3.5.6 Mud Summary by Phase

Mud summary for the 23" x 36" hole section:

The section were drilled with seawater and hivis sweeps made of pre-hydrated Bentonite with a concentration of 90 kg/m³ Bentonite and a FV>150 s. Pumped approximately 5 - 10 m³ high viscosity pills every 15 m drilled.
At TD the hole was cleaned by pumping 25 m³ high viscosity sweep and then displaced to a NaCl/Polymer system. The displacement fluid was 1.20sg NaCl brine with 5 kg/m³ Duotec NS and 2 kg/m³ Trol FL. At the end of the section, some extra hivis was made with seawater and CMC EHV for use when grouting around the well head.

No solids control in use for this section.

The section was drilled with no drilling fluid related problems, and it is recommended to use the same systems and procedures in future wells in the area.

Mud summary for the 16" hole section:

The KMC Oiltools system had a blocked dump valve at the sand trap between shaker 2 and 3, so the seawater in returns had to be diverted to a separate pit when displacing. It was not allowed to open the master dump valve in case some of the other pits are leaking. Oiltools had to pump the seawater over board (25 – 30 m³/hour).
Displaced the well to 1.20 sg Formpro drilling fluid, with a 10 m³ hivis Formpro spacer pumped in front. During displacement, a total of 17 m³ of contaminated inter-phase was diverted into a separate pit. When the inter-phase returned, the shakers over flowed with "gel-lumps". Heavy cement contaminated of the Formpro system was experienced when drilling trough the cement. pH went up to 12.3 and polymers came over the shakers. Addition of Potassium Bicarbonate (625kg) and Formic Acid (600ltr) was done to treat the cement contamination. Drilling fluid density decreased due to solids had "dropped" out together with the polymers and high density Formpro was added to increase the drilling fluid weight back to 1.20 sg. Addition of Trol FL and Duovis Plus NS was needed to restore the drilling fluid properties after the contamination.
A LCM pill with a total concentration of 125 kg/m³, (Nutplug M/F, Mica M/F and MIX II, 25 kg/m³ of each), was mixed prior to the second attempt of the FIT test.
The drilling continued to TD with some stops due to problems with Oiltools' equipment for handling cuttings. Oiltools' main problem is the use of conveyers which mechanically are "crushing" the clay solids into a uniform and sticky consistence. The only way to solve this is using water. The amount of water created settling problems in the buffer tanks from where the cuttings are blown to the vessel.
The Formpro system performed well with fine shaped and inhibited cuttings separated out at the shakers. An excellent rheology profile, typical 3 rpm = 8 - 12 and 600 rpm =46 - 53 lb/100ft². The drilling fluid was kept inside specification except for the Ca^{++} concentration, typical concentration around 1 000 mg/l while drilling. Added some Sodium Carbonate to "take out" Ca^{++}, recommend planning for use of Potassium Carbonate (ref. Operational Procedure Manual). Measuring density on the filtrate with the Triple beam balance and a 10 ml syringe was too rough to measure accurate density, recommend using pycnometer, (ref. M-I

Engineering Manual), and an electronic balance was used to determine brine density.

The totals of new screens used while drilling this interval were as follows:

Screen size	Quantity used		Screen size	Quantity used
230	6		165	5

The VSM 300 shakers performed well. At start, all five shakers were dressed with 20 mesh scalping screens and 84 mesh bottom screens (used). The bottom screens were changed out to a combination of 165, 200 and 210 mesh after finishing drilling the cement.
When drilling with an average ROP of 15 - 20 meters/hrs and a flow of 3 800 ltr/min, three shakers handled all the cuttings. The three shakers were dressed one with 200 TRSF and two with 230 TRSF bottom screens. At approximately 800 m the scalping screens was changed on three of the shakers to 40 mesh. This resulted in longer lasting bottom screens. The ROP was limited by Oiltool's equipment for cuttings handling.

Recommend using as fine scalping screens as possible to reduce the usage of bottom screens.

Mud summary for the 12 1/4" hole section:

Built 250 m³, 1.30 SG Formpro before staring this section, by mixing the 1.55 SG Kill fluid together with 1.20 SG and 1.26 SG Formpro from shore. The cement was drilled with the 1.20 SG Formpro from the previous section. The 1.20 SG drilling fluid was treated with 325 l Formic Acid and 1 350 kg Potassium Bicarbonate due to cement contamination. The 1.30 SG Formpro was displaced in just after the cement was drilled. A 10 m³ LCM pill was prepared using 1.30 SG mud and 120 kg/m³ G-Seal. This pill sealed off the hole during the "Hole Strengthening Test" after the Leak Off Test.
Before entering the "Realgrunnen reservoir" 20 kg/m³ G-Seal, 10 kg/m³ $CaCO_3$ medium and 10 kg/m³ $CaCO_3$ Coarse was added to the drilling fluid due to a very permeable and soft formation. These concentrations of LCM were maintained throughout this reservoir and to 1 400 m depth.
When drilling/coring the sand reservoirs in the Realgrunnen formation some tendency to foaming and aerations was observed. This caused some problems related to well control since volume in active was unstable. Before pulling out to cut core no#1, with a gas level of 18%, foam was observed at the shakers. The foam was coming off the end of the shakers the same way as cuttings come. This was discussed on the rig, but no conclusion could be drawn whether this was caused by the gas or by the additions of $CaCO_3$. Defoam AL was added to reduce the foaming. The defoamer helped, but the foaming and aeration continued throughout the reservoir.
While drilling cement, Formic Acid and Sodium Bicarbonate was added to lower PH.

The totals of new screens used while drilling this interval were as follows:

Screen size	Quantity used		Screen size	Quantity used
110	2		210	24
165	11		230	19

The VSM 300 Shakers generally performed well throughout this section and no special problems was seen.
Drilled / cored the Realgrunnen sand reservoir with 20/40 mesh over 165 mesh on 3 shakers and 210/230 mesh on the other 2 shakers with most of the flow going across the 165 mesh screens. The 165 mesh screens were used to maintain the level of added LCM through this section. According to the FSR# 50 18 X 210 and 4 X165 mesh screens are charged off on the 8 1/2" section, but these screens have been used on the 12 1/4" section.
As a new formation type was reached at 1400 m the screens were changed back to 210 and 230 mesh since it was no longer required to maintain the level of LCM.

Recommend using as fine scalping screens as possible to reduce the usage of bottom screens. Adding Defoam AL with premix instead of directly into the active system is more efficient to reduce foaming.

Mud summary for the 8 1/2" hole section:

To combat cement contamination while drilling out the shoe, Sodium Bicarbonate, Citric Acid and Formic Acid was added to the active drilling system. After drilling 5 m of new formation, the well was displaced to all new built 1.51 sg Formpro drilling fluid made from brine.
The drilling was slow and when experiencing formation losses it was decided to displace back to 1.34 sg Formpro used in the previous interval. From about 1 850 m the density was increased slowly using 1.47 sg and 1.50 sg fluids (were not allowed to use Illminite as far as possible due to logging).
At 2 049 m the hole was displaced back to 1.51 sg. At 2 196 m some moderate formation losses was experienced and some G-Seal and $CaCO_3$ Medium/Fine was added to the active system to increase the bridging properties of the fluid. A 150 kg/m³ LCM pill was also mixed up, but never pumped into the well. It was decided after a while to stop adding G-Seal because it was thought that it influenced the analysis of the cuttings samples done by the geologist. The addition of $CaCO_3$ Fine and Medium was continued towards TD. Lost to the formation at the following rates; 1 850 l/min lost ~10 m³/hour, 1 600 l/min ~2.7 m³/hour, 1 550 l/min no losses.
When drilled to TD, a wiper trip to the shoe was done and after circulating bottoms up when back on TD, the string was pulled out of the hole. Also this time, high amount of air in the drilling fluid was experienced when circulating bottoms up after the wiper trip. Air in the drilling fluid was also seen when circulating bottoms up on the clean up run after the wire line logging. The air/foam in the drilling fluid was treated with addition of defoamer, Defoam AL.

The totals of new screens used while drilling this interval were as follows:

Screen size	Quantity used		Screen size	Quantity used
20	4		210	25
60	3		230	1
165	4		250	9

At start of the interval the same screen configuration as for the 12 1/4" section was used. At 2 100 m an increase in sand content (maximum 0.75%) was seen and the scalping screens was changed from 20 mesh to a combination of 40 and 60 mesh. Also changed over to 250 mesh on one of the shakers whilst the rest of the shakers were dressed with 210 and 230 mesh. At TD the sand content was reduced to 0.5%.

Recommend using as fine scalping screens as possible to reduce the usage of bottom screens.

Mud summary for the 6" hole section:

This section was drilling with the same drilling fluid as used on last section.
Cement contamination was treated with addition of Formic Acid and Sodium Bicarbonate. Also addition of Sodium Bicarbonate and Soda Ash was done to lower the Ca^{++} content in the drilling fluid. As on sections above foaming/aeration caused problems with pump suctions and addition of Defoam AL was added to reduce this problem.
Some Calcium Carbonate bridging material was added throughout this section to maintain concentrations for optimum bridging while drilling the sand reservoir.

The totals of new screens used while drilling this interval were as follows:

Screen size	Quantity used		Screen size	Quantity used
210	5			

The same shaker screen configuration was used in this interval as used in the 8 1/2" interval.

Recommend using as fine scalping screens as possible to reduce the usage of bottom screens.
Be aware of possible aeration/foaming. This causes problems for pumps and may also give well control problems. The usage of defoamer may be higher than planned. On this well usage of defoamer was very close to maximum amount applied for to the environmental department. Consider applying for a higher amount on future wells.

Mud summary for the P&A operations:

Started the P&A operations with 1.54 sg Formpro from previous section. The active system was pre-treated with Citric Acid, Potassium Bicarbonate and Sodium Bicarbonate prior to the cement jobs and more of the same chemicals were added to treat out cement contamination after each cement jobs.

Isolated 13 m³ cement contaminated drilling fluid on surface when circulating bottom up above cement plug #2 at 1233 m, due to over displacement when performing cement job.
The well was displaced to 1.25 sg Formpro drilling fluid from 750 m inside the 13 3/8” casing, after cutting the 9 5/8” casing.

3.5.7 Mud Summary Report

DRILLING FLUID PROPERTIES

OPERATOR: ENI Norge
WELL: 7122/7-3
RIG: Eirik Raude

FSR no	Date	Depth	MW	T	FV	VG-meter readings @ 50C						AV	PV	YP	Gel 10 sec	Gel 10 min	API	pH	Pf	Cl-	Solids corr	MBT	Sand	KCOOH	K+
						600	300	200	100	6	3														
		m	SG	°C	s	lb/100ft²							cP	Pa	Pa	Pa	mls			mg/l	%	kg/m³	%	kg/m³	mg/l
36" SECTION				SPUDMUD																					
1	23-okt-05		1.03		<150																				
2	24-okt-05	393	1.03		>150																				
3	25-okt-05	508	1.03		<150													9.5				90			
4	26-okt-05	538	1.03		<150																				
5	27-okt-05	538	1.03		<150																				
6	28-okt-05	538	1.03		<150																				
7	29-okt-05	538	1.03		<150																				
Minimum			1.03																						
Maximum			1.03																						
Average			1.03																						
16" SECTION				FORMPRO																					
8	30-okt-05	538	1.2	10	70	49	38	30	23	9	7	24.5	13	11.5	4	5.5	5.5	8.7	0.1	7000	13	10	tr	281	122000
9	31-okt-05	538	1.2	10	70	49	38	30	23	9	7	24.5	13	11.5	4	5.5	5.5	8.7	0.1	7000	13	10	tr	281	122000
10	01.nov.05	538	1.2	10	70	48	36	31	24	10	9	24	12	12	4.5	6.5	5.5	8.7	0.1	7000	13	10	tr	281	122000
11	02.nov.05	538	1.2	11	66	50	39	33	26	11	9	25	11	14	4.5	6.5	5.5	8.7	0.1	7000	13	10	tr	281	122000
12	03.nov.05	538	1.2	11	66	50	39	33	26	11	9	25	11	14	4.5	6.5	5.5	8.7	0.1	7000	13	10	tr	281	122000
13	04.nov.05	538	1.2	12	64	50	39	33	26	11	9	25	11	14	4.5	6.5	5.5	8.7	0.1	7000	13	10	tr	281	122000
14	05.nov.05	538	1.2	12	63	50	39	33	26	11	9	25	11	14	4.5	6.5	5.5	8.7	0.1	7000	13	10	tr	281	122000
15	06.nov.05	538	1.2	12	63	45	34	30	23	9	7	22.5	11	11.5	4.5	6.5	5.5	8.7	0.1	7000	13	10	tr	281	122000
16	07.nov.05	522	1.15	13	60	36	27	23	17	7	5	18	9	9	3	4.5	10	9.5	0.2	7000	13	10	0.1	281	122000
17	08.nov.05	543	1.2	13	60	48	38	32	25	11	9	24	10	14	6	6	5.4	9.5	0.2	19000	14	10	tr	390	185000
18	09.nov.05	711	1.2	22	56	49	38	33	26	12	10	24.5	11	13.5	6	9	5.2	9.2	0.2	19000	15	14	0.1	278	129000
19	10.nov.05	900	1.2	22	52	47	35	30	24	10	9	23.5	12	11.5	6	9	7.6	9.4	0.2	7000	15	14	0.1	278	129000
20	11.nov.05	1001	1.2	22	57	53	39	32	25	11	9	26.5	14	12.5	5	8	7.8	8.7	0.2	7000	15	21	0.1	240	107000
21	12.nov.05	1001	1.2	20	54	52	37	31	24	10	8	26	15	11	4	8	8	8.7	0.2	7000	15	21	0.1	240	107000
22	13.nov.05	1001	1.2	20	53	51	36	31	24	9	8	25.5	15	10.5	4	8	7.7	8.5	0.2	7000	15	21	0.1	240	107000
23	14.nov.05	1001	1.2	20	53	51	36	31	24	9	8	25.5	15	10.5	4	8	7.7	8.5	0.2	7000	15	21	0.1	240	107000
Minimum			1.15	10	51	36	27	23	17	7	5	18	9	9	3	5	5	8.4	0.1	7000	13	10	0.1	240	107000
Maximum			1.20	22	70	53	39	33	26	12	10	27	15	14	6	9	10	9.5	0.2	19000	15	21	0.1	390	185000
Average			1.20	15.0	61	49	37	31	24	10	8	24.3	12.1	12.3	4.4	7.0	6.9	8.8	0.2	7375	13.8	13	0.1	268	119938

MI SWACO

DRILLING FLUID PROPERTIES

Eni Norge

OPERATOR: ENI Norge
WELL: 7122/7-3
RIG: Eirik Raude

FSR no.	Date	Depth	MW	T	FV	VG-meter readings @ 50C						AV	PV	YP	Gel 10 sec	Gel 10 min	API	pH	Pf	Cl-	Solids corr	MBT	Sand	KCOOH	K+
						600	300	200	100	6	3														
		m	SG	°C	s	lb/100ft²							cP	Pa	Pa	Pa	ml/s			mg/l	%	kg/m³	%	kg/m³	mg/l
12 1/4" SECTION				FORMPRO																					
24																									
25	16.nov.05	1083	1.3	15	56	51	37	32	25	11	9	25.5	14	11.5	5.5	8	4.3	9.1	0.3	7000	25	21	0.1	434	202000
26	17.nov.05	1088	1.3	16	58	52	39	33	25	11	9	26	13	13	5.5	8	4.2	9.0	0.3	7000	25	21	0.1	432	202000
27	18.nov.05	1104	1.3	15	54	45	32	28	22	10	8	24.5	13	13.5	4.5	8	4.3	9.1	0.3	7000	25	14	0.1	434	203000
28	19.nov.05	1156	1.3	18	50	48	37	31	24	10	8	24	11	13	5	8	4.7	9.1	0.2	7000	25	14	0.2	428	198000
29	20.nov.05	1046	1.3	19	50	48	34	28	22	10	8	23	12	11	5	8	4.6	9.0	0.2	7000	25	14	0.15	428	198000
30	21.nov.05	1156	1.3	18	52	47	35		22	10	8	23.5	12	11.5	5	8	4.7	9.0	0.2	7000	25	14	0.15	428	198000
31	22.nov.05	1170	1.3	18	52	47	35	28	22	10	8	23.5	12	11.5	5	8	5.5	8.9	0.2	7000	28	14	0.15	357	165000
32	23.nov.05	1182	1.3	18	52	47	35	28	22	10	8	23.5	12	11.5	5	8	5.5	8.9	0.2	7000	28	14	0.15	387	180000
33	24.nov.05	1712	1.34	22	58	58	43	35	28	11	9	29	15	14	5.5	12	5.3	8.5	0.1	5000	25.5	14	0.15	432	201000
34	25.nov.05	1712	1.34	12	58	57	43	35	28	11	9	28.5	14	14.5	5.5	12	5.3	8.7	0.1	5000	25.5	14	0.1	432	201000
35	26.nov.05	1712	1.34	10	63	57	43	35	28	11	9	28.5	14	14.5	5.5	10	5.3	8.7	0.1	5000	25.5	14	0.1	432	201000
36	27.nov.05	1712	1.34	10	63	57	43	35	28	11	9	28.5	14	14.5	5.5	10	5.3	8.7	0.1	5000	25.5	14	0.1	432	201000
37	28.nov.05	1712	1.34	10	58	57	43	35	28	11	9	28.5	14	14.5	5.5	10	5.3	8.7	0.1	5000	25.5	14	0.1	432	201000
38	29.nov.05	1712	1.34	10	58	57	43	35	28	11	9	28.5	14	14.5	5.5	10	5.3	8.7	0.1	5000	25.5	14	0.1	432	201000
39	30.nov.05	1712	1.34	10	63	53	40	34	26	11	9	26.5	13	13.5	5	8.5	5.3	8.8	0.1	5000	25.5	14	0.1	432	201000
40	01-des-05	1712	1.34	10	63	53	40	34	26	11	9	26.5	13	13.5	5	8.5	5.3	8.8	0.1	5000	25.5	14	0.1	432	201000
41	02-des-05	1712	1.34	10	63	53	40	34	26	11	9	26.5	13	13.5	5	8.5	5.3	8.8	0.1	5000	25.5	14	0.1	432	201000
42	03-des-05	1712	1.34	10	58	53	39	33	25	10	8	26.5	14	12.5	5	10	5.3	8.8	0.1	5000	25.5	14	0.1	432	201000
43	04-des-05	1712	1.34	10	58	53	39	33	25	10	8	26.5	14	12.5	5	10	5.3	8.8	0.1	5000	25.5	14	0.1	432	201000
44	05-des-05	1712	1.34	10	63	52	38	32	24	11	9	26	14	12	5	10	5.3	8.9	0.1	5000	25.5	14	0.1	432	201000
Minimum			1.30	10	52	46	34	28	22	10	8	23	11	11	5	8	4	8.9	0.1	5000	25	14	0.1	387	180000
Maximum			1.34	22	58	58	43	35	28	11	9	29	15	15	6	12	6	9.1	0.3	7000	28	21	0.2	434	203000
Average			1.32	13.5	61	52	39	33	25	11	9	26.2	13.2	13.0	5.2	9.3	5.1	8.7	0.2	5909	27.4	15	0.1	427	198550

MI SWACO

DRILLING FLUID PROPERTIES

Eni Norge

OPERATOR: ENI Norge
WELL: 7122/7-3
RIG: Eirik Raude

FSR no.	Date	Depth	MW	T	FV	VG-meter readings @ 50C						AV	PV	YP	Gel 10 sec	Gel 10 min	API	pH	Pf	Cl-	Solids corr	MBT	Sand	KCOOH	K+
						600	300	200	100	6	3														
		m	SG	°C	s	lb/100ft²							cP	Pa	Pa	Pa	ml/s			mg/l	%	kg/m³	%	kg/m³	mg/l
8 1/2" SECTION				FORMPRO																					
46	06-des-05	1722	1.54	16	66	57	37	45	31	8	6	43.5	30	13.5	4	8	2.4	10.2	0.2	10500	51	12	0.25	258.9	125000
46	07-des-05	1808	1.34	16	61	50	36	31	23	10	8	28	14	11	4.5	9	4.8	9.3	0.2	7000	29	14	0.25	454	212000
47	08-des-05	1818	1.38	16	56	51	37	31	23	9	7	28.5	14	11.5	4	9	4.8	8.9	0.2	7000	29	14	0.25	454	212000
48	09-des-05	1824	1.38	16	61	52	38	31	23	10	8	28	14	12	5	9	5.6	9.3	0.2	13000	29	14	0.25	454	212000
49	10-des-05	1837	1.38	16	56	52	38	31	23	10	8	28	14	12	5	9	5.6	9.3	0.2	12500	29	14	0.25	454	212000
50	11-des-05	2022	1.41	16	61	52	37	32	23	9	7	28	15	13	4	9	5.4	9.2	0.2	7000	29	14	0.25	546	254000
51	12-des-05	2070	1.52	15	70	61	40	33	23	8	5	30.5	21	9.5	3	5	2.2	9.8	0.2	5000	48	14	0.5	946	441000
52	13-des-05	2420	1.54	16	61	66	43	35	24	7	5	32.5	22	10.5	3.5	6	2.4	9.5	0.2	5000	48	14	0.4	946	441000
53	14-des-05	2420	1.54	15	66	67	45	37	25	7	5	33.5	22	11.5	3.5	6	2.4	9.8	0.2	5000	48	14	0.4	946	441000
54	15-des-05	2420	1.54	15	65	69	46	38	25	7	5	34	22	12	4	6	2.6	9.8	0.2	5000	48	14	0.3	850	442000
55	16-des-05	2420	1.54	15	66	67	45	37	25	7	5	33.5	22	11.5	3.5	6	2.4	9.8	0.2	5000	48	14	0.4	946	441000
56	17-des-05	2420	1.54	15	66	66	46	38	25	7	5	34	22	12	4	6	2.6	9.8	0.2	5000	48	14	0.3	850	442000
57	18-des-05	2420	1.54	15	66	67	45	37	25	7	5	33.5	22	11.5	3.5	6	2.4	9.8	0.2	5000	48	14	0.4	946	441000
58	19-des-05	2420	1.54	15	125	52	41	33	21	6	5	31	21	10	3	5	2.6	9.8	0.2	5000	48	14	0.2	852	443000
59	20-des-05	2420	1.54	15	66	62	42	34	21	7	5	31.5	21	10.5	4	5	2.4	9.8	0.2	5500	48	14	0.2	852	443000
Minimum			1.34	15	51	50	36	31	23	6	5	25	14	10	3	5	2	8.9	0.2	5000	29	12	0.2	268	125000
Maximum			1.54	18	125	67	57	45	31	10	8	44	30	14	5	9	6	10.2	0.2	12000	51	14	0.5	852	443000
Average			1.48	15.7	68	62	42	35	24	8	6	31.1	18.7	11.3	3.9	6.8	3.4	8.8	0.2	6750	42.4	14	0.3	745	346535

DRILLING FLUID PROPERTIES

OPERATOR: ENI Norge
WELL: 7122/7-3
RIG: Eirik Raude

FSR no.	Date	Depth	MW	T	FV	VG-meter readings @ 50C						AV	PV	YP	Gel 10 sec	Gel 10 min	API	pH	Pf	Cl-	Solids corr	MBT	Sand	KCOOH	K+
						600	300	200	100	6	3														
		m	SG	°C	s	lb/100ft²							cP	Pa	Pa	Pa	mls			mg/l	%	kg/m³	%	kg/m³	mg/l
8" SECTION				FORMPRO																					
60	21-des-05	2420	1.54	15	54	53	35	29	20	6	5	26.5	18	8.5	3	5	4.4	10.1	0.2	6000	46	14	0.15	624	430000
61	22-des-05	2420	1.54	15	56	51	35	28	20	6	4	25.5	16	9.5	3	4.5	4.3	9.7	0.2	5500	42	14	0.15	624	430000
62	23-des-05	2440	1.54	16	60	78	53	44	32	11	8	39	23	15	5	10	4.2	9.7	0.2	500	47	14	0.25	753	350000
63	24-des-05	2458	1.53	15	60	71	50	41	29	10	8	35.5	21	14.5	4.5	8.5	4.2	9.7	0.2	5500	48.5	14	0.25	731	340000
64	25-des-05	2518	1.54	17	73	64	44	35	25	9	7	32	20	12	4	7	4.6	9.7	0.2	5000	46	14	0.25	731	340000
65	26-des-05	2523	1.54	18	58	53	43	35	25	9	7	31.5	20	11.5	4	7	4.5	9.8	0.2	5000	46	14	0.25	722	336000
66	27-des-05	2440	1.55	15	62	50	43	35	25	8	7	30	17	13	4	7	4.8	9.8	0.2	5000	45	14	0.1	720	335000
67	28-des-05	2719	1.54	14	63	51	42	35	25	8	6	30.5	19	11.5	4	6	4.9	9.5	0.2	5000	45	14	0.2	697	310000
68	29-des-05	2726	1.54	14	63	51	42	35	25	8	6	30.5	19	11.5	4	6	4.9	9.5	0.2	5000	45	14	0.2	697	310000
69	30-des-05	2726	1.54	16	62	51	42	35	25	8	6	30.5	19	11.5	4	6	4.9	9.5	0.2	5000	45	14	0.2	697	310000
70	31-des-05	2726	1.54	16	62	51	42	35	25	8	6	30.5	19	11.5	4	6	4.9	9.5	0.2	5000	45	14	0.2	697	310000
71	01.jan.06	2726	1.54	16	63	51	42	35	25	8	6	30.5	19	11.5	4	6	4.9	9.4	0.2	5000	45	14	0.2	697	310000
72	02.jan.06	2726	1.54	16	63	51	42	35	25	8	6	30.5	19	11.5	4	6	4.9	9.4	0.2	5000	45	14	0.2	697	310000
73	03.jan.06	2726	1.54	16	63	51	42	35	25	8	6	30.5	19	11.5	4	6	4.9	9.4	0.2	5000	45	14	0.2	697	310000
74	04.jan.06	2726	1.54	16	63	51	42	35	25	8	6	30.5	19	11.5	4	6	4.9	9.4	0.2	5000	45	14	0.2	697	310000
Minimum			1.53	13	55	51	35	28	20	5	4	26	15	9	3	5	4	9.4	0.2	500	45	14	0.1	657	310000
Maximum			1.55	17	80	78	53	44	32	11	8	39	23	15	5	10	5	10.1	0.2	6000	49	14	0.3	824	430000
Average			1.54	15.1	65	62	43	35	25	8	6	30.9	19.1	11.7	4.0	6.5	4.7	9.6	0.2	4833	45.9	14	0.2	723	336667

2.8.3 MDT Pressure Interpretation

Test	File	Depth M	TVD M	Drawdown Mobility MD/CP	Mud Pressure Before BAR	Mud Pressure After BAR	Last read build-up Pres BAR	Formation Pressure BAR	Test Type
5	96	1107.22	1107.18	743.85	147.7941	147.7832	124.0582	124.0582	Volumetric Limited draw-down
7	97	1111.11	1111.07	355.65	148.2962	148.2991	124.0926	124.0926	Volumetric Limited draw-down
1	92	1090.10	1090.07	140.81	145.5879	145.5482	123.8926	123.8926	Normal Pretest
2	93	1095.27	1095.24	832.76	146.2244	146.1988	123.9521	123.9521	Volumetric Limited draw-down
3	94	1099.12	1099.08	555.76	146.7386	146.7107	123.9811	123.9811	Volumetric Limited draw-down
4	95	1103.81	1103.77	836.87	147.3360	147.3185	124.0465	124.0465	Volumetric Limited draw-down
9	98	1117.71	1117.67		149.1627	149.1404	61.7115		Dry Test
11	99	1125.50	1125.47	40.41	150.1743	150.1627	124.2757	124.2757	Volumetric Limited draw-down
12	100	1128.10	1128.06	2262.41	150.5440	150.5107	124.3128	124.3128	Volumetric Limited draw-down
13	101	1133.21	1133.18	821.98	151.2255	151.1837	124.4028	124.4028	Volumetric Limited draw-down
14	102	1135.11	1135.07	176.59	151.4530	151.4317	124.3596	124.3596	Volumetric Limited draw-down
15	103	1136.32	1136.29	453.71	151.6113	151.5986	124.3829	124.3829	Volumetric Limited draw-down
16	106	1143.29	1143.25		152.6006	152.4330	67.8603		Dry Test
17	107	1144.80	1144.76	425.44	152.6377	152.6192	124.4767	124.4767	Volumetric Limited draw-down
18	108	1146.40	1146.36	731.60	152.8535	152.8221	124.5474	124.5474	Volumetric Limited draw-down
20	109	1147.69	1147.65	615.60	153.0180	153.0396	124.6569	124.6569	Volumetric Limited draw-down
21	110	1149.59	1149.55	90.70	153.2486	153.2619	124.8013	124.8013	Volumetric Limited draw-down
22	111	1151.10	1151.06		153.4515	153.4427	65.2797		Dry Test
24	112	1181.11	1181.06	25.92	157.4068	157.3945	125.2569	125.2569	Volumetric Limited draw-down
25	113	1183.51	1183.46		157.7145	157.6661	34.1850		Dry Test
26	115	1184.01	1183.96	5.85	157.7669	157.7687	125.8355	125.8355	Volumetric Limited draw-down
27	116	1187.51	1187.46	8.28	158.2338	158.2142	125.8634	125.8634	Volumetric Limited draw-down
28	117	1188.70	1188.65	5.75	158.4030	158.3883	125.9058	125.9058	Volumetric Limited draw-down
29	118	1190.21	1190.16	4.04	158.6073	158.6315	126.0912	126.0912	Volumetric Limited draw-down
30	119	1191.31	1191.25	10.66	159.0427	158.7644	126.1225	126.1225	Volumetric Limited draw-down
31	120	1195.31	1195.26	46.05	159.3098	159.2871	126.2984	126.2984	Volumetric Limited draw-down
32	121	1196.20	1196.15	22.46	159.4199	159.3897	126.4013	126.4013	Volumetric Limited draw-down
33	123	1198.52	1198.47	238.75	159.7718	159.7429	126.5463	126.5463	Volumetric Limited draw-down
34	124	1199.21	1199.16	133.55	159.8441	159.8338	126.6038	126.6038	Volumetric Limited draw-down
35	125	1200.42	1200.36	440.47	159.9979	159.9983	126.7059	126.7059	Volumetric Limited draw-down
36	126	1202.62	1202.56	292.73	160.2958	160.2868	126.9370	126.9370	Volumetric Limited draw-down
37	127	1203.70	1203.65	75.74	160.4341	160.4263	127.0503	127.0503	Volumetric Limited draw-down
38	129	1217.11	1217.06	283.52	162.2646	162.2261	128.5107	128.5107	Volumetric Limited draw-down
40	131	1218.67	1218.61		162.4330	162.4260			Not Stable
41	132	1219.00	1218.94	165.20	162.4481	162.4452	128.6702	128.6702	Volumetric Limited draw-down
42	134	1270.30	1270.23	11.51	169.3594	169.2930	134.9777	134.9777	Volumetric Limited draw-down
43	137	1139.98	1139.94		152.1317	152.1020	24.2540		Dry Test
46	141	1142.00	1141.96		152.3595	152.2957	24.9105		Dry Test
44	139	1141.02	1140.98		152.2562	152.2363			Lost Seal
45	140	1141.30	1141.26		152.2876	152.2745	21.2297		Dry Test

Table 2.8.6. MDT pressure points

Test No	Depth mMD RKB	Depth mTVD MSL	Initial Hydrostatic Pressure bars Quartz	Initial Hydrostatic Pressure bars Strain	Formation Pressure bars Quartz	Formation Pressure bars Strain	Final Hydrostatic Pressure bars Quartz	Final Hydrostatic Pressure bars Strain	Formation Pressure sg EMW	Test Temp degC	Good Data? Y/N	Probe Used PS1/PS2	Pretest Volume cc	Quartz Mobility md/cp	Remarks
1.00	1808.60	1783.47	276.66	274.71	191.83	191.06	276.55	274.84	1.08	41.40	Y	1.00	10.50	297.20	Good test
2.00	1810.00	1784.87	276.88	275.11	191.92	191.20	276.78	275.12	1.08	42.40	Y	1.00	20.00	494.50	Good test
3.00	1811.00	1785.87	276.94	275.28	191.99	191.29	276.90	275.28	1.08	42.80	Y	1.00	20.00	475.90	Good test
4.00	1812.00	1786.87	277.11	275.57	192.04	191.48	277.05	275.57	1.08	43.10	Y	1.00	20.00	1044.90	Good test
5.00	1813.30	1788.17	277.24	275.82	192.13	191.58	277.23	275.80	1.08	43.40	Y	1.00	20.00	264.20	Good test
6.00	1815.00	1789.87	277.53	276.14	192.23	191.71	277.50	276.14	1.08	43.50	Y	1.00	20.00	140.50	Good test
7.00	1818.90	1793.77	278.17	276.79	192.48	191.97	278.08	276.77	1.08	43.80	Y	1.00	20.00	20.90	Good test
8.00	1821.00	1795.87	278.42	277.16	192.62	192.19	278.34	277.07	1.08	44.10	Y	1.00	20.00	26.90	Reset probe. G
9.00	1822.60	1797.47	278.68	277.40	192.72	192.31	278.68	277.54	1.08	44.60	Y	1.00	20.00	97.20	Good test
10.00	1826.20	1801.07	279.21	278.09					-		N	1.00			Lost seal
11.00	1826.20	1801.07	279.22	278.09	193.24	192.91	279.17	278.12	1.08	45.00	?	1.00	3.50		Supercharged?
12.00	1827.50	1802.37	279.37	278.31	193.01	192.68	279.34	278.33	1.08	45.20	Y	1.00	20.00	364.80	Good test
13.00	1828.50	1803.37	279.60	278.53					-		N	1.00	20.00		Lost seal
14.00	1828.70	1803.57	279.60	278.56	193.07	193.77	279.55	278.54	1.08	45.50	Y	1.00	20.00	156.90	Good test
15.00	1829.90	1804.77	279.81	278.76					-		N	1.00	2.70		Lost seal/Tight?
16.00	1830.30	1805.17	279.86	378.80					-		N	1.00	20.00		Lost seal
17.00	1830.30	1805.17	279.83	278.80					-		N	1.00	20.00		Lost seal
18.00	1840.00	1814.87	281.42	280.31	193.83	193.50	281.25	280.18	1.07		Y	1.00	20.00	61.70	Good test
19.00	1841.70	1816.57	281.59	280.47					-		N	1.00	20.00		Lost seal
20.00	1841.70	1816.57	281.57	280.46					-		N	1.00	20.00		Lost seal
21.00	1842.20	1817.07	282.83	280.72					-		N	1.00	20.00		Lost seal
22.00	1842.20	1817.07	281.58	280.47	194.00	193.62	281.61	280.52	1.07	46.60	?	1.00	20.00	50.50	Unstable
23.00	1845.40	1820.27	282.13	281.00	194.19	193.81	282.10	280.99	1.07	46.60	Y	1.00	20.00	26.60	Good test
24.00	1846.00	1820.87	282.25	281.10	194.23	193.83	282.21	281.06	1.07	46.70	Y	1.00	20.00	66.70	Good test
25.00	1846.80	1821.67	282.37	281.21	194.28	193.88	282.30	281.18	1.07	46.80	Y	1.00	20.00	37.70	Good test
26.00	1858.80	1833.67	284.23	283.04					-		N	1.00	20.00		Lost seal
27.00	1858.80	1833.67	284.19	283.02	195.63	195.18	284.19	282.92	1.07	47.10	Y	1.00	20.00	n/v	Good test
28.00	1860.90	1835.77	284.51	283.27					-		N	1.00	20.00		Lost seal
29.00	1860.90	1835.77	284.57	283.33	195.78	195.31	284.49	283.29	1.07	47.40	Y	1.00	20.00	10.70	Good test
30.00	1868.50	1843.37	285.73	284.45	196.28	195.80	285.75	284.38	1.07	47.60	Y	1.00	20.00	23.30	Good test
31.00	1873.50	1848.37	286.44	285.16	196.60	196.09	286.47	285.12	1.07	47.80	Y	1.00	20.00	n/v	Good test
32.00	1874.50	1849.37	286.61	285.35					-		N	1.00	20.00		Lost seal
33.00	1874.50	1849.37	286.72	285.42	196.69	196.16	286.55	285.26	1.07	47.80	Y	1.00	20.00	17.00	Good test
34.00	1883.20	1858.07	287.92	286.58					-	48.00	N	1.00	4.00		Tight
35.00	1883.00	1857.87	287.91	286.57					-		N	1.00	3.30		Tight
36.00	1886.50	1861.37	288.44	287.00					-		N	1.00	3.60		Tight
37.00	1896.00	1870.87	289.78	288.38					-		N	1.00	3.60		Tight
38.00	1905.00	1879.87	291.11	289.68	199.91	199.30	291.06	289.52	1.07		Y	1.00	20.00	n/v	Good test
39.00	1909.00	1883.87	291.70	290.23	200.33	199.71	291.70	290.24	1.07	48.40	Y	1.00	20.00	13.80	Good test
40.00	1910.00	1884.87	291.87	290.42			291.87	290.39	-	48.80	N	1.00	20.00		Lost Seal
41.00	1910.00	1884.87	291.87	290.41	200.42	199.79	291.86	290.34	1.07	48.80	Y	1.00	10 + 10	(14.1)	Good test - pum
42.00	1914.70	1889.57	292.60	291.12			292.55	291.10	-	49.10	N	1.00	7 + 5		Tight
43.00	1916.50	1891.37	292.88	291.40	201.14	200.47	292.85	291.35	1.07	49.40	Y	1.00	10 + 10	13.00	Good test
44.00	1921.10	1895.97	293.59	292.05	201.66	200.98	293.58	292.06	1.07	49.50	Y	1.00	10 + 10	1.30	Good test
45.00	1928.20	1903.07	294.61	293.08	202.38	201.69	294.54	293.00	1.07	49.20	Y	1.00	10 + 10	57.70	Good test
46.00	1931.20	1906.07	294.97	293.43	202.74	202.01	294.99	293.42	1.07	49.20	Y	1.00	10.00	75.50	Good test
47.00	1938.00	1912.87	296.12	294.55	203.46	202.74	296.06	294.45	1.07	49.40	Y	1.00	10.00	10.50	Good test

Test no.	Depth mMD	Depth mTVD	Initial Hydrostatic Pressure bars		Formation Pressure bars		Final Hydrostatic Pressure bars		Formation Pressure	Test Temp	Good Data?	Probe Used	Pretest Volume	Quartz Mobility	Remarks
	RKB	MSL	Quartz	Strain	Quartz	Strain	Quartz	Strain	sg EMW	degC	Y/N	PS1/PS2	cc	md/cp	
48	1946.2	1921.1	297.321	295.710	204.306	203.570	297.265	295.650	1.070	49.6	Y	PS1	10 + 10	(216)	Good test - pum
49	1953.5	1928.4	298.409	296.740	205.124	204.390	298.359	296.710	1.070	49.7	Y	PS1	10 + 10	22.1	Good test
50	1955.2	1930.1	298.652	296.970	205.309	204.550	298.635	297.010	1.070	49.7	Y	PS1	10 + 10	34.9	Good test
51	1971	1945.9	301.078	299.280	207.003	206.220	301.000	299.290	1.071	50.0	Y	PS1	10 + 10	(108.1)	Good test - pum
52	1980	1954.9	302.444	300.760	207.986	207.190	302.385	300.690	1.071	50.0	Y	PS1	10 + 10	12.8	Good test
53	1997.6	1972.5	305.096	303.370	210.251	209.400	305.083	303.310	1.073	50.4	Y	PS1	10 + 10	(6.2)	Good test - pum
54	2001.2	1976.1	305.610	303.820	210.568	209.710	305.582	303.810	1.073	50.9	Y	PS1	10 + 10	(18.3)	Good test - pum
55	2011.5	1986.4	307.260	305.430	211.640	210.750	307.227	305.410	1.073	51.2	Y	PS1	10 + 10	(33.7)	Good test - pum
56	2052.5	2027.4	313.515	311.660	215.686	214.760	313.453	311.580	1.071	52.1	Y	PS1	10 + 10	(2.2)	Good test - pum
57	2055	2029.9	313.862	311.990			313.799	311.970	-	52.5	N	PS1	6		Tight
58	2057.5	2032.4	314.216	312.460			314.214	312.340	-	52.6	N	PS1	4.3 + 7.6		Tight
59	2068	2042.9	315.831	313.930	217.432	216.500	315.789	313.870	1.072	53.2	Y	PS1	10 + 10	(1.6)	Good test - pum
60	2079.5	2054.4	317.595	315.630			317.516	315.600	-	53.3	N	PS1	5 + 4		Tight
61	2088.5	2063.3	318.949	316.990			318.917	316.970	-	53.4	N	PS1	5		Tight
62	2095.5	2070.3	319.987	318.010	220.413	219.470	319.896	317.940	1.072	54.0	Y	PS1	10 + 10	(1.4)	Good test - pum
63	2097.5	2072.3	320.266	318.270			320.213	318.280	-	54.3	N	PS1	10 + 5.8		Tight
64	2098.5	2073.3	320.394	318.430	220.820	219.830	320.380	318.440	1.073	54.6	Y	PS1	10 + 10	(0.7)	Good test - pum
65	2102.8	2077.6	321.048	319.070			321.049	319.080	-	54.7	N	PS1	8.2		Tight
66	2108.5	2083.3	321.889	320.340			321.879	320.350	-	54.9	N	PS1	5.6 + 7		Tight
67	2115.5	2090.3	322.916	320.920	222.711	221.720	322.894	320.960	1.073	55.0	Y	PS1	10 + 10	5.8	Good Test
68	2121	2095.8	323.742	321.810			323.768	321.650	-	55.2	N	PS1	5.5 + 6.1		Tight
69	2134.2	2109.0	325.752	323.670			325.699	323.710	-	55.2	N	PS1	10 + 10		Engineer set wr
70	2134.5	2109.3	325.751	323.710			325.782	323.750	-	55.4	N	PS1	4.9		Tight
71	2143.2	2118.0	327.107	325.060	225.631	224.550	327.135	325.030	1.073	55.6	Y	PS1	10 + 10	(5.6)	Good test - pum
72	2150	2124.8	328.243	326.160			328.263	326.060	-	55.7	N	PS1	6		Tight
73	2157.2	2132.0	329.154	327.120			329.139	327.060	-	55.8	N	PS1	10 + 10		Tight
74	2176.8	2151.6	332.048	329.980	230.290	229.220	331.968	329.680	1.079	54.9	Y	PS1	10 + 10	(0.8)	Good test - pum
75	2202.6	2177.4	335.930	333.770	232.137	231.000	335.853	333.680	1.074	54.8	Y	PS1	10	4.2	Good test
76	2206	2180.8	336.361	334.220	232.366	231.240	336.324	334.130	1.074	56.3	Y	PS1	10 + 10		Good test - pum
									-						SCANNING ST
77	1886.7	1861.6	288.223	288.200	197.886	197.820	288.230	288.220	1.069		Y	PS2	10 + 10	(1.8)	Too tight to scar
78	1875.5	1850.4	286.529	286.390					-		N	PS2	10 + 10		Lost seal X 2
79	1875.3	1850.2	286.495	286.370					-			PS2			Oil tr Gas < 5%
									-						SAMPLING STA
80	1868.5	1843.4	285.382	285.380					-		N	PS2	10 + 10		Tight - No samp
81	1868.2	1843.1	285.388	285.240					-		N	PS2	10 + 10		Tight - No samp
82	1868.5	1843.4	285.574	285.430					-		N	PS2	10 + 10		Tight - No samp
83	1868.7	1843.6	285.621	285.460					-		N	PS2	10		Lost seal
84	1868.3	1843.2	285.594	285.460					-		N	PS2	10 + 10		Tight - No samp
85	1874.5	1849.4	286.547	286.370	196.648	196.510			1.069		Y	PS2	10 + 10		Oil sample. 1 x
86	1874.5	1849.4	286.547	286.370					-		N	PS2	10 + 10		Oil sample. 2 x
									-						SCANNING ST
87	1846	1820.9	281.996	281.860	194.271	194.150			1.073		Y	PS2	10 + 10		Oil tr Gas, 4% W
88	1812	1786.9	276.745	276.630	191.101	191.950	276.475	276.310	1.075		Y	PS2	10		Oil, 1% Water -
89	1931.2	1906.1	294.444	294.270	202.677		294.437	294.280	1.070		Y	PS2	10 + 10		

2.8.4 Testing / Fluid Sampling

Section [inches]	MDT Run	sample n.	sample nature	bottle type	bottle n.	sample point [m MD RT]	sample point [m TVD ssl]	SBHP [bar]	STHP [deg C]	FBHP [bar]	FTHP [deg C]	fluid
12"1/4	1A	1.01	MPSR 450 cc	CSB	6506-MA	1202.1	1177	126.9	32.1	125.8	33.5	water
12"1/4	1A	1.02	1 gallon	5l plastic	N/A	1202.1	1177	126.9	32.1	125.8	33.5	water
12"1/4	1A	1.03	SPMC 250 cc	SSB	1998-EA	1095.3	1070.3	123.95	27.2	123.7	30.6	gas
12"1/4	1A	1.04	SPMC 250 cc	SSB	5255-EA	1095.3	1070.3	123.95	27.2	123.7	30.7	gas
12"1/4	1A	1.05	SPMC 250 cc	SSB	1122-EA	1095.3	1070.3	123.95	27.2	123.8	30.7	gas
12"1/4	1B	1.06	MPSR 450 cc	CSB	6356-MA	1148.5	1123.5	124.7	30	75	33.7	oil
12"1/4	1B	1.07	MPSR 450 cc	CSB	4570-EA	1148.5	1123.5	124.7	30	80	33.6	oil
12"1/4	1B	1.08	MPSR 450 cc	CSB	7883-QA	1148.5	1123.5	124.7	30	77	33.2	oil
12"1/4	1B	1.09	MPSR 450 cc	CSB	5626-EA	1195.6	1170.5	126.3	31.7	115.5	35.5	oil
12"1/4	1B	1.1	MPSR 450 cc	CSB	6262-MA	1195.6	1170.5	126.3	31.7	115.5	35.5	oil
12"1/4	1B	1.11	MPSR 450 cc	CSB	5236-EA	1195.6	1170.5	126.3	31.7	115.5	35.5	oil
12"1/4	1B	1.12	1 gallon	5l IATA can	N/A	1195.6	1170.5	126.3	31.7	115.5	35.5	oil
8"1/2	1A	2.01	MPSR 450 cc	CSB	6554-MA	1874.5	1849.4	196.7	47.8	175	51	oil
8"1/2	1A	2.02	MPSR 450 cc	CSB	4372-EA	1874.5	1849.4	196.7	47.8	175	51	oil
8"1/2	1A	2.03	MPSR 450 cc	CSB	6321-MA	1874.5	1849.4	196.7	47.8	185	51	oil
8"1/2	1A	2.04	SPMC 250 cc	SSB	1597-EA	1812	1786.9	192	43.2	189	48.4	oil
8"1/2	1A	2.05	MPSR 450 cc	CSB	6430-MA	1812	1786.9	192	43.2	190	48.4	oil
8"1/2	1A	2.06	MPSR 450 cc	CSB	6103-MA	1812	1786.9	192	43.2	190	48.4	oil
8"1/2	1A	2.07	SPMC 250 cc	SSB	0770-EA	1812	1786.9	192	43.2	190.5	48.4	oil
8"1/2	1A	2.08	MPSR 450 cc	SSB	1560-EA	1812	1786.9	192	43.2	190.5	48.4	oil
8"1/2	1A	2.09	1 gallon	5l IATA can	N/A	1812	1786.9	192	43.2	190.5	48.4	oil
8"1/2	1A	2.1	MPSR 450 cc	CSB	6576-MA	1931.2	1906.1	202.7	49	180	54	water
8"1/2	1A	2.11	MPSR 450 cc	CSB	6714-MA	1931.2	1906.1	202.7	49	180	54	water
8"1/2	1A	2.12	SPMC 250 cc	SSB	2389-EA	1931.2	1906.1	202.7	49	180	54	water

Goliat Discovery – Well 7122/7-3

Geochemical study

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REV.	**DESCRIPTION**	**PREPARED BY**	**CHECKED BY**	**APPROVED BY**	**DATE**

SGEO-GEOL
GEBA

"Basin Geology Department "

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DOCU:1
GEBA: 1

Date: June, 2006

1. Summary and Conclusion

Geochemical well logging (TOC and Rock Eval)

The source rock evaluation has been affected by the use of different organic additives used in the drilling mud. In particular one of the additives (G-Seal) contains graphite and its effect on the TOC and Rock Eval analyses is a strong increase of the organic carbon content (TOC) without any changes of the hydrocarbon potential (S2). A second interference can not be associated with a particular additive at the moment, but the effect on the analyses is a clear increase of the TOC value and of the Rock Eval S1 and S2 signals. The additives can not be completely removed by the classic solvent washing.

Well	Depth (m)	$\delta^{13}C$ ‰ HCS	$\delta^{13}C$ ‰ HCA	$\delta^{13}C$ ‰ NSO
7122/7-3	1148.5	-29.44	-28.76	-28.31
7122/7-3	1195.6	-29.86	-28.58	-29.22
7122/7-3	1812	-31.27	-30.89	-30.32
7122/7-2	1078-1136.5	-29.62	-28.44	-28.01
7122/7-1	1106	-29.48	-28.11	-27.86
7122/7-1	1114.4	-29.42	-28.15	-27.96
7122/7-1	1140	-29.30	-28.14	-27.84

Tab. 3.3: Stable carbon isotopic data in the Goliat oils.

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NORWAY - OFFSHORE

WELL : 7122 / 7 - 3 (Goliat 3)

T. O. C. and ROCK-EVAL PYROLYSIS

Depth m	Sample type	TOC Wt%	S1 mg/g	S2 mg/g	HI	Tmax °C	PI
800.00	cuttings	1.05	0.06	0.73	70	432	0.08
820.00	cuttings	0.61	0.05	0.48	79	425	0.09
830.00	cuttings	1.02	0.08	0.64	63	430	0.11
840.00	cuttings	0.77	0.08	0.40	52	427	0.17
850.00	cuttings	0.64	0.05	0.28	44	422	0.15
870.00	cuttings	0.56	0.03	0.14	25	N.D.	0.18
880.00	cuttings	1.06	0.06	0.33	31	425	0.15
890.00	cuttings	1.07	0.07	0.36	34	427	0.16
900.00	cuttings	1.43	0.16	1.60	112	429	0.09
920.00	cuttings	1.17	0.12	0.90	77	427	0.12
930.00	cuttings	0.92	0.09	0.58	63	427	0.13
940.00	cuttings	0.69	0.05	0.30	43	423	0.14
950.00	cuttings	0.55	0.05	0.35	64	414	0.13
960.00	cuttings	2.35	0.09	1.90	81	427	0.05
970.00	cuttings	2.12	0.09	1.48	70	427	0.06
980.00	cuttings	1.61	0.06	1.17	73	427	0.05
990.00	cuttings	0.66	0.03	0.45	68	427	0.06
1000.00	cuttings	0.91	0.06	0.68	75	424	0.08
1010.00	cuttings	0.81	0.07	0.38	47	414	0.16
1020.00	cuttings	1.66	0.08	0.36	22	412	0.18
1030.00	cuttings	2.83	0.12	3.16	112	427	0.04
1040.00	cuttings	2.50	0.21	5.37	215	425	0.04
1050.00	cuttings	6.42	0.46	20.20	315	418	0.02
1060.00	cuttings	39.74	0.60	15.45	39	415	0.04
1070.00	cuttings	13.45	1.72	26.66	198	417	0.06
1080.00	cuttings	8.31	2.87	18.01	217	416	0.14
1115.00	cuttings	10.74	4.33	18.30	170	416	0.19
1125.00	cuttings	6.48	1.29	5.97	92	414	0.18
1125.00	cuttings-ws		0.10	4.62		418	0.02
1135.00	cuttings	3.65	0.69	3.33	91	428	0.17
1135.00	cuttings-ws		0.05	2.70		429	0.02
1155.00	cuttings	4.81	1.26	4.90	102	426	0.20
1155.00	cuttings-ws		0.06	3.53		428	0.02
1165.00	cuttings	1.03	0.22	0.89	86	431	0.20
1165.00	cuttings-ws		0.03	0.81		430	0.04
1175.00	cuttings	5.08	1.29	0.98	19	430	0.57
1175.00	cuttings-ws		0.02	0.60		433	0.03
1195.00	cuttings	1.65	7.31	3.03	184	405	0.71
1195.00	cuttings-ws		0.18	1.03		424	0.15

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NORWAY - OFFSHORE
WELL : 7122 / 7 - 3 (Goliat 3)

T. O. C. and ROCK-EVAL PYROLYSIS

Depth	Sample	TOC	S1	S2	HI	Tmax	PI
m	type	Wt%	mg/g	mg/g		°C	
1205.00	cuttings	1.22	6.78	2.03	166	401	0.77
1205.00	cuttings-ws		0.03	0.46		432	0.06
1215.00	cuttings	0.53	1.97	0.83	157	392	0.70
1215.00	cuttings-ws		0.02	0.22		426	0.08
1220.00	cuttings	0.87	2.24	1.54	177	393	0.59
1220.00	cuttings-ws		0.04	0.42		423	0.09
1240.00	cuttings	2.39	0.35	0.48	20	428	0.42
1240.00	cuttings-ws		0.02	0.25		429	0.07
1250.00	cuttings	2.34	0.43	1.38	59	429	0.24
1250.00	cuttings-ws		0.03	0.98		433	0.03
1270.00	cuttings	2.47	0.42	1.59	64	428	0.21
1270.00	cuttings-ws		0.03	1.25		430	0.02
1280.00	cuttings	0.39	0.36	0.30	77	410	0.55
1280.00	cuttings-ws		0.01	0.14		N.D.	0.07
1290.00	cuttings	1.21	0.55	1.55	128	413	0.26
1290.00	cuttings-ws		0.03	1.10		415	0.03
1300.00	cuttings	0.20	0.05	0.17	85	N.D.	0.23
1315.00	cuttings	0.23	0.04	0.14	61	N.D.	0.22
1330.00	cuttings	0.25	0.07	0.21	84	424	0.25
1340.00	cuttings	0.26	0.05	0.18	69	N.D.	0.22
1345.00	cuttings	0.29	0.05	0.14	48	N.D.	0.26
1355.00	cuttings	4.60	0.50	5.60	122	425	0.08
1365.00	cuttings	1.66	0.22	1.68	101	432	0.12
1375.00	cuttings	1.04	0.09	1.16	112	429	0.07
1385.00	cuttings	0.62	0.02	0.38	61	427	0.05
1395.00	cuttings	0.34	0.02	0.13	38	N.D.	0.13
1405.00	cuttings	0.62	0.03	0.26	42	427	0.10
1415.00	cuttings	0.29					
1425.00	cuttings	0.35	0.03	0.27	77	431	0.10
1435.00	cuttings	4.13	0.65	9.79	237	427	0.06
1445.00	cuttings	0.66	0.08	0.83	126	435	0.09
1455.00	cuttings	0.32	0.05	0.30	94	427	0.14
1465.00	cuttings	3.88	0.80	9.93	256	425	0.07
1470.00	cuttings	0.86	0.09	0.73	85	432	0.11
1470.00	cuttings-ws		0.03	0.49		433	0.06
1475.00	cuttings	0.36	0.01	0.16	44	N.D.	0.06
1475.00	cuttings-ws		0.01	0.15		N.D.	0.06
1490.00	cuttings	1.45	0.14	2.14	148	434	0.06
1500.00	cuttings	1.85	0.08	0.92	50	431	0.08

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T. O. C. and ROCK-EVAL PYROLYSIS

Depth m	Sample type	TOC Wt%	S1 mg/g	S2 mg/g	HI	Tmax °C	PI
1510.00	cuttings	0.74	0.05	1.25	169	445	0.04
1520.00	cuttings	0.96	0.11	0.87	91	432	0.11
1535.00	cuttings	0.31	0.03	0.32	103	438	0.09
1545.00	cuttings	0.28					
1555.00	cuttings	0.47	0.06	0.53	113	436	0.10
1570.00	cuttings	0.48	0.03	0.37	77	436	0.08
1590.00	cuttings	1.05	0.08	0.92	88	434	0.08
1600.00	cuttings	2.71	0.20	4.72	174	429	0.04
1615.00	cuttings	0.62	0.03	0.31	50	435	0.09
1625.00	cuttings	0.66	0.04	0.57	86	440	0.07
1635.00	cuttings	0.57	0.04	0.32	56	431	0.11
1645.00	cuttings	0.64	0.04	0.36	56	437	0.10
1655.00	cuttings	0.35	0.02	0.22	63	438	0.08
1665.00	cuttings	0.33	0.03	0.13	39	N.D.	0.19
1675.00	cuttings	0.76	0.03	0.33	43	434	0.08
1685.00	cuttings	0.33	0.02	0.14	42	N.D.	0.13
1695.00	cuttings	0.22					
1705.00	cuttings	0.24					
1715.00	cuttings	0.76	0.63	2.54	334	429	0.20
1715.00	cuttings-ws		0.22	2.24		440	0.09
1725.00	cuttings	1.01	1.51	4.75	470	367	0.24
1725.00	cuttings-ws		1.17	3.66		338	0.24
1735.00	cuttings	1.10	1.57	3.84	349	336	0.29
1735.00	cuttings-ws		0.87	3.09		331	0.22
1745.00	cuttings	1.07	1.80	4.62	432	370	0.28
1745.00	cuttings-ws		1.24	3.54		339	0.26
1755.00	cuttings	1.25	1.37	3.64	291	335	0.27
1755.00	cuttings-ws		0.71	3.11		331	0.19
1760.00	cuttings	1.09	0.94	1.56	143	435	0.38
1760.00	cuttings-ws		0.10	1.39		436	0.07
1770.00	cuttings	1.86	1.96	4.32	232	330	0.31
1770.00	cuttings-ws		0.79	4.06		326	0.16
1780.00	cuttings	1.09	0.68	2.07	190	322	0.25
1780.00	cuttings-ws		0.18	1.95		452	0.08
1800.00	cuttings	0.42	0.16	0.44	105	434	0.27
1800.00	cuttings-ws		0.04	0.34		434	0.11
1810.00	cuttings	0.79	0.22	1.14	144	439	0.16
1810.00	cuttings-ws		0.09	1.14		440	0.07
1820.00	cuttings	1.48	0.51	2.67	180	442	0.16

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T. O. C. and ROCK-EVAL PYROLYSIS

Depth m	Sample type	TOC Wt%	S1 mg/g	S2 mg/g	HI	Tmax °C	PI
1820.00	cuttings-ws		0.21	2.44		448	0.08
1830.00	cuttings	0.99	0.67	2.77	280	363	0.19
1830.00	cuttings-ws		0.15	2.21		435	0.06
1840.00	cuttings	0.90	0.52	1.84	204	430	0.22
1840.00	cuttings-ws		0.16	1.60		440	0.09
1855.00	cuttings	0.77	0.25	0.84	109	426	0.23
1855.00	cuttings-ws		0.04	0.54		433	0.07
1865.00	cuttings	0.51	0.09	0.34	67	428	0.21
1865.00	cuttings-ws		0.02	0.25		429	0.07
1875.00	cuttings	1.01	0.18	0.99	98	430	0.15
1875.00	cuttings-ws		0.03	0.72		432	0.04
1895.00	cuttings	0.45	0.07	0.33	73	427	0.18
1895.00	cuttings-ws		0.02	0.27		428	0.07
1905.00	cuttings	0.47	0.09	0.48	102	425	0.16
1905.00	cuttings-ws		0.03	0.44		426	0.06
1915.00	cuttings	0.40	0.22	0.65	163	424	0.25
1915.00	cuttings-ws		0.03	0.45		430	0.06
1925.00	cuttings	0.21					
1930.00	cuttings	0.17					
1945.00	cuttings	0.06					
1965.00	cuttings	0.30	0.05	0.26	87	431	0.16
1975.00	cuttings	0.33	0.05	0.28	85	429	0.15
1985.00	cuttings	0.69	0.07	0.74	107	438	0.09
1995.00	cuttings	1.23	0.12	2.01	163	437	0.06
2005.00	cuttings	0.75	0.06	0.80	107	438	0.07
2015.00	cuttings	0.55	0.05	0.58	105	440	0.08
2025.00	cuttings	0.53	0.05	0.56	106	438	0.08
2035.00	cuttings	0.59	0.06	0.60	102	437	0.09
2050.00	cuttings	0.65	0.15	0.89	137	436	0.14
2060.00	cuttings	0.43	0.07	0.47	109	433	0.13
2070.00	cuttings	0.31	0.05	0.37	119	422	0.12
2080.00	cuttings	0.26					
2090.00	cuttings	0.21					
2100.00	cuttings	0.18					
2110.00	cuttings	0.23					
2130.00	cuttings	0.06					
2145.00	cuttings	0.12					
2150.00	cuttings	0.22					
2160.00	cuttings	0.07					

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WELL : 7122 / 7 - 3 (Goliat 3)

T. O. C. and ROCK-EVAL PYROLYSIS

Depth m	Sample type	TOC Wt%	S1 mg/g	S2 mg/g	HI	Tmax °C	PI
2170.00	cuttings	0.31	0.02	0.07	23	N.D.	0.22
2180.00	cuttings	0.36	0.01	0.07	19	N.D.	0.13
2190.00	cuttings	0.55	0.01	0.07	13	N.D.	0.13
2200.00	cuttings	0.34	0.01	0.06	18	N.D.	0.14
2210.00	cuttings	0.31	0.01	0.06	19	N.D.	0.14
2220.00	cuttings	0.37	0.01	0.08	22	N.D.	0.11
2230.00	cuttings	82.77	0.05	0.12	0	N.D.	0.29
2240.00	cuttings	75.83	0.05	0.11	0	N.D.	0.31
2250.00	cuttings	58.42	0.05	0.12	0	N.D.	0.29
2260.00	cuttings	24.07	0.01	0.06	0	N.D.	0.14
2270.00	cuttings	31.72	0.03	0.11	0	N.D.	0.21
2280.00	cuttings	36.12	0.04	0.24	1	419	0.14
2290.00	cuttings	38.69	0.04	0.20	1	423	0.17
2300.00	cuttings	34.01	0.14	0.53	2	295	0.21
2310.00	cuttings	23.07	0.09	0.47	2	317	0.16
2320.00	cuttings	17.39	0.09	0.45	3	421	0.17
2330.00	cuttings	19.17	0.09	0.31	2	419	0.23
2340.00	cuttings	24.62	0.14	0.76	3	308	0.16
2355.00	cuttings	6.68	0.76	1.95	29	298	0.28
2365.00	cuttings	7.63	0.24	0.94	12	427	0.20
2375.00	cuttings	3.27	0.17	1.19	36	307	0.13
2385.00	cuttings	7.21	0.19	1.45	20	308	0.12
2395.00	cuttings	1.67	0.10	0.68	41	423	0.13
2405.00	cuttings	11.51	0.05	0.35	3	422	0.13
2410.00	cuttings	5.32	0.06	0.33	6	424	0.15
2420.00	cuttings	11.62	0.18	0.33	3	425	0.35
2430.00	cuttings	1.46	0.29	1.14	78	367	0.20
2440.00	cuttings	0.36	0.46	1.68	467	337	0.21
2450.00	cuttings	0.25					
2460.00	cuttings	1.98	0.39	1.50	76	317	0.21
2460.00	cuttings-ws		0.29	1.50		327	0.16
2470.00	cuttings	0.84	0.33	0.85	101	360	0.28
2470.00	cuttings-ws		0.07	0.80		414	0.08
2480.00	cuttings	0.61	0.52	1.53	251	342	0.25
2480.00	cuttings-ws		0.14	1.36		357	0.09
2495.00	cuttings	0.63	0.44	1.36	216	337	0.24
2495.00	cuttings-ws		0.12	1.15		353	0.09
2505.00	cuttings	0.73	0.29	0.73	100	424	0.28
2505.00	cuttings-ws		0.06	0.58		433	0.09

Divisione

S.Donato M. 7 - 4 -2006
Boll. nr. 5

NORWAY - OFFSHORE
WELL : 7122 / 7 - 3 (Goliat 3)

T. O. C. and ROCK-EVAL PYROLYSIS

Depth m	Sample type	TOC Wt%	S1 mg/g	S2 mg/g	HI	Tmax °C	PI
2515.00	cuttings	0.71	0.37	0.99	139	328	0.27
2515.00	cuttings-ws		0.16	0.78		337	0.17
2525.00	cuttings	0.53	0.96	2.18	411	325	0.31
2525.00	cuttings-ws		0.37	1.96		323	0.16
2535.00	cuttings	0.21					
2545.00	cuttings	0.22					
2555.00	cuttings	0.12					
2565.00	cuttings	0.11					
2575.00	cuttings	0.25					
2585.00	cuttings	0.57	0.13	0.52	91	419	0.20
2585.00	cuttings-ws		0.04	0.41		427	0.09
2595.00	cuttings	0.67	0.10	0.47	70	319	0.18
2595.00	cuttings-ws		0.04	0.23		309	0.15
2605.00	cuttings	1.03	0.29	1.79	174	439	0.14
2605.00	cuttings-ws		0.03	1.26		443	0.02
2615.00	cuttings	0.50	0.28	1.09	218	439	0.20
2615.00	cuttings-ws		0.09	1.02		432	0.08
2625.00	cuttings	0.52	0.21	0.67	129	435	0.24
2625.00	cuttings-ws		0.02	0.44		436	0.04
2635.00	cuttings	1.32	0.38	1.45	110	437	0.21
2635.00	cuttings-ws		0.05	1.19		438	0.04
2645.00	cuttings	1.62	0.28	3.06	189	381	0.08
2645.00	cuttings-ws		0.06	1.75		433	0.03
2655.00	cuttings	0.89	0.12	0.46	52	428	0.21
2655.00	cuttings-ws		0.03	0.35		426	0.08
2665.00	cuttings	0.79	0.13	1.58	200	385	0.08
2675.00	cuttings	0.80	0.09	0.56	70	380	0.14
2675.00	cuttings-ws		0.04	0.52		379	0.07
2685.00	cuttings	0.74	0.15	0.77	104	422	0.16
2685.00	cuttings-ws		0.03	0.65		410	0.04
2695.00	cuttings	0.52	0.18	0.36	69	431	0.33
2705.00	cuttings	0.48	0.31	0.44	92	326	0.41
2705.00	cuttings-ws		0.08	0.43		334	0.16
2710.00	cuttings	0.41	0.41	1.86	454	373	0.18
2710.00	cuttings-ws		0.11	0.68		344	0.14
2720.00	cuttings	0.18					
2725.00	cuttings	0.27					

N.D. = Tmax not determinable (S2 < 0.2)

Yellow samples: samples with double S2 peak, probably contaminated by the glycol additive
For these samples the TOC - S1 - S2 are overestimated and the HI and Tmax are not reliable

Note: the rich TOC measured in the interval 2230-2430 m are due to the graphite additive.

5. Annex 2 – Optical Analyses

Exploration & Production Division

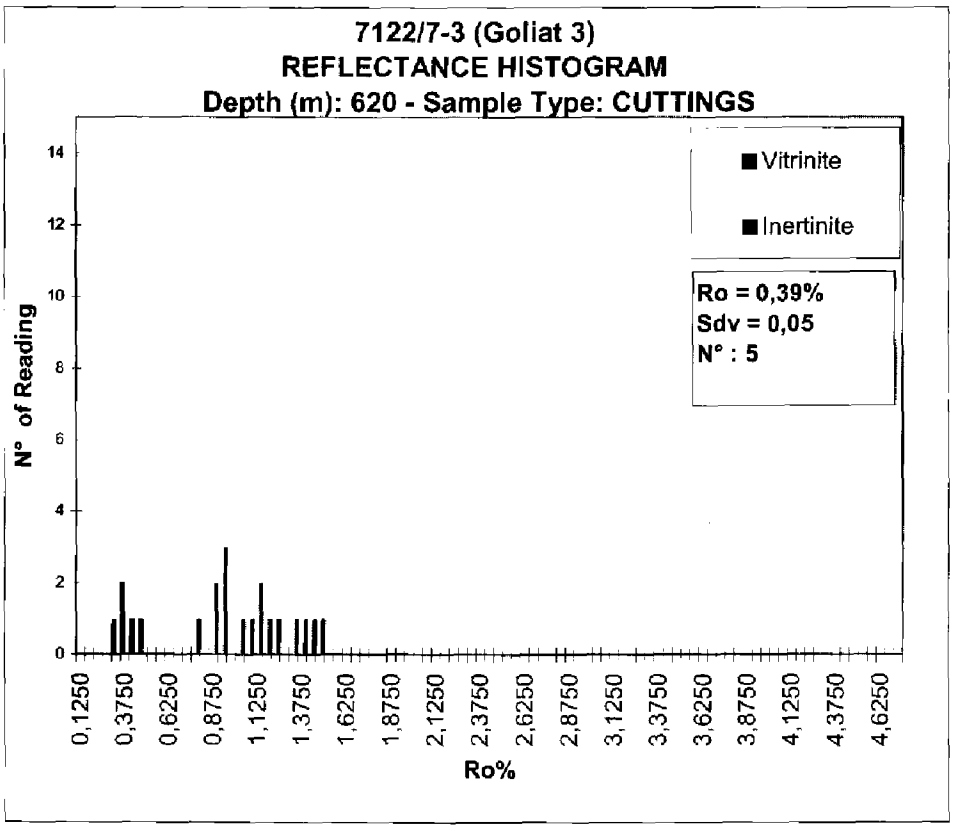
S. Donato 24-04-2006
Bull. n° 4

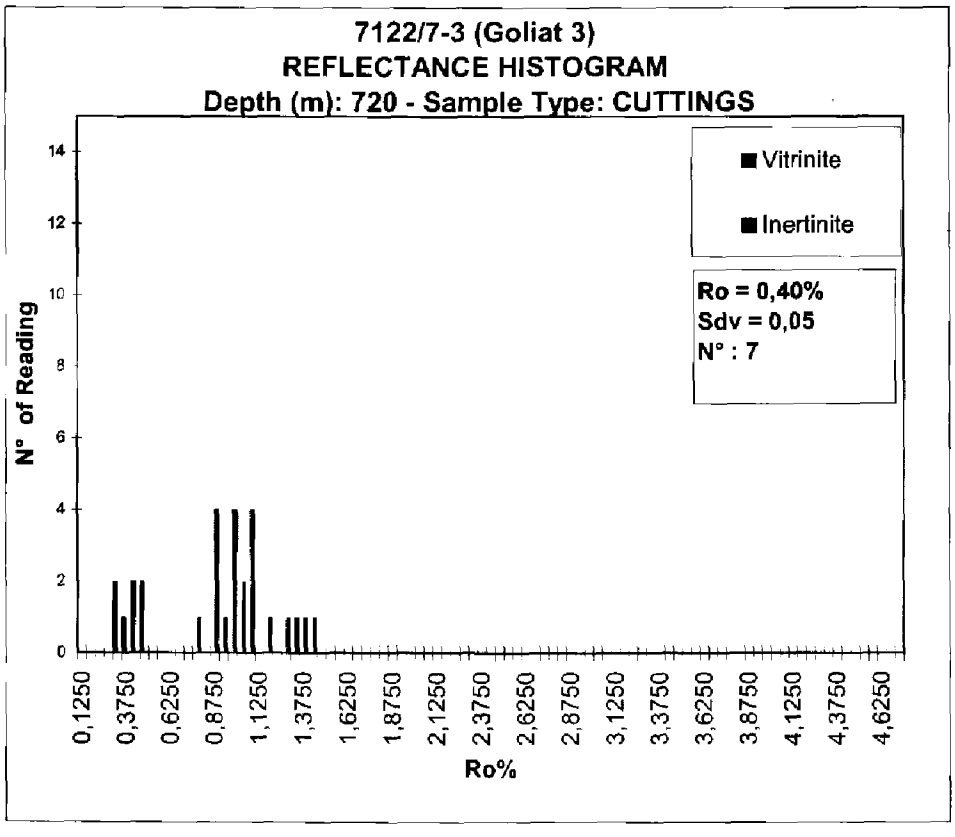
NORWAY - OFFSHORE

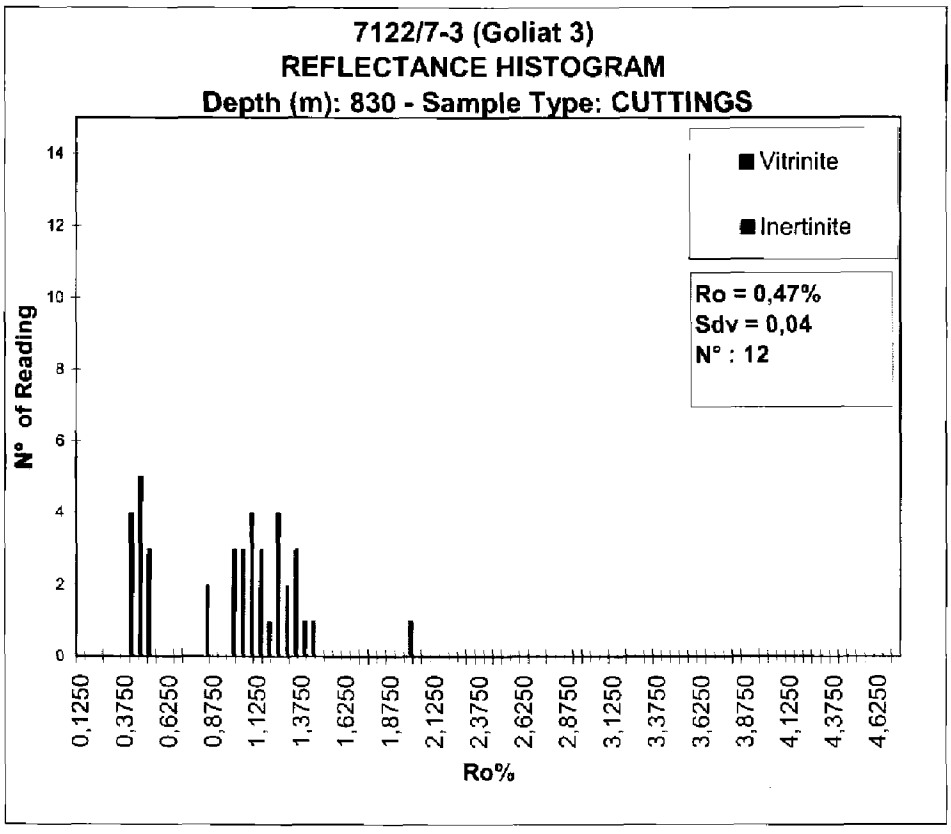
WELL: 7122/7-3 (Goliat 3)

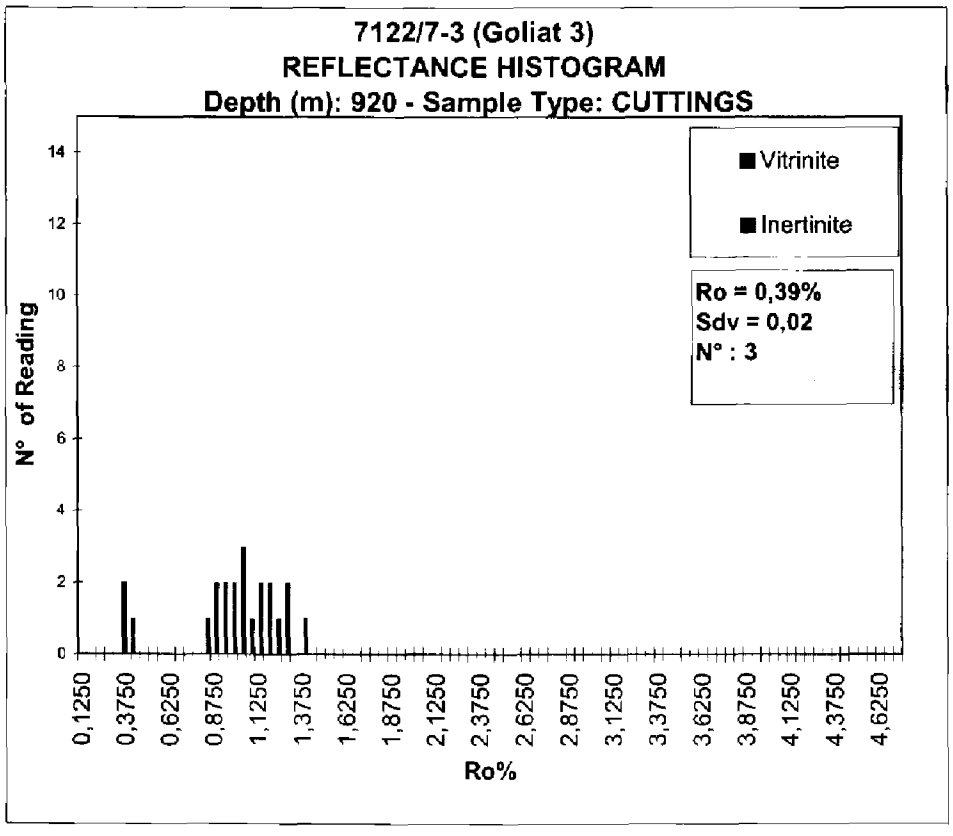
KEROGEN COMPOSITION AND MATURITY DATA

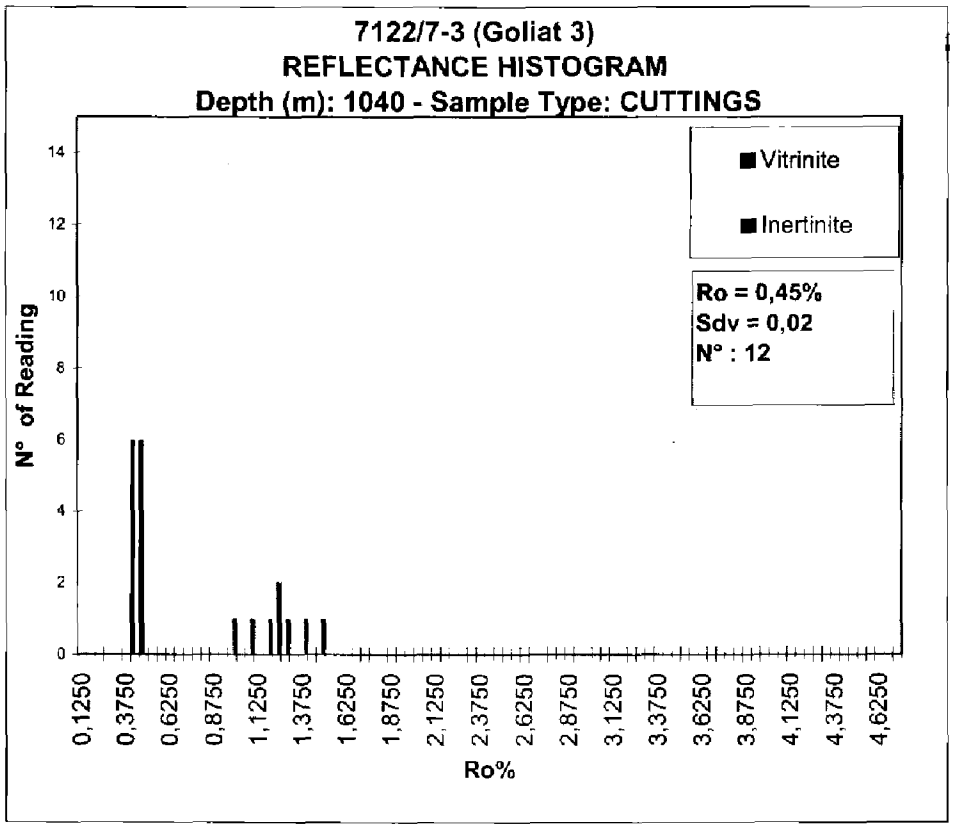
Depth m	Sample Type	AOM %	MPH %	CHF %	CWF %	TAI	Fluor.	Ro %	ST. DEV.	N° Measured Points
620.00	Cuttings	T	75	10	15	0.0	Y-DY	0.39	0.05	5
620.00	Cuttings							0.58		3
720.00	Cuttings	T	20	60	20	1.2	Y-DY	0.40	0.05	7
830.00	Cuttings	T	15	35	50	0.0	Y-DY	0.47	0.04	12
830.00	Cuttings							0.68	0.06	5
920.00	Cuttings	35	10	10	45	0.0	Y-DY	0.39	0.02	3
1040.00	Cuttings	60	T	20	20	0.0	Y	0.45	0.02	12
1082.50	Core	5		15	80	1.5/1.7	Y-DY	0.44	0.04	17
1149.50	Core			20	80	1.5/1.7	Y-DY	0.48	0.05	20
1152.55	Core			30	70	1.5/1.7	Y-DY	0.49	0.04	17
1220.00	Cuttings	10	T	15	75	0.0	Y-DY	0.50	0.04	8
1220.00	Cuttings							0.66	0.04	3
1365.00	Cuttings			40	60	1.7	Y-DY	0.48	0.03	17
1365.00	Cuttings							0.66	0.02	3
1470.00	Cuttings	5		15	80	1.7	Y-DY	0.56	0.05	16
1470.00	Cuttings							0.71	0.02	6
1555.00	Cuttings			60	40	1.7	Y-DY	0.61	0.05	8
1665.00	Cuttings			20	80	0.0	Y	0.72	0.09	9
1760.00	Cuttings			50	50	2.0	DY	0.58	0.04	3
1814.90	Core			60	40	2.0?	Y-DY	0.58	0.06	6
1834.20	Core			60	40	2.0	Y-DY	0.58	0.03	5
1965.00	Cuttings			30	70	2.0	Y-DY	0.56	0.05	20
2060.00	Cuttings			35	65	2.0	Y-DY	0.56	0.03	30
2160.00	Cuttings			50	50	>2.0	Y-DY	V.A.		
2220.00	Cuttings			60	40	2.0	Y-DY	0.59	0.05	17
2310.00	Cuttings			50	50	>2.0	Y-DY	V.A.		
2410.00	Cuttings			50	50	>2.0	Y-DY	0.62		1
2565.00	Cuttings			50	50	>2.0	Y-DY	V.A.		
2665.00	Cuttings			5	95	0.0	NF	0.68	0.07	12
2665.00	Cuttings							0.90	0.02	6
2710.00	Cuttings				100	0.0	NF	V.A.		

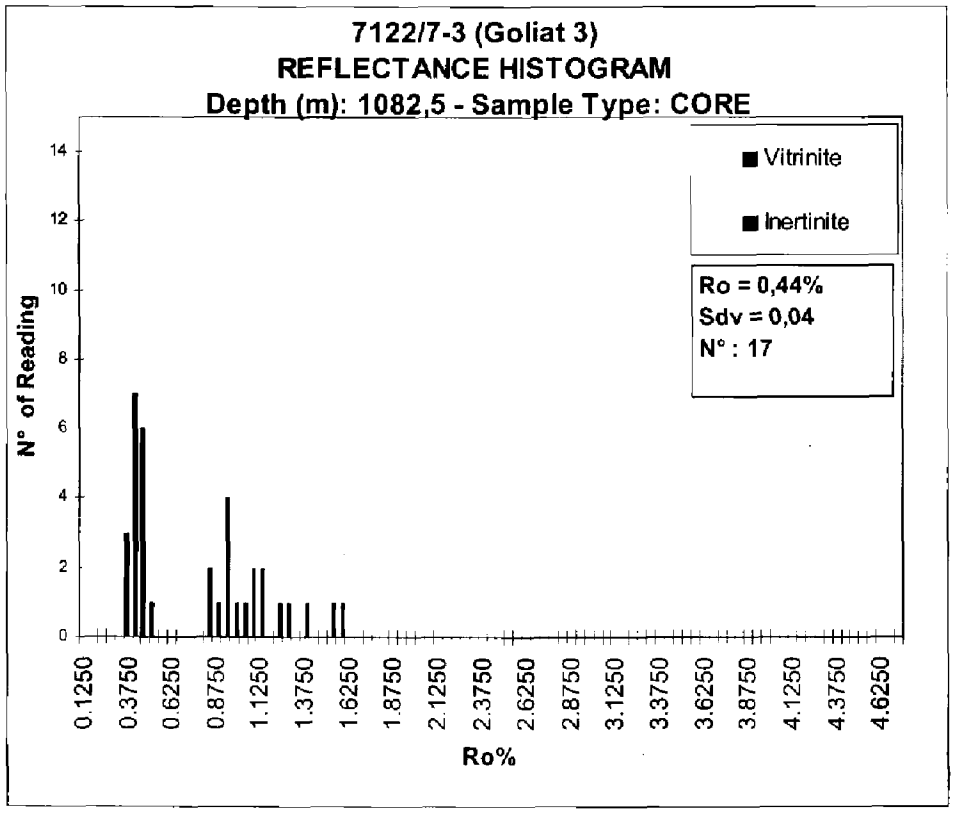

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 620 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,39%
Sdv = 0,05
N° : 5
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250

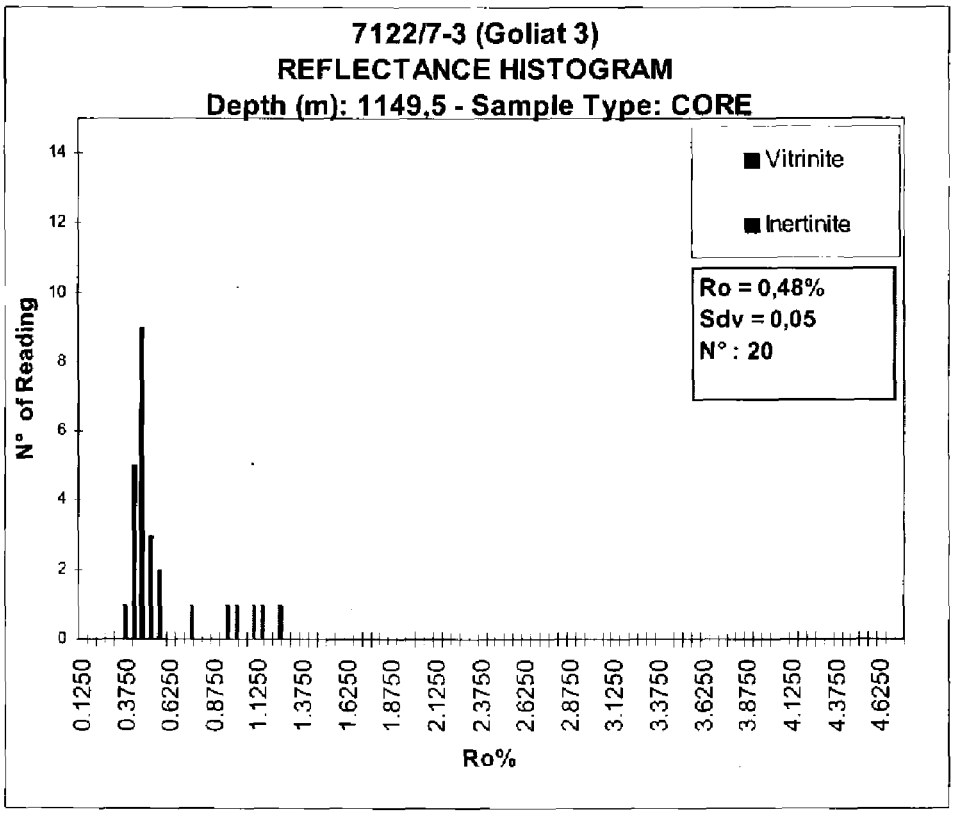

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 720 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,40%
Sdv = 0,05
N° : 7
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250

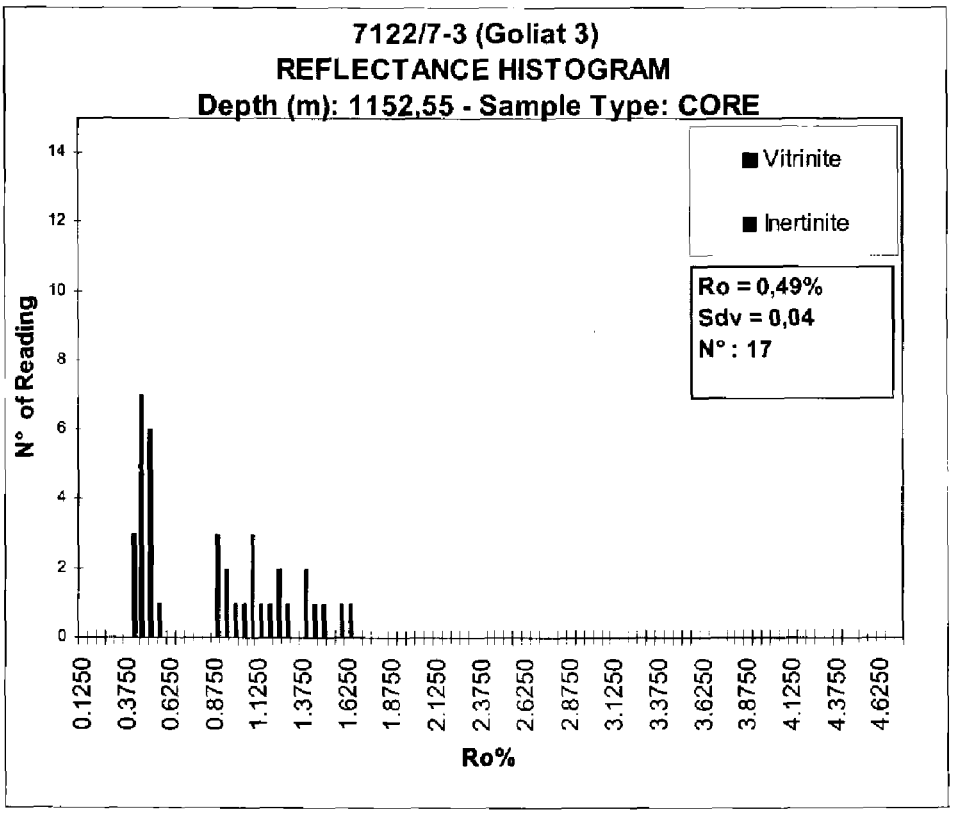

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 830 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,47%
Sdv = 0,04
N° : 12
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250

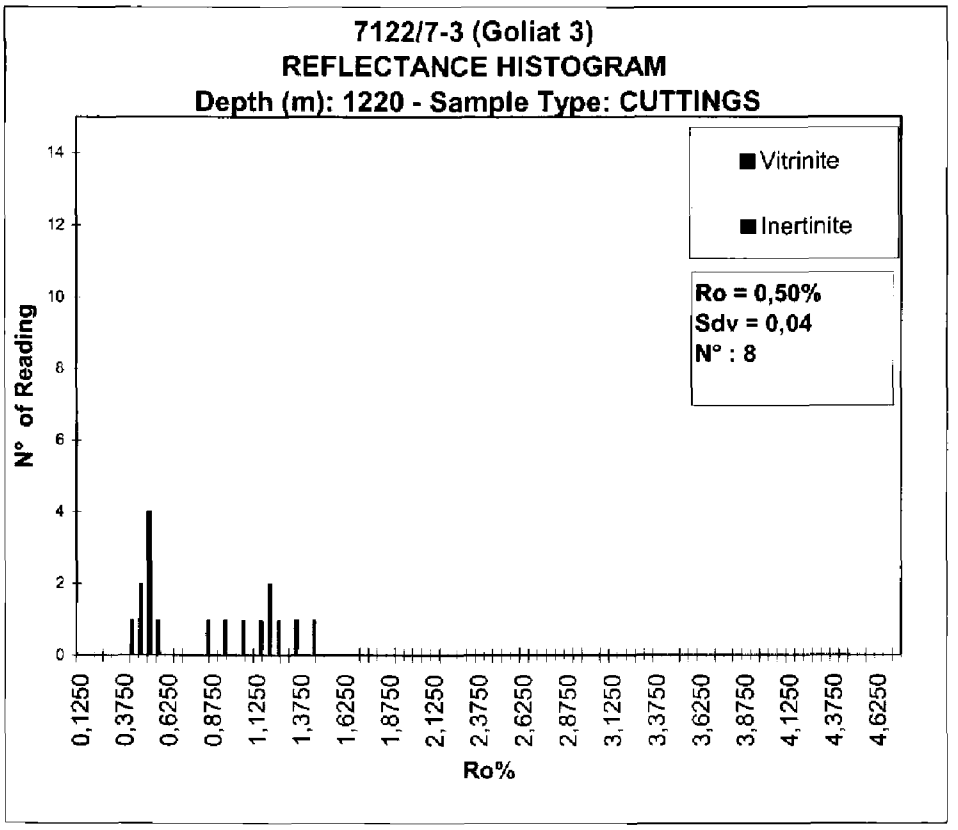

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 920 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,39%
Sdv = 0,02
N° : 3
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250

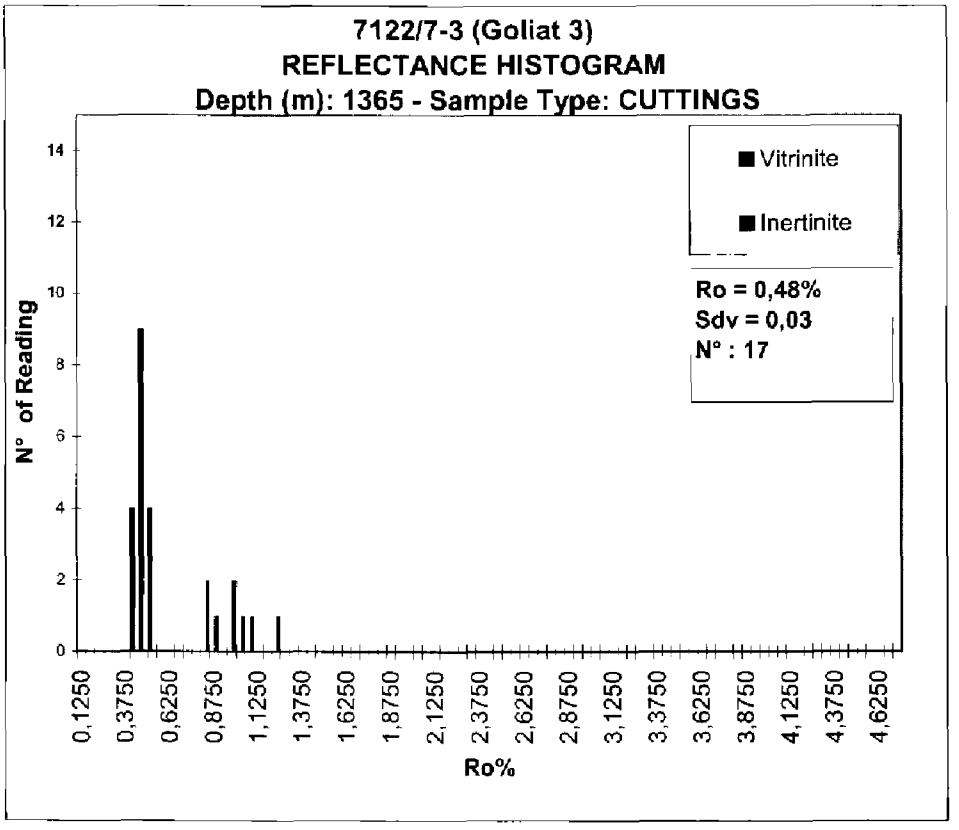

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1040 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,45%
Sdv = 0,02
N° : 12
N° of Reading
0
2
4
6
8
10
12
14
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250
Ro%

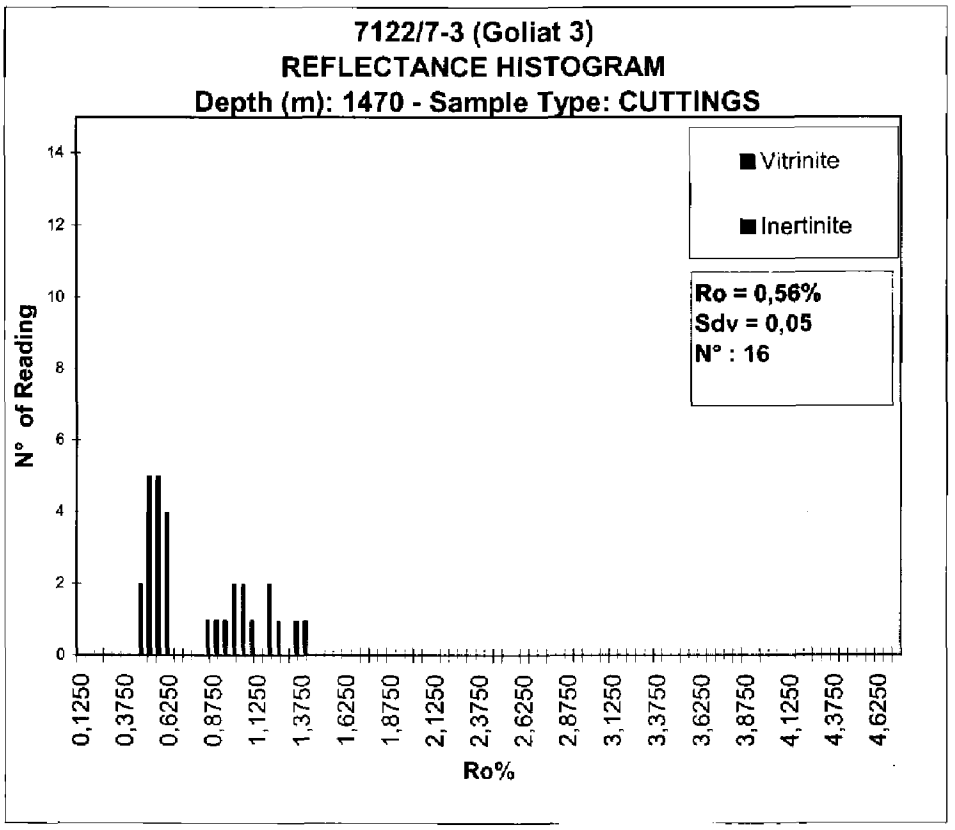

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1082,5 - Sample Type: CORE
Vitrinite
Inertinite
Ro = 0,44%
Sdv = 0,04
N° : 17
N° of Reading
0
2
4
6
8
10
12
14
0.1250
0.3750
0.6250
0.8750
1.1250
1.3750
1.6250
1.8750
2.1250
2.3750
2.6250
2.8750
3.1250
3.3750
3.6250
3.8750
4.1250
4.3750
4.6250
Ro%

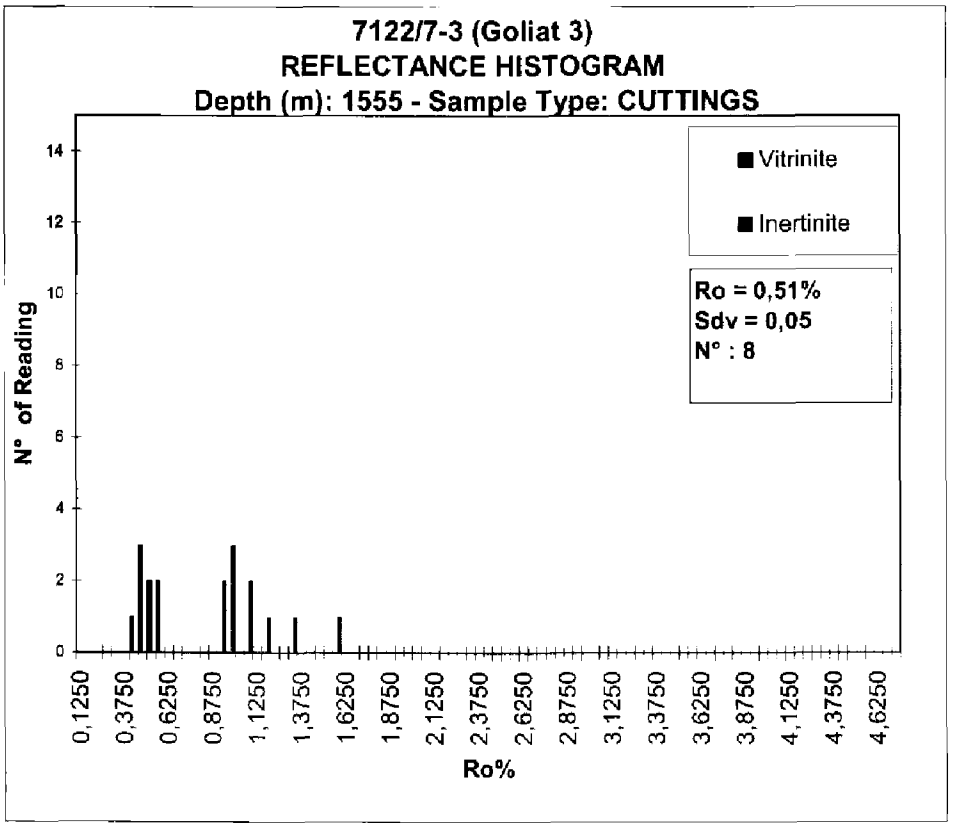

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1149,5 - Sample Type: CORE
Vitrinite
Inertinite
Ro = 0,48%
Sdv = 0,05
N° : 20
N° of Reading
Ro%
0.1250
0.3750
0.6250
0.8750
1.1250
1.3750
1.6250
1.8750
2.1250
2.3750
2.6250
2.8750
3.1250
3.3750
3.6250
3.8750
4.1250
4.3750
4.6250

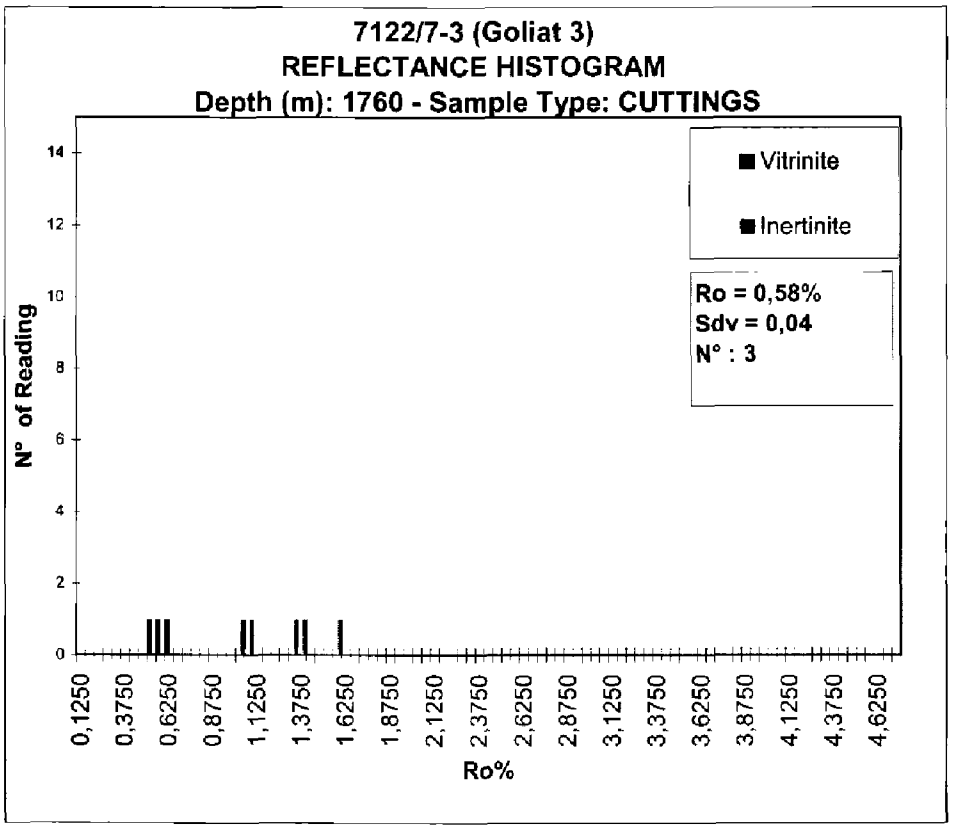

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1152,55 - Sample Type: CORE
Vitrinite
Inertinite
Ro = 0,49%
Sdv = 0,04
N° : 17
N° of Reading
Ro%
0.1250
0.3750
0.6250
0.8750
1.1250
1.3750
1.6250
1.8750
2.1250
2.3750
2.6250
2.8750
3.1250
3.3750
3.6250
3.8750
4.1250
4.3750
4.6250

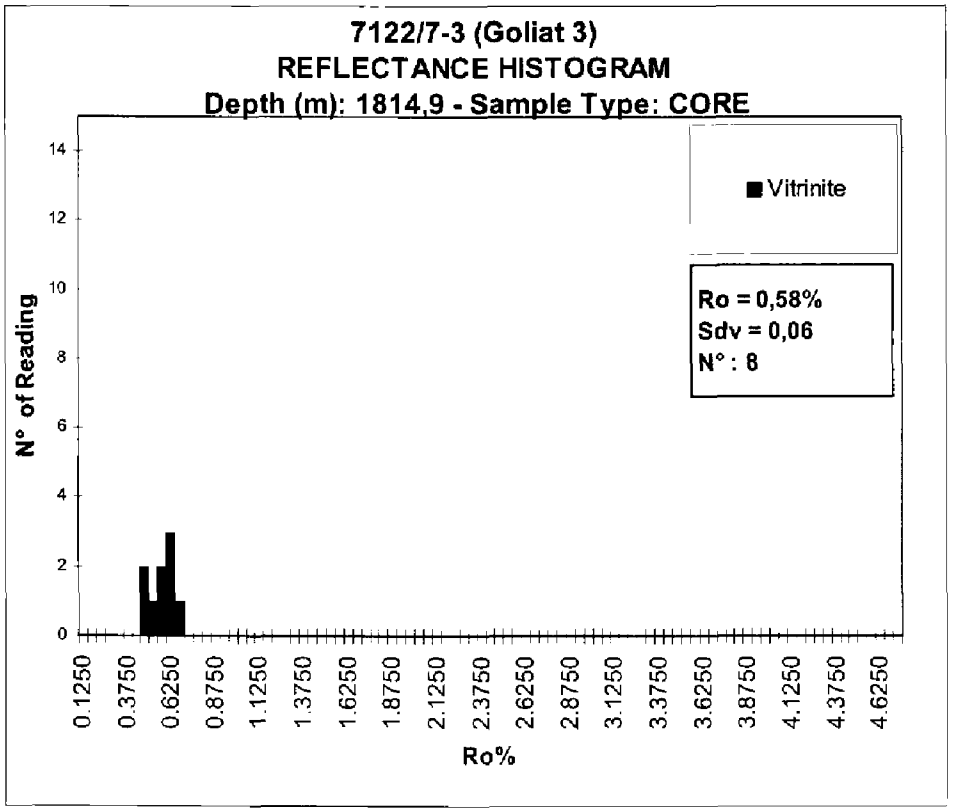

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1220 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,50%
Sdv = 0,04
N° : 8
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250

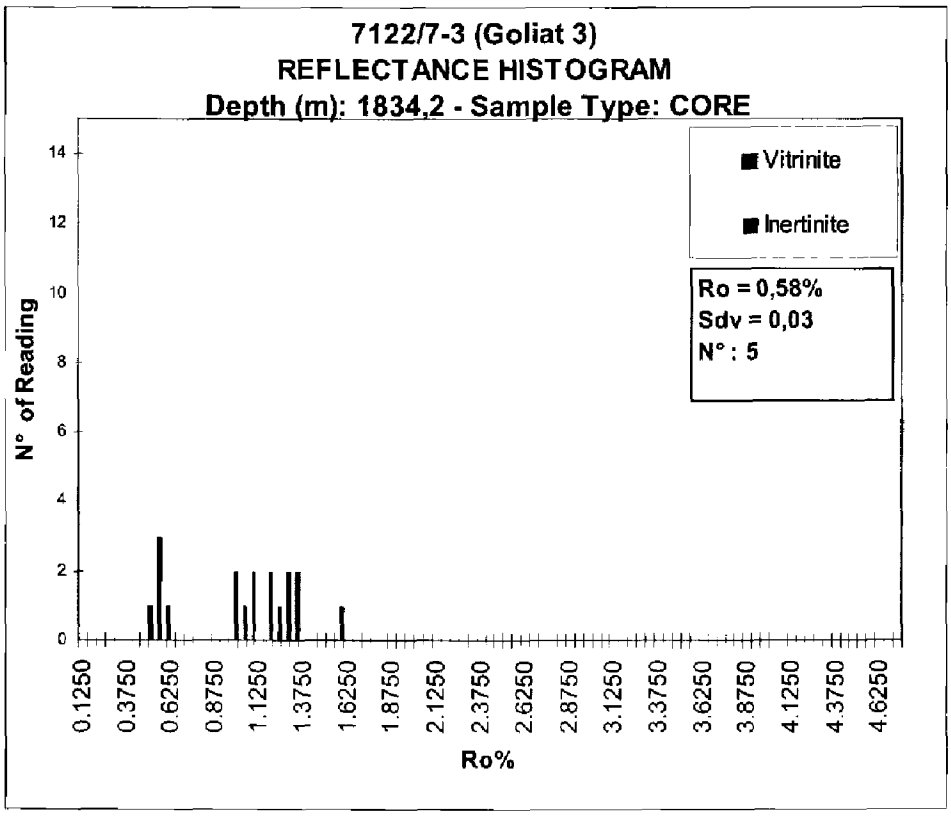

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1365 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,48%
Sdv = 0,03
N° : 17
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250

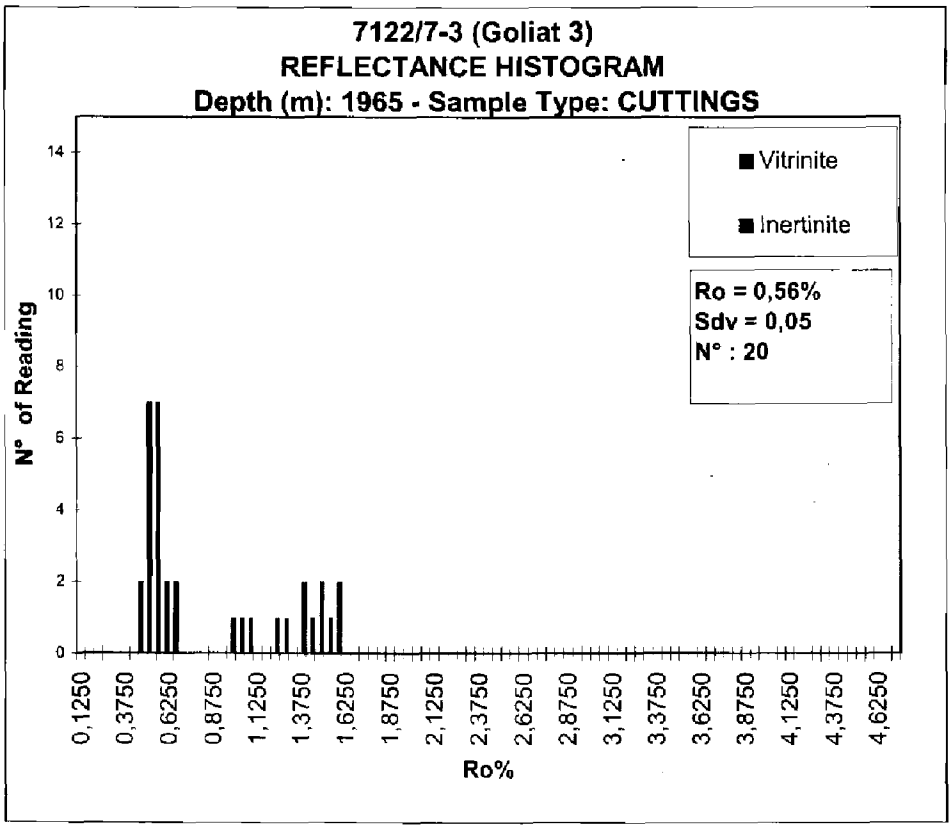

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1470 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,56%
Sdv = 0,05
N° : 16
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250

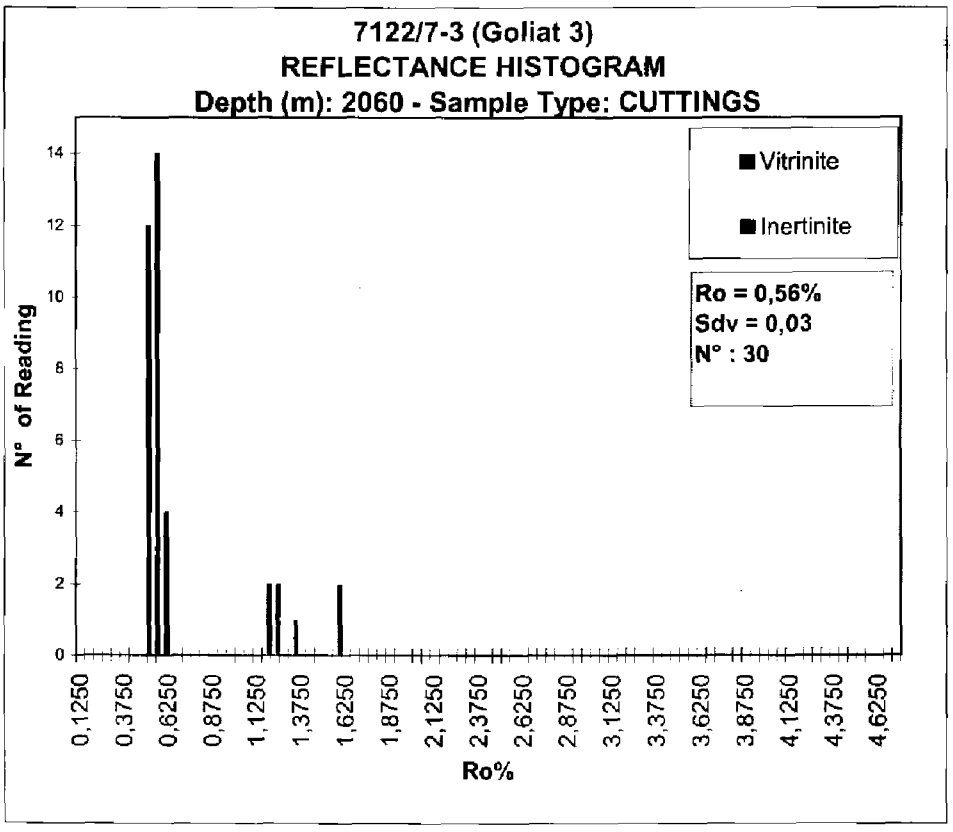

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1555 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,51%
Sdv = 0,05
N° : 8
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250

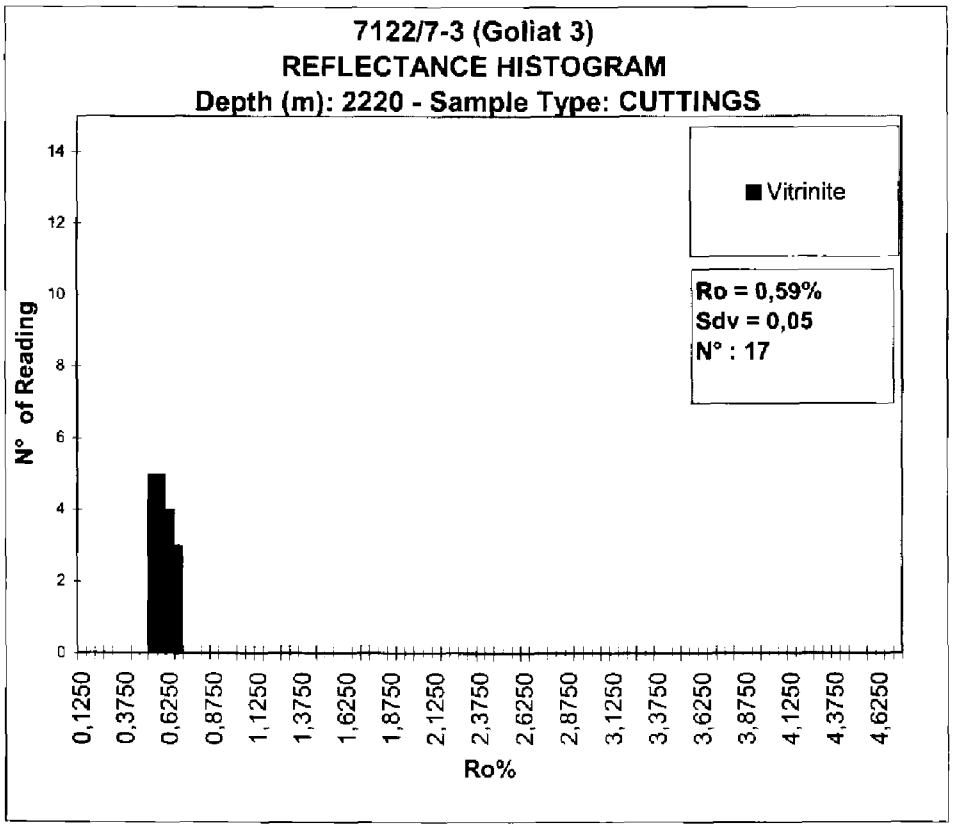

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1760 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,58%
Sdv = 0,04
N° : 3
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250

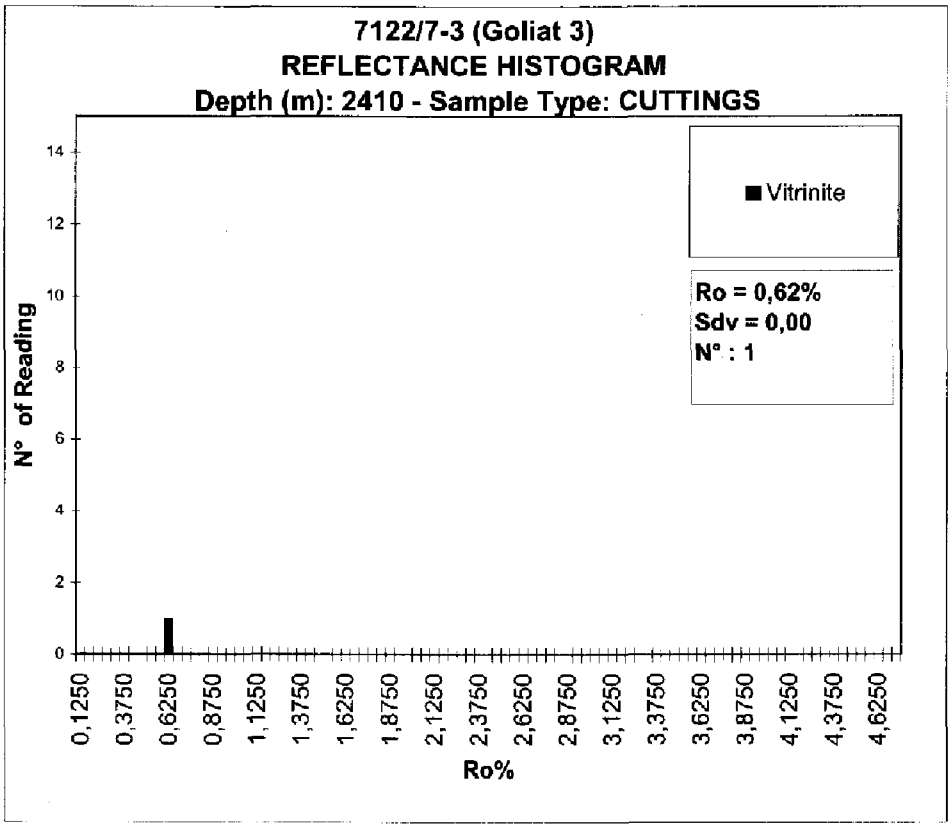

7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1814,9 - Sample Type: CORE
Vitrinite
Ro = 0,58%
Sdv = 0,06
N° : 8
N° of Reading
Ro%
0.1250
0.3750
0.6250
0.8750
1.1250
1.3750
1.6250
1.8750
2.1250
2.3750
2.6250
2.8750
3.1250
3.3750
3.6250
3.8750
4.1250
4.3750
4.6250


7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1834,2 - Sample Type: CORE
Vitrinite
Inertinite
Ro = 0,58%
Sdv = 0,03
N° : 5
N° of Reading
Ro%
0.1250
0.3750
0.6250
0.8750
1.1250
1.3750
1.6250
1.8750
2.1250
2.3750
2.6250
2.8750
3.1250
3.3750
3.6250
3.8750
4.1250
4.3750
4.6250


7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 1965 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,56%
Sdv = 0,05
N° : 20
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250


7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 2060 - Sample Type: CUTTINGS
Vitrinite
Inertinite
Ro = 0,56%
Sdv = 0,03
N° : 30
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250


7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 2220 - Sample Type: CUTTINGS
Vitrinite
Ro = 0,59%
Sdv = 0,05
N° : 17
N° of Reading
Ro%
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250


7122/7-3 (Goliat 3)
REFLECTANCE HISTOGRAM
Depth (m): 2410 - Sample Type: CUTTINGS
Vitrinite
Ro = 0,62%
Sdv = 0,00
N° : 1
N° of Reading
0
2
4
6
8
10
12
14
0,1250
0,3750
0,6250
0,8750
1,1250
1,3750
1,6250
1,8750
2,1250
2,3750
2,6250
2,8750
3,1250
3,3750
3,6250
3,8750
4,1250
4,3750
4,6250
Ro%

6. Annex 3 – GC-MS Analysis

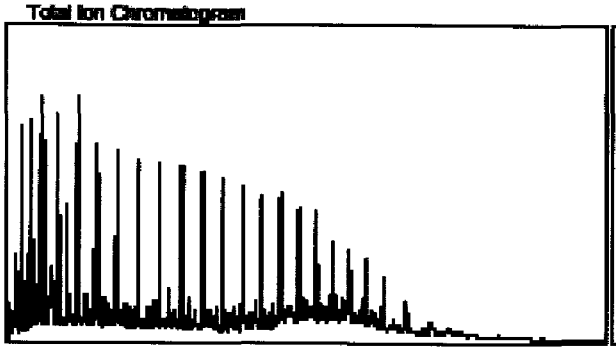
Summary Report

Country: Norway
Age:
Form Name: Reisgrunnen Gp.

Site Name: 7122/7-3 (GOLIAT 3)
Basin:
Oil NL: 3945

Sample_ID: p00830-OIL-0001
Depth: 1148.5(M)
S_Type: Oil

Total Ion Chromatogram



Bulk Parameters

API Gravity:	
% Sulfur:	
del C13 Whole Crude:	
del C13 Saturates:	
del C13 Aromatics:	
% Saturates:	
% Aromatics:	
% NSO/HC PC:	
OEP:	0.89

GCMS Para 1

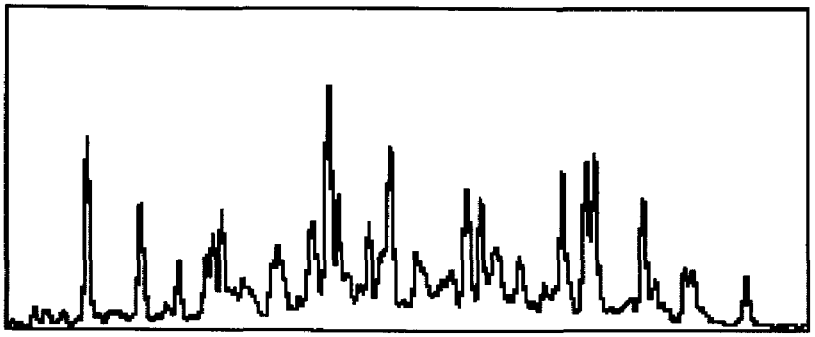
Pr/Ph:	1.47
Tri:	0.00
Tet:	0.00
Tri:	1.08
Ts/Tm:	0.80
C29Hop/C30Hop:	0.80
C30Ur:	
C29Ts/C30Hop:	0.10
C29Ts/C29Hop:	0.08
Gam/C30:	
Dia:	0.83

TERPANES(m/z 191)

GCMS Para 2

Organic Matter Parameters:	
C27/C29 Sterane:	0.71
%27:	30.73
%28:	28.72
%29:	40.55
Steran/Hopan:	0.11
Maturity Parameters:	
Pr/C17:	1.20
Ph/C18:	0.82
28/H Terpanes:	0.00
28/H Steranes:	0.00
Ts/Tm:	0.80
29/Ts:	0.00
TT/H:	0.00
MPI:	0.74
Age Parameters:	
Oleanane/29Hop:	
Bicadinane:	
Other Parameters:	
31/30:	0.00
Methylhopane:	1.00

STERANES(m/z 217)



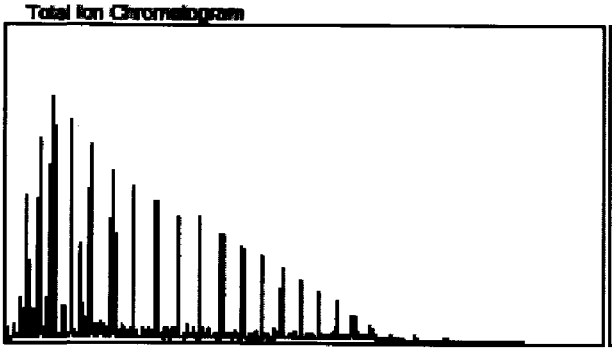
Summary Report

Country: Norway
Age:
Form Name: Snadd

Site Name: 7122/7-3 (GOLIAT 3)
Basin:
Oil N.: 3916

Sample_ID: 21783-OIL-0001
Depth: 1195.6(M)
S_Type: OIL

Total Ion Chromatogram



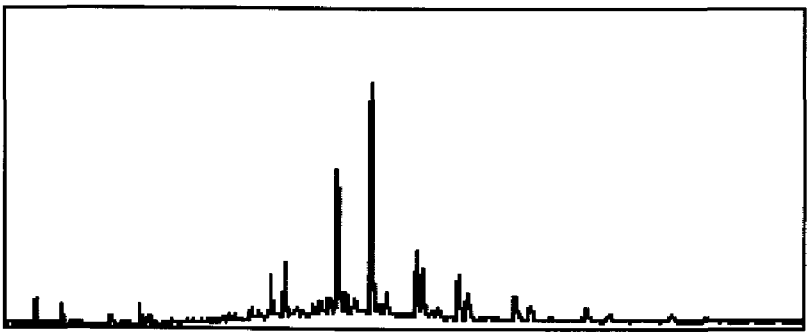
Bulk Parameters

API Gravity:	
% Sulfur:	
d13 C15 Whole-Oil:	
d13 C15 Saturates:	
d13 C15 Aromatics:	-28.4
% Saturates:	
% Aromatics:	
% NSO/HC/PO:	
OEP:	0.97

GCMS Para 1

Pr/Ph:	1.77
Tri:	0.11
Tet:	0.09
Tri:	1.30
Ts/Tm:	0.78
C29Hop/C30Hop:	0.92
C24/Un:	
C26R/aC30Hop:	0.39
C26R/C30Hop:	0.09
Gam/C30:	
Dia:	0.84

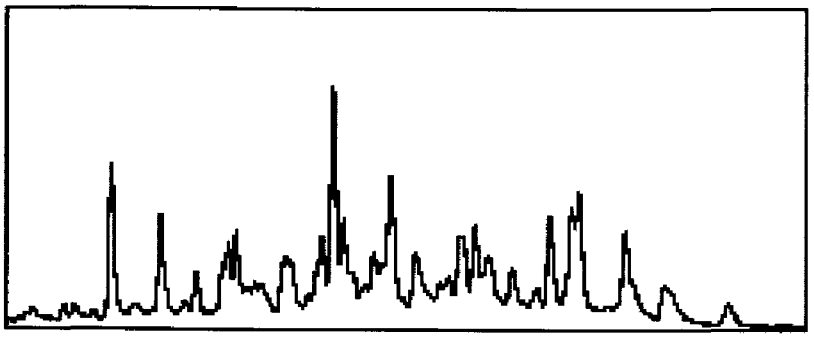
TERPANES(m/z 191)



GCMS Para 2

Organic Matter Parameters:	
C27/C29 Sterane:	0.70
%27:	39.47
%28:	24.39
%29:	42.29
Sterane/Hopane:	0.15
Maturity Parameters:	
Pr/C17:	1.02
Ph/C18:	0.61
22S/(S+R) Terpanes:	0.59
22S/(S+R) Steranes:	0.54
Ts/Tm:	0.78
20S/(S+R):	0.00
Ts/Tri:	0.67
MPI:	0.74
Age Parameters:	
Oleanane/C30Hop:	
Bicadinane:	
Other Parameters:	
3-MBI:	0.00
Methylhopane:	

STERANES(m/z 217)



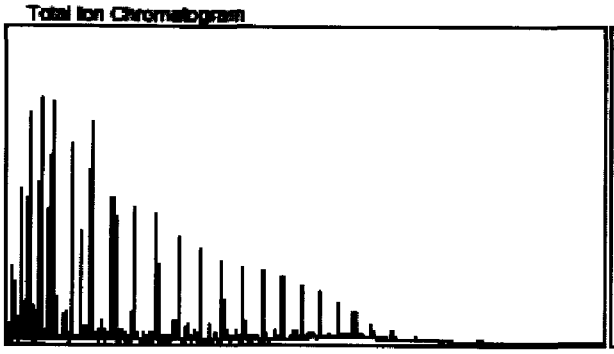
Summary Report

Country: Norway
Age:
Form Name: kobbe

Site Name:7122/7-3 (GOLIAT 3)
Basin:
Oil NL: 3917

Sample_ID: 21783-OIL-0002
Depth: 1812(M)
S_Type: OIL

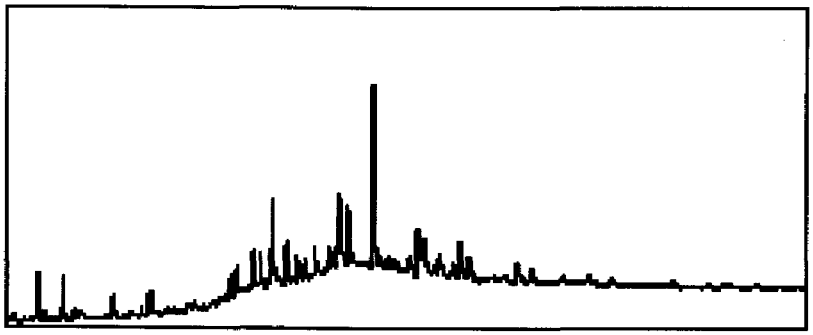
Total Ion Chromatogram



Bulk Parameters	
API Gravity:	
% Sulfur:	
delt C13 Whole Crude:	
delt C13 Saturates:	
delt C13 Aromatics:	-30.6
% Saturates:	
% Aromatics:	
% NSO/HC PO:	
OEP:	1.00

GCMS Para 1	
Pr/Ph:	1.83
Tri:	0.28
Tet:	0.08
Tri:	4.40
Ts/Tm:	2.02
C29Hop/C30Hop:	0.41
C35/Lo:	
C29Ts/C30Hop:	0.38
C29/C30Hop:	0.56
Gam/C30:	
Dia:	0.71

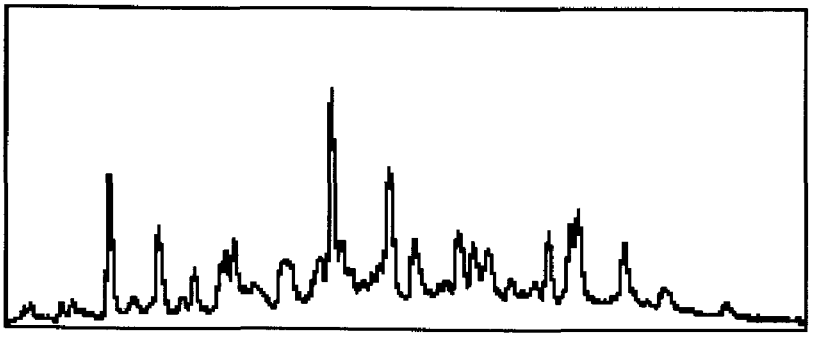
TERPANES(m/z 191)



GCMS Para 2

Organic Matter Parameters:	
C27/C29 Sterane:	0.74
%27:	32.91
%28:	22.68
%29:	44.89
Steran/Hopane:	0.17
Maturity Parameters:	
Pr/C17:	1.27
Ph/C18:	0.69
5/6+R Terpanes:	0.55
5/6+R Steranes:	0.53
Ts/Tm:	2.02
22/22+:	0.60
T/Tet:	0.80
MPI:	0.97
Age Parameters:	
Oleanane/C30Hop:	
Bacteria:	
Other Parameters:	
34S0:	0.45
Methylhopane:	

STERANES(m/z 217)



7. Annex 4 – Gas Show and Head Space analysis

Eni GROUP

CHEMICAL ANALYSIS OF MINI HEAD SPACE

WELL

Norvegia - 7122/7-3

Depth (m)	C1 %	C2 %	C3 %	i-C4 %	n-C4 %	i-C5 %	n-C5 %	C6+ %	%CH_4 Vol. tot.	ppb	i/n C4
550	100								0.060	198	
600	69.65	6.18	2.91	5.21	3.08	5.06	1.75	6.16	0.430	1470	1.69
650	91.31	3.35	0.41	0.74	3.13	0.92	0.14		0.200	592	0.24
700	46.87	14.49	6.18	8.15	8.54	9.43	6.34		0.290	1115	0.95
750	44.03	13.43	14.58	8.20	9.21	7.02	3.53		0.320	909	0.89
800	39.51	16.04	12.60	8.90	10.93	7.76	4.26		0.280	810	0.81
850	68.23	12.70	8.38	3.57	3.66	2.54	0.92		0.270	618	0.98
920	45.64	18.01	14.92	7.71	7.15	4.70	1.87		0.310	878	1.08
950	71.91	11.00	7.67	3.16	3.23	1.99	1.04		0.710	1399	0.98
1000	63.07	15.79	9.31	3.73	4.07	2.60	1.43		0.290	820	0.92
1050	56.68	26.12	12.79	1.99	1.85	0.41	0.16		4.720	10805	1.08
1080	74.11	19.43	3.43	1.36	0.97	0.46	0.24		12.290	17215	1.40
1120	68.57	24.48	3.49	1.52	1.12	0.54	0.28		2.760	7844	1.36
1155	65.14	26.76	1.44	3.98	0.65	1.70	0.33		1.530	2361	6.12
1205	54.15	31.27	2.99	6.95	1.52	2.66	0.46		0.530	949	4.57
1255	40.45	10.39	13.81	6.86	14.89	7.16	6.44		1.070	2085	0.46
1305	59.35	13.41	8.48	3.84	7.38	4.16	3.38		0.390	556	0.52
1355	80.39	11.14	3.36	1.31	2.09	1.01	0.70		3.020	5214	0.63
1405	57.42	7.15	9.37	5.44	9.98	6.73	3.91		0.100	301	0.55
1455	63.66	12.97	7.29	3.36	5.51	4.22	2.99		0.470	1370	0.61
1510	45.11	12.98	15.25	7.66	11.78	4.47	2.75		0.240	709	0.65
1555	36.21	14.84	16.50	9.66	15.18	4.91	2.70		0.230	536	0.64
1605	53.15	14.82	15.95	5.90	8.08	1.52	0.58		0.650	1629	0.73
1655	72.77	8.34	8.75	2.85	5.21	1.21	0.87		0.590	1052	0.55
1705	72.93	8.60	10.00	2.25	4.86	0.66	0.70		0.240	599	0.46
1755	65.92	14.02	13.56	1.79	3.82	0.36	0.53		0.840	2114	0.47
1815	13.86	5.61	16.43	8.32	14.60	8.74	7.31	25.04	0.230	376	0.57
1855	17.67	11.40	23.70	7.94	14.64	6.79	4.84	13.02	0.580	1583	0.54
1905	19.47	9.38	20.41	6.86	12.35	6.78	5.29	19.46	0.340	781	0.56
1955	36.76	15.19	21.44	4.97	8.44	3.17	2.26	7.77	0.290	542	0.59
2005	58.05	17.67	16.29	2.70	3.30	0.94	0.38	0.67	1.450	2382	0.82
2055	56.43	9.15	13.53	4.32	7.84	3.15	2.57	3.01	0.610	1288	0.55
2105	35.40	9.51	20.16	6.75	12.94	5.63	4.49	5.12	0.280	656	0.52
2160	73.46	5.37	5.73	2.37	4.73	2.35	1.89	4.10	0.200	501	0.50
2205	81.38	4.02	3.37	1.69	3.15	2.02	1.73	2.64	0.310	556	0.54
2260	77.88	9.13	5.68	1.60	3.04	0.83	0.78	1.06	0.390	540	0.53
2310	69.54	9.87	7.11	2.22	4.32	1.90	2.41	2.63	0.360	754	0.51
2355	52.37	9.93	10.32	4.23	8.28	4.16	5.63	5.08	0.130	277	0.51
2405	54.02	16.41	13.73	3.84	6.50	1.93	1.68	1.89	0.160	372	0.59
2455	52.90	3.84	8.08	5.98	10.64	6.51	5.56	6.49	0.080	147	0.56
2515	25.02	8.38	18.34	8.71	15.73	7.72	7.05	9.05	0.040	66	0.55
2605	43.62	15.81	18.16	5.22	8.68	3.24	2.95	2.32	0.360	898	0.60
2655	76.37	9.47	6.58	1.41	2.85	1.05	0.84	1.43	0.370	1347	0.49
2705	56.31	12.61	10.70	2.08	5.34	2.45	1.99	8.52	0.040	62	0.39

Eni
GROUP

ISOTOPIC ANALYSIS OF MINI HEAD SPACE

WELL

Norway - 7122/7-3 (Goliat 3)

Depth (m)	$\delta^{13}C$ C1	$\delta^{13}C$ C2	$\delta^{13}C$ C3	$\delta^{13}C$ i-C4	$\delta^{13}C$ n-C4	$\delta^{13}C$ i-C5	$\delta^{13}C$ n-C5	$\delta^{13}C$ CO2
1080	-46.58	-32.21	-30.01	-29.12	-29.72	-29.58	-29.02	-43.09
1120	-45.02	-32.00	-28.80	-27.43	-28.89	-28.14	-28.63	-49.87
1155	-46.34	-32.39	-17.82	-26.00	-21.61	-27.84	-27.42	-39.52
1205	-46.13	-31.07	-17.31	-24.16	-22.75	-26.32	-24.47	-38.67
1255	-47.72	-32.20	-31.31	-30.74	-32.57	-30.72		-39.85
1355	-45.01	-29.12	-28.91	-28.93	-29.67	-28.76		-35.03
1455	-47.43	-32.18	-29.34	-29.20	-28.85	-29.75	-29.57	-47.29
1605	-46.52	-33.11	-29.48	-28.96	-28.23	-28.41	-26.89	-46.92
1705	-45.07	-31.15	-29.95	-27.10	-29.23			-39.49
1755	-44.84	-32.55	-29.75	-29.68	-28.89			
1815	-38.74	-30.93	-29.10	-29.68	-28.68	-28.74	-27.60	
1855	-42.57	-33.03	-30.94	-31.20	-29.91	-29.50	-27.95	
1905	-42.11	-33.66	-30.84	-32.05	-28.52	-30.21	-26.51	
1955	-42.72	-32.92	-29.49	-30.46	-30.04	-30.88	-31.35	-13.20
2005	-40.19	-32.79	-30.34	-31.38	-28.62	-30.95	-29.11	-36.28
2055	-40.28	-31.12	-28.17	-28.60	-26.45	-27.52	-25.87	-32.65
2105	-40.71	-31.52	-29.06	-29.34	-27.83	-28.49	-27.88	-26.49
2260	-38.95	-29.47	-25.29	-25.67	-24.69			-31.52
2405	-32.24	-27.03	-23.97	-25.24	-24.69			-37.48
2605	-32.83	-30.28	-26.68	-26.21	-25.25	-26.49	-26.24	
2705	-34.05	-27.63	-25.74					-9.45

n.d. = not determinable
n.m. = not measured

Eni
GROUP

CHEMICAL ANALYSIS OF GAS SHOW

WELL

Norway - 7122/7-3 (Goliat 3)

Depth (m)	C1 %	C2 %	C3 %	i-C4 %	n-C4 %	i-C5 %	n-C5 %	C6+ %	C1 vs. tot. Gas	i/n C4
524	98.20	1.41	0.16	0.17	0.06				1.45	2.83
565	100.00								0.90	
707	94.94	3.84	0.45	0.35	0.20	0.15	0.07		1.40	1.75
960	94.93	3.54	0.85	0.22	0.20	0.10	0.05	0.11	3.17	1.10
1069	88.16	6.89	3.13	0.49	0.85	0.22	0.16	0.10	1.76	0.58
1074	93.71	4.26	1.19	0.24	0.36	0.10	0.07	0.07	6.33	0.67
1082	94.21	3.83	1.03	0.27	0.39	0.13	0.08	0.06	4.67	0.69
1098	96.96	2.55	0.16	0.12	0.12	0.07	0.02		2.24	1.00
1104	97.67	2.14	0.06	0.05	0.03	0.02	0.03		9.39	1.67
1110	97.22	2.49	0.08	0.08	0.04	0.03	0.02	0.04	6.59	2.00
1156	95.32	4.10	0.12	0.23	0.05	0.07	0.03	0.08	4.91	4.60
1183	93.38	5.18	0.25	0.42	0.12	0.22	0.05	0.38	3.96	3.50
1187	93.46	5.48	0.22	0.45	0.11	0.23	0.05		7.00	4.09
1196	93.95	5.25	0.13	0.22	0.04	0.10	0.02	0.29	4.90	5.50
1197	94.16	4.66	0.16	0.34	0.08	0.22	0.07	0.31	2.58	4.25
1255	93.80	4.42	0.44	0.36	0.23	0.18	0.08	0.49	2.00	1.57
1808	73.20	7.68	8.59	2.28	3.70	1.57	1.13	1.85	0.55	0.62
1825	71.45	7.53	8.66	2.68	4.46	2.04	1.49	1.69	0.88	0.60
1840	66.27	8.60	10.27	3.15	5.33	2.58	1.94	1.86	0.47	0.59
1858	66.92	8.34	10.04	3.10	5.10	2.37	1.78	2.35	1.88	0.61
1867	69.43	7.77	9.32	2.86	4.77	2.24	1.68	1.93	3.77	0.60
2052	88.51	4.62	2.82	0.62	1.08	0.47	0.33	1.55	1.10	0.57

Eni
GROUP

ISOTOPIC ANALYSIS OF GAS FROM VACUTAINER

WELL

Norway - 7122/7-3 (Goliat 3)

Depth (m)	$\delta^{13}C$ C1	$\delta^{13}C$ C2	$\delta^{13}C$ C3	$\delta^{13}C$ i-C4	$\delta^{13}C$ n-C4	$\delta^{13}C$ i-C5	$\delta^{13}C$ n-C5	$\delta^{13}C$ CO2
524	-46.94	-31.51						-15.47
960	-45.33	-32.42						-21.01
1074	-45.94	-31.99	-29.77	-28.97	-28.59			
1098	-44.63	-30.52	-31.13	-29.32	-30.39			
1104	-45.98	-31.53						
1110	-44.40	-31.28						
1187	-44.72	-30.89		-25.60				
1255	-42.99	-29.32	-24.97					
1808	-43.16	-32.07	-30.26	-30.21	-30.30	-28.91	-29.93	
1840		-22.50	-25.30	-27.67	-27.71	-28.63	-29.86	-15.17
1867	-44.35	-33.21	-31.15	-30.50	-30.76	-29.84	-29.39	

n.d. = not determinable
n.m. = not misured