

UNITED STATES GOVERNMENT  
MEMORANDUM

07/02/98

To: Public Information, (MS 5034)

From: Exploration/Development Plans Section, (MS 5231)

Reference is made to the following plan received June 18, 1998:

Type Plan - Unit Development Operations Coordination Document  
Leases - OCS-G 7049, 8010, and 8876  
Blocks - 254, 298, and 297  
Area - Green Canyon  
Activities Proposed - Platform A (TLP) and 5 Subsea Wells  
Control Number - N-6222  
Operator - British-Borneo

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

  
Reviewing Engineer

*Noted/oa*

RECEIVED  
EXPLORATION/DEVELOPMENT PLANS SECTION  
JUL 2 1998

**BRITISH-BORNEO**  
EXPLORATION, INC.

1201 LOUISIANA SUITE 3500 HOUSTON, TEXAS 77002-5009  
TEL. 713-650-8292 FAX 713-650-1053

June 14, 1998

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



REFER TO CONTROL NO. N-6222

RE: Initial Unit Development Operations Coordination Document  
Leases OCS-G 7049/8876/8010, Green Canyon Blocks 254/297/298  
Allegheny Project, (Federal Unit Agreement No. 754395015)  
OCS Federal Waters, Gulf of Mexico, Offshore, Louisiana

Gentlemen:

In accordance with the provisions of Title 30 CFR 250.34, British-Borneo Exploration, Inc. ("British-Borneo") hereby submits for your review and approval nine copies of an Initial Unit Development Operations Coordination Document for Leases OCS-G 7049/8876/8010, Green Canyon Blocks 254/297/298, respectively, (Federal Unit Agreement No. 754395015) Offshore, Louisiana. Five copies are "Proprietary Information" and four copies are "Public Information".

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

British-Borneo anticipates commencing activities under this proposed Initial Unit Development Operations Coordination Document in September, 1998.

Should additional information be required, please contact the undersigned, or our regulatory agent, Cathy Thornton, J. Connor Consulting, Inc., at (281) 578-3388.

Sincerely,

A handwritten signature in cursive script that reads "G. Ross Frazer".

G. Ross Frazer, P.E.  
Manager, Regulatory Affairs & Partner Liaison

**"Public Information"**

GRF:CAT

BRITISH-BORNEO EXPLORATION, INC.  
INITIAL UNIT DEVELOPMENT  
OPERATIONS COORDINATION DOCUMENT  
LEASES OCS-G 7049/8876/8010  
GREEN CANYON BLOCKS 254/297/298  
ALLEGHENY PROJECT

British Borneo Exploration, Inc. ("British-Borneo"), as designated Operator of the subject leases hereby submits this proposed Initial Unit Development Operations Coordination Document in accordance with the regulations contained in Title 30 CFR 250.34 and more specifically defined in the Minerals Management Service Letters to Lessees and Operators dated October 12, 1988 and September 5, 1989.

***HISTORY OF LEASE***

Leases OCS-G 7049/8876/8010, Green Canyon Blocks 254/297/298, are all part of British-Borneo's Allegheny Field. The subject leases were acquired at the Central Gulf of Mexico Lease Sales 81, 98 and 110, respectfully.

Lease OCS-G 8005, Green Canyon Block 253 was originally included under Federal Unit Agreement No. 754395015. However, it was allowed to revert to the Minerals Management Service since none of the field extends into this block.

On August 28, 1997, British-Borneo acquired a 60% working interest (40% from Mobil and 20% from Enserch) in the three block area containing the Allegheny discovery. Reading & Bates Development Company subsequently acquired the remaining 20% of Enserch's working interest to increase their working interest to 40%.

Plans of Exploration have been submitted on Green Canyon Blocks 254, 297 & 298 which provided for the drilling and completion of a total of 10 wells. A total of four wells have been deemed capable of producing and temporarily abandoned. The subject unit is currently held by a suspension of production.

In accordance with Letter to Lessees and Operators (LTL) dated November 5, 1993, which amends Title 30 CFR Part 256 (surety bond requirements applicable to OCS lessees and operators), British-Borneo has submitted additional bonding to meet the \$3,000,000 areawide criteria

### ***SCHEDULE OF OPERATIONS***

This Initial Unit Development Operations Coordination Document provides for the drilling, completion and potential testing of one additional well (Lease OCS-G 8010, Well No. 1) from a previously approved surface location, installation of a single column, tension leg platform (TLP) to be designated Platform "A" and commencement of production of five subsea wells.

The four existing wells are in two groups on Leases OCS-G 7049, 8876 and 8010. These are approximately 5550' apart on a line running southeast to northwest. Lease OCS-G 8876 Well No. 1 is at the southern end of this line while Lease OCS-G 7049 Well Nos. 3, 4/ST#1 and 5 are at the northern end. The tension leg platform will be located approximately halfway between the two well clusters. The proposed new well (Lease OCS-G 8010, Well No. 1) will have its surface location within 25' of Lease OCS-G 8876, Well No. 1.

Production from the subsea wells will be via 4" steel catenary risers back to the tension leg platform. Flexible control umbilicals will run from the TLP to the wells. Oil and gas production will flow from the TLP via proposed 12" oil and gas right-of-way steel catenary export risers/pipelines to a point approximately four miles away in a northwest direction.

No new nearshore or onshore pipelines or facilities will be constructed.

A well location plat and table showing the surface and bottom hole locations, total well depths and water depth of the subject wells are included as Attachments A-1 and A-2.

Activities under this Initial Unit Development Operations Coordination Document for Green Canyon Blocks 254/297/298 will commence in September, 1998.

The following schedule details the chronological order of the proposed events leading to the full start up of production.

<u>Activity</u>	<u>Activity Schedule</u> <u>Approximate Date</u>
1. Commence Installation of Piles for the Allegheny Tension Leg Platform A	September, 1998

- |    |  |                |
|----|--|----------------|
| 2. | Commence Completion of the wells<br><i>(Lease OCS-G 7049, Well Nos. 3, 4/ST#1 and 5<br/>and Lease OCS-G 8876, Well No. 1<br/>provided for in previously submitted Plans)</i> | December, 1998 |
| 3. | Commence Installation of R-O-W pipelines   | February, 1999 |
| 4. | Commence Installation of Tension Leg Platform  | April, 1999    |
| 5. | Commence Installation of Lease Term Flowlines and<br>Umbilical Lines from Subsea Wells to Host Platform  | June, 1999     |
| 6. | Commence Drilling of Lease OCS-G 7049, Well No. 6  | July, 1999     |
| 7. | Hook-Up and Commence Production  | August, 1999   |

#### ***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 with a semi-submersible drilling rig (MV "Atwood Hunter"). The BOP Schematic for the "Atwood Hunter" is included as Attachment B.

Safety features will include well control and blowout prevention equipment as described in Title 30 CFR 250.50. 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.

#### ***DESCRIPTION OF PLATFORM***

Proposed Platform "A" will consist of a single column TLP. A representation of the proposed platform is included as Attachment C.

All hydrocarbon handling equipment installed for testing and production operations will be designed, installed and operated to prevent pollution from the proposed structures.

Maintenance or repairs which are necessary to prevent pollution of offshore waters shall be undertaken immediately.

There shall be no disposal of equipment, cables, containers, or other materials into offshore waters.

### ***STRUCTURE MAP***

Current structure maps drawn to the top of each prospective hydrocarbon accumulation showing the surface and bottom hole locations of the subject wells are included as Attachment D.

### ***CROSS SECTION***

A generalized stratigraphic column from the surface to total depth and deep seismic lines intersecting at or near the primary well locations are necessary to evaluate geologic conditions.

A Generalized Stratigraphic Column and Cross Section Map depicting the subject wells depicting geologic name and age of the anticipated structures are included as Attachments E-1 and E-2.

### ***BATHYMETRY MAP***

A bathymetry map showing the surface location of the subject wells and Platform "A" is included as Attachment F.

### ***CHEMOSYNTHETIC ANALYSIS***

In accordance with the provisions in Minerals Management Service's Notice to Lessees (NTL 88-11) dated February 1, 1989, deepwater operations proposed in water depths greater than 400 meters require an analysis of the evidence and consequences of geological phenomena.

A chemosynthetic community evaluation providing for Platform "A" is included as Attachment G.

### ***SHALLOW HAZARDS***

Enserch Exploration, Inc., with partner Exxon Company USA, contracted Fugro-McClelland Marine Geosciences, Inc. in November 1993, to conduct a geological and geophysical survey on Green

Canyon Blocks 253, 254, 297 and 298. The purpose of the survey was to determine bottom and sub-bottom conditions within the lease area and inspect for potential drilling hazards.

Additionally, British-Borneo has evaluated the Diamond Geophysical 3-D seismic survey for shallow hazards. Detailed seafloor topographic and amplitude maps have been constructed and examined on a 3-D workstation.

A shallow hazards analysis evaluating any seafloor and subsurface geologic and manmade features and conditions for Platform "A" is included as Attachment H.

#### ***OIL SPILL RESPONSE PLAN***

All drilling, construction and production operations shall be performed in accordance with industry standards to prevent pollution of the environment. MMS has reviewed and approved British-Borneo's Annual Update to its Oil Spill Response Plan. This plan designates an Oil Spill Management Team consisting of British-Borneo and contract personnel. This team's duties are to eliminate the source of any spill, remove all sources of possible ignition, deploy the most reliable means of available transportation to monitor the movement of a slick, and contain and remove the slick if possible.

British-Borneo is a member of Clean Gulf Associates (CGA). CGA stores pollution control equipment at two locations in Texas (Ingleside and Galveston), five locations in Louisiana (Fourchon, Grand Isle, Lake Charles, Houma and Fort Jackson), and one location in Mississippi, (Pascagoula).

Each base is equipped with fast response skimmers and there is a barge mounted high volume open sea skimmer based at Grand Isle, Louisiana. In addition to providing equipment, CGA also supplies advisors for clean-up operations. Equipment available from CGA and the base at which it is located is listed in the CGA Manual, Volume I, Section III.

British-Borneo will make every effort to see that a spill is responded to as quickly as possible. Response equipment and times will be suitable for anticipated environmental conditions in the area.

In good weather conditions fast response with open ocean boom and skimmers would require approximately 15 - 16 hours. This figure includes preparation time as detailed below. A heavy equipment system response (HOSS Barge) would require as much as 36 hours (assuming 6 hours for preparation time).

		<u>Hours</u>
1.	Procurement of marine vessel capable of handling spill response equipment (Grand Isle, LA)	2.0
2.	Load out Fast Response Unit	<u>1.5</u>
	<i>Total Load Out</i>	3.5 → 3.5
3.	Travel time to Spill Site	
	(Inland Water Travel Time - 3 miles @ 6MPH)	.5
	(Open Water Travel Time - 105 miles @ 10MPH)	10.5
4.	Deployment of Equipment at Lease Site	<u>1.0</u>
	Estimated Total Time	15.5

Equipment located in Grand Isle, Louisiana would be utilized first with additional equipment transported from the nearest equipment base as required.

In the event a spill occurs from a surface location of the TLP, British-Borneo has projected the trajectory of a spill and the probability of it impacting a land segment. This analysis is based on information in Minerals Management Service's Oil Spill Risk Analysis for the Central and Western Gulf of Mexico OCS Lease Sales 157 and 161. The results are tabulated below.

<u>AREA/BLOCK</u>	<u>LAND SEGMENT</u>	<u>%</u>	<u>CGA MAP</u>
Green Canyon Blocks 254/297/298	Terrebonne, LA	1%	Map No. 6

Should a spill occur from the subject location, British-Borneo would relay current conditions to Spillnet for assistance in predicting spill movement, probable impact location and time of landfall. Then, using the Clean Gulf Operations Manual, Volume II and Spillnet's database, the Spill Management Team would identify the biologically sensitive areas and determine the appropriate response strategies.

Section VI, Volume II of the CGA Operations Manual depicts the protection response modes that are applicable for oil spill clean-up operations. Each response mode is schematically represented to show optimum deployment and operation of the equipment in areas of environmental concern. Implementation of the suggested procedures assures the most effective use of the equipment and will result in reducing the adverse impact of oil spills on the environment. Supervisory personnel have the option to modify the deployment and operation of equipment to more effectively respond to site-



specific circumstances.

### ***NEW OR UNUSUAL TECHNOLOGY***

In accordance with Minerals Management Service's Notice to Lessees (NTL 96-4N) and regulations contained in 30 CFR 250.3 (b) and 30 CFR 250.34 (b)(5) and (7), British-Borneo will be submitting a Deepwater Operations Plan (DWOP) for Minerals Management Service's review and approval.

British-Borneo proposes to install a single column, tension leg platform, to be designated Platform "A". The design is basically a passive buoy held in place with a conventional tension leg mooring system. The design intent incorporates (1) no active ballasting during normal operations, (2) no machinery in the hull, (3) no crude oil storage in the hull, and (4) two tendons per corner for redundancy. This tension leg platform design is virtually the same as that being used for British-Borneo's Morpeth Field in EW 921/964/965. The vessel will be classed according to ABS rules as ⌘ FOI (TLP).

### ***LEASE STIPULATIONS***

Oil and gas exploration and development 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.

The MMS did not invoke any lease stipulations on the subject leases.

### ***CULTURAL RESOURCES***

By letter to Lessees (LTL) dated September 5, 1995, Minerals Management Service designated Green Canyon Blocks 254/297/298 as areas having a low probability for historic and prehistoric archaeological resources on the OCS. Therefore, an archaeological resources report is not required based on data from prehistoric site remote-sensing surveys.

### ***DISCHARGES***

All discharges associated with drilling, completing and producing the subject well will be in accordance with regulations implemented by Minerals Management Service (MMS), U. S.

Environmental Protection Agency (EPA), and the U. S. Coast Guard (USCG).

The MMS issued a special advisory notice (NTL 86-11) strongly encouraging the oil and gas industry to take special educational, operational and awareness measures to reduce or eliminate contributions to marine debris in the Gulf of Mexico.

Annex V of the International Convention for the Prevention of Pollution from ships, also known as MARPOL Protocol, prohibits the dumping of all plastic wastes, including plastic packaging materials and fishing gear.

EPA's Western Gulf of Mexico NPDES General Permit GMG290000 addresses the discharge limitations and testing protocol for drilling fluids, cuttings and associated wastes.

Discharges will contain no free oil and will be in compliance with and monitored as required by the permit. Any drilling fluid contaminated with oil will be transported to shore for proper disposal at an authorized disposal site.

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

Mud may be discharged for purposes of dilution or at end of well. Surveillance of the fluid is accomplished through daily inventory of mud and chemicals added to the system. This is in addition to monthly and end-of-well LC50 toxicity tests required by EPA. Typical mud components which may be used in the drilling of the proposed well is included as Attachment I.

Anticipated discharges associated with British-Borneo's proposed drilling operations for Well No. 1, Green Canyon Block 298 are included as Attachment J.

### ***HYDROGEN SULFIDE***

In accordance with Title 30 CFR 250.67, British-Borneo requests that Green Canyon Blocks 254/297/298 be classified by the Minerals Management Service as an area where the absence of hydrogen sulfide has been confirmed.

### ***PROJECTED EMISSIONS***

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.

Projected air emissions providing for the drilling, completion and testing of one additional well, installation of Platform "A", installation of five lease term flowlines with umbilical lines from the subject wells to Platform "A", and commencement of production are included as Attachment K.

### ***ENVIRONMENTAL REPORT***

An Environmental Report is included as Attachment L.

### ***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 M. A copy of the Public Notice request for publication in the Louisiana Baton Rouge State Times is included as Attachment N, as well as the appropriate Parish Journal being included as Attachment O.

***ONSHORE SUPPORT BASE***

The subject locations are located approximately 90 miles from the nearest shoreline and 95 miles from British-Borneo's onshore support base located in Fourchon, Louisiana. Water depths across the blocks range from approximately 2900 feet to 3200 feet. A Vicinity Plat showing the location of Green Canyon Blocks 254/297/298 relative to the shoreline is included as Attachment P.

British-Borneo will utilize existing onshore facilities located in Fourchon, Louisiana. This will serve as 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. Support vessels and travel frequency during drilling, completion and production activities are as follows:

	<b><i>DRILLING/COMPLETION</i></b>	<b><i>PRODUCTION</i></b>
Crew Boat	4 Trips Per Week	2 Trips Per Week
Supply Boat	3 Trips Per Week	2 Trips Per Week
Helicopter	4 Trips Per Week	3 Trips Per Week

***AUTHORIZED REPRESENTATIVE***

Inquiries may be made to the following authorized representative:

Cathy Thornton  
J. Connor Consulting, Inc.  
16225 Park Ten Place, Suite 500  
Houston, Texas 77084  
(281) 578-3388

*British-Borneo Exploration, Inc.*  
*Initial Unit Development Operations Coordination Document*  
*Leases OCS-G 7049/8876/8010*  
*Green Canyon Blocks 254/297/298*  
*June 15, 1998*

*Page 11*

***LIST OF ATTACHMENTS***

- A Well Location Table and Plat
- B Diverter and BOP Schematics
- C Platform Schematic
- D Structure Map
- E Cross Section Map and Generalized Stratigraphic Column
- F Bathymetry Map
- G Chemosynthetic Review
- H Shallow Hazards Analysis
- I Typical Mud Components
- J Quantities and Rates of Discharges
- K Projected Air Emissions
- L Environmental Report
- M Coastal Zone Consistency Certification
- N Public Notice Request - State Times
- O Public Notice Request - Parish Journal
- P Vicinity Map

BRITISH-BORNEO EXPLORATION, INC.

INITIAL UNIT DEVELOPMENT  
OPERATIONS COORDINATION DOCUMENT

LEASES OCS-G 7049/8876/8010

GREEN CANYON BLOCKS 254/297/298

*WELL LOCATION TABLE*

<u>WELL</u>		<u>LOCATION</u>	<u>TOTAL DEPTH</u>	<u>WATER DEPTH</u>	<u># OF DAYS</u>
<b><i>PROPOSED</i></b>					
PLATFORM A	PSL:	99' FSL & 3410' FWL (254)		3250'	NA
G 8010 #1	PSL:	2820' FNL & 2718' FWL (298)		3310'	75/25
<b><i>EXISTING</i></b>					
G 7049 #3	SL:	2605' FSL & 1760' FWL (254)		3226'	NA
G 7049 #4/ST#1	SL:	2557' FSL & 1763' FWL (254)		3225'	N/A
G 7049 #5	SL:	2606' FSL & 1745' FWL (254)		3234'	N/A
G 8876 #1	SL:	2849' FNL & 2725' FWL (298)		3308'	N/A

253

254



SeaStar

297

298

SL 6  
X=2,521,278  
Y=10,055,580  
2718'FWL  
2820'FNL



**BRITISH - BORNEO**

**ALLEGHENY PROSPECT  
Green Canyon Block 298**

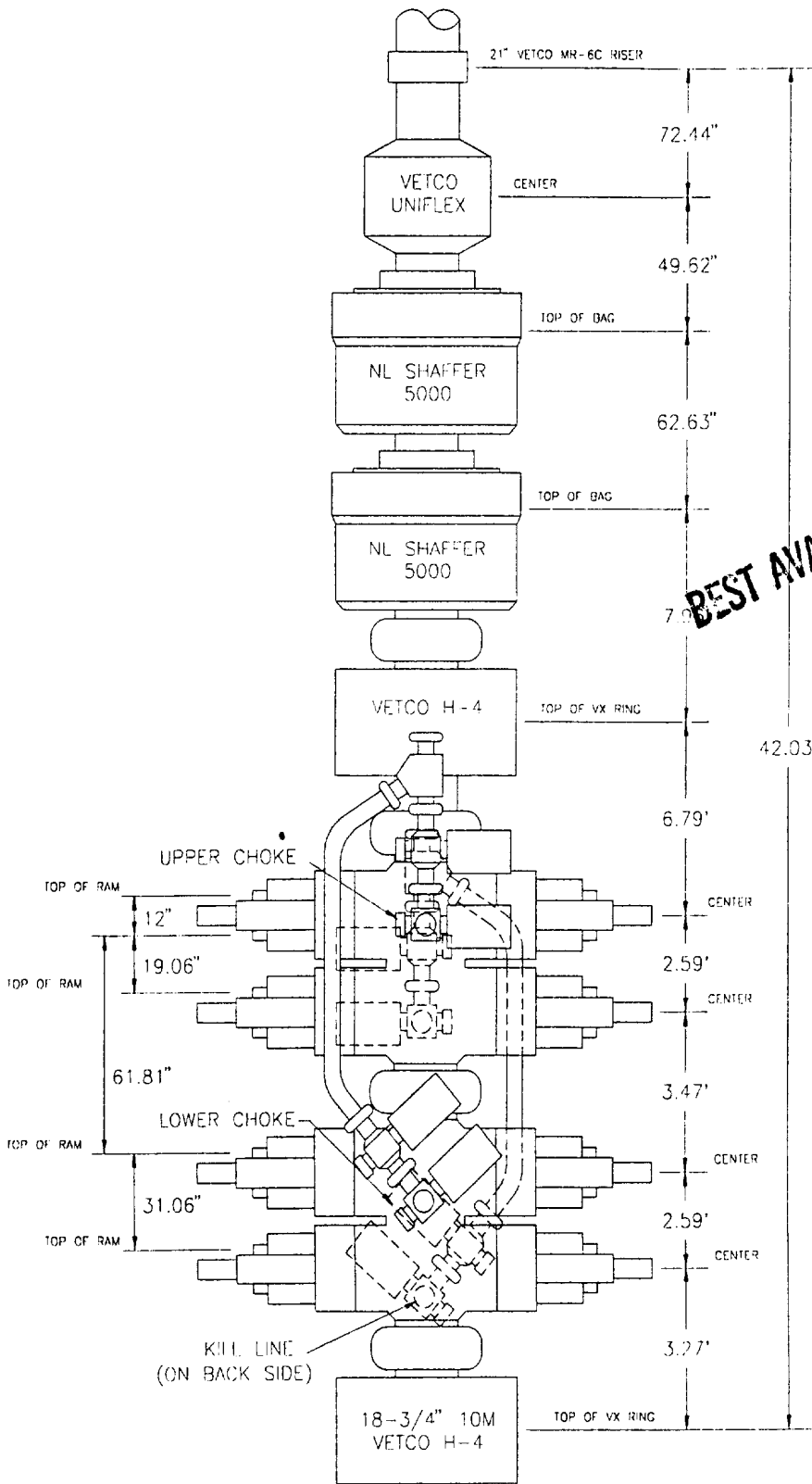
**Location Plat**

Scale: 1"=2000'


**ATTACHMENT A-2**

Author.  
Drawn.

Date.  
Fig No.

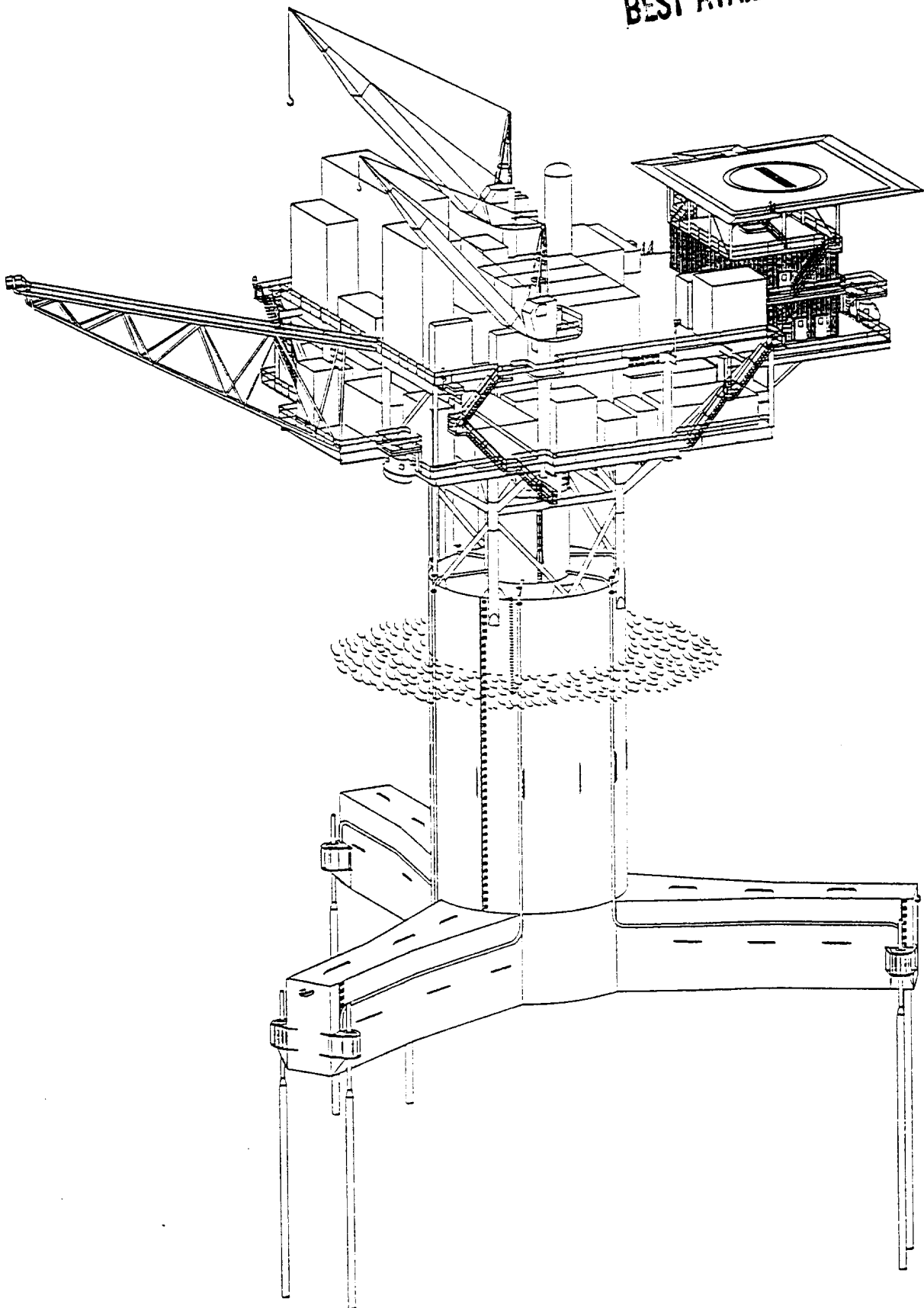


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			3	12/23/94	MJR	REVISED CHOKE & KILL LINES LOCATIONS
			2	6/6/95	MJR	REVISED CHOKE & KILL LINES LOCATIONS
			1	6/6/95	MJR	REVISED DIMENSIONS
NO.	DRAWING NO.	DRAWING TITLE	NO.	DATE	BY	DESCRIPTION
REFERENCE DRAWINGS			REVISIONS			
<h1>"HUNTER"</h1>			 <b>ATWOOD OCEANICS, INC.</b> HOUSTON, TEXAS			
<small>THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF ATWOOD OCEANICS, INC. ORGANIZATION AND IT IS GIVEN ON THE DISTINCT UNDERSTANDING THAT IT SHALL NOT BE DISCLOSED, LOANED, COPIED, NOR OTHERWISE USED BY ANY THIRD PARTIES WITHOUT EXPRESS WRITTEN CONSENT OF ATWOOD OCEANICS, INC.</small>			APPROVALS		DATE	TITLE
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			APPROVED			
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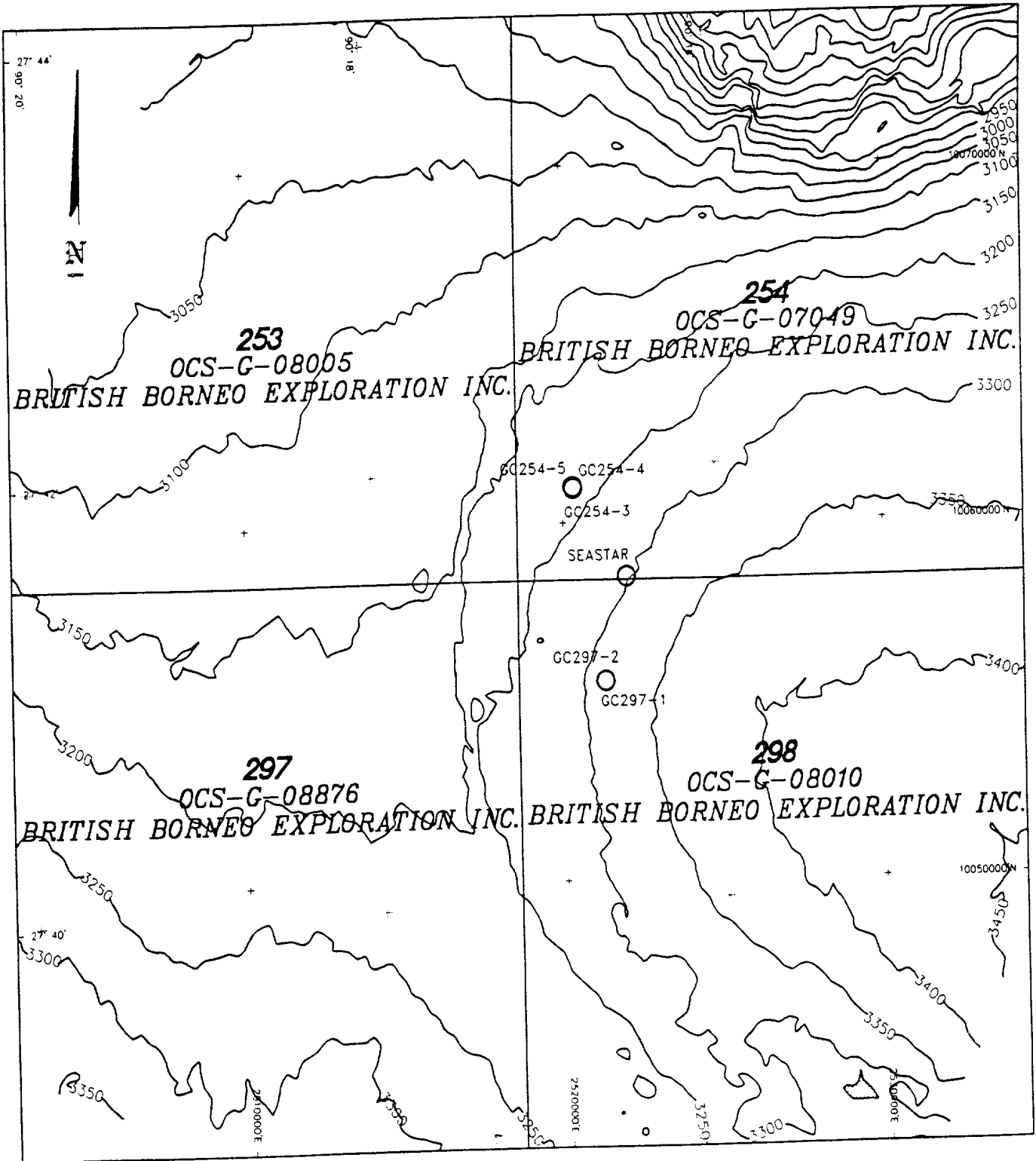


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ATTACHMENT C

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BATHYMETRY MAP, ALLEGHENY PROSPECT

**DRILLING FLUID ADDITIVES  
PRODUCT CROSS REFERENCE**

MILPARK	BAROID	M-I	DESCRIPTION
<b>WEIGHT MATERIALS</b>			
MIL-BAR	BAROID	M-I BAR	API bante. 4.2 specific gravity
DENSIMIX	BARODENSE	FER-OX	Macaceous nematite
W.O. 30	BARACARB	LO-WATE	Calcium carbonate
<b>VISCOSIFIERS</b>			
MILGEL	AQUAGEL	M-I GEL	API-grade Wyoming bentonite
MILGEL NT	AQUAGEL GOLD SEAL		Untreated Wyoming bentonite
SALTWATER GEL	ZEOGEL	SALT GEL	API-grade attapulgite
SUPER-CCL	QUIK-GEL	KWIK-THIK	High-yield bentonite, treated
NEW-VIS			Organic polymer blend
XCD POLYMER	XCD POLYMER	XCD POLYMER	XC Dispersable
MIL-BEN	SHUR-GEL		Bentonite-OCMA Spec. DFCP4
<b>DEFLOCCULANTS</b>			
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
<b>FILTRATION CONTROL AGENTS</b>			
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	Pregeatinized 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
<b>CORROSION CONTROL CHEMICALS</b>			
MIL-GARD	NO-SULF	SULF-X	Basic zinc carbonate
MIL-GARD R	BARASCAV-L	SULF-X ES	Chelated zinc
NOXYGEN	COAT-388	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		
<b>CARBO-DRILL OIL MUD ADDITIVES</b>			
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 nectante
CARBO-VIS	GELTONE II	VERSAMOD	Organophilic clay
CARBO-TROL		VERSATROL	Filtration control agent
CARBO-TROL A-9	DURATONE HT	VERSALIG	Nonasphaltic 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
<b>SHALE CONTROL ADDITIVES</b>			
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 DP		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
<b>SPOTTING FLUIDS</b>			
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
<b>LUBRICANTS</b>			
AQUA-MAGIC			Low-toxicity lubricant
LUBRI-FILM	EP MUDLUBE	E.P. LUBE	Extreme-pressure lubricant
MIL-LUBE		LUBE-106	General lubricant
<b>DETERGENTS/FOAMERS</b>			
AMPLI-FOAM	DRILFOAM	FOAMER 80	Mist and stiff foaming agent
MIL CLEAN	BARCID RIG WASH BARA-KLEAN	KLEEN-UP	Biodegradeable detergent
MILPARK MD	CON-DET	DD	Drilling detergent
<b>DEFOAMING AGENTS</b>			
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
<b>LOST CIRCULATION MATERIALS</b>			
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
<b>WORKOVER AND COMPLETION FLUID ADDITIVES</b>			
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
<b>PRESERVATIVES</b>			
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.

# J. Connor Consulting, Inc.



14-Jun-98

## AIR QUALITY REVIEW

COMPANY: BRITISH-BORNEO EXPLORATION, INC.  
AREA: GREEN CANYON  
BLOCK: 254/297/298  
LEASE: G 7049/8876/8010  
PLATFORM: PLATFORM A  
WELLS: (5) SUBSEA WELLS

COMPANY CONTACT: CATHY THORNTON

TELEPHONE NO.: (281) 578-3388

REMARKS: THE PROPOSED INITIAL UNIT DEVELOPMENT OPERATIONS COORDINATION DOCUMENT PROVIDES FOR THE INSTALLATION PLATFORM A, DRILLING, COMPLETION AND TESTING OF ONE (1) ADDITIONAL WELL AND COMMENCEMENT OF PRODUCTION OF FIVE (5) SUBSEA WELLS.

THE FIVE (5) SUBSEA WELLS WILL PRODUCE TO PLATFORM A VIA PROPOSED LEASE TERM FLEXIBLE FLOWLINES. SEPARATED PRODUCTION FROM PLATFORM A WILL FLOW VIA PROPOSED RIGHT-OF-WAY PIPELINES WITH STEEL CATENARY RISERS.

## ATTACHMENT K

## GULF OF MEXICO AIR EMISSION CALCULATIONS

**General**

This document (MMS.WK3) was prepared through the cooperative efforts of those professionals in the oil industry including the API/OOC Gulf of Mexico Air Quality Task Force, who deal with air emission issues. Exploration (POE) and Development, Operations, Coordination Documents (DOCD) approved by the Minerals Management Service (MMS). It is intended to be thorough but flexible to meet the needs of different operators. This first sheet gives the basis for the emission factors used in the emission spreadsheet as well as some general instructions. This file contains 8 sheets: A,B,C,D,E,F,G,& H. A is the Instruction Sheet, B is the Title Sheet, C is the Factors Sheet, D,E,F, & G are the Emission Spreadsheets and H is the Summary Sheet. These sheets will describe and calculate emissions from an activity.

**Title Sheet**

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

**Factor Sheet**

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

The basis for the factors is as follows:

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

**Emission Factors*****Natural Gas Prime Movers***

1. TNMOC refers to total non-methane organic carbon emissions and these can be assumed equivalent to VOC emissions.
2. The sulfur content assumed is 2000 grains/mmscf (3.33 ppm). If your concentration is different then ratio your emission factor up or down.

***Diesel-Fired Prime Movers***

1. Diesel sulfur level 0.4% by wt
2. For boats use > 600 HP factors based on AP-42 Vol. II, Table II-3-3. Those figures closely match the above values. Include only the emissions from the boats within 25 mile radius of the well/platform.
3. For diesel engines <600 HP VOC emissions equal total HC emissions; for diesel engines >600 HP VOC emissions equal non-methane HC emissions.

## AIR EMISSION CALCULATIONS

### *Heaters/Boilers/Firetubes/NG-Fired*

1. NG Sulfur content is 2000 grains per million cu ft
2. VOCs emissions based on total non-methane HCs

### *Gas Flares*

1. Flare is non-smoking
2. 1050 btu/cu. ft. for NG heating value
3. The sulfur content assumed is 2000 grains/mmscf (3.33 ppm). If your concentration is different then ratio your emission factor up or down or you may use the following formula

$$\text{H2S flared (lbs/hr)} = \text{Gas flared (cu ft/hr)} \times \text{ppm H2S} \times 10^6 \times 34/379$$

$$\text{SOx emis (lbs/hr)} = \text{H2S flared (lbs/hr)} \times 64/34$$

### *Liquid Flares*

1. Assume 1% by wt Sulfur maximum in the crude oil.
2. VOC equals non-methane HCs
3. Particulate emissions assumes Grade 5 oil.

### *Tanks*

1. Tank emissions assumes uncontrolled fixed roof tank.

### *Fugitives*

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

### *Glycol Dehydrator Vent*

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

### *Gas Venting*

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

### **Emissions Spreadsheet**

The emissions from an operation should be presented for a calendar year (1994, 1995, etc.). The operation may include drilling only or drilling in conjunction with other activities such as pipeline installation or production operations. For the first year use sheet D, for the second year use sheet E, third use F, fourth use G and if you need more you will have to insert a sheet and copy the spreadsheet to the new sheet. The year (CELL D:A38) should be changed and the different operating parameters entered to calculate revised emissions for that subsequent year. The spreadsheet will calculate maximum fuel usage (UNIT/HR) using the known horsepower. It will assume maximum fuel usage is equal to actual fuel

## AIR EMISSION CALCULATIONS

(UNIT/DAY) usage unless the actual fuel usage is known. If so, insert actual fuel usage in appropriate column. The emissions will be calculated as follows:

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

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

To customize the spreadsheet for your application you may want to delete lines for non-applicable equipment/activities or you can input "0" for the HP of equipment that does not apply. You may also need to copy/insert an entire line if more than one similar type of equipment is present.

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

Turbine  
Turbine - Gas Compressor

Burner  
Burner - Line Heater

### Summary Sheet

The Summary Sheet is designed to show a proposed estimate of emissions from an activity over a future period of time. In this example ten years was chosen. Each row links to the corresponding emission calculation spreadsheet for that year. For example, Row 7 of the summary corresponds to the annual totals from Sheet D. Row 8 links to the second emission calculation spreadsheet, Row 9 to the third and Row 10 to the fourth. Row 11 - 16 will carry down the emissions from the last spreadsheet with an emission rate greater than zero. The Summary Sheet will always carry down the last non-zero emission total. For example, if emission calculations are done for the years 1994 and 1995, then the 1995 total will be carried down through the year 2003. Row 17 of the summary sheet reflects the allowable for the air quality review exemption determination. If more or less years are needed you will have to modify the spreadsheet.

### Print Instructions

The table below lists macros that were written to print sheets A, C, D, E, F, G, & H.

- VA - This macro prints 3 pages of instructions (sheet A).
- VC - This macro prints the emissions factors sheet (sheet C).
- VD - This macro prints the emissions calculations sheet (sheet D).
- VE - This macro prints the emissions calculations sheet (sheet E).
- VF - This macro prints the emissions calculations sheet (sheet F).
- VG - This macro prints the emissions calculations sheet (sheet G).
- VH - This macro prints the emissions calculations sheet (sheet H).
- VX - This macro prints all sheets - A, C, D, E, F, G, & H.

To run one of these macros, hold down ALT and press the letter in the macro range name. For example, to run the macro VA, press ALT-a.



COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELLS
BRITISH-BORNEO EXPLORATION, IN	GREEN CANYON	254/297/298	G 7049/8876/8010	PLATFORM A	(5) SUBSEA WELLS

Year	Emitted			Substance	
	TSP	SOx	NOx	HC	CO
1998	0.70	4.37	32.27	0.97	7.04
1999	11.57	72.26	529.35	118.00	118.45
2000	1.25	7.76	57.27	243.93	12.50
2001	1.25	7.76	57.27	243.93	12.50
2002	1.25	7.76	57.27	243.93	12.50
2003	1.25	7.76	57.27	243.93	12.50
2004	1.25	7.76	57.27	243.93	12.50
2005	1.25	7.76	57.27	243.93	12.50
Allowable	2997.00	2997.00	2997.00	2997.00	69314.07

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELLS	LATITUDE	LONGITUDE	CONTACT	PHONE	REMARKS	TONS PER YEAR						
											TSP	SOx	NOx	VOC	CO	TSP	SOx
BRITISH-BORNEO EXPLORATION IN GREEN CANYON		254297298	G 7049/8876/8010	PLATFORM A	(9) SUBSEA WELLS			CATHY THORNTON	(281) 578-3388		POUNDS PER HOUR						
OPERATIONS		MMBTU/HR	MAX. FUEL GAL/HR SCF/HR	ACT. FUEL GAL/HR SCF/HR	RUN TIME HRR/D	DAYS	TSP	SOx	NOx	VOC	CO	TSP	SOx	NOx	VOC	CO	
DRILLING	EQUIPMENT Diesel Engines		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	PRIME MOVER->600hp diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	PRIME MOVER->600hp diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	PRIME MOVER->600hp diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	AUXILIARY EQUIP->600hp diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSLS->600hp diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSLS->600hp diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PIPELINE	PIPELINE LAY BARGE diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
INSTALLATION	SUPPORT VESSEL diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	PIPELINE BURY BARGE diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	SUPPORT VESSEL diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY	DERRICK BARGE diesel	18000	869.40	20865.60	24	5	9.52	59.07	436.12	13.08	96.15	0.57	3.54	26.17	0.79	5.71	
INSTALLATION	MATERIAL TUG diesel	4200	202.86	4868.64	24	5	2.22	13.78	101.76	3.05	22.20	0.13	0.83	6.11	0.18	1.33	
PRODUCTION	RECIP ->600hp diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RECIP ->600hp diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RECIP ->600hp diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	SUPPORT VESSEL diesel		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	TURBINE nat gas		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RECIP 2 cycle lean nat gas		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RECIP 4 cycle lean nat gas		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RECIP 4 cycle lean nat gas		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	BURNER nat gas		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	BURNER nat gas		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	BURNER nat gas		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	BURNER nat gas		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	BURNER nat gas		0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	MISC	BPD	SCF/HR	COUNT													
	TANK	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	FLARE	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	PROCESS VENT	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	FUGITIVES	0.0	0.00	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	GLYCOL STILL VENT	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	OIL BURN	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	GAS FLARE	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
DRILLING							11.74	72.86	537.89	16.14	117.36	0.70	4.37	32.27	0.97	7.04	
WELL TEST																	
1998 YEAR TOTAL							2997.00	2997.00	2997.00	2997.00	2997.00	2997.00	2997.00	2997.00	2997.00	2997.00	69314.07
EXEMPTION CALCULATION										DISTANCE FROM LAND IN MILES							90.0

COMPANY	AREA	BLOCK	LEASE	PLATFORM		WELLS		LATITUDE	LONGITUDE	CONTACT	PHONE	REMARKS	TONS PER YEAR								
				PLATFORM A	ACT. FUEL	(5) SUBSEA WELLS	RUN TIME						TSP	SOx	NOx	VOC	CO	TSP	SOx	NOx	VOC
OPERATIONS	EQUIPMENT	HP	MAX. FUEL	GAL/HR	SCF/HR	GAL/HR	SCF/HR	HRD	DAYS	TSP	SOx	NOx	VOC	CO	TSP	SOx	NOx	VOC	CO		
																				MMBTU/HR	SCF/D
DRILLING	PRIME MOVER-600hp diesel	1950	94.19	2260.44	100	24	1.03	6.40	47.25	1.42	10.31	1.24	7.68	56.70	1.70	12.37					
	PRIME MOVER-600hp diesel	1950	94.19	2260.44	100	24	1.03	6.40	47.25	1.42	10.31	1.24	7.68	56.70	1.70	12.37					
	PRIME MOVER-600hp diesel	1950	94.19	2260.44	100	24	1.03	6.40	47.25	1.42	10.31	1.24	7.68	56.70	1.70	12.37					
	PRIME MOVER-600hp diesel	1950	94.19	2260.44	100	24	1.03	6.40	47.25	1.42	10.31	1.24	7.68	56.70	1.70	12.37					
	AUXILIARY EQUIP-600hp diesel	410	19.80	475.27	4	4	0.22	1.35	9.93	0.30	2.17	0.04	0.27	1.99	0.06	0.43					
	VESSELS-600hp diesel	2265	109.40	2625.59	8	8	1.20	7.43	54.88	1.65	11.97	0.27	1.70	12.54	0.38	2.74					
	VESSELS-600hp diesel	2265	109.40	2625.59	10	10	1.20	7.43	54.88	1.65	11.97	0.26	1.59	11.76	0.35	2.57					
	VESSELS-600hp diesel - 3 TUGS	12600	608.58	14605.92	18	18	6.66	41.35	305.29	9.16	66.61	0.12	0.74	5.50	0.16	1.20					
	VESSELS-600hp diesel - ANCHOR	4200	202.86	4868.64	24	24	2.22	13.78	101.76	3.05	22.20	0.05	0.33	2.44	0.07	0.53					
PIPELINE	PIPELINE LAY BARGE diesel	13000	627.80	15069.60	24	24	6.87	42.67	314.98	9.45	68.72	1.15	7.17	52.92	1.59	11.55					
INSTALLATION	SUPPORT VESSEL diesel	5600	270.48	6491.52	24	24	2.96	18.38	135.68	4.07	29.60	0.50	3.09	22.79	0.68	4.97					
	PIPELINE BURY BARGE diesel	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	SUPPORT VESSEL diesel	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
FACILITY	DERRICK BARGE diesel	18000	869.40	20865.60	24	24	9.52	59.07	436.12	13.08	95.15	2.85	17.72	130.84	3.93	28.55					
INSTALLATION	MATERIAL TUG diesel	4200	202.86	4868.64	24	24	2.22	13.78	101.76	3.05	22.20	0.53	3.31	24.42	0.73	5.33					
	MATERIAL TUG diesel	3600	173.88	4173.12	24	24	1.90	11.81	87.22	2.62	19.03	0.27	1.70	12.56	0.38	2.74					
PRODUCTION	RECIP -600hp diesel-CRANE	55	2.66	63.76	1	1	0.12	0.11	1.70	0.14	0.37	0.00	0.00	0.02	0.00	0.00					
	RECIP -600hp diesel	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	RECIP -600hp diesel	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	SUPPORT VESSEL diesel	2265	109.40	2625.59	10	10	1.20	7.43	54.88	1.65	11.97	0.26	1.62	11.99	0.36	2.62					
	SUPPORT VESSEL diesel	2265	109.40	2625.59	10	10	1.20	7.43	54.88	1.65	11.97	0.26	1.62	11.99	0.36	2.62					
	TURBINE nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	RECIP 2 cycle lean nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	RECIP 4 cycle lean nat gas-COMPRESSO	2200	15714.60	377150.40	0	153	0.01	0.01	58.15	3.49	7.75	0.00	0.00	0.00	0.00	0.00					
	RECIP 4 cycle lean nat gas-GENERATOR	4700	33572.10	805730.40	0	153	0.02	0.02	124.23	7.45	16.56	0.00	0.00	0.00	0.00	0.00					
	BURNER nat gas-FEEDWATER	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	BURNER nat gas-COL. TREATER	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	MISC	BPD	SCF/HR	COUNT																	
	TANK-FLARE	35000	0	0	24	24	43.35	285.36	2118.71	143.63	569.88	11.57	72.26	529.35	118.00	118.45					
	PROCESS VENT-FUGITIVES	0	0	2800.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	GLYCOL STILL VENT-OIL BURN	100	1750000	0	24	24	1.75	27.50	9.58	0.04	0.88	0.04	0.66	0.23	0.02						
	GAS FLARE	333333	0	0	24	24	0.19	0.19	23.80	20.10	129.50	0.00	0.00	0.57	0.48	3.11					
1999 YEAR TOTAL												2997.00	2997.00	2997.00	2997.00	2997.00	2997.00	2997.00	2997.00	2997.00	69314.07
EXEMPTION CALCULATION												DISTANCE FROM LAND IN MILES							90.0		



Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		REF.	DATE
	SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0483	AP42 3.2-1	4/76 & 8/84

Equipment/Emission Factors	units	TSP	SOx	NOx	VOC	CO	REF.	DATE
NG Turbines	gms/hp-hr		0.00247	1.3	0.01	0.83	AP42 3.2-2	4/93
NG 2-cycle lean	gms/hp-hr		0.00185	11	0.43	1.5	AP42 3.2-2	4/93
NG 4-cycle lean	gms/hp-hr		0.00185	12	0.72	1.6	AP42 3.2-2	4/93
NG 4-cycle rich	gms/hp-hr		0.00185	10	0.14	8.6	AP42 3.2-2	4/93
Diesel Recip. < 600 hp.	gms/hp-hr	1	0.931	14	1.12	3.03	AP42 3.3-1	4/93
Diesel Recip. > 600 hp.	gms/hp-hr	0.24	1.49	11	0.33	2.4	AP42 3.4-1	4/93
NG Heaters/Boilers/Burners	lbs/mmscf	5	0.6	140	2.8	35	AP42 1.4-1	4/93
NG Flares	lbs/mmscf		0.57	71.4	60.3	388.5	AP42 11.5-1	9/91
Liquid Flaring	lbs/bbls	0.42	6.6	2.3	0.01	0.21	AP421.3-1	4/93
Tank Vapors	lbs/bbl				0.03		E&P Forum	1/93
Fugitives	lbs/hr/comp.				0.000025		API Study	12/93
Glycol Dehydrator Vent	lbs/mmscf				6.6		La. DEQ	1991
Gas Venting	lbs/scf				0.0034			

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***DEVELOPMENT OPERATIONS COORDINATION DOCUMENT***

***ENVIRONMENTAL REPORT***

***GREEN CANYON BLOCKS 254/297/298***

***LEASES OCS-G 7049/8876/8010***

***OFFSHORE, LOUISIANA***

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Prepared by:

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June 14, 1998

**ATTACHMENT L**

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## ***I. DESCRIPTION OF PROPOSED ACTION***

British-Borneo Exploration, Inc. ("British-Borneo") proposes to conduct development activities within Green Canyon Blocks 254/297/298, Leases OCS-G 7049/8876/8010, respectively, Offshore, Louisiana.

As proposed, the Initial Unit Development Operations Coordination Document provides for the drilling, completion and potential testing of one additional well (Lease OCS-G 8010, Well No. 1) from a previously approved surface location, installation of a single column, tension leg platform (TLP) to be designated Platform "A" and commencement of production of five subsea wells.

At this time, the planned commencement date for proposed activities is in September, 1998.

### ***A. DESCRIPTION OF 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	Production
Crew Boats	4 Trips Per Week	2 Trips Per Week
Supply Boats	3 Trips Per Week	2 Trips Per Week
Helicopters	4 Trips Per Week	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 exploration 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.



### **C. NEW OR UNUSUAL TECHNOLOGY**

No new or unusual technology will be required for this operation.

### **D. VICINITY MAP**

Green Canyon Blocks 254/297/298 are located approximately 90 miles from the Louisiana shoreline and approximately 95 miles from the shorebase located in Fourchon, Louisiana. Water depths across the block range from approximately 2900 to 3200 feet.

### **E. PROPOSED MEANS TO TRANSPORT OIL OR GAS**

The four existing wells are in two groups on Leases OCS-G 7049, 8876 and 8010. These are approximately 5550' apart on a line running southeast to northwest. Lease OCS-G 8876 Well No. 1 is at the southern end of this line while Lease OCS-G 7049 Well Nos. 3, 4/ST#1 and 5 are at the northern end. The tension leg platform will be located approximately halfway between the two well clusters. The proposed new well (Lease OCS-G 8010, Well No. 1) will have its surface location within 25' of Lease OCS-G 8876, Well No. 1.

Production from the subsea wells will be via 4" steel catenary risers back to the tension leg platform. Flexible control umbilicals will run from the TLP to the wells. Oil and gas production will flow from the TLP via proposed 12" oil and gas right-of-way steel catenary export risers/pipelines to a point approximately four miles away in a northwest direction.

## **II. DESCRIPTION OF AFFECTED ENVIRONMENT**

### **A. COMMERCIAL FISHING**

The Gulf of Mexico provides nearly 20% of the commercial fish landings in the continental United States. During 1991, commercial landings of all fisheries in the Gulf totaled nearly 1.5 billion pounds valued at about \$641 million.

Menhaden, with landings of 1.2 billion pounds, valued at \$41 million, was the most important Gulf species in quantity landed during 1991. Shrimp, with landings of 229 million pounds, valued at \$411 million, was the most important Gulf species in value landed during 1991. The 1991 Gulf oyster fishery accounted for 43% of the national total with landings of 13.7 million pounds of meats, valued at about \$35.5 million. The Gulf blue crab fishery accounted for 29% of the national total with landings of 65.4 million pounds, valued at \$23.5 million.

Alabama ranked last among Central and Western Gulf states in total commercial landings for 1991 with 13.6 million pounds landed, valued at \$18.3 million. Shrimp was the most important fishery landed, with 6.5 million pounds, valued at \$14.2 million. In addition, during 1991, the following

six species each accounted for landings valued at over \$125,000: blue crab, shark, black mullet, red snapper, flounder, and the American oyster. Alabama had about 3,470 and 2,515 commercial saltwater, licensed fishermen during 1991 and 1992, respectively.

Mississippi ranked second among Central and Western Gulf states in total commercial fishery landings for 1991, with 208.6 million pounds landed, valued at an estimated \$20.5 million. Shrimp was the most important fishery, with 6 million pounds landed, valued at about \$9.6 million. Menhaden landings during 1991, are estimated at 200 million pounds landed, valued at \$9.4 million. In addition, during 1991, the following four species each accounted for landings valued at over \$150,000: red snapper, blue crab, American oyster, and black mullet. In 1991 and 1992, Mississippi had about 3,329 and 2,515 commercial saltwater, licensed fishermen, respectively.

Louisiana ranked first among Central and Western Gulf states in total commercial fishery landings for 1991, with nearly 1.2 billion pounds landed, valued at \$163.4 million. Menhaden was the highest quantity finfish, with 1.0 billion pounds landed, valued at \$48 million. Shrimp was the highest value shellfish, with 27.3 million pounds landed, valued at \$36.7 million. In addition, during 1991, the following nine species each accounted for landings valued at over \$1 million: black drum, red mullet roe, shark, red snapper, spotted seatrout, bluefin tuna, yellowfin tuna, blue crab, and the American oyster. In 1991 and 1992, Louisiana had about 19,923 and 19,241 commercial saltwater, licensed fishermen, respectively.

Texas ranked third among Central and Western Gulf states in total commercial fishery landings for 1990 with nearly 99 million pounds landed, valued at \$182 million. In quantity and value, shrimp ranked first, with about 92 million pounds, valued at \$17 million. In addition, during 1991, the following four species each accounted for landings valued at over \$500,000: red snapper, black drum, blue crab, and the American oyster. In 1991 and 1992, Texas had about 17,483 and 14,519 commercial saltwater, licensed fishermen, respectively.

The Gulf of Mexico yielded the nation's second largest regional commercial fishery by weight in 1991. The Gulf Fisheries landing were 20% of the national total by weight and 20% by value. Most commercial species harvested from Federal waters of the Gulf of Mexico are considered to be at or near an overfished condition. Continued fishing at the present levels may result in rapid declines in commercial landings and eventual failure of certain fisheries. Commercial landings of traditional fisheries, such as shrimp, red snapper, and spiny lobster, have declined over the past decade despite substantial increases in fishing effort. Commercial landings of recent fisheries, such as shark, black drum, and tuna, have increased exponentially over the past five years, and those fisheries are thought to be in need of conservation communication.

The Gulf of Mexico shrimp fishery is the most valuable in the United States accounting for 71.5% of the total domestic production. Three species of shrimp--brown, white, and pink--dominate the landings. The status of the stocks are as follows: (1) brown shrimp yields are at or near the maximum sustainable levels; (2) white shrimp yields are beyond maximum sustainable levels with signs of overfishing occurring; and (3) pink shrimp yields are at or beyond maximum sustainable levels.

## ***B. SHIPPING***

The establishment of a series of safety fairways or traffic separation schemes (TSS's), and anchorage areas provide unobstructed approach for vessels using U.S. ports. Shipping safety fairways are lanes or corridors in which no fixed structure, whether temporary or permanent, is permitted. TSS's increase navigation safety by separating opposing lanes of vessel traffic. Fairway anchorage are areas contiguous to and associated with a fairway, in which fixed structures may be permitted within certain spacing limitations.

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 platform and each of the 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 Green Canyon Blocks 254/297/298 are clear of any designated shipping fairways and/or anchorage areas.

## ***C. PLEASURE BOATING, SPORT FISHING AND RECREATION***

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.

The coastal shorelines of the CPA and WPA contain extensive public park and recreation areas, private resorts, and commercial lodging. Most of the outdoor recreational activity focused on the Gulf shorefront is associated with accessible beach areas. Beaches are a major inducement for coastal tourism, as well as a primary resource for resident recreational activity. However, recreational resources, activities, and expenditures are not constant along the Gulf of Mexico shorefront, but are focused where public beaches are close to major urban centers. Beach use is a major economic factor for many Gulf coastal communities, especially during peak-use seasons in the spring and summer. Tourism in the central zone of the five Gulf Coast States has been valued at an estimated \$20 billion/year.

#### ***D. POTENTIAL OR KNOWN CULTURAL 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 those 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. Management of this resource was accomplished by establishing a high-probability zone for the occurrence of historic shipwrecks. A recently completed 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. MMS redefined those blocks in the Gulf of Mexico that are considered to have a high probability for the occurrence of **historic** period shipwrecks. The number of blocks with a high probability for historic shipwrecks were reduced from 3,410 to 2,263. Remote sensing surveys required by MMS have recorded evidence of approximately 57 potential shipwrecks.

Geomorphic features that have a high probability for associated prehistoric **archaeological resources** in the Central and Western Gulf include barrier islands and back-barrier embayments, river channels and associated floodplains and terraces, and salt dome features. Remote sensing

surveys have been very successful in identifying the geographic features that have a high probability for associated prehistoric sites. Though lease block surveys have identified many specific areas in the Gulf as having a high potential for **prehistoric** sites, oil and gas development has generally avoided rather than investigated these high-probability areas for archaeological content.

Minerals Management Service did not invoke the cultural resources stipulation for Leases OCS-G 7049/8876/8010, Green Canyon Blocks 254/297/298, respectively.

### *E. ECOLOGICALLY SENSITIVE FEATURES*

Coastal barrier landforms consist of islands, spits, and beaches that stretch in an irregular chain from Alabama to Texas. 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. Barrier landforms are young coastal features. They began to form 5,000 to 6,000 years ago after the main mass of continental ice sheets had melted and global rate of sea-level rise began to slow.

The term "barrier" identifies the structure as one that protects other features, such as bays, lagoons, estuaries, and marshes, from the direct impacts of open ocean. By separating coastal waters from the ocean, barriers contribute to the amount of estuaries habitat available along the coast. As much as two-thirds of the high-value Atlantic and Gulf species of fish are considered to be directly dependent during some stage of their life on conditions in an estuary. Another benefit of both the barriers and their adjacent marshes and bays is that of providing habitats for a large number of birds and other animals, including several threatened or endangered species, such as the loggerhead turtle, the southern bald eagle, the alligator, and the brown pelican.

Barrier landforms are relatively low landmasses that are continually adjusting configuration in response to changing environmental conditions. Landform changes can be seasonal and cyclical, such as the transition from a summer (swell wave) beach to a winter (storm wave) beach, or they can be indicative of a trend, such as a net landward movement of a feature. The long-term survival of fixed structures, such as roads, buildings, and power lines, constructed on a barrier landform can often be jeopardized by the changing and migratory nature of the barrier features. Some types of construction or stabilization projects on barrier landforms may actually encourage erosion, especially when the project interferes with longshore or shore-normal sediment movements.

The barrier landforms of the Central Gulf of Mexico occur in three settings. From east to west, these include the barrier islands of Mississippi Sound, the Mississippi River deltaic plain barriers, and the barriers of the Chenier Plain in Louisiana.

Louisiana has the most rapidly retreating beaches in the nation. The statewide average for 1956-1978 was 27.2 ft/yr (van Beek and Meyer-Arendt, 1982). The average retreat rate for the Fourchon beach over the last 100 years has been 35 to 65 ft/yr (Boyd and Penland, 1988). The

statewide average, according to Dolan et al. (1982) is in excess of 3.6 m/yr. Beaches along the deltaic plain in Louisiana fit into one of three categories, depending on the stage of the deltaic cycle of the nearby landmass. When a major distributary of the Mississippi River is abandoned, subsidence results in a local sea-level transgression that transforms the active delta into an erosional headland with flanking barriers. Fourchon Beach is an example of an eroding headland beach. With increased age and subsidence, the barrier shoreline evolves into a transgressive barrier-island arc that is separated from the mainland by a lagoon. Isles Derniers is an example of a barrier that underwent the transformation from a headland beach to a barrier arc within the past century. Eventually, with continued subsidence and sediment deprivation, the island ceases to exist, its remnant forming a submarine inner-shelf shoal.

The Chenier Plain is located farther to the west in Louisiana. Here, the coast is fronted by sand beaches and coastal mudflats. The source of the mud is the discharge of the Mississippi and Atchafalaya Rivers, which tends to drift westward along with the prevailing winds and associated nearshore currents.

From the Texas-Louisiana border to Rollover Pass, Texas, the Texas coast is a physiographic continuation of the Chenier Plain. Here, thin accumulations of sand, shell, and caliche nodules make up beaches that are migrating landward over tidal marshes. These beaches are narrow and have numerous overwash features and local, poorly developed sand dunes.

The rest of the Texas coast is a continuous barrier shoreline. The barrier islands and spits were formed from sediments supplied from three deltaic headlands: the Trinity delta, which is immediately west of the Sabine River, in Jefferson County; the Brazos-Colorado Rivers delta complex in Brazoria and Matagorda Counties; and the Rio Grande delta in southernmost Cameron County.

The Central and Western Gulf Coast includes barrier islands that are part of the National Park System. These are the Padre Island National Seashore along the south Texas coast and Gulf Islands National Seashore offshore Mississippi.

The importance of coastal wetlands to the coastal environment has been well documented. Coastal wetlands are characterized by high organic productivity, high detritus production, and efficient nutrient recycling. 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 and the largest fur harvest in North America.

Louisiana contains most of the Gulf coastal wetlands. 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 km<sup>2</sup> for the period 1955-1978. A recent study has shown that the current rate of landloss on the Deltaic Plain area of the Louisiana coast has decreased to about 90 km<sup>2</sup> per year. Several factors contribute to wetlands loss in Coastal Louisiana, including sediment deprivation (a result of a 50% decrease in the suspended-sediment load of the river since the

1950's and the channelization of the river, which has prevented overbank sediment deposition), subsidence and sea-level rise, and the construction of pipeline and navigation canals through the wetlands.

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. On a percentage basis, wetlands loss has occurred more rapidly in Alabama during these years than it did in Louisiana. Major causes of non-fresh wetland losses were industrial development and navigation, residential and commercial development, natural succession, and erosion/subsidence. The loss of fresh marsh was mainly attributable to commercial and residential development and silviculture.

In Texas, coastal marshes occur along the inshore side of barrier islands and bays and on river deltas. Salt marshes consisting primarily of smooth cordgrass occur at lower elevations and at higher salinities. Brackish marshes occur in transition areas landward of salt marshes on slightly higher elevations and at greater distances from saltwater bodies. Freshwater marshes of the region occur primarily along the major rivers and tributaries. Sparse bands of black mangroves are also found in the region. Broad expanses of emergent wetland vegetation and hypersaline waters to the south. In these areas, *Spartina Alterniflora*, the most common salt-marsh grass elsewhere in the Gulf, occurs rarely in salt marshes. Common salt-marsh plants here include more salt-tolerant species such as *Batis Maritima* and *Salicornia*.

Wetland changes observed in Texas during the past several decades appear to be driven by subsidence and sea-level increases. 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 magnitudes of these wetland acreage changes in most of Texas have 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.

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% of all the direct impacts that have occurred in Louisiana's wetlands. Direct OCS impacts account for only 4%-5% 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% of the total amount of wetland loss that occurred in coastal Louisiana between 1955/56 to 1978.

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 effluent from the delta to Galveston. In general, the vast majority of the benthos of the Central and Western Gulf consists of soft, muddy bottom dominated by polychaetes. The most extensive beds occur in Chandeleur Sound in coastal Louisiana and the Mississippi Sound. The distribution of seagrass beds in the Central and Western Gulf have diminished during recent decades. The primary factors believed to be responsible for these conditions include hurricanes, freshwater diversions from the Mississippi river during flood stage into coastal areas dredging activities and water quality degradation.

The term sensitive offshore resources refers 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 northeastern portion of the Central Gulf of Mexico exhibits a region of topographic relief, the "pinnacle trend," between 67 and 110 m (220 and 360 ft) depth. The pinnacles appear to be carbonate reefal 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 indurated pinnacles provide a surprising amount of surface area for the growth of sessile invertebrates and attract large numbers of fish.

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 a variety of 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 have 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 the deep waters of the Gulf. These cold-water communities are associated with seismic wipe-out zones and hydrocarbon seep areas between water depths greater than 400 meters and 1,000 meters. Chemosynthetic communities have been a source of controversy over the past few years, in part because of the unusual environmental requirements and hypothesized sensitivity of the communities to oil and gas activities. The MMS requires site-specific surveys of bottom-disturbing actions in water depths greater than 400 m in order to judge the potential of the region for supporting chemosynthetic organisms.

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. None of those listed are located in or near the vicinity of the proposed operations in Green Canyon Blocks 254/297/298.

#### ***F. PIPELINES AND CABLES***

As a prudent operator, British-Borneo Exploration, Inc. will conduct its operations in accordance with the provisions specified in Minerals Management Service Notice to Lessees 83-03 in order to avoid all pipelines and/or cables in the vicinity of the proposed operations.

#### ***G. OTHER MINERAL USES***

The activities proposed for Green Canyon Blocks 254/297/298 will have no direct or indirect impact on other mineral uses.

#### ***H. OCEAN DUMPING***

The Marine Pollution Research and Control Act of 1987 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.

Interim final rules published May 2, 1990 explicitly stated that fixed and floating platforms or all drilling rigs, 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.

A general NPDES, 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 workover fluids; and from production operations, produced sand, deck drainage, and miscellaneous well fluids (cement, BOP fluid); and other sanitary and domestic wastes, gas and oil processing wastes, and miscellaneous discharges.

## ***I. ENDANGERED AND THREATENED SPECIES AND CRITICAL HABITAT***

Twenty-eight species of cetaceans, one sirenian, and one exotic pinniped (California sea lion) have been sighted in the northern Gulf of Mexico. Seven species of baleen whales have been reported in the Gulf of Mexico. These include the northern right whale and six species of balaenopterid whales (blue, fin, sei, Bryde's, minke and humpback).

Twenty-one species of toothed whales and dolphins have been reported in the Gulf of Mexico. These include the sperm whale; pygmy and dwarf sperm whales; four species of beaked whales (Cuvier's, Gervais', Blainville's, and Sowerby's); killer whale; false and pygmy killer whale; short-finned pilot whale; Risso's dolphin; melon-headed whale; and nine other species of dolphins (bottlenose, Atlantic spotted, Pantropical spotted, spinner, Clymene, striped, Fraser's and rough-toothed). Many of these species are distributed in warm temperate to tropical waters throughout the world.

Five species of baleen whales (northern right, blue, fin, sei, and humpback), one species of toothed whales (sperm whale), and the manatee found within the Gulf of Mexico are currently listed as endangered species under the provisions of the U.S. Endangered Species Act of 1973. All are uncommon to rare in the Gulf except for the sperm whale.

The Alabama, Choctawhatchee, and Perdido Key beach mice, subspecies of the old field mouse, occupy restricted habitats in the mature coastal dunes of Florida and Alabama. The beach mice feed nocturnally on the lee side of the dunes and remain in burrows during the day. Seeds are the major item of their diet.

The green turtle population in the Gulf once supported a commercial harvest in Texas and Florida, but the population has not completely recovered since the collapse of the fishery around the turn of the century. Green turtles prefer depths of less than 20 m, where seagrasses and algae are plentiful. In coastal Texas, green turtles demonstrated site fidelity, remaining in one location for several months (NMFS Newsbreaker, 1993). Leatherbacks, the largest and most oceanic of the marine turtles, occasionally enter shallow water in more northern areas. Their nesting is concentrated on coarse-grain beaches in the tropical latitudes.

The hawksbill is the least commonly reported marine turtle in the Gulf. Texas is the only Gulf state where stranded turtles are regularly reported. The Kemp's ridley sea turtle is the most imperiled of the world's marine turtles. Nesting in the United States occurs infrequently on Padre and Mustang Islands in south Texas from May to August.

Female Kemp's ridleys appear to inhabit nearshore areas, and congregations of Kemp's have been recorded off the mouth of the Mississippi River. Juvenile ridleys that were recently tagged and released in Atlantic habitats demonstrated movements southward along the coast of Florida (NMFS Newsbreaker, 1993), but to date their re-migration to the Gulf is unverified.

The loggerhead sea turtle appears worldwide in habitats ranging from estuaries to the continental shelf. Aerial surveys indicate that loggerheads are common in less than 50m depths, but they are also found in deep water. In the Gulf of Mexico, 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. Nesting in Texas occurs primarily on North and South Padre Islands, although occurrences are recorded throughout coastal Texas.

The recently designated Archie Carr National Wildlife Refuge in Brevard and Indian River Counties, Florida, hosts the largest concentration of nesting loggerhead and green sea turtles in the United States. It is believed to be the second largest nesting beach for loggerheads in the world.

The offshore waters, coastal beaches, and contiguous wetlands of the northern Gulf of Mexico are populated by both resident and migratory species of coastal and marine birds separated into five major groups: seabirds, shorebirds, wading birds, marsh birds and waterfowl. The following coastal and marine birds species which inhabit or frequent the north-central and western Gulf of Mexico coastal areas and recognized by the FWS as either endangered or threatened area: piping plover, whooping crane, eskimo curlew, bald eagle, peregrine falcon, eastern brown pelican, and interior least tern.

Those birds most susceptible to oiling either raft at sea, such as gulls and terns, or dive when disturbed, such as cormorants and boobies. Migrant and nonmigrant coastal and marine birds populate the beaches and wetlands of the northern Gulf of Mexico. This broad category consists of three main groups: waterfowl, wading birds, and marine birds. Feeding habitats include the waters and coastal shores of the open Gulf, bays, and estuaries, brackish and freshwater wetlands, as well as coastal farmlands and landfills.

The piping plover is endangered in the Great Lakes watershed and threatened elsewhere. Its historic populations have remained depressed because of losses to their beach and nesting habitat. On the Gulf Coast, Texas and Louisiana have the largest numbers and highest wintering densities. There, the plover prefers intertidal flats and beaches for its habitat. Piping plovers are susceptible to contact with spilled oil because of their preference for feeding in intertidal areas.

The whooping crane breeding population winters along the Texas coast from November to April, occupying the coastal marshes of Aransas, Calhoun, and Matagorda Counties. Portions of these counties and the Aransas National Wildlife Refuge have been designated as critical habitat for the whooping crane.

The Arctic peregrine falcon is a subspecies of the peregrine falcon, which breeds in North American tundra. A portion of the population migrates along the Mississippi, Central and Eastern flyways to winter on the U.S. and Mexican gulf coasts. The birds concentrate along beaches and barrier islands.

Bald eagles are found throughout the Gulf States. Bald eagles actively nest in upland and wetland areas 30-50 miles from the coast throughout the Gulf. Bald eagles inhabit areas near water although they rarely nest on the coast. They prey on birds, fish, and small mammals.

Historically, two nestings have occurred along the Mississippi coast. In northwestern Florida, coastal nesting occurs at St. Vincent, St. Marks, and lower Suwannee National Refuges. Brown pelicans have been removed from the Federal endangered species list in Alabama and Florida but remain listed as endangered in Mississippi, Louisiana, and Texas. Their decline is primarily the result of hatching failure caused by ingestion of fish containing pesticides. Nesting occurs in colonies on coastal islands. Six brown pelican rookeries have been documented in Louisiana: on Queen Bess, North, Last, Calumet-Timbalier, and Grand Gosier Islands, and at South Pass. There is also a small rookery on Pelican Island in Nueces County, Texas. Unsuccessful nesting has occurred on Sunset Island in Matagorda Bay, and 40 hatchlings have been reintroduced to San Bernard National Wildlife Refuge. Brown pelicans inhabit the coast, rarely venturing into freshwater or flying more than 32 km (20 miles) offshore. They feed by plunge-diving to catch fish near the surface.

## *J. SOCIOECONOMIC*

In relation to oil and gas activity in the Gulf of Mexico, the exploration and production of crude oil and gas is classified as a primary industry. Classified as secondary industries are activities associated with the processing of crude oil and gas in refineries, natural gas plants, and petrochemical plants.

The production of OCS oil and gas, particularly offshore Louisiana, has been a major source of revenue in the study area since 1954. Data from the 1987 Census show that the average annual payroll associated with oil and gas activities amounts to approximately \$2.2 billion for the Gulf of Mexico Region (\$1.7 billion for the Central Gulf, \$0.6 billion for the Western Gulf, and \$2.2 million for the Eastern Gulf). Average annual tax dollars generated per employee in the offshore oil and gas program are estimated at 8% of payroll revenues. Thus, State and local taxes generated annually by the Federal offshore oil and gas program are estimated at \$134.7 million from the Central Gulf, \$44.3 million from the Western Gulf, and \$0.2 million from the Eastern Gulf.

Job estimates as of June 1991 show that 83,400 jobs are directly or indirectly dependent on the offshore program. Approximately 80% of these jobs are associated with activity in the Central Gulf and 20% are related to the Western Gulf. Nearly all offshore-related employment in the Central Gulf is due to activity offshore Louisiana; In addition, offshore activity in other areas of the Gulf also generates employment in Louisiana. Estimates of direct employment offshore are 30,000 workers in the Central Gulf, and 7,500 workers in the Western Gulf.

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, Intracoastal City, and Cameron, Louisiana. The onshore support base for operations in Green Canyon Blocks 254/297/298 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.

### ***III. UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS***

#### ***A. WATER QUALITY***

Routine operational discharges (drilling muds and cuttings, produced waters, deck drainage and sanitary and domestic wastes) or accidental oil spills may temporarily degrade some measures of water quality adjacent to the proposed surface location. However, these impacts decrease to very low with distance from the source. Therefore, the impact level from these factors is considered to be low.

#### ***B. EFFECTS ON MARINE ORGANISMS***

Some organisms will be killed and some will be temporarily functionally impaired as a result of operational discharges. The most affected groups will be plankton and benthos immediately around the proposed surface locations. Damage will be both mechanical and toxicological. These communities are widespread throughout the deep-water areas of the Gulf. These impacts are considered to be localized, short term and reversible at the population level.

An oil spill could affect a broad spectrum of marine organisms. However, most effects would be localized and short term. Any effects on mammals and turtles would be significant.

#### ***C. EFFECTS ON THREATENED OR ENDANGERED SPECIES***

Activities resulting from the proposed action have a potential to cause detrimental effects on endangered cetaceans. These cetaceans could be impacted by operational discharges, helicopter and vessel traffic, platform noise, explosive platform removals, seismic surveys, oil spills, and oil-spill response activities. The effects of the majority of these activities are estimated to be sublethal, and expected impact levels range from low to very low. Sale-related oil spills of any size are expected to seldom contact endangered and threatened cetaceans.

Activities resulting from the proposed action have a potential to affect Alabama, Choctawhatchee, and Perdido Key beach mice detrimentally. Beach mice could be impacted by oil spills and oil-spill response activities. It is expected that there will seldom be interaction between these events and beach mice or their habitats.

Activities resulting from the proposed action have a potential to affect marine turtles detrimentally.

Marine turtles could be impacted by anchoring, structures installation, pipeline placement, dredging, operational discharges, OCS-related trash and debris, vessel traffic, explosive platform removals, oil-spill response activities and oil spills. The effects of the majority of these activities are expected to be sublethal. Sale-related oil spills of any size are seldom expected to contact marine turtles.

Activities resulting from the proposed action have the potential to affect Central Gulf 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 activities are expected to be sublethal. Sale-related oil spills of any size are expected to seldom contact threatened and endangered birds or their critical feeding, resting, or nesting habitats.

The Gulf sturgeon can be impacted by oil spills resulting from the proposed action. The impact is expected to result in sublethal effects and cause short-term physiological or behavioral changes.

#### ***D. WETLANDS AND BEACH***

The major impact-producing factors associated with the proposed action that could affect barrier landforms include oil spills, pipeline emplacements, navigation canal dredging and maintenance dredging, and support infrastructure. Impacts from onshore and nearshore construction of OCS-related infrastructure (pipeline landfalls, navigation channels, service bases, platform yards, etc) are not expected to occur, because no new infrastructure construction is anticipated as a result of the proposed action. Although some maintenance dredging is expected to occur, this activity has not been shown to have a negative impact on barriers, and the need for dredging cannot be attributed to the small percentage of vessel traffic in these channels. Deepening of the channel to Port Fourchon is not expected to affect nearby barrier features.

The proposed activity is not expected to result in permanent alterations of barrier beach configurations, except in localized areas downdrift from navigation channels that have been dredged and deepened. The contribution to this localized erosion is expected to be less than 1%.

Wetlands include forested wetlands (swamps), tidal marshes, and seagrasses. Swamps and marshes occur throughout the coastal zone. Seagrasses are restricted in distribution to small areas behind barrier islands in Mississippi and Chandeleur Sounds. Impact-producing factors resulting from OCS oil and gas activities that could adversely affect wetlands include oil spills, onshore discharge of OCS-produced waters, pipeline placements, dredging of new navigation channels, maintenance dredging and vessel usage of existing navigation channels, and construction of onshore facilities in wetland areas.

The proposed activity is expected to result in a small amount of dieback and mortality of wetlands vegetation as a result of contacts from oil spills. Most of these wetlands will recover within 10 years and the remaining will be converted to open water. Some wetlands are projected to be eroded along channel margins as a result of OCS vessel wake erosion, and some wetlands are projected to be created as a result of beneficial disposal of dredged material from channel-deepening projects.

#### ***E. AIR QUALITY***

The potential degrading effects on air quality from onshore and offshore operational activities are platform emissions; drilling activities during exploration, delineation, and development; service vessel operation; evaporation of volatile hydrocarbons from surface oil slicks; and fugitive emissions during hydrocarbon venting and offloading.

Emissions of pollutants into the atmosphere for these activities are likely to have minimum impact on offshore air quality because of prevailing atmospheric conditions, emission heights, and pollutant concentrations. Onshore impact on air quality from emission from OCS activities is estimated to be negligible because of the atmospheric regime, the emission rates, and distance of these emissions from the coastline. The above discussion is based on average conditions; however, there will be days of low mixing heights and wind speeds that could increase impact levels. These conditions are characterized by for formation, which in the Gulf occurs about 35 days a year, mostly during winter. Impact from these conditions is reduced in winter because the onshore winds have the smallest frequency (37%) and rain removal is greatest. Summer is the worst time, with onshore winds having a frequency of 61%. Emissions of pollutants into the atmosphere are expected to have concentrations that would not change the onshore air quality classifications.

#### ***F. COMMERCIAL FISHING***

The major impact producing factors on fishing activities from the proposed operations is structure placement, underwater OCS obstructions, production platform removals, seismic surveys, oil spills, subsurface blowouts, pipeline trenching, and offshore discharges of drilling muds, produced waters and naturally occurring radioactive material (NORM).

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 OCS when high concentrations of pelagic eggs and larvae are present have the greatest potential to damage commercial fishery resources. Migratory species, such as mackerel, cobia, and crevalle could be impacted if oil spills contact nearshore open waters. The majority of the Gulf's fishes are estuary dependent. The effects from an oil spill contacting a large area of a Gulf estuary would be considerable on local populations of commercial fishery resources, such as menhaden, shrimp, and blue crabs, that use that area as a nursery and/or spawning ground. The effects from chronic



oiling in Gulf coastal wetlands would be substantial on all life stages of a local population of a sessile fishery resource such as oysters.

The emplacement of a structure, with a surrounding 100-m navigational safety zone, results in the loss of approximately 6 ha of bottom trawling area to commercial fishermen and causes space-use conflicts. Gear conflicts from underwater OCS obstructions result in losses of trawl and shrimp catch, business downtime, and vessel damage.

Commercial fishery resources may also be affected by the discharge of drilling muds which may contain material toxic to marine fishes; however, this is only at concentrations four or five orders of magnitude higher than those found more than a few meters from the discharge point. Further dilution is extremely rapid in offshore waters.

Activities resulting from the proposed action have the potential to cause detrimental effects to Central Gulf commercial fisheries. It is expected that the effects from the major impact-producing factors on commercial fisheries in the CPA are inconsequential and of nominal occurrence. As a result, there will be little discernable disturbance to Gulf commercial fisheries.

#### ***G. SHIP NAVIGATION***

Very little interference can be expected between the drilling unit, structures and marine vessels utilized during exploratory operations and ships that use established fairways. However, at night and during rough weather, fog, and heavy seas, ships not using established fairways could collide with the structures.

Approved aids to navigation will be installed on the structure and all marine vessels servicing these operations in accordance with USCG regulations.

#### ***H. CULTURAL RESOURCES***

The greatest potential impact to an historic and/or prehistoric archaeological resource as a result of the proposed action would result from a contact between an OCS offshore activity (platform installation, drilling rig emplacement, dredging or pipeline project) and a historic shipwreck.

The OCS activity could contact a shipwreck because of incomplete knowledge on the location of shipwrecks in the Gulf. Although this occurrence is not probable, such an event would result in the disturbance or destruction of important historic archaeological information. Other factors associated with the proposed action are not expected to affect historic archaeological resources.

The archaeological surveys required prior to an operator beginning oil and gas activities in a lease block are estimated to be 90% effective as identifying possible sites.

The evaluation of the high resolution survey data for this area indicates that no formerly subaerially exposed landforms which would represent high probability areas for the occurrence of prehistoric archaeological sites.

There is only a small probability that unknown cultural resources exist in the lease area.

British-Borneo Exploration, Inc., as a prudent operator, agrees that should any site, structure, or object of historical or archaeological significance be discovered during drilling and exploration activities within the lease, such findings would immediately be reported to the Director, Gulf of Mexico OCS Region, and every reasonable effort would be made to preserve and protect the cultural resources from damage until said Director has given directions as to its preservation.

### *I. RECREATION AND AESTHETIC VALUES*

The structure and marine vessels may represent an obstacle to some sport fisherman, but such effect is expected to be negligible and not permanent.

Even though existing regulations and orders prohibit indiscriminate littering of the marine environment with trash, offshore oil and gas operations involving men, machines, equipment, and supplies is bound to result in some littering of the ocean. Human nature and accidents associated with offshore operation will contribute some floatable debris to the ocean environment which will eventually come ashore on major recreational beaches.

The effects that normal operations or a minor oil spill would have any fish stocks important to sport fishermen are also considered to be negligible.

A few oil spills greater than 1 and less than or equal to 50 bbls are assumed to affect portions of CPA beaches, with little disruption of recreational activities. Marine debris will be lost from time to time. However, the impact from the resulting intermittent pollution wash up on Louisiana and Texas beaches should be very low. A drilling rig and production platform in the nearshore area off Louisiana and Mississippi could also impact the natural seascape from some wilderness beaches. Helicopter and vessel traffic will add very little additional noise pollution likely to affect wilderness beach users.

The proposed action is expected to result in minor pollution events and nearshore operations that may adversely affect the enjoyment of some beach users on Texas and Louisiana beaches.

#### *IV. SUMMARY*

The proposed activity will be carried out and completed with the guarantee of the following items.

- A. 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.
- B. All operations are covered by a Minerals Management Service approved Oil Spill Contingency Plan.
- C. 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.
- D. The proposed activities described in detail in the Initial Joint Development Operations Coordination Document will comply with Louisiana's Coastal Management Program and will be conducted in a manner consistent with such Program.

## *REFERENCES*

1. Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 110 and 112, Gulf of Mexico OCS Region, OCS EIS, MMS 86-0087.
2. Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 110 and 112, Gulf of Mexico OCS Region, OCS EIS, MMS 86-0087, visuals.
3. Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 113, 115, and 116, Gulf of Mexico OCS Region, OCS EIS, MMS 87-0077.
4. Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 118 and 122, Gulf of Mexico OCS Region, OCS EIS, MMS 88-0044.
5. Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 123 and 125, Gulf of Mexico OCS Region, OCS EIS, MMS 89-0053.
6. Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 131, 135 and 137, Gulf of Mexico OCS Region, OCS EIS, MMS 90-0042.
7. Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 139 and 141, Gulf of Mexico OCS Region, OCS EIS, MMS-91-0054.
8. Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 142 and 143, Gulf of Mexico OCS Region, OCS EIS, MMS-92-0054.
9. Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 147 and 150, Gulf of Mexico OCS Region, OCS EIS, MMS 93-0065.



# BRITISH-BORNEO

## EXPLORATION, INC.

1201 LOUISIANA SUITE 3500 HOUSTON, TEXAS 77002-5009  
TEL. 713-650-8292 FAX 713-650-1053

June 14, 1998

Morning Advocate State Times  
Legal Ad Department- Public Notice  
525 Lafayette Street  
Baton Rouge, Louisiana 70804

Attention: Vicky Thompson

Gentlemen:

Please publish the following as a legal ad no later than June 22, 1998.

Public Notice of Federal Consistency review of a Proposed Initial Unit Development Operations Coordination Document by the Coastal Management Section/Louisiana Department of Natural Resources for the plan's consistency with the Louisiana Coastal Resources Program.

Applicant: British-Borneo Exploration, Inc.  
1201 Louisiana, Suite 3500  
Houston, Texas 77002

Location: Leases OCS-G 7049/8876/8010  
Green Canyon Blocks 254/297/298  
Offshore, Louisiana

Description: Development activities will include the drilling, completion and potential testing of one additional well (Lease OCS-G 8010, Well No. 1) from a previously approved surface location, installation of a single column, tension leg platform (TLP) to be designated Platform "A" and commencement of production of five subsea wells. Support operations will be from an existing 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.

**ATTACHMENT N**

Initial Unit Development  
Operations Coordination Document  
Leases OCS-G 7049/8876/8010  
Green Canyon Blocks 254/297/298

June 14, 1998

Page Two


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.

A copy of the published notice and bill should be submitted to the attention of the undersigned:

Mr. G. Ross Frazer  
British-Borneo Exploration, Inc.  
1201 Louisiana, Suite 3500  
Houston, Texas 77002

Please direct any questions concerning this request to the attention of the undersigned.

Sincerely,



G. Ross Frazer, P.E.  
Manager, Regulatory Affairs and Partner Liaison

GRF:CAT

# BRITISH-BORNEO

## EXPLORATION, INC.

1201 LOUISIANA SUITE 3500 HOUSTON TEXAS 77002-5009  
TEL. 713-650-8292 FAX 713-650-1053

June 14, 1998

The Daily Comet  
Legal Ad Department-Public Notice  
P.O. Box 5238  
Thibodaux, Louisiana 70302

Attention: Doris Dome

Gentlemen:

Please publish the following as a legal ad no later than June 22, 1998.

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**ATTACHMENT O**



Initial Unit Development  
Operations Coordination Document  
Leases OCS-G 7049/8876/8010  
Green Canyon Blocks 254/297/298

June 14, 1998

Page Two

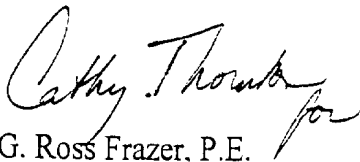
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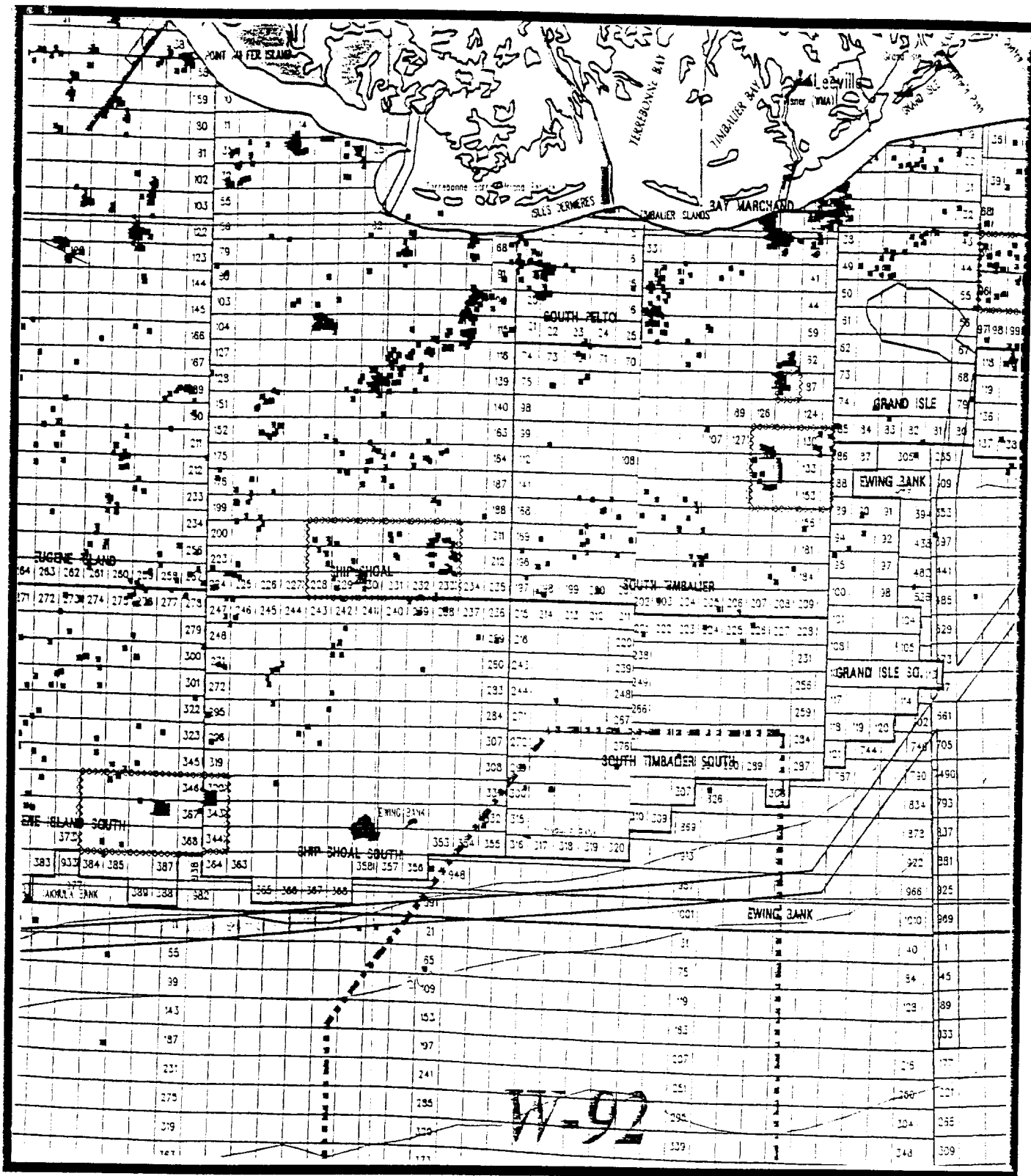
Please direct any questions concerning this request to the attention of the undersigned.

Sincerely,

A handwritten signature in cursive script, appearing to read "Cathy Thorne".

G. Ross Frazer, P.E.  
Manager, Regulatory Affairs and Partner Liaison

GRF:CAT



BEST AVAILABLE COPY

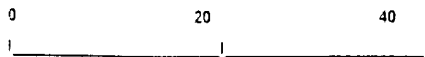
BRITISH-BORNEO EXPLORATION, INC.

GREEN CANYON BLOCKS 254/297/298

VICINITY PLAT

SHOREBASE: FOURCHON, LOUISIANA

JLG.06/15/98



SCALE