UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

SEPTEMBER 18, 1998

In Reply
Refer To: WTR-5

R. Gary Matlock
S.O. International, Inc.
137 Parklane Road
Lafayette, LA 70507

Dear Mr. Matlock:

We have reviewed the information submitted on August 24, 1998, in response to your request for approval of the following drilling mud additive:

Mud Additive	Usage Rate
S.O. Lube 1000	**0-6% by volume**

Discharges from offshore oil and gas operations in Federal waters off Southern California are authorized by general NPDES permit No. CA0110516. This permit authorizes the discharge of "generic" drilling muds defined in Condition III.C.18, and other muds subject to the condition that there be no exceedence of a limiting permissible concentration (LPC) after initial mixing (Condition I.A.1(e)).

On the basis of drilling mud dispersion studies EPA, Region 9, has concluded that 20,000 ppm is the minimum 96 hour LC_{50} (suspended particulate phase (SPP)) required for compliance with Condition I.A.1(e). The information which was submitted showed that the above additive, when included in a reference mud, would comply with this requirement. Accordingly, subject to the special limitation discussed below, we find that the discharge of the proposed additive (used in the concentration range shown above) would comply with the requirements of the general permit.

The above mud additive may be included and discharged in generic drilling muds defined in Condition III.C.18 of permit No. CA0110516 or in the generic muds defined at 50 Federal Register 34592, Appendix B, excluding mud #1 (KCl polymer mud). EPA, Region 9 has excluded mud #1 because toxicity tests at EPA's Gulf Breeze Laboratory showed that the 96 hour LC_{50} for this mud without additives is only slightly above the minimum LC_{50} required for compliance with Condition I.A.1(e). (The 96 hour LC_{50} for mud #1 was determined to be 30,000 ppm for the SPP.) Therefore, mud #1 is being excluded as a base mud from EPA, Region 9's mud additive approval program. However, it may still be possible to approve mud #1 including

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additives prior to discharge if all the additives are specified in advance or if additional toxicity data is provided for the specific mud formulation.

The above additive could also be used in combination with other additives approved by EPA, Region 9 in the generic muds discussed above (excluding mud #1) and discharged in compliance with the requirements of general permit No. CA0110516.

It should also be pointed out that final effluent limitations guidelines were promulgated on March 4, 1993 for the Offshore Subcategory of the Oil and Gas Extraction Point Source Category (58 Fed. Reg. 12454), and we would like to clarify the effect of the new regulations on EPA, Region 9's program of mud and mud additive approvals. EPA, Region 9's approval program represents the "clearinghouse" approach for regulating these discharges. Although this approach was not adopted as the framework for the national regulations, the Response to Comments accompanying the regulations clarifies that EPA Regions may adopt this approach at their discretion (58 Fed. Reg. 12496).

EPA, Region 9 is currently in the process of reissuing general NPDES permit No. CA0110516. The final reissued permit may or may not provide for a clearinghouse for drilling mud and additive approvals. Additional review is necessary of the advantages and disadvantages of this approach. Until the general permit is reissued, however, EPA, Region 9 intends to continue its existing program of mud and mud additive approvals.

Should you have any questions regarding this matter, please contact Eugene Bromley of the CWA Standards and Permits Office at (415) 744-1906.

Sincerely yours,

Eugene Bromley

for Terry Oda, Chief
CWA Standards and Permits Office
Water Division

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY.
SCOTT, LOUISIANA 70583-8544
PHONE (318) 237-4775
FAX (318) 237-8005

DRILLING MUD
TOXICITY REPORT
OF
S. O. International
Product ID: S.O. Lube 1000 at 6% by volume

Sample Collected on: 7-30-98
Sample Received: 7-30-98
Depth of Well: N/A
Collected by: Chevron
SPL Identification No.: L1-9807G27
Date Reported: August 10, 1998

PREPARED BY
SPL, Incorporated
500 Ambassador Caffery Parkway
Scott, Louisiana 70583-8544
(318) 237-4775

FOR:
S. O. International
201 Nova Scotia
Lafayette, LA 70507
ATTN: Gary Matlock

TEST SUMMARY:

Test Started: 8-3-98, 15:55 Test Terminated: 8-7-98, 14:55
M. bahia 96 hr LC50: 108,290 ppm Method used: Probit
Analyzed by: P. Frederick, L. Stevens, S. Melancon
NOTE: This sample passes the 30,000 EPA toxicity criteria.

Eloy Granados
Manager Biomonitoring Services

Vickie Frederick
Bioassay Document Control

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY
SCOTT, LOUISIANA 70583-8544
PHONE (318) 237-4775
FAX (318) 237-8005

Certificate of Analysis No. L1-9808823-01

S.O. INTERNATIONAL, INC.
137 PARKLANE ROAD
LAFAYETTE, LA 70507
ATTN: GARY MATLOCK

DATE: 08/17/98

PROJECT: SO LUBE 1000
SITE:
SAMPLED BY: SO INTERNATIONAL
SAMPLE ID: SO LUBE 1000 @ 6% BY VOL.

PROJECT NO:
MATRIX: LIQUID
DATE SAMPLED: 07/29/98
DATE RECEIVED: 07/30/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Static Sheen Test EPA Guidelines Analyzed by: EG Date: 08/17/98 10:50:00	NEGATIVE		+/-

NEGATIVE - Negative result found.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: This analysis was performed in accordance with EPA guidelines for analysis and quality control. Results reported on a Wet Weight Basis unless otherwise noted.

ENVIRONMENTAL ENTERPRISES USA, INC.

96-Hour Static Definitive Toxicity Test

Lab Sample 598202

Prepared For: S. O. International

E.E. Sample No.: M-823-98

Sample Type: Lab Sample 598202

Sample Requirement: Definitive 96-hour LC50

LC50 Results: 92,600 ppm (C.I. = 81,500 - 105,300 ppm), Test Passed

Testing Supervisor: Alicia Jewell (for) David S Daniel Date 8/17/98

QA/QC Officer: Mark O'Neil Mark A. O'Neil Date 8/17/98

Laboratory Director: David L. Daniel David S Daniel Date 8/17/98

Analytical Method Used:

U.S. Environmental Protection Agency, March 1993. Appendix 2 to Subpart A of Part 435 - Drilling Fluids Toxicity Test, Final Rule for Offshore Subcategory of the Oil and Gas Extraction Point Source Category, *Federal Register* / Volume 58, No. 41 / Thursday, March 4, 1993 (40 CFR Part 435/12507).

58485 Pearl Acres Road • Suite D • Slidell, Louisiana 70461
OFFICE: 504-646-2787 • FAX: 504-646-2810 • 1-800-966-2788

Date: August 17, 1998

****
****

CERTIFICATE OF ANALYSIS: STATIC SHEEN TEST

****
****

CLIENT: S. O. International

LOCATION: n/a

SAMPLE TYPE: Lab Sample, 598202

SAMPLE RECEIVED: August 6, 1998

EE#	Date Collected	Static Sheen	Analyzed Date	Analyzed Time	Analyst
M-823-98		Pass	08/17/98	1:33pm	D. Daniel

Reference: THE FINAL NPDES PERMIT FOR NEW AND EXISTING SOURCES IN THE OFFSHORE SUBCATEGORY OF THE OIL AND GAS EXTRACTION CATEGORY FOR THE WESTERN PORTION OF THE OUTER CONTINENTAL SHELF OF THE GULF OF MEXICO. FR Vol. 61, No. 155, August 9, 1996.

Static Sheen Test Part I., Section D., 6.

Comments:

Mark A. O'Neil
Mark O'Neil
QA/QC Supervisor

David L. Daniel
David L. Daniel
Laboratory Director

58485 Pearl Acres Road • Suite D • Slidell, Louisiana 70461
OFFICE: 504-646-2787 • FAX: 504-646-2810 • 1-800-966-2788

Gulf of Mexico. In Texas, where the state has mineral rights to 3 leagues, some operators with state lease tracts are required to request coverage under this Federal NPDES general permit. This permit does not authorize discharges from facilities discharging to the territorial seas of the Gulf coastal states or from facilities defined as "coastal", "onshore", or "stripper" (see 40 CFR Part 435, Subparts C, D, and E).

2. Notification Requirements

Written notification of intent to be covered including the legal name and address of the operator, the lease block number assigned by the Department of the Interior or the state or, if none, the name commonly assigned to the lease area, and the number and type of facilities located within the lease block shall be submitted fourteen days prior to the commencement of discharge.

Permittees located in lease blocks that (a) are neither in nor adjacent to MMS-defined "no activity" areas, or (b) do not require live-bottom surveys are required only to submit a notice of intent to be covered by this general permit. Permittees who are located in lease blocks that are either in or adjacent to "no activity" areas or require live bottom surveys are required to submit both a notice of intent to be covered that specifies they are located in such a lease block, and in addition are required to submit a notice of commencement of operations.

Permittees located in lease blocks either in or immediately adjacent to MMS-defined "no activity" areas, shall be responsible for determining whether a controlled discharge rate is required. The maximum discharge rate for drilling fluids is determined by the distance from the facility to the "no activity" area boundary and the discharge rate equation provided in Appendix A. The permittee shall report the distance from the permitted facility to the "no activity" area boundary and the calculated maximum discharge rate to EPA with its notice of commencement of operations.

For permittees located in lease blocks that require live-bottom surveys, the final determination of the presence or absence of live-bottom communities, the distance of the facility from identified live-bottom areas, and the calculated maximum discharge rate shall be reported with the notice of commencement of operations.

All notifications of intent to be covered and any subsequent reports under this permit shall be sent to the following address: Enforcement Branch (6W-EA), Region 6, U.S. Environmental Protection Agency, P.O. Box 50625, Dallas, TX 75270.

Operators who have previously submitted a written notification of intent to be covered by this permit need not submit an additional notification of intent to be covered until submitting a notification of intent to be covered by a subsequent permit.

3. Termination of Operations

Lease block operators shall notify the Regional Administrator within 60 days after the permanent termination of discharges from their facilities within the lease block.

4. Intent To Be Covered by a Subsequent Permit.

Lease block operators authorized to discharge by this permit shall notify the Regional Administrator on or before May 19, 1997, that they intend to be covered by a permit that will authorize discharge from these facilities after the termination date of this permit (November 18, 1997).

Section B. Effluent Limitations and Monitoring Requirements

1. Drilling Fluids

The discharge of drilling fluids shall be limited and monitored by the permittee as specified in Table 3 of Appendix A and as below.

Special Note: The permit prohibitions and limitations that apply to drilling fluids, also apply to fluids that adhere to drill cuttings. Any permit condition that may apply to the drilling fluid discharges, therefore, also applies to cuttings discharges.

[Exception] The discharge rate limit for drilling fluids does not apply to drill cuttings.

(a) Prohibitions

Oil-Based Drilling Fluids. The discharge of oil-based drilling fluids and inverse emulsion drilling fluids is prohibited.

Oil Contaminated Drilling Fluids. The discharge of drilling fluids which contain waste engine oil, cooling oil, gear oil or any lubricants which have been previously used for purposes other than borehole lubrication, is prohibited.

Diesel Oil. Drilling fluids to which any diesel oil has been added as a lubricant may not be discharged.

(b) Limitations

Mineral Oil. Mineral oil may be used only as a carrier fluid (transporter fluid), lubricity additive, or pill.

Cadmium and Mercury in Barite. There shall be no discharge of drilling fluids to which barite has been added, if such barite contains mercury in excess of 1.0 mg/kg (dry weight) or cadmium in excess of 3.0 mg/kg (dry weight). The permittee shall analyze a representative sample of all stock barite used once, prior to drilling each well, and submit the results for total mercury and cadmium in the Discharge Monitoring Report (DMR).

If more than one well is being drilled at a site, new analyses are not required for subsequent wells, provided that no new supplies of barite have been received since the previous analysis. In this case, the results of the previous analysis should be used on the DMR.

Alternatively, the permittee may provide certification, as documented by the supplier(s), that the barite being used on the well will meet the above limits. The concentration of the mercury and cadmium in the barite shall be reported on the DMR as documented by the supplier.

Analyses shall be conducted by absorption spectrophotometry (see 40 CFR part 136, flame and flameless AAS) and the results expressed in mg/kg (dry weight).

Toxicity. Discharged drilling fluids shall meet both a daily minimum and a monthly average minimum 96-hour LC_{50} of at least 30,000 ppm in a 9:1 seawater to drilling fluid suspended particulate phase (SPP) volumetric ratio using *Mysidopsis bahia*. Monitoring shall be performed at least once per month for both a daily minimum and the monthly average. In addition, an end-of-well sample is required for a daily minimum. The type of sample required is a grab sample, taken from beneath the shale shaker. Permittees shall report pass or fail on the DMR using either the full toxicity test or the partial toxicity test as specified at 58 FR 12512; however, if the partial toxicity test shows a failure, all testing of future samples from that well shall be conducted using the full toxicity test method to determine the 96-hour LC_{50}.

Free Oil. No free oil shall be discharged. Monitoring shall be performed using the static sheen method once per week when discharging. The number of days a sheen is observed must be recorded.

Discharge Rate. All facilities are subject to a maximum discharge rate of 1,000 barrels per hour.

For those facilities subject to the discharge rate limitation requirement because of their proximity to areas of biological concern, the discharge rate of drilling fluids shall be determined by the following equation:

$$R = 10^{(D \text{ Log } (W/S) + T_d)}$$

Where:

R=discharge rate (bbl/hr)

Chevron

Chevron Petroleum
Technology Company
Drilling and Well Performance
2202 Oil Center Court
Houston, TX 77073
P. O. Box 4460
Houston, TX 77210
Fax 713 230 2669

Houston, Texas
October 2, 1997

MUD FORMULATION AND TOXICITY TESTING OF DRILLING MUD FOR ADTI/AVIARA ENERGY

Mr. Gary Young

As per your request, the submitted formulation provided by your self was prepared and the following tests were conducted. The mud system was prepared and the initial properties of the mud was measured. The properties measured were the rheological properties and gel strengths at 120 °F. The pH of the mud was also be measured. A static sheen test was conducted on this sample. The mud was hot-rolled at 150 °F overnight and the rheological properties, gel strengths, pH and API filtrate were measured on the after hot-rolled sample. A second static sheen test was performed on the hot-rolled sample. A sufficient quantity of the mud was then be sent to Environmental Enterprises and SPL labs for a range finder and full 96 hour LC 50 test.

Attached are the results of the lab tests on the submitted formulation. Results from the two labs performing the toxicity testing are as follows:

Lab	Range Finder LC 50	96 Hour LC-50
SPL	323,590 ppm	359,740 ppm

This sample passes the 30,000 EPA toxicity criteria.

Environmental Enterprises	252,000 ppm	217,000 ppm

A sheen test was conducted by our labs on the before and after hot-rolled sample and after one hour, there was no sheen. The static sheen test was performed by SPL labs on the sample of mud that we first hot-rolled and then submitted to SPL. A negative sheen test was indicated by SPL. Results of all tests are found in the attached sheets. The formulation is depicted in two manners. The first column is the products used and time mixed. The second column is the quantity of materials in grams or milliliters used to make the total quantity of mud for the toxicity testing. The third column is the lb/bbl equivalent of the products used in the formulation tested.

Post-it® Fax Note 7671	Date	# of pages ▶ 7
To Mr. Ed Fraserson	From K. Morton	
Co./Dept. Aviara	Co.	
Phone #	Phone #	
Fax #	Fax #	

If you have any questions, please feel free to give me a call at 281-230-2677.

Keith Morton
Cement and Fluids Work Group

cc: Mr. Ed Furgerson - Aviara

Water Base Mud
Pilot Test Analysis

Project No. : S97278 Series: 1 Date: 2-Oct-97

Materials Added	1 gm / ml	2 lb/bbl		
Fresh Water	1650.0			
Aquagel Gold Seal	140.0	25.0		
Mix 1 hour on dispersator	! ! ! !			
Fresh Water	1650.0			
Carbonox	140.0	12.5		
Q-Broxin	60.0	5.0		
KOH as needed	! ! ! !			
Mix 1 hour on dispersator; adjust pH	! ! ! !			
to 9.0 to 9.2 with KOH				
Mix the above and add:				
Aquagel Gold Seal	140.0			
Desco	55.0	5.0		
NaOH as needed for pH 9.0 to 9.2	! ! ! !			
Blacknite	80.0	2%		
Baracarb 5	35.0	3.0		
Baracarb 50	35.0	3.0		
Lubra Seal	70.0	6.0		
Cesco C-G	70.0	6.0		
Barite	2700.0	235.0		
Stir 30 minutes on dispersator	! ! ! !			
SO-1000	120.0	3%		
Stir 30 minutes on dispersator;	! ! ! !			
XCD if needed	4.0	0.3		
Adjust pH with NaOH	! ! ! !			

Initial properties: after mixing according to above procedure

		120F	Room Temp		
Fann dial reading @:	600 RPM	116	90		
	300 RPM	84	52		
	200 RPM	72	38		
	100 RPM	60	23		
	6 RPM	32	6		
	3 RPM	30	4		
Plastic Viscosity, cps @ °F		32	38		
Yield Point, lb/100 ft²		52	14		
10 sec gel, lb/100 ft²		37	5		
10 min gel, lb/100ft²		26	8		
pH, meter, @ °F		9.1	9.1		

Properties after hot rolling @ 150°F for 16 hours

Fann dial reading @:	600 RPM	170			
	300 RPM	114			
	200 RPM	89			
	100 RPM	59			
	6 RPM	20			
	3 RPM	19			
Plastic Viscosity, cps @ °F		56			
Yield Point, lb/100 ft²		58			
10 sec gel, lb/100 ft²		30			
10 min gel, lb/100ft²		40			
pH, meter, @ °F		7.3			
API filtrate, ml		21			

5229

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY.
SCOTT, LOUISIANA 70583-8544
PHONE (318) 237-4775
FAX (318) 237-8005

48-HR RANGEFINDER
TOXICITY REPORT
OF
Chevron Petroleum Tech. Co. / Drilling Tech. Ctr.
Location: 803
OCS-G-N/A
Sample Collected on:
Sample Received: 09-22-97
Depth of Well: Product Testing
Collected by: Chevron
SPL Identification No.: L1-9709955
Date Reported: September 26, 1997

PREPARED BY
SPL, Incorporated
500 Ambassador Caffery Parkway
Scott, Louisiana 70583-8544
(318) 237-4775

FOR:
Chevron Petroleum Tech. Co.
2202 Oil Center Court
Houston, TX 77073
ATTN: Keith Morton

TEST SUMMARY:

Test Started: 09-22-97, 14:00 Test Terminated: 09-24-97, 13:00
M. bahia 48hr LC50(ppm): 323,590 Method used: Probit
Analyzed by: P. Frederick, J. Pryor, A. Bourgeois, L. Stevens

Eloy Granados
Manager Biomonitoring Services

Vickie Frederick
Bioassay Document Control

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY
SCOTT, LOUISIANA 70583-8544
PHONE (318) 237-4775
FAX (318) 237-8008

DRILLING MUD
TOXICITY REPORT
OF
Chevron Petroleum Technology Co.
Product ID: Applied Drilling Technology Inc. water base mud
OCS-G-M-4729-97
Sample Collected on: 09-19-97
Sample Received: 09-25-97
Depth of Well: N/A
Collected by: Chevron
SPL Identification No.: L1-9709C56
Date Reported: October 2, 1997

PREPARED BY
SPL, Incorporated
500 Ambassador Caffery Parkway
Scott, Louisiana 70583-8544
(318) 237-4775

FOR:
Chevron Petroleum Technology Co.
P. O. Box 4450
Houston, TX 77210
ATTN: Keith Morton

TEST SUMMARY:

Test Started: 09-28-97, 08:25 Test Terminated: 10-02-97, 09:55
M. bahia 96 hr LC50: 359,740 ppm Method used: Probit
Analyzed by: J. Pryor, E. Granados, A. Bourgeois, P. Frederick
NOTE: This sample passes the 30,000 EPA toxicity criteria.

Eloy Granados
Manager Biomonitoring Services

Vickie Frederick
Bioassay Document Control

LAFAYETTE LABORATORY
600 AMBASSADOR CAFFERY PKWY.
SCOTT, LOUISIANA 70583-8644
PHONE (318) 237-4775
FAX (318) 237-8006

Certificate of Analysis No. L1-9709955-01

CHEVRON PETROLEUM TECH. CO.
PO BOX 4450
HOUSTON, TX 77210
ATTN: KEITH MORTON

DATE: 09/26/97

PROJECT: CHEVRON PETROLEUM
SITE:
SAMPLED BY: CHEVRON PETROLEUM TECH
SAMPLE ID: #1

PROJECT NO:
MATRIX: SLUDGE
DATE SAMPLED: 09/18/97
DATE RECEIVED: 09/22/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Static Sheen Test EPA Guidelines Analyzed by: EG Date: 09/24/97 08:00:00	negative		+/-

NEGATIVE - Negative result found.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: This analysis was performed in accordance with EPA guidelines for analysis and quality control. Results reported on a Wet Weight Basis unless otherwise noted.

ENVIRONMENTAL ENTERPRISES USA, INC.
58485 Pearl Acres Road, Suite D
Slidell, Louisiana 70461

1-800-966-2788 FAX 504-646-2810

Facsimile Transmission Sheet
96-HOUR RANGE-FINDER / DEFINITIVE TEST RESULTS

Chevron Petroleum Technology Company
Carole Flemming (281) 230-2669

SAMPLE RECEIVED FROM:

Area & Block ADTI WATER BASE MUD Well # — EE#: M-803-27

Date Collected —/27 Date Received 9/19/97 Temperature — °C

96-Hour Range-Finding Test will be initiated 9/19/97.

Alicia L. Jewell
Drilling Fluids Supervisor

David L. Daniel
Laboratory Director

—/—/27

96-HOUR RANGE-FINDING RESULTS:

The estimated 96-hour LC50 was 252,200 ppm.

Statistical Method: Trim. Spearman-Karber

96-Hour Definitive LC50 Test will be initiated 9/24/97.

Alicia L. Jewell
Drilling Fluids Supervisor

David L. Daniel
Laboratory Director

9/23/97

DEFINITIVE 96-HOUR LC50 TEST RESULTS:

The 96-hour LC50 was 217,000 ppm. 241,100

95% Confidence Interval: 195,300 to ~~241,000~~ ppm.

Statistical Method: Trim. Spearman-Karber

Alicia L. Jewell
Drilling Fluids Supervisor

David L. Daniel
Laboratory Director

9/29/97

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

In Reply
Refer To: W-5-1

APR 16 1996

Gary Matlock
President
S.O. International, Inc.
201 Nova Scotia
Lafayette, LA 70507

Dear Mr. Matlock:

We have reviewed the information submitted on April 8, 1996, in response to your request for approval of the following drilling mud additive:

Mud Additive	Usage Rate
S.O. Lube 1000	0 - 2% by volume

Discharges from offshore oil and gas operations in Federal waters off Southern California are authorized by general NPDES permit No. CA0110516. This permit authorizes the discharge of "generic" drilling muds defined in Condition III.C.18, and other muds subject to the condition that there be no exceedence of a limiting permissible concentration (LPC) after initial mixing (Condition I.A.1(e)).

On the basis of drilling mud dispersion studies EPA, Region 9, has concluded that 20,000 ppm is the minimum 96 hour LC_{50} (suspended particulate phase (SPP)) required for compliance with Condition I.A.1(e). The information which was submitted showed that the above additive, when included in a reference mud, would comply with this requirement. Accordingly, subject to the special limitation discussed below, we find that the discharge of the proposed additive (used in the concentration range shown above) would comply with the requirements of the general permit.

The above mud additive may be included and discharged in generic drilling muds defined in Condition III.C.18 of permit No. CA0110516 or in the generic muds defined at 50 Federal Register 34592, Appendix B, excluding mud #1 (KCl polymer mud). EPA, Region 9 has excluded mud #1 because toxicity tests at EPA's Gulf Breeze Laboratory showed that the 96 hour LC_{50} for this mud

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without additives is only slightly above the minimum LC_{50} required for compliance with Condition I.A.1(e). (The 96 hour LC_{50} for mud #1 was determined to be 30,000 ppm for the SPP.) Therefore, mud #1 is being excluded as a base mud from EPA, Region 9's mud additive approval program. However, it may still be possible to approve mud #1 including additives prior to discharge if all the additives are specified in advance or if additional toxicity data is provided for the specific mud formulation.

The above additive could also be used in combination with other additives approved by EPA, Region 9 in the generic muds discussed above (excluding mud #1) and discharged in compliance with the requirements of general permit No. CA0110516.

It should also be pointed out that final effluent limitations guidelines were promulgated on March 4, 1993 for the Offshore Subcategory of the Oil and Gas Extraction Point Source Category (58 Fed. Reg. 12454), and we would like to clarify the effect of the new regulations on EPA, Region 9's program of mud and mud additive approvals. EPA, Region 9's approval program represents the "clearinghouse" approach for regulating these discharges. Although this approach was not adopted as the framework for the national regulations, the Response to Comments accompanying the regulations clarifies that EPA Regions may adopt this approach at their discretion (58 Fed. Reg. 12496).

EPA, Region 9 is currently in the process of reissuing general NPDES permit No. CA0110516. The final reissued permit may or may not provide for a clearinghouse for drilling mud and additive approvals. Additional review is necessary of the advantages and disadvantages of this approach. Until the general permit is reissued, however, EPA, Region 9 intends to continue its existing program of mud and mud additive approvals.

Should you have any questions regarding this matter, please contact Eugene Bromley of the Permits Issuance Section at (415) 744-1906.

Sincerely yours,

Robert Wills

for Catherine Kuhlman, Chief
Permits and Compliance Branch
Water Management Division

LAFAYETTE AREA LAB
500 AMBASSADOR CAFFERY PKWY
SCOTT, LOUISIANA
ZIP 70583-8544
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9702228-01

S.O. INTERNATIONAL, INC.
201 NOVA SCOTIA
LAFAYETTE, LA 70507
ATTN: GARY MATLOCK

DATE: 02/14/97

PROJECT: S.O. 1000
SITE:
SAMPLED BY: S.O. INTERNATIONAL
SAMPLE ID: S.O. LUBE 1000

PROJECT NO:
MATRIX: OIL
DATE SAMPLED: 01/16/97
DATE RECEIVED: 02/06/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Pour Point Method ASTM D-97 Analyzed by: CS Date: 02/11/97	-25		°F

Notes:

QUALITY ASSURANCE: This analysis was performed in accordance with ASTM, UOP, or GPA guidelines for quality assurance.

Billy H. Rich

Billy Rich, Laboratory Manager

SPL LAB ID: 9702228 24858 Page _____ of _____

SPL Laboratories, Inc.
500 Ambassador Caffery Pkwy.
Scott, Louisiana 70583
(318) 237-4775 / (800) 304-5227 / Fax (318) 237-8005

Analysis Request and Chain of Custody Record

Sample submitted by: Gary MatHock

Project Name: S.O. 1000

Company: SO-Intl.01 S.O. International | Address: 201 Nova Scotia Lafayette, LA 70507 | Contact: Gary MatHock | Phone: 235-9110 | Project Location and State: S.O. LUBE 1000 | Project No.:

Sample No. / Identification	Date and Time	Grab	Comp	Sample Container (Size/Type)	Sample Type (Water, Soil, Oil, Sludge, Etc.)	Preservative	ANALYSIS REQUESTED TEST	METHOD	REMARKS
1	1-16-97	✓		500mL	OIL	—	Pour Point	POUR, SM4DIS	Due 1-12-97

Samplers: (Signature)	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	Intact
Affiliation	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	Intact
	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	Intact
SAMPLER REMARKS:			Received by: (Signature) Thomas	Date: 2/4/97 Time: 1000	Data Results to:
			Invoice to:		

United States Department of the Interior

MINERALS MANAGEMENT SERVICE
Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394

In Reply Refer To: MS 5221

September 3, 1997

S. O. International, Inc.
Attention: Mr. Gary Matlock
201 Nova Scotia
Lafayette, Louisiana 70507

Gentlemen:

Your letter of August 21, 1997, requested the Minerals Management Service (MMS) approve S. O. Lube 1000 for use in the Gulf of Mexico. Upon review of your S. O. Lube 1000, MMS cannot approve the use of this system pursuant to the provisions of 30 CFR 250.

It should be noted, that MMS does not have responsibility under the current regulatory framework to endorse or accept the use of services or products on the Outer Continental Shelf (OCS) of the Gulf of Mexico. It is the lessee's responsibility, not the manufacturer or service company's responsibility to seek approval for use on the OCS from MMS.

If additional information is needed, please contact Mr. B. J. Kruse at (504) 736-2634.

Sincerely,

William H. Martin
for Donald C. Howard
Regional Supervisor
Field Operations

To better serve you we now have a toll-free number to our Public Information Office...
1-800-200-GULF

TEST RESULTS

Table #1 - HLT Coefficient of Friction Test Results (Metal-to-metal contact, 150 rpm, 125 lbf)

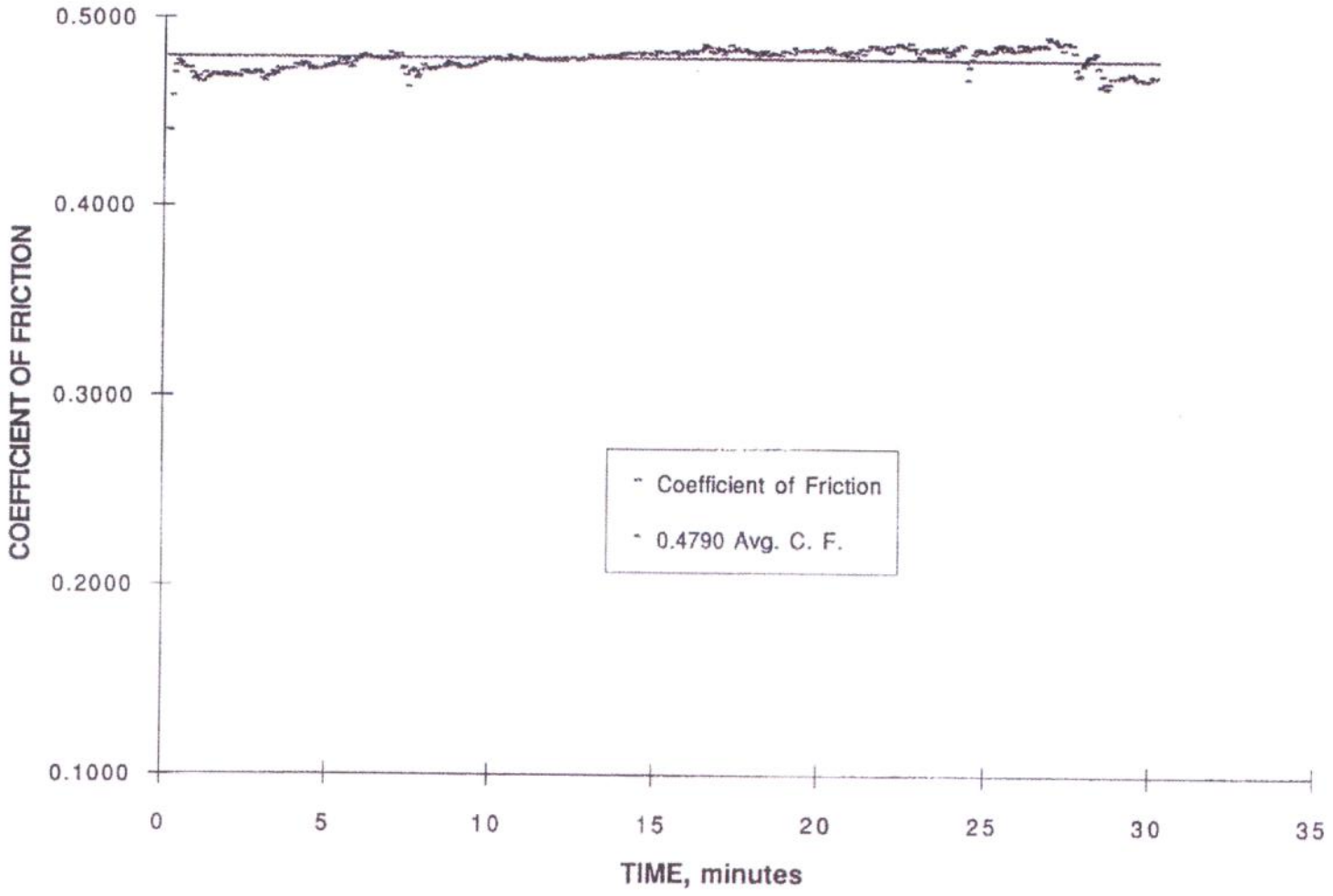
Coefficient of Friction Readings

Fluid Tested	Coefficient of Friction	% Reduction from Base
Base slurry	0.4790	-
Base slurry, 2% vol. S O LUBE 1000	0.2594	45.85%

Lubricity tester designed and manufactured by British Petroleum at the Westport Technology Center International

GRAPH #1

IITRI/M-I HLT LUBRICITY TEST
Metal Bob, L-80 Casing, 10 lb/bbl Gel Slurry, 150 rpm, 125 lbf

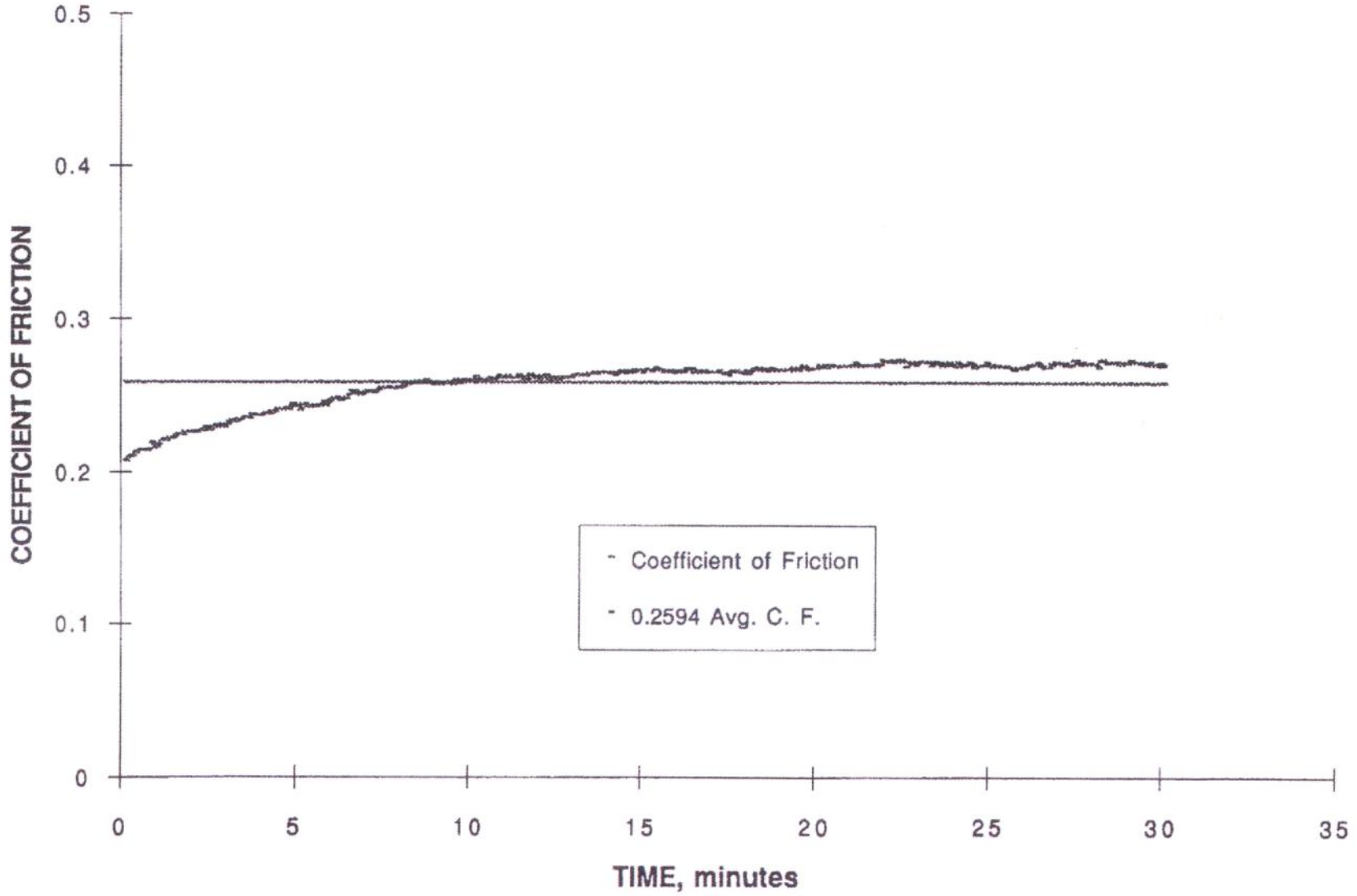


WESTPORT LAB,
HOUSTON, TX.

JULY, 1996

IITRI/M-I HLT LUBRICITY TEST
10 lb/bbl Gel Slurry, 2% SO LUBE 1000
150 rpm, 125 lbf

GRAPH #2



WESTPORT LAB,
HOUSTON, TX.

JULY, 1996

DRILLING FLUIDS TECHNOLOGY
MUDTECH
DIVISION OF BAKER ENGINEERING

8310 MILWEE · HOUSTON, TEXAS 77092 · (713) 683-8716

DATE: July 20, 1982

TO: S. O. INTERNATIONAL INC.
5909 West Loop South, Suite 615
Bellaire, TX

ATTENTION: Mr. Gary Matlock

SUBJECT: Laboratory Report No. M82-274
EVALUATION OF S.O. LUBE 1000

We have completed the evaluation of S.O. Lube 1000. The effects of this lubricant on the properties of a 13 lb/gal lignosulfonate mud were measured initially after mixing and after 16 hours hot rolling at 150°F. S.O. Lube 1000 was tested at a concentration of 2% by volume.

The results are shown on the attached Data Sheet.

REMARKS

Table 1 below summarizes some important properties of the S.O. Lube 1000 treated mud.

Table 1

Properties of a 13 lb/gal Lignosulfonate Mud Treated
With 2% by Volume of S.O. Lube 1000,
After Hot Rolling 16 Hours at 150°F

	Blank Mud	S.O. Lube 1000 Mud
Yield Point, lb/100 sq ft	46	55
10 min Gel, lb/100 sq ft	5	22
API Filtrate, ml	6.4	5.6
Mud Lubricity Coefficient	0.20	0.13
Differential Sticking Coefficient	0.134	0.029

S.O. Lube 1000 reduced the mud lubricity coefficient 45% and reduced the differential sticking coefficient 78% in the tests on the hot rolled muds. The API Filtrate was reduced from 6.4 ml to 5.6 ml. S.O. Lube 1000 caused thickening of the mud and the mud foamed upon high speed stirring. The foam dissipated upon standing undisturbed.

Respectfully submitted,

David N. Bailey
Chemist

DNB:rmq
Attachment

DATA SHEET

PROPERTIES OF S.O. LUBE 1000 TREATED MUD

Sample	Blank		S.O. Lube 1000	
Concentration, % by Vol.	0		2%	
Mud Properties	I	HR	I	HR
Fann VG Meter Readings				
600 rpm	127	202	160	263
300 rpm	72	124	99	159
Plastic Viscosity, cp	55	78	61	104
Yield Point, lb/100 sq ft	17	46	38	55
10 sec Gel, lb/100 sq ft	3	4	4	6
10 min Gel, lb/100 sq ft	4	5	18	22
pH	9.5	10.1	8.9	10.3
API Filtrate, ml	5.5	6.4	4.8	5.6
Cake Thickness, 32nd in.	2	2	1	2
Mud Lubricity Coefficient	0.21	.20	.10	.13
Differential Sticking Data:				
Filtrate Volume at				
30 min	4.1	4.1	3.6	5.2
35 min	4.5	4.5	4.0	5.5
45 min	5.1	5.0	4.5	6.1
Torque, in-lb	65	70	65	15
Pressure, psi	500	500	500	500
Differential Sticking Coefficient	0.124	0.134	0.124	0.029

I = properties measured initially after mixing

HR = properties measured after 16 hours of hot rolling at 150°F.