. And their densities would not be expected to be high near the vicinity of platform removals.

If a hydrocarbon spill would occur, the severity of effects and the extent of the damage to marine turtles would be characterized by geographic location, oil type, impact area, oceanographic conditions, meteorological conditions, and season (NRC, 1985; USDOJ, MMS, 1987b). Oil spills can adversely affect marine turtles by toxic external contact, toxic ingestion or blockage of the digestive tract, disruption of salt gland function, asphyxiation, and displacement from preferred habitats (Vargo et al., 1986; Lutz and Lutcavage, 1989). Mitigative measures imposed on the operator should reduce the risk of a spill occurring and facilitate the containment and clean up of the spilled hydrocarbon limiting the potential effects to marine turtles.

Oil-spill response activities, such as vehicular and vessel traffic in shallow areas of seagrass beds and live-bottom communities, can adversely affect sea turtle habitat and cause displacement from these preferred areas. Oil spills and oil spill response activities, such as beach sand removal, can negatively affect marine turtles.

Birds - The peregrine falcon on North America is separated into three subspecies; Arctic, American and Peale's. Peregrines prey almost exclusively on birds.

The piping plover (*Charadrius melodus*) is a migratory shorebird that is endemic to North America. It has been hypothesized that specific wintering habitat, which includes coastal sand faults and mud flats in close proximity to large inlets or passes, may attract the largest concentrations of piping plovers because of a preferred prey base and/or because the substrate coloration provides protection from aerial predators due to chromatic matching, or camouflage (Nicholls and Baldassarre, 1990). This species remains in a precarious state given its low population numbers, sparse distribution, and continued threats to habitat throughout its range.

The whooping crane is an omnivorous, wading bird. Whooping cranes currently exist in three wild populations and at five captive locations (USDOJ, FWS, 1994). These birds winter in coastal marshes and estuarine habitats along the GOM coast at Aransas National Wildlife Refuge (ANWR), Texas, and represent the majority of the world's population of free-ranging whooping cranes.

The eskimo curlew is a small American curlew that nests in Arctic tundra and migrates to its wintering habitat in the pampas grasslands

of southern South America. In 1929, the eskimo curlew was thought to be extinct; however, occasional records persist (Collar et al., 1994).

The bald eagle is the only species of sea eagle that regularly occurs on the North American continent (USDOJ, FWS, 1984). The bulk of the bald eagle's diet is fish, though bald eagles will opportunistically take birds, reptiles, and mammals (USDOJ, FWS, 1984). In July 1995, the FWS reclassified the bald eagle from endangered to threatened in the lower 48 states (Federal Register, 1995).

The brown pelican is one of two pelican species in North America. It feeds entirely upon fishes captured by plunge diving in coastal waters. In recent years, there has been a marked increase in brown pelican populations along its entire former range. The Louisiana Department of Wildlife and Fisheries submitted a request in March 1994 to the FWS to officially remove the eastern brown pelican from the endangered species list in Louisiana (Louisiana Department of Wildlife and Fisheries, 1994a).

The least tern (*Sterna antillarum*) is the smallest North American tern. Least terns are listed as endangered, except within 50 miles of the coast. Least terns prefer inshore habitats.

Potential Impacts to Birds - Activities resulting from the proposed operations have the potential to affect NEGOM coastal and marine birds detrimentally. It is expected that the effects from the major impact-producing factors on coastal and marine birds are negligible and of nominal occurrence. As a result, there will be no discernible disturbance to Gulf coastal and marine birds.

The brown pelican, arctic peregrine falcon, bald eagle, and piping plover may be impacted by helicopter and service-vessel traffic, offshore pipeline landfalls, entanglement in and ingestion of offshore oil- and gas-related plastic debris, and oil spills. The effects of these operations are expected to be sublethal. Oil spills of any size are expected to seldom contact threatened and endangered birds or their critical feeding, resting, or nesting habitats.

The roseate tern is a transient in the affected area and will not be analyzed. Similarly, for the least tern only the population nesting in the interior is endangered, so the species will not be analyzed.

The southeastern snowy plover is a candidate species in Alabama and Florida. The piping plover is threatened there. Plovers flying at high altitudes may collide with helicopters of the proposed action. Density of plovers is expected to be low; for example, in some cases snowy plover nests were less than 2 per km (Gore and Chase, 1989).

Therefore impacts of helicopters are expected to be very low. Plovers may consume beach trash or become entangled in it, causing sublethal or lethal effects. However, Title 30 CFR 250.300 prohibits disposal of trash in the water during OCS operations. Therefore, impacts from disposal of trash by personnel of OCS-related activities are not expected.

Hydrocarbon Spills on All Birds - The magnitude of impact to birds following an oil spill depends on the size of the local bird population (oftentimes a function of season), their foraging behavior(s), whether or not the population is aggregated or dispersed into smaller subunits at the time of the spill, and the quantity of oil spilled and its persistence in the environment (NRC, 1985). The birds most vulnerable to direct effects include those species that spend most of their time swimming on and under the sea surface, and often aggregate in dense flocks (Piatt et al., 1990; Vauk et al., 1989). This group includes loons, grebes, sea ducks and pochards, and cormorants. Coastal birds, including shorebirds, waders, marsh birds, and certain waterfowl, may be the hardest hit indirectly through destruction of their feeding grounds and / or food source if the spilled oil reaches their habitat (Hansen, 1981; Vermeer and Vermeer, 1975). Mitigative measures are in place to lower the risk of spilled hydrocarbon from reaching these habitats.

Beach Mice - These mice are subspecies of the old-field mouse (*Peromyscus polionotus*) that occupy restricted habitats in the mature coastal dunes of Florida and Alabama (USDOJ, FWS, 1987). The Alabama, Choctawhatchee, and Perdido Key subspecies are listed as endangered (the Alabama subspecies in Alabama, the Perdido Key subspecies in both Alabama and Florida, and the Choctawhatchee subspecies in Florida). The range of these subspecies is listed in USDOJ, MMS (1994). The St. Andrew subspecies and Santa Rosa subspecies are candidates for listing in Florida. Beach mouse diet, habits, and reasons for population decline are given in USDOJ, MMS (1994).

Potential Impact to Beach Mice - Beach mouse subspecies of the old field mouse that live in the area of the proposed action are the Alabama, Perdido Key, Choctawhatchee, St. Andrew, and Santa Rosa subspecies. Beach trash and debris could be eaten by mice or could entangle them in their foraging habitat behind the dunes, causing sublethal or lethal impacts. However, no impacts from OCS-related activities are expected because the MMS prohibits disposal of debris into offshore waters by lessees (30 CFR 250.300).

Direct contact with spilled oil can cause skin and eye irritation, asphyxiation from inhalation of toxic fumes, food reduction, food contamination, oil ingestion, and displacement from preferred habitat. Vehicular traffic and activity associated with oil-spill cleanup activities can degrade preferred habitat and cause displacement from these areas, or it can attract predators. Because the preferred habitat of Alabama, Choctawhatchee, and Perdido Key beach mice is behind the barrier dunes, an oil spill would have to breach the dunes to reach either the mice or their preferred habitat. This could occur only if an oil spill coincided with a storm surge.

Large Whales - There are five baleen (northern right, blue, fin, sei, and humpback) whale species, one toothed whale (sperm) whale species, and one sirenian (West Indian manatee) occurring in the GOM that are listed as endangered. The sperm whale is common in the Gulf, while the baleen whales are considered uncommon (Davis and Fargion, 1996). Two families of baleen whales occur in the Gulf: balaenids (northern right) and balaenopterids, or rorquals (blue, fin, sei, and humpback). Two subspecies of the West Indian manatee are recognized: the Florida manatee and the Antillean manatee (Domning and Hayek, 1986).

Potential Impacts to Large Whales and Other Marine Mammals- Humpback whale sightings indicate the species is only transient in the area of the proposed action, so the species will not be analyzed.

Hydrocarbon spills and spill response activities can adversely affect cetaceans. Direct contact with hydrocarbons can lead to irritation and damage of skin and soft tissues. Studies by Geraci and St. Aubin (1982 and 1985) have shown, however, that the cetacean epidermis functions as an effective barrier to noxious substances found in petroleum. Unlike other mammals, penetration of such substances in cetacean skin is impeded by tight intercellular bridges, the vitality of the superficial cells, the thickness of the epidermis, and the lack of sweat glands and hair follicles (Lofflan, personal communication, 1993). Inhalation of vapors can lead to irritation of respiratory membranes, lung congestion, and pneumonia (Geraci and St. Aubin, 1982; Hansen, 1985; Geraci, 1990).

The probable effects on cetaceans swimming through the area would depend on a number of factors, including ease of escape from the vicinity, the health of the individual animal, and its immediate response to stress (Davis, personal communication, 1993; Wursig, personal communication, 1993). Spilled oil can also lead to the reduction or contamination of prey and temporary displacement from

migratory routes. An analysis of stomach contents from captured and stranded odontocetes suggest that they are deep-diving animals, feeding predominantly on mesopelagic fish and squid or deep-water benthic invertebrates (Heyning, 1989; Mead, 1989). Delphinids feed on fish and/or squid, depending upon the species (Mullin et al., 1991).

Reactions of cetaceans to spilled oil are varied, with evidence of both direct avoidance and obvious indifference in even heavily oiled areas. Several observations of cetaceans confronting spilled oil show them in the vicinity, and in some cases in the midst of a spill, behaving quite normally. At present, it is unknown whether these animals in such cases are simply not affected by the presence of oil, or perhaps are even drawn to the area in search of prey organisms attracted to the oil's protective surface shadow (Geraci, 1990). Controlled experiments on detection and avoidance response of bottlenose dolphin to oil films showed that dolphins can see oil at the surface and that they prefer to avoid it (Geraci et al., 1983; Smith et al., 1983; St. Aubin et al., 1985).

In the event that "oiling" of cetaceans should occur from a spill associated with the proposed operations, the effects would be primarily sublethal.

Gulf Sturgeon - A subspecies of the Atlantic sturgeon, Gulf sturgeon are classified as anadromous, with immature and mature fish participating in freshwater migrations. Gill netting and biotelemetry have shown that subadults and adults spend eight to nine months each year in rivers and three to four of the coolest months in estuaries or Gulf waters. According to Wooley and Brateau (1985), Gulf sturgeon occurred in most major river systems from the Mississippi River to the Suwannee River, Florida, and marine waters of the Central and Eastern GOM south to Florida Bay. The decline of the Gulf sturgeon is believed to be due to overfishing and habitat destruction, primarily the damming of coastal rivers and the degradation of water quality (Barkuloo, 1988).

Potential Impacts on the Gulf Sturgeon - The Gulf sturgeon may be impacted only by oil spills. The discussion presented on the effects to commercial fisheries is germane to the Gulf sturgeon.

In summary, impacts of the proposed action on endangered species are expected to be very low.

B. SOCIOECONOMIC CONDITIONS AND OTHER CONCERNS

The Gulf of Mexico impact area for population, labor, and employment is defined as that portion of the Gulf of Mexico coastal

zone whose social and economic well being (population, labor, and employment) is directly or indirectly affected by the OCS oil and gas industry.

The Gulf area in 1990 reflects a modest to significant recovery from the high unemployment levels experienced after the 1986 downturn of the oil and gas industry. Ironically, the Gulf Coast is experiencing a shortage of skilled labor in the oil and gas industry due to "the restructuring of the oil industry to centralize management, finance, and business services, and the use of computer technology. The Central Gulf of Mexico's unemployment rate of 6.3 percent is still somewhat over the national average.

The production of oil and gas has been a major source of revenue in the study area since 1954. Data from the Bureau of Economic Analysis's Regional Measurement Division for 1994 show that the average annual payroll associated with oil and gas activities amounts to approximately \$8.2 billion for the Gulf of Mexico Region. Average annual tax dollars generated per employee in the offshore oil and gas program are estimated at 8 percent of payroll revenues. Thus, State and local taxes generated annually by the exploratory of oil and gas in the Gulf of Mexico coastal region are estimated at approximately \$660 million.

The exploration and production of crude oil and gas is classified as a primary industry. Secondary industries are activities associated with the processing of crude oil and gas in refineries, natural gas plants, and petrochemical plants.

Infrastructure and public service development in the area of consideration have tracked population growth and community development. The Gulf Coast physiography has strongly influenced population distribution and community growth. The Louisiana coastal area includes broad expanses of coastal marshes and swamps interspersed with ridges of higher well-drained land along the courses of modern and extinct river systems. Most of the larger urban centers in coastal Louisiana are located along major navigable rivers and/or along the landward edge of the coastal zone (i.e., Lafayette and Lake Charles). To a lesser extent, this pattern continues into eastern Texas where urban centers such as Houston and Beaumont are located at the heads of navigable estuaries. In Mississippi and Alabama, much of the population resides along the immediate coastal fringe and along the shores of navigable estuaries between Gulfport, Mississippi, and Mobile, Alabama.

Public services and infrastructures depend heavily on levels of population, migration patterns and employment. The most important factor in the Gulf Coastal area has been the oil and gas industry, particularly in Louisiana and Texas.

Offshore development began off the coast of Louisiana in the 1940's. Initially, it was confined to the coastal waters; however, by the late 1940's, development had moved onto what is presently recognized as the Federal OCS. Offshore development off the coast of Texas occurred at approximately the same time (i.e., late 1940's). Cumulative production from the Louisiana coastal areas from 1954 through 1982 exceeded production from the GOM OCS by 72 percent for oil and condensate, and by approximately 50 percent for gas. Annual production from the State coastal area consistently exceeded production from the OCS until 1974 (USDOJ, MMS, 1984a). Since 1974, the hydrocarbon production from the GOM OCS has surpassed onshore and nearshore coastal production. As of 1994, the Federal OCS accounted for about 80 percent of offshore crude oil and 88 percent of natural gas production (USDOJ, MMS, 1997).

Since 1971, OCS crude oil as a percentage of total U.S. production remained stable between 8.8 and 12.9 percent before reaching an all-time high of 15.3 percent in 1994. Production of OCS natural gas as a percentage of total U.S. production has continued to rise since 1971, reaching an all-time high in 1990 of 27.4 percent before dropping to 23.7 percent in 1994 (USDOJ, MMS, 1997).

There is a differentiation across the northern GOM between the involvement of the states in the OCS oil and gas industry. Louisiana has historically been most dependent on oil and gas activity, both onshore and offshore. Mississippi and Alabama have, historically, been much less involved in oil and gas extractive activities. In Alabama, however, oil and gas (primarily gas) production activity has been increasing over the last decade (cf. Wade, 1996). Florida is minimally involved in offshore extractive activities. Texas may be considered to be analogous to Louisiana in that there is a long history of both onshore and offshore oil and gas activity. In a very real sense, it may be said that familial economic involvement in the oil and gas industry has become a traditional occupation in coastal Louisiana and in portions of Texas. The translation of this traditional involvement from onshore activities to the OCS is apparently more pronounced in Louisiana than in Texas.

The offshore oil exploration industry including oil companies, drilling contractors, and oilfield suppliers provide a major input to Louisiana's economy. A number of ports in the Central and Western Gulf have developed into important centers for offshore support. The most

active of these in Louisiana are (from east to west) Intracoastal City, Morgan City, and Cameron, Louisiana. The onshore support base for operations in Garden Banks Block 197 is Fourchon, Louisiana.

The MMS sponsored a socioeconomic workshop in September 1992 designed to provide a recommended social and economic studies agenda for the region. A total of 18 proposed studies were designed by participants in hopes of defining gaps in the understanding of social and economic impacts of the OCS oil and gas industry in the Region and to provide a mechanism to provide this information to decision makers.

Impacts to Economic and Demographic Conditions

Effects on Local Employment - It is estimated that up to two people will be utilized at the shore base in support of the proposed operations. The employees will man the shore base. They will rotate on a 7-days on/7-days-off schedule. Local residents, depending upon personnel availability, qualifications, etc, could fill any part-time contract positions.

It is estimated that additional employees will be required for supply boat, crew boat and standby operations. The vessel crews will not require local housing as they will usually live on their respective vessels while working in the area and will return to their residence upon completion of each tour of duty. Some deck hands may be hired from the local labor pool.

Some of the service firm employees may be hired locally. Most of these employees will return to their places of residence on their days off.

To summarize, the proposed operations will require additional personnel. Normally, most of these employees return to their homes in Louisiana, Texas, or other states when their tour of assignment is complete. Some may remain in the local area during their off-duty periods. No new families are expected to move permanently into the vicinity of the shore base as a result of the proposed action. While a few employees may be hired from the local labor pool, impacts to labor resources are expected to be negligible. In the unlikely event of a diesel spill contacting land, approximately 500 cleanup workers would come from companies with existing contracts and, if necessary, from existing labor pools in the Gulf region. It is expected that temporary cleanup workers would return to their homes following the completion of cleanup activities.

Effects on Local Population and Industry Centers - At the end of their respective tours of duty, the personnel manning the shore base would return to their places of residence. While on location, these employees would be in temporary quarters either at the onshore base or in a local motel. Vessel crews, including any transient personnel, would not require local housing, as they would live on the vessels and would return to their residences upon completion of each tour of duty. Contracted personnel would be housed in a local motel by the contract operator while on duty and would return to their homes in Louisiana, Texas, or other states when their tour of assignment is completed. Some may remain in the local area during their off-duty period. No new families are expected to move into the vicinity of the shore base (Racal Survey, 1987).

Because most of the personnel would be returning to their places of residence during their off-duty shifts, no significant effects on population centers and industry are expected to result from the proposed activity. Expenditures associated with operations at the shore base facility could contribute funds to the local and state economy. The existing facilities at the shore base are sufficient to engage in operations required to implement the proposed operations. No new support facilities will be required and no new land acquisition or expansion of existing support bases is anticipated as a result of the proposed operations.

In the unlikely event of a diesel spill contacting land, beach cleanup personnel are typically housed locally in hotels, motels, or temporary residences. Personnel assigned to Kerr-McGee's Oil Spill Response Team will be responsible for ensuring that staging areas are established to service various operational areas and for making quartering and meal accommodations for personnel. Such operations would last less than 6 weeks. While the potential for impact is low, should such contact occur there could be a temporary need for housing of spill cleanup personnel?

IV. *UNAVOIDABLE ADVERSE IMPACTS*

The proposed operations may cause some unavoidable adverse environmental effects on air quality, geology and sediment quality, water quality, benthic communities and marine mammals, turtles and birds. However, effects from the proposed operations will be minor and temporary in nature.

Air Quality - Minor transient increases in air pollution due to drilling and construction activities would be short term and intermittent in the development phase. Emissions due to production operations, support

vessels and helicopters would be minor and would occur along the transit routes.

Geology and Sediment Quality - Sediment disturbance and re-suspension during rig placement, platform and pipeline installation are expected to occur during the primary development phase. Deposits of drilling fluids and cuttings would occur at the drill sites, which would result in altered sediment texture and metal concentrations (mainly barium) within a few hundred meters around each drill site. All of the sediment disturbance impacts would occur during the development phase, allowing for recovery (Shinn et al, 1993) without further disturbance (except for occasional deposition of organic debris sloughed from platform legs; Wolfson et al, 1979) during the production phase. Possible deposition of debris accidentally lost overboard from platforms and service vessels could occur. During the abandonment phase, retrieval of such debris around the platforms and the platform removal would result in additional sediment disturbance impacts; however, it would be separated from the initial construction and development impacts by a time period of approximately 20 years.

Water Quality - Minor, transient impacts on water quality would be intermittent resulting from waste discharges from service vessels. Transient turbidity would occur during the drilling rig placement and platform and pipeline installation. These turbidity impacts would be separated in time and space from each other. Trenching operations during pipeline installation involve localized sediment re-suspension and turbidity; however, these impacts will be minimal due to the minimization of pipelines and short installation time. Additionally, turbidity at platform sites would occur during the abandonment phase, however, would be separated from the initial construction and development impacts by a time period of approximately 20 years. If platforms are abandoned in place as artificial reefs, beneficial impacts for fish and epibiota would continue.

Marine Mammals and Turtles - During all phases of the proposed project, the primary source of potential impacts to marine mammals is service vessel traffic. Impacts include potential startling or collisions of the mammals, birds and turtles with vessels and/or helicopters. Due to the low probability of such collisions, minimal impacts on the marine mammal population are expected. Marine mammals and birds could be adversely affected by noise and disturbances during routine drilling, construction and production operations, impacts, however, would be minimal due to avoidance. During the abandonment phase, platform removal with explosives could affect marine mammals and turtles; however, such activities are conducted

under stringent mitigation requirements developed by the MMS and NMFS to minimize the risk on impacts to these animals.

Benthic Communities - Minor soft bottom impacts would occur during rig placement, and platform and pipeline installation. Burial and smothering of benthic organisms by drilling fluids and cuttings discharges are potential impacts mainly within a few hundred meters around each drill site. All of the soft bottom benthic impacts would occur during the development phase, allowing for recovery without further disturbances during the production phase (except for possible sloughing of epibiota and organic debris under the platform sites; Wolfson et al, 1979). Platform removal during the abandonment phase would result in minor additional benthic impacts, however, these impacts would be isolated to the platform sites and would occur approximately 20 years after initial development impacts.

V. REFERENCES

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- U. S. Department of the Interior, Minerals Management Service. 1995. Gulf of Mexico Sales 166 and 168: Central and Western Planning Areas. Final Environmental Impact Statement, OCS EIS/EA MMS 96-0058, Gulf of Mexico Region, New Orleans; LA.
- U. S. Department of the Interior, Minerals Management Service. August 1996. Outer Continental Shelf Oil & Gas Leasing Program: 1997 - 2002, Final Environmental Impact Statement.
- U. S. Department of the Interior, Minerals Management Service. November 1997. Gulf of Mexico Lease Sales 169, 172, 175, 178 and 182: Central Planning Area. Final Environmental Impact Statement, OCS EIS/EA MMS 97-0033, Gulf of Mexico Region, New Orleans; LA.
- U. S. Department of the Interior, Minerals Management Service. May 1998. Gulf of Mexico Lease Sales 171, 174, 177 and 180: Western Planning Area. Final Environmental Impact Statement, OCS EIS/EA MMS 98-0008, Gulf of Mexico Region, New Orleans; LA.

VI. STATEMENT

The proposed activity will be carried out and completed with the guarantee that:

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.

All operations are covered by a Minerals Management Service approved Oil Spill Response Plan.

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

SECTION I

**Coastal Zone
Consistency
Certification**

COASTAL ZONE CONSISTENCY

COASTAL ZONE CONSISTENCY CERTIFICATION

Issues identified in the Louisiana Coastal Zone Management Program include the following: general coastal use guidelines, levees, linear facilities (pipelines); dredged soil deposition; shoreline modifications, surface alterations, hydrologic and sediment transport modifications; waste disposal; uses that result in the alteration of waters draining into coastal waters; oil, gas or other mineral activities; and air and water quality.

A certificate of Coastal Zone Management Consistency for the State of Louisiana is enclosed as *Attachment I-1*. A copy of the Public Notice request for publication in the State Times Newspaper is included as *Attachment I-2*, as well as the appropriate Parish Journal being included as *Attachment I-3*.

COASTAL ZONE MANAGEMENT
CONSISTENCY CERTIFICATION
INITIAL EXPLORATION PLAN
GARDEN BANKS BLOCK 197
LEASE OCS-G 19084

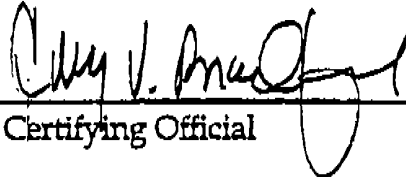
The proposed activities described in this Plan comply with the Louisiana approved Coastal Zone Management Program and will be conducted in a manner consistent with such Program.

Arrangements have been made with The Advocate in Baton Rouge, Louisiana to publish a legal notice no later than October 29, 2002.

Additionally, arrangements have been made with The Daily Comet to publish a public notice of the proposed activities no later than October 29, 2002.

Kerr-McGee Oil & Gas Corporation

 Company Name



 Certifying Official

October 15, 2002

 Date

October 16, 2002

The Advocate
Legal Ad Department-Public Notice
525 Lafayette Street
Baton Rouge, Louisiana 70804

Attention: Susan Bush

Gentlemen:

Please publish the following as a legal ad no later than October 29, 2002.

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

Applicant: Kerr-McGee Oil & Gas Corporation
16666 Northchase Drive
Houston, Texas 77060

Location: Lease OCS-G 19084
Garden Banks Block 197
Offshore, Louisiana

Description: Exploratory activities include the drilling and completion of four (4) exploratory wells. Support operations will be from an onshore base located in Fourchon, Louisiana. No ecologically sensitive species or habitats are expected to be affected by these activities.

A copy of the plan described above is available for inspection at the Coastal Management Division 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 AM to 5:00 PM, Monday thru Friday. The public is requested to submit comments to the Louisiana Department of Natural Resources Coastal Management Division, Attention: OCS Plans, P. O. Box 44487, Baton Rouge, Louisiana 70804-4487. Comments must be received within 15 days of this notice or 15 days after the Coastal Management Section 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.

Initial Exploration Plan
Lease OCS-G 19084
Garden Banks Block 197

Page Two

A copy of the published notice and bill should be submitted to my attention at the following address:

Kerr-McGee Oil & Gas Corporation
16666 Northchase Drive
Houston, Texas 77060

If you have any questions concerning this request, please call me at (281) 618-6338.

Sincerely,

KERR-MCGEE OIL & GAS CORPORATION

C. V. Bradford
Manager of Regulatory Affairs

CVB:JAD:tmp

October 16, 2002

The Daily Comet
705 W. Fifth
Thibodeaux, Louisiana 70301

Attention: Doris Dome

Gentlemen:

Please publish the following as a legal ad no later than October 29, 2002.

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

Applicant: Kerr-McGee Oil & Gas Corporation
16666 Northchase Drive
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BEST AVAILABLE COPY

Initial Exploration Plan
Lease OCS-G 19084
Garden Banks Block 197

Page Two

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Kerr-McGee Oil & Gas Corporation
16666 Northchase Drive
Houston, Texas 77060

If you have any questions concerning this request, please call me at (281) 618-6338.

Sincerely,

KERR-MCGEE OIL & GAS CORPORATION

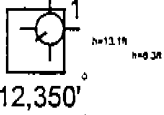
C. V. Bradford
Manager of Regulatory Affairs

CVB:JAD:tmp

Y=10,090,080

1 Mile Zone

Marathon
OCS-G-07447



KERR-McGEE
OCS-G-19084
197

KERR-McGEE
OCS-G-23274
198

Minor isolated seabed scouring
observed in this region

KMG Prop
SL "A", "B"

3 Mile Zone

KMG Prop
SL "C", "D"

Y= 10,074,240

241

242

X= 1,679,040

Limit Surrounding Elvers Bank



KERR MCGEE OIL & GAS CORPORATION

16666 Northchase Dr. Houston, Texas 77060

Garden Banks Blocks 197 & 198

Proposed Locations "A", "B", "C" & "D"

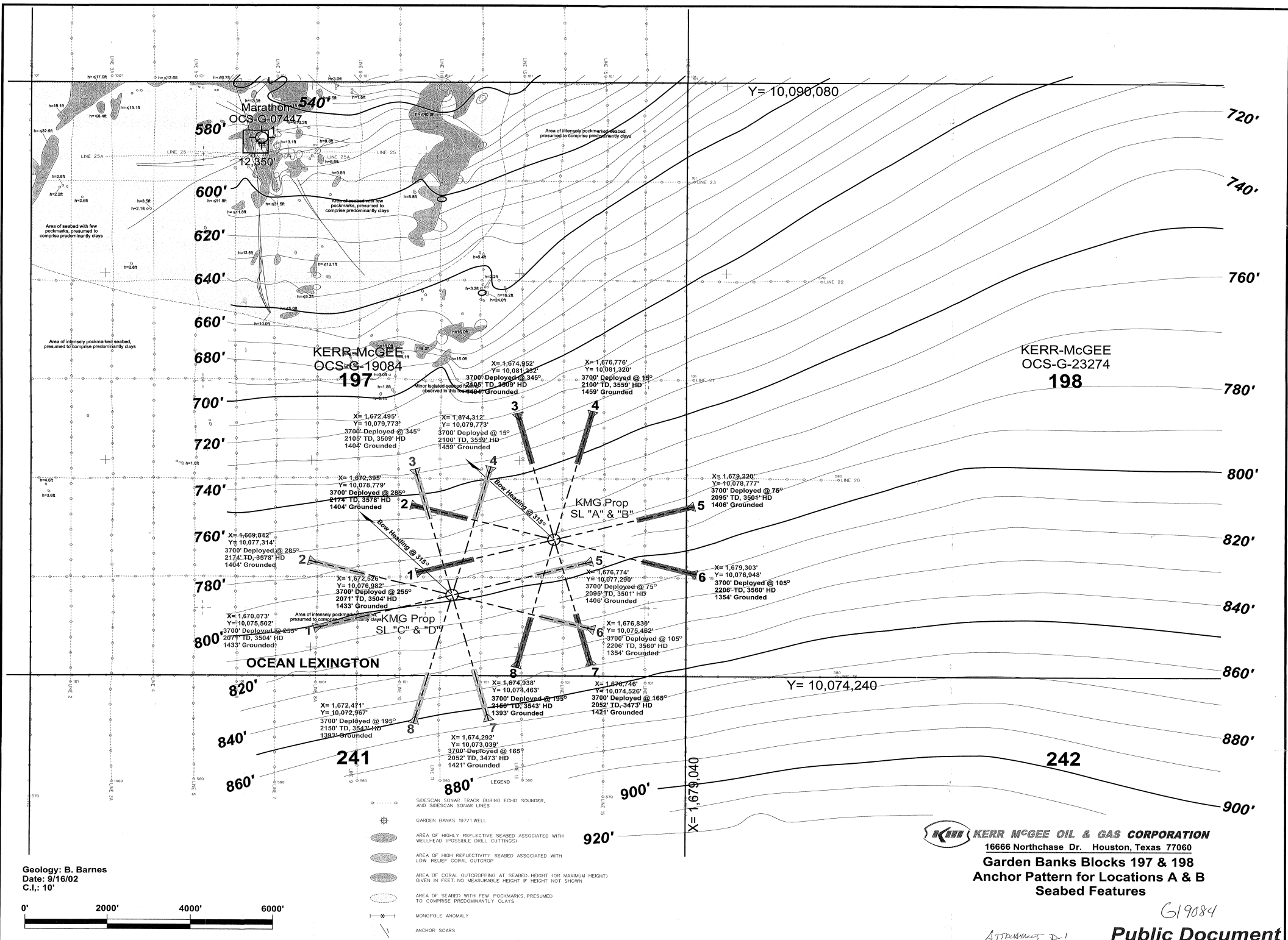
Geohazard Summary Map

Public Document

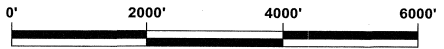
Geology: J. Kamm
Date: 10/4/02

0' 2000' 4000' 6000'

ATTACHMENT D-3



Geology: B. Barnes
 Date: 9/16/02
 C.I.: 10'



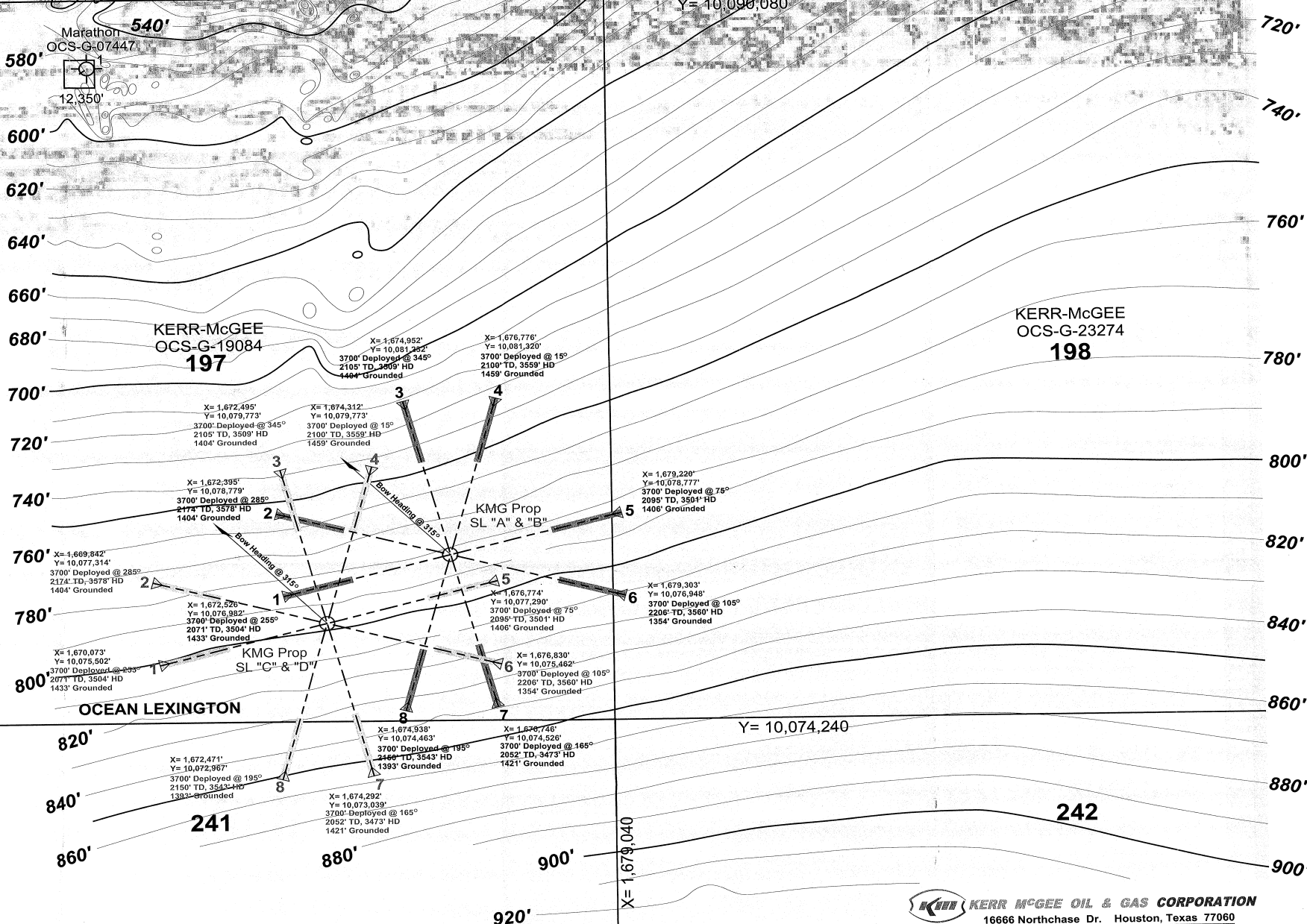
- SIDECAN SONAR TRACK DURING ECHO SOUNDER, AND SIDECAN SONAR LINES
- GARDEN BANKS '97/1 WELL
- AREA OF HIGHLY REFLECTIVE SEABED ASSOCIATED WITH WELLHEAD (POSSIBLE DRILL CUTTINGS)
- AREA OF HIGH REFLECTIVITY SEABED ASSOCIATED WITH LOW RELIEF CORAL OUTCROP
- AREA OF CORAL OUTCROPPING AT SEABED HEIGHT (OR MAXIMUM HEIGHT) GIVEN IN FEET. NO MEASURABLE HEIGHT IF HEIGHT NOT SHOWN.
- AREA OF SEABED WITH FEW POCKMARKS, PRESUMED TO COMPRISE PREDOMINANTLY CLAYS
- MONOPOLE ANOMALY
- ANCHOR SCARS

KERR-McGEE OIL & GAS CORPORATION
 16666 Northchase Dr. Houston, Texas 77060
Garden Banks Blocks 197 & 198
Anchor Pattern for Locations A & B
Seabed Features

G19084

ATTACHMENT D-1

Public Document



Geology: B. Barnes
 Date: 9/16/02
 C.I.: 10'



KERR MCGEE OIL & GAS CORPORATION
 16666 Northchase Dr. Houston, Texas 77060
Garden Banks Blocks 197 & 198
Anchor Pattern for Locations A & B
 with
Diamond Phase1 3D Water Bottom
RMS Amplitude Extraction

G19084

Northchase D-2

Public Document