MDT SAMPLING SUMMARY
25/8-6 T2

Sample Chronology	Depth (m)	Sample Chamber vol	Pretest pump-out vol (L)	OFA prior to sampling	Chamber filling Time	Result	Comments
1.) Planned Oil	**2082.2**	**1 x 1gal, 4 X 450cc**	**16.38**	**Oil**	**1 hr, 9 min**	**successful**	**2 PVT containers did not open**
Continue Pressure Profile							
2.) Planned water	**2145.0**	**1 x 1gal**	**28.08**	**water**	**44 min**	**successful**	**Sampling flow restricted by partially plugged probe, abort additional sampling here**
3.) Water	2147.0		0.58	water		unsuccessful	Probe plugging immediately upon pumping with pump-out sub on 2 attempts - abort test
Complete pressure profile							
4.) Water	2201.0		0	water		unsuccessful	Probe plugging while pumping out during pretest - abort test
5.) Water	**2143.5**	**1 x 1gal**	**7.02**	**water**	**1 hr, 32 min**	**successful**	**Probe plugged but chamber filled**
6.) Planned transition	2123.7		2.9	water		unsuccessful	Probe plugging during pump out resulting in complete pack-off
7.) Transition	**2123.0**	**1 x 1gal**	**7.6**	**60% wtr 10-20% oil**	**2 hr, 12 min**	**successful**	**Probe plugged but filling chamber**
8.) Transition	2122.0		14.6	oil		unsuccessful	Probe plugged immediately upon opening smpl chamber
9.) Transition	2122.0		2.9	oil		unsuccessful	Reset tool, sample chamber plugged immed upon opening
10.) Transition	2122.2			OFA unusable		unsuccessful	Probe/flowline/OFA plugged on pretest set, not displayed on log
11.) Transition	**2122.1**	**1 x 1gal**	**14.04**	OFA unusable	**1 hr, 26 min**	**successful**	**Probe plugged immediately upon opening smpl chamber, but filling chamber**

Note: Probe unplugged in open hole multiple times with use of pump-out sub

Mud and Product Usage, 12 1/4" hole section — Well: 25/8-6

Operator: Esso Norge — Anchor Drilling Fluids

Initial volume 0 (m3) — **Volume transferred to next well (m3):** 0

Date 1995		24-05	25-05	26-05	27-05	28-05	29-05	30-05	31-05	01-06	02-06	03-06	04-06	05-06	06-06	07-06	08-06	09-06	10-06	11-06	Total
FSR no.		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Depth at 24:00 hr	m	1060	1063	1700	2054	2063	2077	2085	2100	2109	2138	2211	2335	2473	2565	2565	2565	2565	2565	2565	
Mud Usage:																					
Built	m3	228	87	82	94	8	2	27	6	1	26	17	1	28	4	0	13	10	17	0	4	655
Received	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surface loss	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dumped #1 (SC)	m3	0	9	0	0	0	0	0	0	0	0	0	0	0	10	4	8	0	0	0	0	31
Dumped #2	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	102	133	235
Solids equipment	m3	0	4	59	43	6	3	4	18	0	15	20	17	19	33	8	15	21	0	0	0	285
Formation loss	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Behind casing	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Left in hole	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	68	0	104
Back-loaded	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Final volume	**m3**	**228**	**302**	**325**	**376**	**378**	**377**	**400**	**388**	**389**	**400**	**397**	**381**	**390**	**351**	**339**	**329**	**318**	**299**	**129**	**0**	
Product Additions:																						**Total**
Barite	mt	56	37	4	39	24	1	0	24	3	5	0	0	3	0	0	54	42	24	0	0	316
Soda Ash	kg	150	50	50	25	200	0	150	175	0	0	50	75	200	150	0	0	0	0	0	100	1375
Lampac Exlo	kg	2625	1000	1250	1375	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6250
Rhodopol 23 P	kg	850	425	725	375	0	0	0	0	0	0	100	150	0	150	0	0	400	200	0	0	3375
KCl-brine	m3	286	73	75	70	0	0	25	0	0	23	15	0	25	0	0	0	0	11	0	0	603
KCl-powder	kg	3000	3000	3000	5000	2000	2000	1000	0	0	0	3000	0	2000	5000	0	0	0	0	0	0	29000
Anco 208 (Brine)	lit.	8550	2000	2250	2200	0	0	780	0	0	580	530	0	600	0	0	0	0	330	0	70	17890
Anco 208	lit.	2000	500	1000	8500	1200	400	0	0	0	1200	0	1000	0	0	0	0	0	0	0	0	15800
Sodium Nitrate	kg	0	0	0	175	25	0	0	0	0	0	0	0	0	0	0	0	75	0	0	0	275
Citric Acid	kg	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	250	500	0	800
Anco cide	kg	0	0	0	0	0	0	325	75	0	0	0	0	0	0	0	0	75	0	0	0	475
Antisol FL 10	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	2000	0	0	0	250	0	0	2250
Sodium Bicarb.	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	250	300	0	550

Mud and Product Usage, 12 1/4" Sidetrack

Well: 25/8-6

Operator: Esso Norge

Anchor Drilling Fluids

Initial volume 0 (m3)

Volume transferred to Base (m3): 342

Date 1995		12-06	13-06	14-06	15-06	16-06	17-06	18-06	19-06	20-06	21-06	22-06	23-06	24-06	Total
FSR no.		25	26	27	28	29	30	31	32	33	34	35	36	37	
Depth at 24:00 hr	m	1247	1714	2258	2337	2504	2507	2539	2577	2577	2577	2577	2577	2577	
Mud Usage:															
Built	m3	44	41	47	10	23	19	2	2	0	0	0	0	0	188
Received	m3	302	0	0	0	0	0	0	0	0	0	0	0	0	302
Surface loss	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dumped #1 (SC)	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
To sloptk.	m3	18	4	0	0	0	0	0	4	0	0	3	0	13	42
Solids equipment	m3	12	8	8	39	12	5	6	6	0	0	2	0	0	98
Formation loss	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Behind casing	m3	0	0	0	0	0	0	0	0	0	0	0	0	8	8
Dumped	m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Back-loaded	m3	0	0	0	0	0	0	0	0	82	0	0	0	260	342
Final volume	**m3**	**316**	**345**	**384**	**355**	**366**	**380**	**376**	**368**	**286**	**286**	**281**	**281**	**0**	
Product Additions:															**Total**
Barite	mt	9	30	31	15	12	7	4	0	0	0	0	30	0	138
Safemul PE	ltr	800	1600	800	400	1400	400	0	200	0	0	0	0	0	5600
Safemul SE	ltr	400	800	400	400	1400	400	0	200	0	0	0	0	0	4000
Safemul MOD	ltr	200	1200	800	200	200	200	0	600	0	0	0	0	0	3400
Safemul OW	ltr	400	0	0	0	0	0	200	0	0	0	200	0	0	800
Safemul VIS	ltr	625	1250	2175	600	2025	200	625	0	0	0	0	0	0	7500
Lime	kg	250	1200	400	400	1600	0	400	1440	0	0	160	0	0	5850
Cals. Chloride	kg	2100	1050	1050	0	0	0	0	0	0	0	0	0	0	4200
Baseoil	m3	21	29	36	5	16	16	0	0	0	6	0	0	0	129
Renax 100	ltr	0	0	0	0	0	0	0	25	100	0	0	0	0	125

Geochemistry of Core Chips Gas: Well 25/8-6, Norway

Research Application Project Documentation

Work Reported by ..... J. D. Yeakel (965-4637)
..... Petroleum Geochemistry Section
..... Integrated Basin Analysis Division

Report Sent to ..... Torunn Valheim
..... Esso Norge AS

Date Report issued ..... September 1995

Period Covered ..... September 1995

EPR Research Application Job No. 51204

Key words: geochemistry, gas analysis, hydrogen sulfide, gas chromatography.

A Risk-Screening Form is included with this document.

For Company Use Only

EXXON PRODUCTION RESEARCH COMPANY

[redacted]

TECHNICAL PRODUCT (TP) RISK SCREENING FORM

TP: H_2S in Headspace Gas | **USER(S): ESSO NORGE**

RISK ASSESSMENT DECISION

_X_ This TP does not require EPR Risk Study. ***Indicate below decision rationale and any assumptions about the TP and its use, such as limits on operating conditions, mitigators/preventers in place, training/experience of operating personnel, critical safety systems and safeguards in place, use of hazardous materials, and emergency response plans.***

_____ EPR Risk Study is necessary. Previous Risk Study results are adequate and are attached.

_____ EPR Risk Study is necessary. Previous Risk Study results have been modified to be adequate and are attached.

_____ A new EPR Risk Study should be carried out using about _____ individuals and should take approximately _____ days. The following units should be represented or consulted:

_____ _____ _____

_____ _____ _____

Comments or Rationale Supporting this Decision and Assumptions About Use:

This technical product is applicable only to the sample of gas+sediment received at EPR, at the time an aliquot of gas was removed from the container. The technical product cannot be considered a definitive statement about the presence or absence of H_2S in the rock interval sampled.

The sample container was not appropriate for removing an aliquot of the headspace gas using established, reliable techniques; nor was the container appropriate for the collection, storage, and shipment of the sample of sediment and its associated gas. Due to the use of such a container gases such as H_2S may not have been collected or may have been lost. Thus, the sample analysed may not represent the true nature of the gases of the sampled rock interval.

It is further assumed that Esso Norge AS will conduct appropriate OIMS risk studies prior to utilizing the results of this study for making business decisions.

Responsible R&E Staff Jesse Yeahee 9/25/95 **date**

Intermediate R.A. Trained Staff T. Dy Rudge 09/25/95 **date**

Section Supervisor [signature] 9-26-95 **date**

This page is to accompany the TP when delivered.

SCREENING PAGE 3

Geochemistry of Core Chips Gas: Well 25/8-6, Norway

Jesse Yeakel

The bottled sediment sample from the 2112-2119 m interval in well 25/8-6 contained sediment and headspace gas with a noticeable unpleasant odor that we determined was not due to H_2S or low molecular weight hydrocarbons. However, the absence of H_2S in the sample, as we received it, does not conclusively eliminate the possibility that the odor detected during coring of this interval was due to H_2S or some S-bearing organic compound. The sample we received may not have captured or retained the compound(s) responsible for the odor detected at the drill site.

Bottles, even with plastic-lined lids, should not be used as containers for sediment that you would like gas analyses on. The bottle submitted may not have retained all gases emitted by the sediment, or may have leaked and diluted the gas from the sediment with air, thus reducing the concentration of sediment-evolved gases. Sampling guidelines for cuttings and sediment samples recommend the use of paint cans for the sample. The can containing a sample should be stored and shipped upside down to minimize gas leakage. Detailed guidelines for these kinds of samples are presented in an EPR report "Acquisition and Handling of Geochemical Samples" by T. S. Loutit and A. E. Bence (EPR report no. EPR3MA.89).

Sample Handling and Analyses:

We were able to sample the head-space gas in the bottle without compromising the integrity of the container. A test for H_2S and gas chromatography were performed on the head-space gas. After gas analysis, the sediment in the bottle was washed and examined. The results of the analyses and observations are listed in the following section. A copy of the report by the laboratory performing the analyses is also provided (see attached sheets).

Results of Head-Space Gas Analysis

- An unpleasant odor was present. However, the odor was not that of H_2S or mercaptans, both of which have distinctive, noticeable odors in extremely small concentrations (parts per billion).
- The test for H_2S was negative. The method used employs an analyzer tube packed with lead salt that is discolored by H_2S. This test detects H_2S in the range of 10 to 120 parts per million (v/v) by discoloration of the packing. Concentrations greater than 120 PPM are detected by this method but concentration cannot be estimated by the method.
- Gas chromatography of the sample for C1-C4 and C5-C7 hydrocarbons indicated minor concentrations of these compounds.

Hydrocarbon	Concentration (PPM v/v)
Methane	209
Ethane	59
Propane	111
iso-Butane	73
n-Butane	98
C5-C7	1732

Results of Sediment Examination

- Sediment had an unpleasant odor, though not that of H_2S or mercaptans.
- There was nothing about the sediment's appearance that was unusual.
- After washing with water, the sediment had no odor.

Interpretation

- The sample, as received, had an odor but not one that was due to H_2S or mercaptans. These compounds have distinctive odors at extremely low concentrations (parts per billion) and would have been recognizable by smell, if present. Also, the test was negative for higher concentrations of H_2S.
- If H_2S is present, it is at such low concentrations that it cannot be detected by smell and is not present at high enough concentrations to be detected by standard tests.
- The sample odor was not due to low molecular weight hydrocarbons. These hydrocarbons are in very low concentrations in the headspace gas.
- The sediment in this sample may not be the source of the odor emitted by this sample. After washing, the sediment was odor-free. Odor detected in the sample prior to washing may be due to a drilling mud additive or some other, unknown source.
- The sample bottle may not have captured the compound(s) responsible for the odor detected at the drill site. The odor at the drill site could have come from a variety of sources including the sediment in the cuttings, a formation gas, or some contaminant in the drilling mud.
- Bottles are not appropriate containers for storage and transportation of sediments and their associated gases. This bottle may not have retained the gas causing the odor, even if it was evolving from the sediment.

GEOCHEMICAL ANALYSES
SOURCE ROCK EVALUATION

MODELLING-PETROLEUM SYSTEMS

CRUDE OIL CHARACTERIZATION
GEOCHEMICAL PROSPECTING

CRUDE OIL-SOURCE ROCK CORRELATION

1143-C BRITTMOORE ROAD • HOUSTON, TEXAS 77043-5094
Phone: 713-467-7011 • Fax: 713-467-7639

September 6, 1995

EXXON PRODUCTION RESEARCH COMPANY
P.O.Box 2189
Houston, Texas 77252-2189

Attention: Mr. Jesse Yeakel

Dear Sir:

We are pleased to report the analytical results determined on the bottled sample of "sand" submitted to GeoChem on Friday, September 1, 1995.

It was believed that this sample had a very pungent odor which may be Hydrogen Sulfide. The object was to determine the nature of the odor and to analyze the C1-C7 light gas hydrocarbon content using flame ionization detection.

The sample was logged in at GeoChem under the Job No. E1175, sample number - 001 (E1175-001). EPRCo sample number was 200952 and the label on the bottle was 2112-2119rkb.

The following analyses were carried out.

1. Detection of Hydrogen Sulfide.

Two small holes were carefully drilled through the cap of the sample bottle but not penetrating the sealing plastic cap liner. Two septa were used to seal the holes and the cap liner was then pierced with a sampling needle.

A 50ml sample of the gas space in the bottle was withdrawn from the bottle through a Bendix Gastec H2S Analyzer tube piercing one of the sampling septa whilst 50ml of degassed water was admitted to the bottle via the second septa.

The analyzer tube detects H2S in the range 10ppm. v/v to 120ppm. v/v by discoloration of the chemical packing (lead salt). No discoloration was observed and it is probable that should any H2S be present it is in concentrations less than 1ppm.v/v.

The sampled gas was then discharged from the Bendix Gas Sampling syringe and personally "sniffed". There is a definite unpleasant odor (possibly a mud additive) but definitely no H2S odor. The human nose detection for H2S is at the parts per billion level and the H2S odor is readily recognized. I would also state that the odor does not have a mercaptan smell which is equally recognizable.

SEP- 6-95 WED 14:06

Bryson.

330 vol. Bottle
210 vol Airspace
120 vol Sample

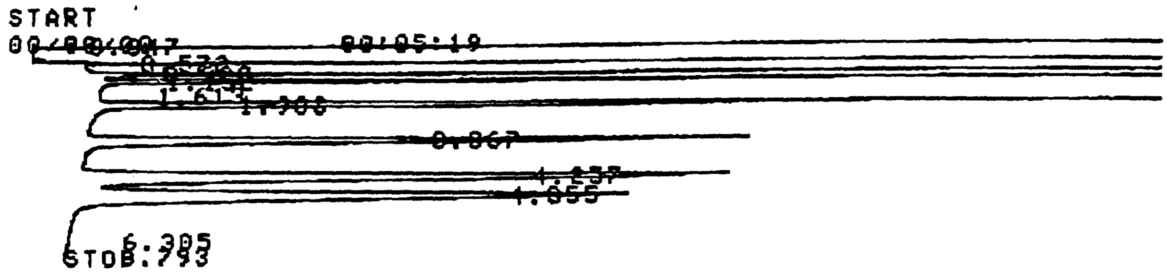
LIST WIDTH(1)
ANALYSIS PARAMETER FILE 1

WIDTH	5	SLOPE	8000
DRIFT	0	MIN.AREA	200000
T.DBL	0	STOP.TM	75
ATTEN	4	SPEED	5
METHOD$	0840	FORMAT$	0
SPL.WT	100	IS.WT	1

METHOD$(1)="0041"
SLOPE(1)=70
MIN.AREA(1)=10000
STOP.TM(1)=12
LIST WIDTH(1)
ANALYSIS PARAMETER FILE 1

WIDTH	5	SLOPE	70
DRIFT	0	MIN.AREA	10000
T.DBL	0	STOP.TM	12
ATTEN	4	SPEED	5
METHOD$	0041	FORMAT$	0
SPL.WT	100	IS.WT	1

PRINT LEVEL
4884.4
PRINT WIDTH(1)LEVEL
5 3418.4
PRINT LEVEL
2882
ZERO
START



Std @ 10^{-11}

CHROMATOPAC CR601 FILE 1
SAMPLE NO 0 METHOD 0041
REPORT NO 6075

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	~~0.047~~	~~130135~~			13.0938	
2	0.572	84418			5.8135	
3	0.928	136409	V		9.3939	
4	1.152	136335	V		9.3888	
5	1.613	37602	V		2.5895	
6	1.903	250948	V		17.2817	
7	3.067	209600	V		14.4342	
8	4.257	194609	V		13.4018	
9	4.855	212049	V		14.6029	

Shimadzu 221-25412 13 5

2. C1-C7 Light Gas Hydrocarbon Analysis.

A standard sample of the headspace gas (1ml) was sampled and analyzed by gas chromatography. The concentration of the individual C1-C4 hydrocarbons are reported below along with a measure of the C5-C7 gasoline-range hydrocarbon determined by backflush (see attached chromatogram).

Hydrocarbon	Concentration ppm v/v*
Methane	209
Ethane	59
Propane	111
iso-Butane	73
n-Butane	98
C5-C7	1732
C1-C4	550
C2-C4	341
%Wetness	62%

* volume of gas per million volumes of sand.

3. We have also washed the sample and report nothing unusual in the appearance of the solids. The odor is washed away and the remaining sand solids are odor free.

I would advise examining the well records to determine what mud additives, if any, were used in the coring operation. It does not appear that the odor is associated with the interval being cored.

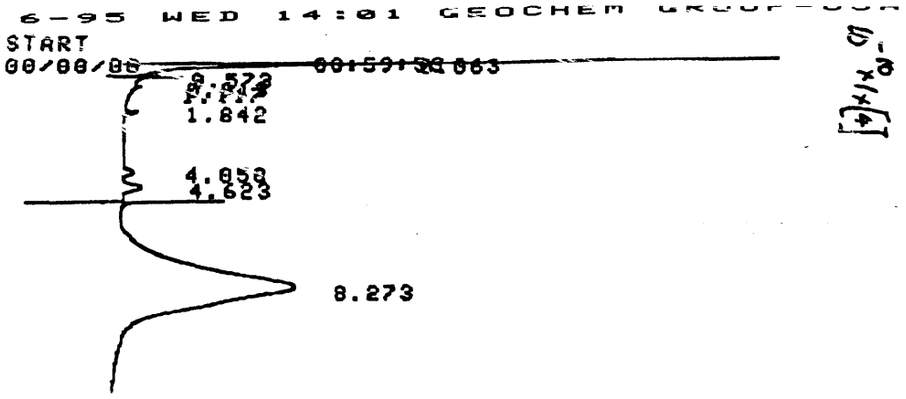
Please advise if we can be of any further service. As per your instruction the sample has been discarded.

We appreciate you using GeoChem for this work.

Sincerely yours

Geoffrey S. Bayliss
President
GeoChem Laboratories Inc.

GSB/nl

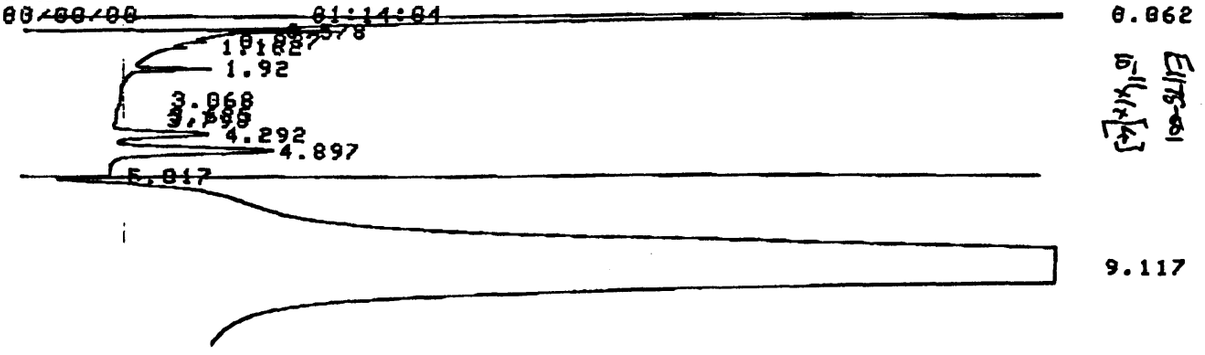


E1175-001

CHROMATOPAC CR601 FILE 1
SAMPLE NO 8 METHOD 8041
REPORT NO 6082

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	8.063	63631			18.5532	
2	8.273	279335			81.4468	
TOTAL		342966			100	

PRINT WIDTH(1)LEVEL
5 18826.4
PRINT WIDTH(1)LEVEL
5 23382.2
PRINT WIDTH(1)LEVEL
5 13114.6
PRINT LEVEL
4749.6
PRINT WIDTH(1)LEVEL
5 3057.6
ZERO
START
00/00/00 01:14:01



E1175-001

CHROMATOPAC CR601 FILE 1
SAMPLE NO 8 METHOD 8041
REPORT NO 6083

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	0.062	548816			13.3245	
2	0.578	93339			2.2662	
3	0.937	43046	V		1.0451	
4	1.162	107346	V		2.6062	
5	1.92	143488	V		3.4816	
6	3.868	59523	V		1.4451	
7	3.625	21587	V		0.5221	
8	4.292	77641	V		1.885	
9	4.897	111135	V		2.6982	
10	5.817	24158	V		0.5863	
11	9.117	2888950			70.1397	
TOTAL		4118853			100	