MUD VOLUME DISTRIBUTION SUMMARY

Well: 6407/9-8 Rig: West Vanguard

WATER BASED MUD

Hole Size inches	Hole to. Meters	Hole length. Meters	Mud built m^3	Received m^3	Surface losses m^3	Sub losses m^3	Cuttings volume drilled m^3	Mud trans to next section m^3	Mud type used for interval
9 7/8"	1117	865	610	-	298	-	43	312	Seaw/Bent.
36"	311	59	89	-	95	-	36	306	Seaw/Bent.
26"	1120	809	216	-	427	-	237	95	Seaw/Bent.
17 1/2"	1582	462	444	-	494	45	72	0	Polym/Gyps
12 1/4"	2126	544	552	-	484	68	41	0	KCl/Polym.

Totals:

Mud from previous well	0	m^3
Mud built	2006	m^3
Mud received	0	m^3
Mud backloaded	0	m^3
Mud surface loss		m^3
Mud sub loss	113	m^3
Mud other loss	1893	m^3

Total Mud to sea	2006	m^3
Total cuttings volume drilled	429	m^3

* Left over to be used on workovers/backloaded

volnew

A/S NORSKE SHELL - DRAUGEN

WEST VANGUARD - 6407/9-8

INVENTORY SECTION-1 QA NO. : 367

PRODUCT	UNIT SIZE	UNIT COST	START STOCK	USED	REC'D	BACK LOAD	END STOCK	SECTION COST NOK
BARITE	MT	764.00	0	75	300	0	225	57300.00
BENTONITE WYOMING	MT	1880.00	0	60	100	0	40	112800.00
CEPAC REG	25 KG	758.00	0	18	80	0	62	13644.00
CEPAC LV	25 KG	758.00	0	30	120	0	90	22740.00
IDCIDE L	25 KG	555.00	0	3	32	0	29	1665.00
GYPSUM	25 KG	39.00	0	48	48	0	0	1872.00
GYPSUM BULK	MT	1560.00	0	0	4	0	4	0.00
IDVIS POLYMER	25 KG	1724.00	0	0	40	0	40	0.00
LIME	20 KG	38.00	0	21	240	0	219	798.00
MICA (F/M/C)	25 KG	97.00	0	0	160	0	160	0.00
NUTSHELL (F/M/C)	25 KG	95.00	0	0	180	0	180	0.00
SODA ASH	25 KG	67.00	0	17	102	0	85	1139.00

SECTION TOTAL = NOK 211958.00

A/S NORSKE SHELL - DRAUGEN

WEST VANGUARD - 6407/9-8

INVENTORY SECTION-2 QA NO. : 36

PRODUCT	UNIT SIZE	UNIT COST	START STOCK	USED	REC'D	BACK LOAD	END STOCK	SECTION COST NOK
BARITE	MT	764.00	225				225	0.00
BENTONITE WYOMING	MT	1880.00	40	7	0	0	33	13160.00
CEPAC REG	25 KG	758.00	62	0	80	0	142	0.00
CEPAC LV	25 KG	758.00	90	0	160	0	250	0.00
IDCIDE L	25 KG	555.00	29				29	0.00
GYPSUM BULK	MT	1560.00	4	0	2	0	6	0.00
IDVIS POLYMER	25 KG	1724.00	40	0	40	0	80	0.00
LIME	20 KG	38.00	219	6	0	0	213	228.00
MICA (F/M/C)	25 KG	97.00	160				160	0.00
NUTSHELL (F/M/C)	25 KG	95.00	180				180	0.00
SODA ASH	25 KG	67.00	85	2	0	0	83	134.00

SECTION TOTAL = NOK 13522.00

A/S NORSKE SHELL - DRAUGEN

WEST VANGUARD - 6407/9-8

INVENTORY SECTION-3 QA NO. : 36

PRODUCT	UNIT SIZE	UNIT COST	START STOCK	USED	REC'D	BACK LOAD	END STOCK	SECTION COST NOK
BARITE	MT	764.00	225	0	140	0	365	0.00
BENTONITE WYOMING	MT	1880.00	33	7	0	0	26	13160.00
CEPAC REG	25 KG	758.00	142				142	0.00
CEPAC LV	25 KG	758.00	250				250	0.00
IDCIDE L	25 KG	555.00	29				29	0.00
GYPSUM BULK	MT	1560.00	6				6	0.00
IDVIS POLYMER	25 KG	1724.00	80				80	0.00
LIME	20 KG	38.00	213	19	0	0	194	722.00
MICA (F/M/C)	25 KG	97.00	160				160	0.00
NUTSHELL (F/M/C)	25 KG	95.00	180				180	0.00
SODA ASH	25 KG	67.00	83	1	0	0	82	67.00

SECTION TOTAL = NOK 13949.00

A/S NORSKE SHELL - DRAUGEN

WEST VANGUARD - 6407/9-8

INVENTORY SECTION-4 QA NO. : 36

PRODUCT	UNIT SIZE	UNIT COST	START STOCK	USED	REC'D	BACK LOAD	END STOCK	SECTION COST NOK
BARITE	MT	764.00	365	241	87	0	211	184124.00
BENTONITE WYOMING	MT	1880.00	26				26	0.00
WATER	M3	0.00	0	147	147	0	0	0.00
CEPAC REG	25 KG	758.00	142	45	0	80	17	34110.00
CEPAC LV	25 KG	758.00	250	295	320	160	115	223610.00
IDCIDE L	25 KG	555.00	29	11	32	0	50	6105.00
GYPSUM BULK	MT	1560.00	6	9	10	6	1	14040.00
IDVIS POLYMER	25 KG	1724.00	80	4	0	0	76	6896.00
IDFLO	25 KG	260.20	0	0	300	0	300	0.00
LIME	20 KG	38.00	194	6	0	0	188	228.00
MICA (F/M/C)	25 KG	97.00	160				160	0.00
NUTSHELL (F/M/C)	25 KG	95.00	180	15	0	0	165	1425.00
KCL BULK	BB	2051.00	0	0	21	0	21	0.00
SODA ASH	25 KG	67.00	82				82	0.00
LIQUID CASING	25 LB	584.00	0	0	486	0	486	0.00
CAL.CARBONATE BULK	MT	1505.20	0	0	116	0	116	0.00

SECTION TOTAL = NOK 470538.00

A/S NORSKE SHELL - DRAUGEN

WEST VANGUARD - 6407/9-8

INVENTORY SECTION-5 QA NO. : 36

PRODUCT	UNIT SIZE	UNIT COST	START STOCK	USED	REC'D	BACK LOAD	END STOCK	SECTION COST NOK
BARITE	MT	764.00	211	0	0	133	78	0.00
BENTONITE WYOMING	MT	1880.00	26				26	0.00
WATER	M3	0.00	0	386	386	0	0	0.00
CEPAC REG	25 KG	758.00	17	0	0	17	0	0.00
CEPAC LV	25 KG	758.00	115	0	0	115	0	0.00
BENTONITE WYOMING	25 KG	58.75	0	12	12	0	0	705.00
IDCIDE L	25 KG	555.00	50	16	0	0	34	8880.00
GYPSUM BULK	MT	1560.00	1	0	0	1	0	0.00
IDVIS POLYMER	25 KG	1724.00	76	90	40	0	26	155160.00
IDFLO	25 KG	260.20	300	566	266	0	0	147273.20
LIME	20 KG	38.00	188	57	0	60	71	2166.00
MICA (F/M/C)	25 KG	97.00	160	0	0	80	80	0.00
NUTSHELL (F/M/C)	25 KG	95.00	165	0	0	120	45	0.00
KCL BULK	BB	2051.00	21	29	19	4	7	59479.00
SODA ASH	25 KG	67.00	82	28	0	0	54	1876.00
LIQUID CASING	25 LB	584.00	486	382	228	258	74	223088.00
CAL.CARBONATE BULK	MT	1505.20	116	112	44	40	8	168582.40
NACL BULK		1538.00	0	0	40	0	40	0.00
IDFILM 220X	200 LT	4937.85	0	0	4	0	4	0.00
IDSCAV 110	25 LTR	572.30	0	0	8	0	8	0.00

SECTION TOTAL = NOK 767209.60

A/S NORSKE SHELL - DRAUGEN

WEST VANGUARD - 6407/9-8

INVENTORY WELL TOTALS QA NO. : 367

PRODUCT	UNIT SIZE	UNIT COST	START STOCK	USED	REC'D	BACK LOAD	END STOCK	SECTION COST NOK
BARITE	MT	764.00	0	316	527	133	78	241424.00
BENTONITE WYOMING	MT	1880.00	0	74	100	0	26	139120.00
WATER	M3	0.00	0	533	533	0	0	0.00
CEPAC REG	25 KG	758.00	0	63	160	97	0	47754.00
CEPAC LV	25 KG	758.00	0	325	600	275	0	246350.00
BENTONITE WYOMING	25 KG	58.75	0	12	12	0	0	705.00
IDCIDE L	25 KG	555.00	0	30	64	0	34	16650.00
GYPSUM	25 KG	39.00	0	48	48	0	0	1872.00
GYPSUM BULK	MT	1560.00	0	9	16	7	0	14040.00
IDVIS POLYMER	25 KG	1724.00	0	94	120	0	26	162056.00
IDFLO	25 KG	260.20	0	566	566	0	0	147273.20
LIME	20 KG	38.00	0	109	240	60	71	4142.00
MICA (F/M/C)	25 KG	97.00	0	0	160	80	80	0.00
NUTSHELL (F/M/C)	25 KG	95.00	0	15	180	120	45	1425.00
KCL BULK	BB	2051.00	0	29	40	4	7	59479.00
SODA ASH	25 KG	67.00	0	48	102	0	54	3216.00
LIQUID CASING	25 LB	584.00	0	382	714	258	74	223088.00
CAL.CARBONATE BULK	MT	1505.20	0	112	160	40	8	168582.40
NACL BULK		1538.00	0	0	40	0	40	0.00
IDFILM 220X	200 LT	4937.85	0	0	4	0	4	0.00
IDSCAV 110	25 LTR	572.30	0	0	8	0	8	0.00

WELL TOTAL = NOK 1477176.60

DRILLING FLUID PROPERTIES RECORD | WELL NAME: 6407/9-8 9.88" HOLE | AREA: DRAUGEN

WATER BASED MUD | RIG: WEST VANGUARD | CONTRACTOR: SMEDVIG

A/S NORSKE SHELL | FLUID SYSTEM: | IDF MUD ENGINEERS: JORPELAND/HAYTHORN/LAURITZEN

DAY No.	DATE	DEPTH M	WEIGHT S.G.	TEMP	FV	AV	PV	YP	GELS 10s	GELS 10m	FLUID LOSS API	CAKE HTHP	pH	Pf	Mf	TOT HARD	CA HARD	CL- G/L	OIL %	SOLID %	SAND %	MBT	BAR Kg/M3	BAR % v/v	LGS Kg/M3	LGS % v/v	KCL	REMARKS
1	14/08/92	316	1.01	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	7.9	0.2	5.7	0.2		MWD FAILURE POOH.
2	15/08/92	654	1.01	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	7.9	0.2	5.7	0.2		TRIP, DRLG AHEAD
3	16/08/92	1117	1.01	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	7.9	0.2	5.7	0.2		TD PILOT HOLE @1117M
4	17/08/92	1117	1.01	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	7.9	0.2	5.7	0.2		LOGGING , WIPER TRIP
5	18/08/92	1117	1.01	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	7.9	0.2	5.7	0.2		LOGGING

DRILLING FLUID PROPERTIES RECORD | WELL NAME: 6407/9-8 36.00" HOLE | AREA: DRAUGEN

WATER BASED MUD | RIG: WEST VANGUARD | CONTRACTOR: SMEDVIG

A/S NORSKE SHELL | FLUID SYSTEM: | IDF MUD ENGINEERS:

DAY No.	DATE	DEPTH M	WEIGHT S.G.	TEMP	FV	AV	PV	YP	GELS 10s	GELS 10m	FLUID LOSS API	FLUID LOSS HTHP	CAKE	pH	Pf	Mf	TOT HARD	CA HARD	CL- G/L	OIL %	SOLID %	SAND %	MBT	BAR Kg/M3	BAR % v/v	LGS Kg/M3	LGS % v/v	KCL	REMARKS
6	19/08/92	1117	1.02	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	7.9	0.2	5.7	0.2		TD 36" @ 310M.
7	20/08/92	1117	1.02	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	7.9	0.2	5.7	0.2		LAND & CMT 30" @310M

DRILLING FLUID PROPERTIES RECORD | WELL NAME: 6407/9-8 26.00" HOLE | AREA: DRAUGEN

WATER BASED MUD | RIG: WEST VANGUARD | CONTRACTOR: SMEDVIG

A/S NORSKE SHELL | FLUID SYSTEM: | IDF MUD ENGINEERS:

DAY No.	DATE	DEPTH M	WEIGHT S.G.	TEMP	FV	AV	PV	YP	GELS 10s	GELS 10m	FLUID API	LOSS HTHP	CAKE	pH	Pf	Mf	TOT HARD	CA HARD	CL- G/L	OIL %	SOLID %	SAND %	MBT	BAR Kg/M3	BAR % v/v	LGS Kg/M3	LGS % v/v	KCL	REMARKS
8	21/08/92	1117	1.02	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	7.9	0.2	5.0	0.2		DRILL CMT, DR. AHEAD
9	22/08/92	1117	1.02	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	7.9	0.2	5.0	0.2		DRILL, POOH, DRILL
10	23/08/92	1120	1.02	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	0	0.0	0.0	34.2	0.8	5.0	0.2		DRLG,1120M,ST.,POOH
11	24/08/92	1120	1.02	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	1	0.0	0.0	11.1	0.3	18.0	0.7		POOH,RUN 18 5/8 CSG
12	25/08/92	1120	1.02	10	200	46.0	10	35	38	56	40.0	0.0	0	10.0	0.00	0.00	0	0	0.6	0	1	0.0	0.0	11.1	0.3	18.0	0.7		RUN CSG TO 1112 CMT.

DRILLING FLUID PROPERTIES RECORD | WELL NAME: 6407/9-8 17.50" HOLE | AREA: DRAUGEN

WATER BASED MUD | RIG: WEST VANGUARD | CONTRACTOR: SMEDVIG

A/S NORSKE SHELL | FLUID SYSTEM: | IDF MUD ENGINEERS:

DAY No.	DATE	DEPTH M	WEIGHT S.G.	TEMP	FV	AV	PV	YP	GELS 10s	GELS 10m	FLUID LOSS API	FLUID LOSS HTHP	CAKE	pH	Pf	Mf	TOT HARD	CA HARD	CL- G/L	OIL %	SOLID %	SAND %	MBT	BAR Kg/M3	BAR % v/v	LGS Kg/M3	LGS % v/v	KCL	REMARKS
13	26/08/92	1120	1.4	10	58	49.0	35	13	2	3	3.0	0.0	1	8.9	0.20	0.50	2640	2560	24.0	0	14	0.0	14.3	481.7	11.4	24.8	1.0		RUN RISER,BOP,TEST
14	27/08/92	1129	1.4	10	60	34.0	24	10	2	3	4.0	0.0	1	9.5	0.10	0.60	3200	2400	23.0	0	14	0.0	14.3	480.9	11.4	27.1	1.0	9.3	DRILL CMT, FIT DRILL
15	28/08/92	1398	1.4	27	66	37.0	29	8	2	4	3.7	0.0	1	8.6	0.15	0.55	3360	2200	20.0	0	15	0.1	54.0	436.3	10.4	86.5	3.3	10.6	DRILL/WIPERTRIP.
16	29/08/92	1584	1.4	27	87	45.5	36	9	4	28	3.1	0.0	1	8.2	0.15	0.66	3480	2120	24.0	0	16	0.5	72.0	397.1	9.4	130.3	5.0	10.2	DRILL/WIPERTRIP.
17	30/08/92	1584	1.4	27	84	44.0	34	10	4	26	3.6	0.0	1	8.3	0.12	0.60	3240	2080	24.0	0	16	0.5	68.0	397.1	9.4	130.3	5.0	9.7	TD SECTION/LOGGING
18	31/08/92	1584	1.4	27	82	42.5	32	10	4	22	3.4	0.0	1	8.2	0.14	0.60	3160	2040	23.0	0	16	0.5	65.0	396.3	9.4	132.5	5.1	8.4	RUN CASING 13 3/8
19	01/09/92	1584	1.4	27	82	42.5	32	10	4	22	3.4	0.0	1	8.2	0.14	0.60	3160	2040	23.0	0	16	0.5	65.0	396.3	9.4	132.5	5.1	8.4	RUN CASING 13 3/8

DRILLING FLUID PROPERTIES RECORD | WELL NAME: 6407/9-8 | 12.25" HOLE | AREA: DRAUGEN

WATER BASED MUD | RIG: WEST VANGUARD | CONTRACTOR: SMEDVIG

A/S NORSKE SHELL | FLUID SYSTEM: | IDF MUD ENGINEERS:

DAY No.	DATE	DEPTH M	WEIGHT S.G.	TEMP	FV	AV	PV	YP	GELS 10s	GELS 10m	FLUID API	LOSS HTHP	CAKE	pH	Pf	Mf	TOT HARD	CA HARD	CL- G/L	OIL %	SOLID %	SAND %	MBT	BAR Kg/M3	BAR % v/v	LGS Kg/M3	LGS % v/v	KCL	REMARKS
20	02/09/92	1584	1.4	27	82	42.5	32	10	4	22	3.4	0.0	1	8.2	0.14	0.60	3160	2040	23.0	0	16	0.5	65.0	396.3	9.4	132.5	5.1		BOP,LOG,TRIP
21	03/09/92	1605	1.4	27	82	42.5	32	10	4	22	3.4	0.0	1	8.2	0.14	0.60	3160	2040	23.0	0	16	0.5	65.0	396.3	9.4	132.5	5.1		DRILLING,DISP. MUD
22	04/09/92	1624	1.15	17	41	15.5	9	6	4	8	2.0	0.0	1	8.9	0.14	0.50	1480	680	32.0	0	10	0.5	12.0	149.2	5.0	22.7	0.9		CORE #1,TRIP
23	05/09/92	1650	1.15	18.5	39	15.0	9	6	4	9	2.5	0.0	1	8.5	0.10	0.40	1200	1120	32.0	0	10	0.5	18.0	149.2	5.0	22.7	0.9		CORE,TRIP,CORE.
24	06/09/92	1666	1.15	18	40	15.5	9	6	4	13	2.5	0.0	1	8.8	0.20	0.45	1160	1000	32.5	0	10	0.5	21.0	150.5	5.0	20.6	0.8		TRIP,CORE.
25	07/09/92	1702	1.16	21	40	15.0	9	6	4	13	3.4	0.0	1	8.6	0.10	0.45	1080	1000	33.0	0	11	0.5	24.0	104.1	3.5	87.1	3.3		CORE,TRIP,DRILL.
26	08/09/92	1742	1.16	19	39	14.5	9	5	4	16	3.4	0.0	1	8.3	0.10	0.40	1080	1000	34.0	0	11	0.1	27.0	106.7	3.5	82.9	3.2		DRILL,TRIP,CORE.
27	09/09/92	1800	1.17	22	39	13.5	8	5	3	13	4.3	0.0	1	8.0	0.10	0.50	1080	1000	34.0	0	12	0.1	25.0	129.5	4.3	73.8	2.8		CORE,LOG,TRIP,DRILL
28	10/09/92	1962	1.15	26	37	12.5	7	5	3	11	7.0	0.0	1	8.0	0.10	0.75	1120	1040	33.0	0	10	0.1	25.0	127.2	4.2	44.6	1.7		DRILL AHEAD.
29	11/09/92	2126	1.15	26	38	15.5	9	6	5	14	9.0	0.0	1	8.5	0.10	3.30	1200	1120	36.0	0	11	0.1	25.0	42.6	1.4	132.5	5.1		DRILL TO 2126
30	12/09/92	2126	1.15	26	38	15.5	9	6	5	14	10.0	0.0	1	8.5	0.10	3.30	1200	1120	36.0	0	11	0.1	25.0	42.6	1.4	132.5	5.1		LOGGING
31	13/09/92	2126	1.15	26	38	15.5	9	6	5	14	10.0	0.0	1	8.5	0.10	3.30	1200	1120	36.0	0	11	0.1	25.0	42.6	1.4	132.5	5.1		LOGGING,STUCK RFT.
32	14/09/92	2126	1.15	26	38	15.5	9	6	5	14	9.0	0.0	1	8.5	0.10	3.30	1200	1120	36.0	0	11	0.1	25.0	42.6	1.4	132.5	5.1		FISHING RFT
33	15/09/92	2126	1.15	26	39	19.5	13	6	5	18	6.5	0.0	1	9.3	0.20	2.40	1000	800	33.0	0	11	0.1	25.0	28.9	1.0	152.2	5.8		WIPER TRIP,POOH,LOG
34	16/09/92	2126	1.15	26	38	16.5	10	6	5	13	7.8	0.0	1	9.9	0.20	2.40	1200	880	31.0	0	11	0.1	25.0	23.9	0.8	160.5	6.2		WIPER TRIP,POOH,LOG
35	17/09/92	2126	1.15	26	37	15.0	10	5	4	8	7 8	0.0	1	9.2	0.10	2.10	1200	880	31.0	0	11	0.0	25.0	23.9	0.8	160.5	6.2		WIPER TRIP,POOH,LOG
36	18/09/92	2126	1.15	26	37	15.0	10	5	4	8	6.5	0.0	1	9.2	0.10	2.10	1200	880	31.0	0	11	0.0	25.0	23.9	0.8	160.5	6.2		RUN 9 5/8 CSG

DRILLING FLUID PROPERTIES RECORD

WELL NAME: 6407/9-8 8.68" HOLE

AREA: DRAUGEN

WATER BASED MUD

RIG: WEST VANGUARD

CONTRACTOR: SMEDVIG

A/S NORSKE SHELL

FLUID SYSTEM: 0

IDF MUD ENGINEERS: 0

DAY No.	DATE	DEPTH M	WEIGHT S.G.	TEMP	FV	AV	PV	YP	GELS 10s	GELS 10m	FLUID LOSS API	FLUID LOSS HTHP	CAKE	pH	Pf	Mf	TOT HARD	CA HARD	CL- G/L	OIL %	SOLID %	SAND %	MBT	BAR Kg/M3	BAR % v/v	LGS Kg/M3	LGS % v/v	KCL	REMARKS
37	19/09/92	2126	1.15	26		0.0	0	0	0	0	0.0	0.0	0	0.0	0.00	0.00	0	0	0.0	0	100	0.0	0.0	**********	**********	462.5			SUSPEND WELL
38	20/09/92	2126	1.15	26		0.0	0	0	0	0	0.0	0.0	0	0.0	0.00	0.00	0	0	0.0	0	100	0.0	0.0	**********	**********	462.5			SUSPEND WELL

8 FMT

As mentioned previously, the section of interest has been rather densely sampled with FMT pressures. The initial objective, of proving the fluid distribution and providing pressure information in the various geological zonation would, considering the absence of hydrocarbons, not have required that many pressure points. The reason for the dense sampling was to provide additional permeability information, as an alternative to an expensive production test.

A graph of FMT pressures as a function of depth (figure 8.1) confirms that all points with reliable pressure information fall on a straight line with a gradient of approximately 1.441 psi/m (.0994 bar/m), very close to the theoretical value of Draugen formation water at the prevailing pressure and temperature conditions. The pressure at a datum level of 1900 m tvss is 2784 psia (192 bar).

A number of attempts were made to take water samples at depths of 1731.5 m and 1940 m Some degree of filtrate contamination was noted. The samples will be used for the purpose of geochemical analysis and are not further reported here.

BA-93-204-1
04 FEB. 1993
REGISTRATIE

Januari 1993

RKER 93.002

Geochemical investigation of an extracted core sample well 6407/9-8, Norway

by

J.M.A. Buiskool Toxopeus and F.A.M. de Gier

Sponsor: Shell Risavika Code: 774.106.10

investigation: 8BAS0457

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KONINKLIJKE/SHELL EXPLORATIE EN PRODUKTIE LABORATORIUM
RIJSWIJK, THE NETHERLANDS

(Shell research B.V.)

CONTENTS

Initial distribution:

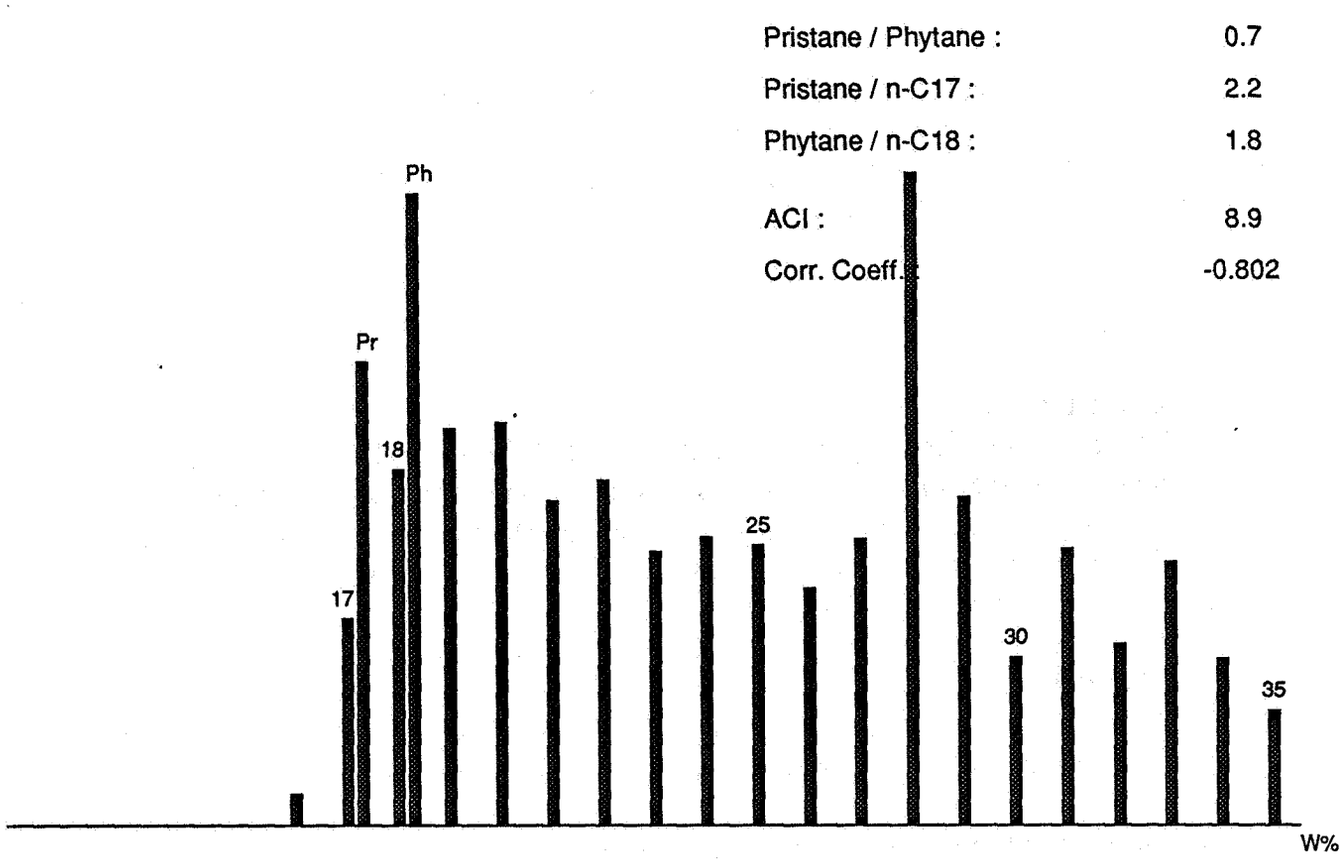
Shell Risavika - 3 copies
SIPM-EPA/2 - 3 copies

Geochemical investigation of an extracted core sample well 6407/9-8, Norway

1.0 Introduction

A geochemical investigation has been carried out on a combined and extracted core sample (1665.45 + 1666.50 m) from well 6407/9-8, Norway (request telex ref. Ris 271013 of 27.10.92).
The geochemical parameters are shown on pages 2 to 6, analysis results are presented on the yellow pages.

Bar diagram of Normal-alkanes & Isoprenoids of the extract from well 6407/09-08 (1665.45 m.), Norway



S16137101

The Light Fraction (< 120 C.) of the extract from well 6407/09-08 (1665.45 m.), Norway

C-7 ALKANES (%)

Normal C-7 :	19
Mono Branched :	47
Poly Branched :	34

C-7 ALKANES / CYCLO ALKANES (%)

Normal C-7 :	6
Cyclo Alkanes :	67
Branched Alkanes :	27

C-7 ALK. / CYCLO ALK. / AROMATICS (%)

Alkanes :	32
Cyclo Alkanes :	66
Aromatics :	2

S16137101

GCMS Sterane typing of the extract from well 6407/09-08 (1665.45 m.), Norway

STERANE DISTRIBUTION	(ppm)	(%)
Iso Steranes :	79	36
Rearranged Steranes :	45	20
Normal Steranes :	96	44
CARBON NUMBER DISTRIBUTION		
C-27 :	70	32
C-28 :	62	28
C-29 :	88	40
C-29 STERANE CONVERSION RATIOS		
20S / 20R + 20S :		0.37
Iso / Iso + Normal :		0.41

S16137101

GCMS Triterpane typing of the extract from well 6407/09-08 (1665.45 m.), Norway

STERANES/TRITERPANES (calculated %)

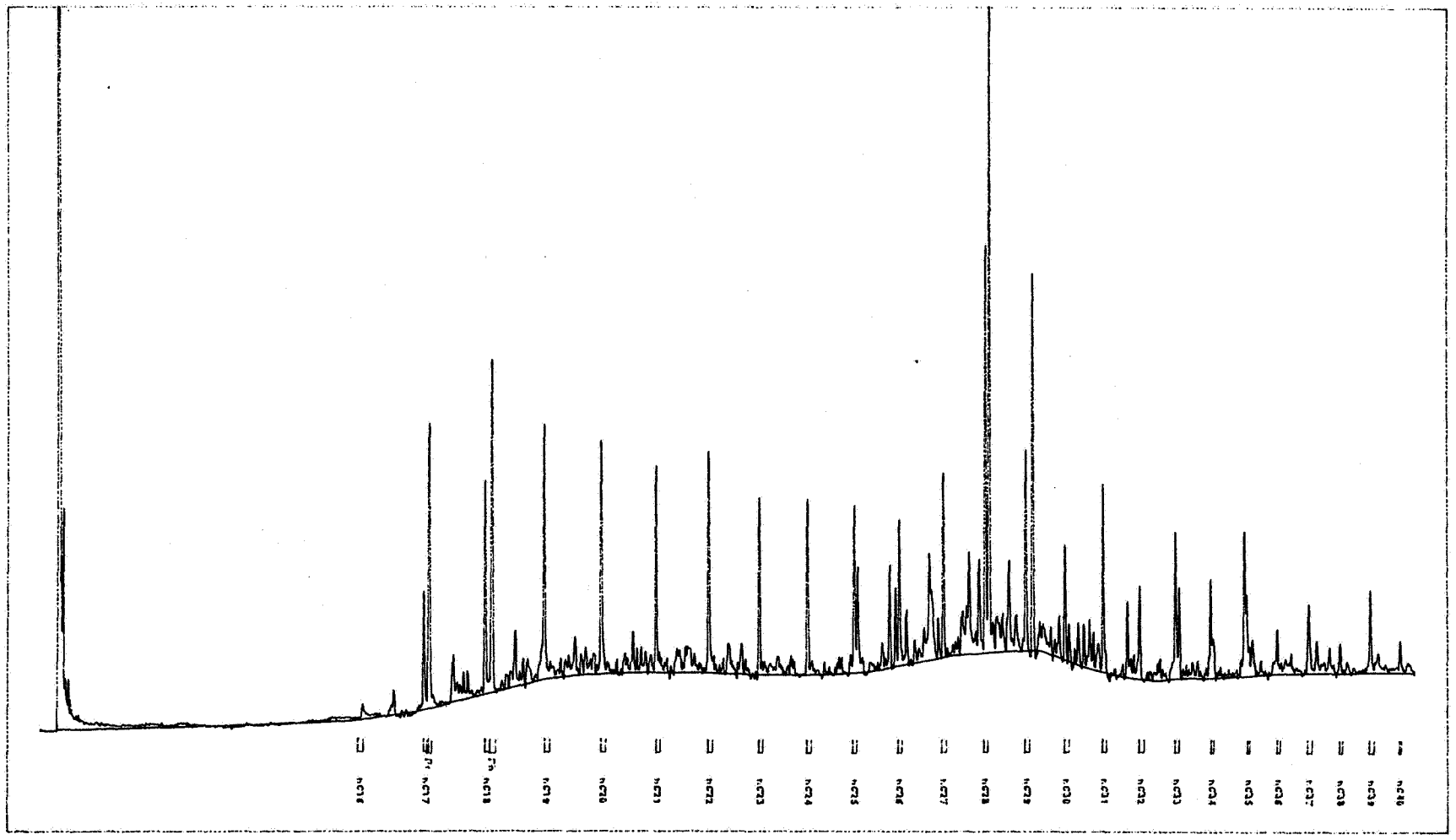
Iso Steranes :	48
Rearranged Steranes :	41
Triterpanes :	11

TRITERPANE CONVERSION RATIOS

TS / TM :	0.72
3R / 3R + 5R :	0.20

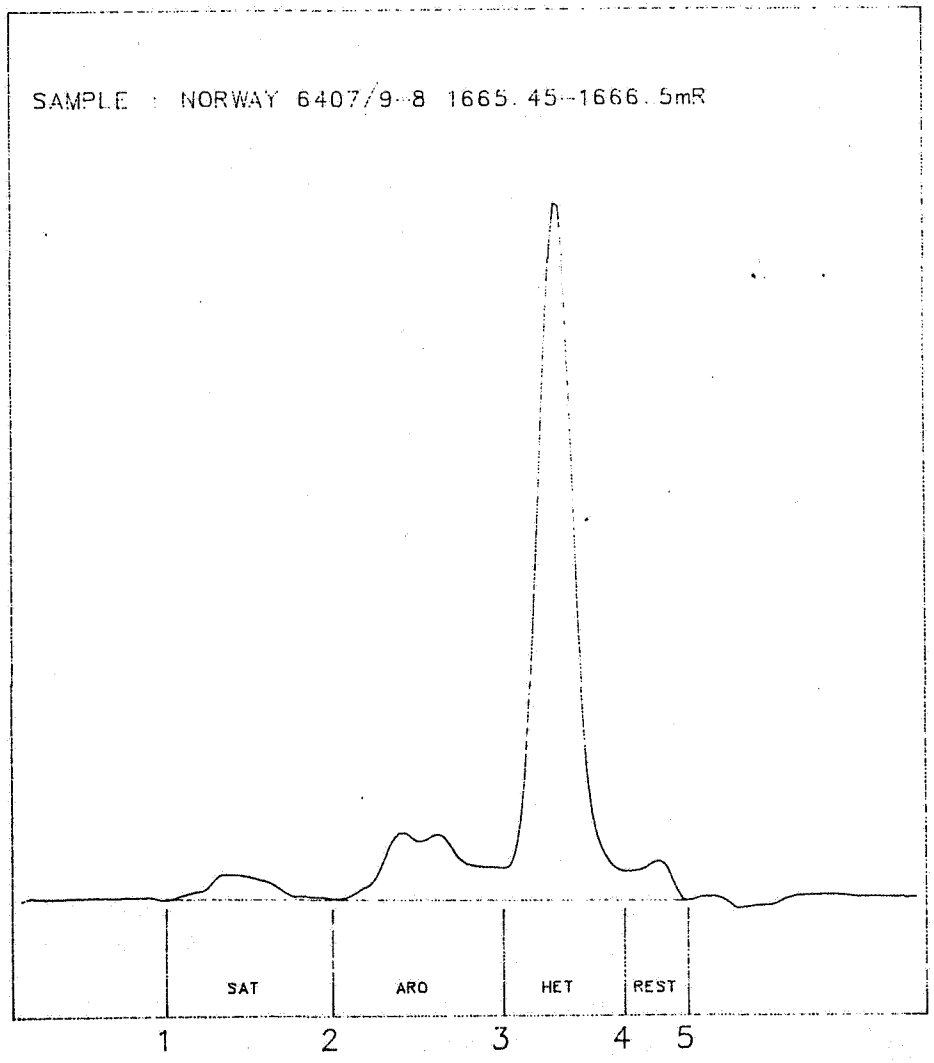
C30 Hopane (ppm) :	22

Gas chromatogram of the saturated hydrocarbons of the extract from well 6407/09-08 (1665.45 m.), Norway



Confidential

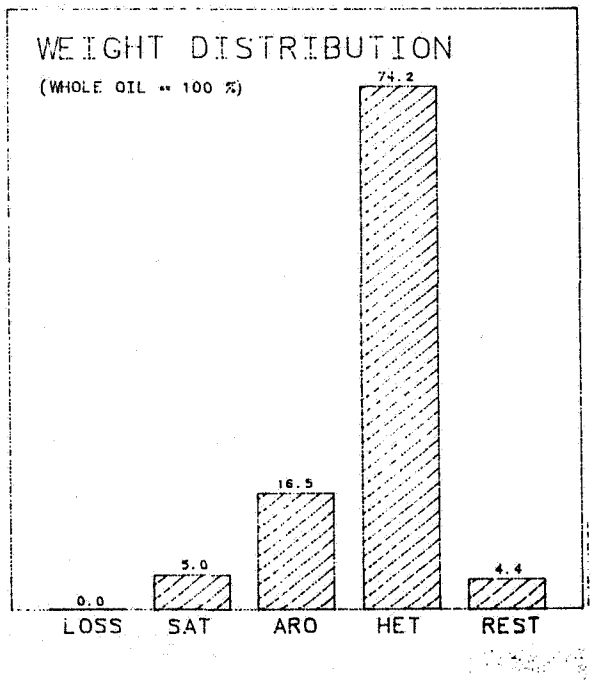
Gross Composition of the extract from well 6407/09-08 (1665.45 m.), Norway



SAMPLE : S161371-1

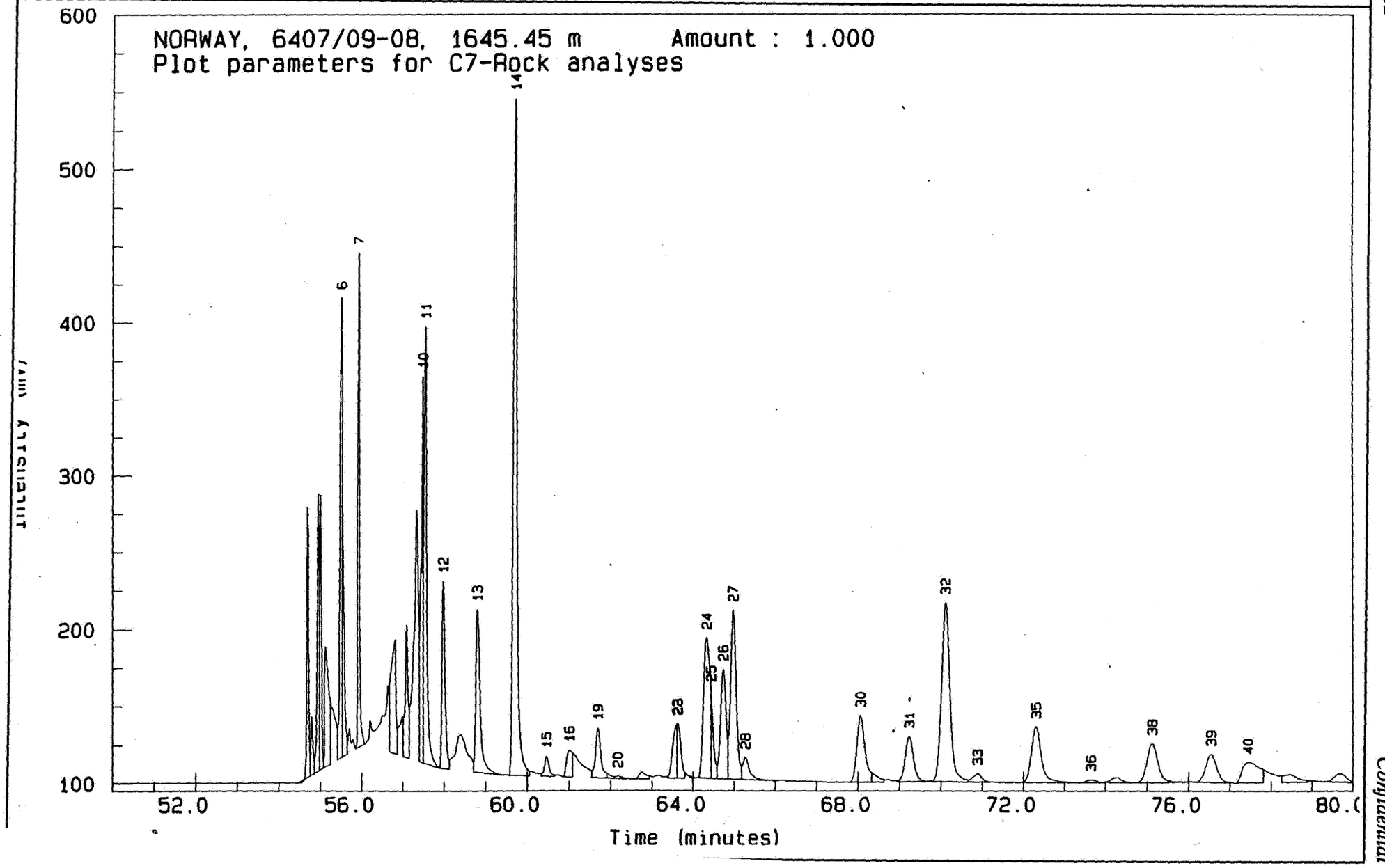
WEIGHT LOST ON TOPPING	:	0.0 %
-- SATURATES	:	5.0 %
-- AROMATICS	:	16.5 %
-- HETEROCOMPOUNDS	:	74.2 %
-- REST (HIGH MOL.)	:	4.4 %

* WEIGHT PERCENTAGES CALCULATED FROM FID RESPONSE



Confidential

Gas chromatogram of the light fraction (< 120 C.) of the extract from well 6407/09-08 (1665.45 m.), Norway



Confidential

Gas chromatographic hydrocarbons analysis (< 120 C.) well 6407/09-08 (1665.45 m.), Norway

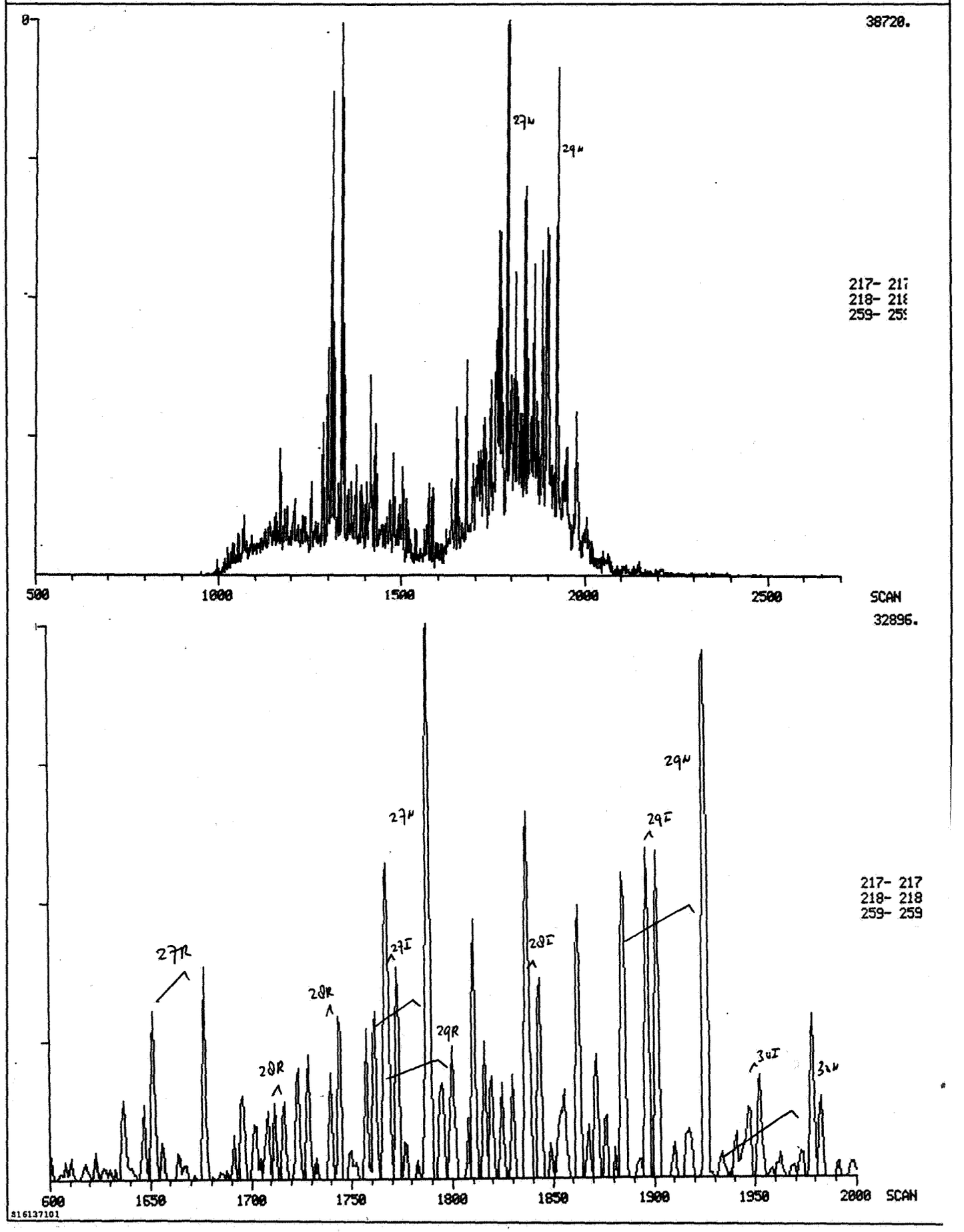
GAS CHROMATOGRAPHICS ANALYSIS OF THE FRACTION BOILING BELOW 120 DEGREES CENTIGRADE

Sample: NORWAY, 6407/09-08, 1645.45 m

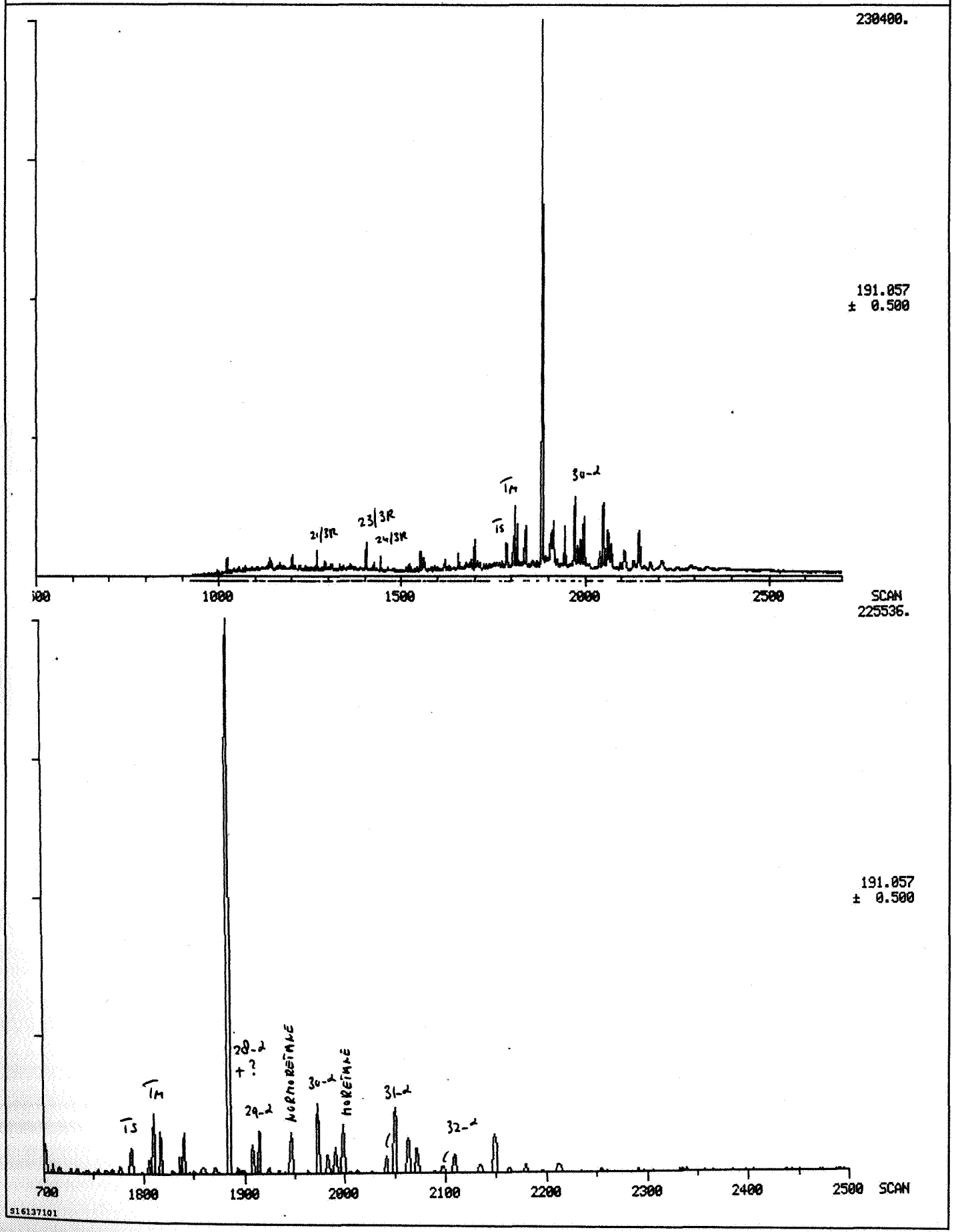
COMPONENT No.	Name	RET.TIME (min)	HEIGHT (uV)	AREA (uVs)
1	methane	0.00	0	0
2	ethane	0.00	0	0
3	propane	0.00	0	0
4	i-butane	0.00	0	0
5	n-butane	0.00	0	0
6	i-pentane	55.51	299736	1012168
7	n-pentane	55.93	322453	534351
8	2.2-dimethylbutane	56.51	20443	1
9	cyclopentane	56.68	44813	26689
10	2.3-dimethylbutane	57.48	250247	730255
11	2-methylpentane	57.55	283120	1036913
12	3-methylpentane	57.98	120723	461068
13	n-hexane	58.81	104833	540987
14	methylcyclopentane	59.71	440007	2684228
15	2.2-dimethylpentane	60.46	12689	46897
16	benzene	61.01	16984	130607
17	2.4-dimethylpentane	61.09	15139	95843
18	2.2.3-trimethylbutane	61.23	10779	60193
19	cyclohexane	61.70	31797	273193
20	3.3-dimethylpentane	62.17	1444	20628
21	1.1-dimethylcylopentane	63.14	2313	32471
22	2-methylhexane	63.62	35690	277511
23	2.3-dimethylpentane	63.63	35812	234836
24	1-c-3-dimethylcyclopentane	64.34	91541	1010513
25	3-methylhexane	64.44	57300	215667
26	1-tr-3-dimethylcyclopentane	64.74	70974	653570
27	1-tr-2-dimethylcyclopentane	64.98	109497	1058393
28	3-ethylpentane	65.27	14207	156854
29	reference peak	0.00	0	0
30	n-heptane	68.07	43228	579058
31	1-c-2-dimethylcyclopentane	69.24	29434	392420
32	methylcyclohexane	70.12	115839	1627868
33	1.1.3-trimethylcyclopentane	70.89	5466	83368
34	2.2-dimethylhexane	71.40	192	225
35	ethylcyclopentane	72.31	36231	618236
36	2.5-dimethylhexane	73.64	2037	32315
37	not present	0.00	0	0
38	2.2.3-trimethylpentane	75.13	25466	448725
39	1-tr-2-c-4-trimethylcyclopentane	76.54	18019	320136
40	toluene	77.44	13406	366130

516137101

Sterane Fragmentograms of the extract from well 6407/09-08 (1665.45 m.), Norway



Triterpane Fragmentograms of the extract from well 6407/09-08 (1665.45 m.), Norway



MACERAL DESCRIPTION OF WELL/OUTCROP
Norway, 6407/09-08

Date : 23-DEC-92

Page : 1

Sample(s)	ORGANIC MATTER																										MINERAL MATTER		
	SOM			VITRINITE						LIPTINITE												INERTINITE							
	LOAD BEARING			NON-L. B.	VIT.-1				VIT.-2								ALGAE												
	DENSE	LAYERS	LENSES	DIFFUSE / INTERGRANULAR	LAYERS / LENSES TELOCOLLINITE	DETRITAL TELOCOLLINITE	LAYERS / LENSES TELINITE	DETRITAL TELINITE	LAYERS / LENSES DESMOCOLLINITE	DETRITAL DESMOCOLLINITE	SPORINITE (MICRO-)	SPORINITE (MEGA-)	CUTINITE	SUBERINITE	RESINITE (+ FLUORINITE)	LIPTODETRINITE	BOTRYOCOCCUS	TASMANITES	OTHER ALGAE	MICROPLANKTON	EXSUDATINITE (FLUORESCING)	EXSUDATINITE (NON-FLUORESING) S.HYDR.	SCLEROTINITE	(SEMI-) FUSINITE (+ INERTODETRINITE)	MICRINITE (+ OXY-MICRINITE)	UNDEFINED MINERALS	FRAMBOIDAL PYRITE	AGGREGATES / CRYSTALS PYRITE
1617.70 m/R		/	/	/						-	-					/		-		/				/	+	*	+	/
1683.50 m/R		+	+	+						-	/					/		-		-				+	/	*	+	/
1713.00 m/C		/	/	/						-	/					/		-		-				/	/	*	/	/
1887.00 m/C		/	/	/			/		+	/	-		-		-	/	-			-				/	/	*	/	+

LEGEND	
*	ABUNDANT
+	COMMON
/	FEW
-	RARE

Fig. a

VISUAL VOLUME PERCENTAGE ESTIMATION

Norway, 6407/09-08

Date : 23-DEC-92

Page : 1

Sample(s)

Sample(s)	ORGANIC MATTER																										MINERAL MATTER		
	SOM				VITRINITE						LIPTINITE												INERTINITE						
	LOAD BEARING			NON-L. B.	VIT.-1				VIT.-2							ALGAE													
	DENSE	LAYERS	LENSES	DIFFUSE / INTERGRANULAR	LAYERS / LENSES TELOCOLLINITE	DETRITAL TELOCOLLINITE	LAYERS / LENSES TELINITE	DETRITAL TELINITE	LAYERS / LENSES DESMOCOLLINITE	DETRITAL DESMOCOLLINITE	SPORINITE (MICRO-)	SPORINITE (MEGA-)	CUTINITE	SUBERINITE	RESINITE (+ FLUORINITE)	LIPTODETRINITE	BOTRYOCOCCUS	TASMANITES	OTHER ALGAE	MICROPLANKTON	EXSUDATINITE (FLUORESCING)	EXSUDATINITE (NON-FLUORESING) S.HYDR.	SCLEROTINITE	(SEMI-) FUSINITE (+ INERTODETRINITE)	MICRINITE (+ OXY-MICRINITE)	UNDEFINED MINERALS	FRAMBOIDAL PYRITE	AGGREGATES / CRYSTALS PYRITE
1617.70 m/R		1	2	2						<1	<1					2		<1		1				1	C	86	3	2
1683.50 m/R		3	3	3						<1	2					2		<1		<1				3	F	80	3	1
1713.00 m/C		2	2	2						<1	1					2		<1		<1				2	F	86	2	1
1887.00 m/C		1	1	1			1		3	1	<1		<1		<1	1	<1			<1				2	F	78	1	10

Fig. b

K. S. E. P. L., LRE/4
G F S - Geochemical Filing System

L i s t i n g o f C o m m e n t l i n e s

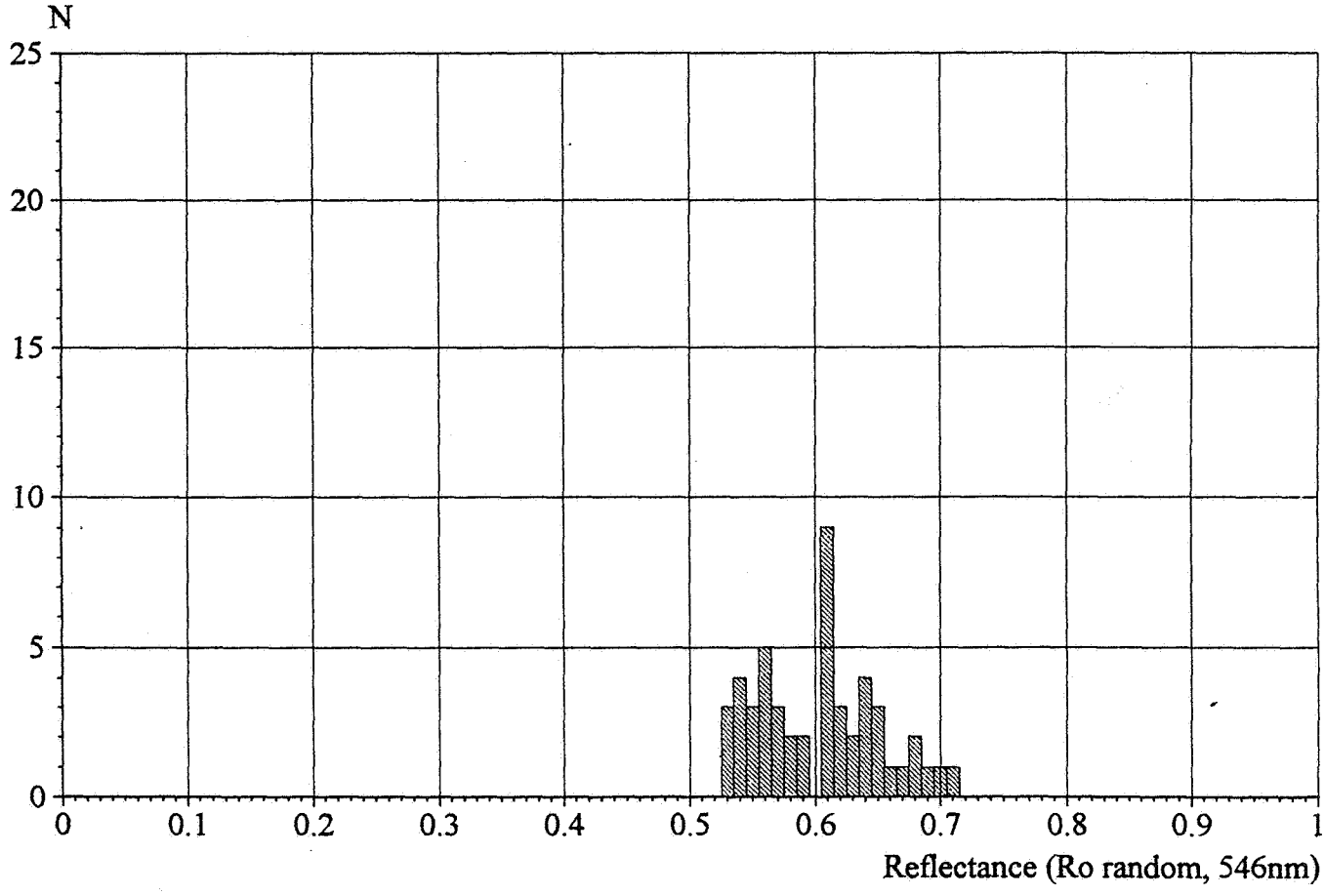
Country : Norway (203)
Well/Outcrop : 6407/09-08 (203/0216)
Order seq.nr. : ALL orders

Depth (m)	Sample Type	Comment
1617.70 (S 161551)	R	SOM partly micrinised Micrinite = oxy-micrinite ? Sample slightly oxidised Moderate Type II source rock Pinkish white-light yellow fluorescence -> immature
1683.50 (S 161553)	R	SOM partly micrinised Micrinite = oxy-micrinite ? Sample slightly oxidised Good Type II/IV source rock White-light yellow fluorescence -> immature
1713.00 (S 161555)	C	SOM partly micrinised Micrinite = oxy-micrinite ? Sample partly oxidised Sample severely oxidised Fossil remains Inhom. sample; Few good Type II/(IV) source rock particles Few plankt. forams; White-(light)yellow fluor.->immature
1887.00 (S 161557)	C	SOM partly micrinised Micrinite = oxy-micrinite ? Sample partly oxidised Inhom. sample; Large pyrite crystals Large Botryocc. algae; Light yellow fluor.-> im/just mature

Reflectance histogram

Country	*Norway*	Sample type	*Cutting*
Well	*6407/09-08*	Sample/Order	*S161557/03*
Depth	*1887*	Analyst	*KMR*
Reference	*Derrick floor*	Date	*17-12-1992*

	Mean	Std	Min	Max	Mode	Measurements
Desmocollinite	*0.6*	*0.05*	*0.53*	*0.71*	*0.61*	*50*



BA-93-690-1

30 MAR 1993

March 1993

RKER 93.015

Geochemical investigation of four source rock samples from well 6407/9-8, Norway

by

J.M.A. Buiskool Toxopeus and F.A.M. de Gier

Sponsor: Shell Risavika Code: 774.106.10

investigation: 8BAS0457

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KONINKLIJKE/SHELL EXPLORATIE EN PRODUKTIE LABORATORIUM
RIJSWIJK, THE NETHERLANDS

(Shell research B.V.)

Geochemical investigation of four source rock samples from well 6407/9-8, Norway

1.0 Introduction

A geochemical investigation has been carried out on the following four source rock extracts from well 6407/9-8, Norway (request telex ref. Ris 261101 of 26.11.92):

- 1617.7 m, core;
- 1683.5 m, core;
- 1713 m, cuttings;
- 1887 m, cuttings.

Analysis of the aromatic hydrocarbons of a previously reported sample from 1665.45-1666.5 m in the same well have been added in this report.
The geochemical parameters are shown on pages 2 to 20, analysis results are presented on the yellow pages.

Correlation table
well 6407/9-8, Norway

	6407/09-08 1617.7 m. S161550/ 2	6407/09-08 1683.5 m. S161552/ 2	6407/09-08 1713 m. S161554/ 2	6407/09-08 1887 m. S161556/ 2	6407/09-08 1665.45 m. S161371/ 1
Pristane/Phytane	no data	not detectable	not detectable	2.4	0.7
Pristane/n-C17	no data	not detectable	not detectable	4.1	2.2
Phytane/n-C18	no data	0.2	not detectable	1.4	1.8
C7 ALKANES:					
normal	42	30	38	35	19
monobranched	42	45	40	37	47
polybranched	16	25	22	28	34
C7 ALKANES/NAPHTHENES:					
normal	11	6	9	9	6
naphthenes	74	81	77	73	67
branched	15	13	14	18	27
STERANES/TRITERPANES:					
iso-steranes	67	41	21	40	48
rearranged steranes	11	37	20	34	41
triterpanes	22	22	59	26	11
STERANE CONVERSION DIAGRAM:					
iso-steranes	50	42	29	42	36
rearranged steranes	6	25	18	24	20
normal steranes	44	33	53	34	44
STERANE CARBON NUMBER:					
C27 steranes	35	52	32	16	32
C28 steranes	29	21	0	28	28
C29 steranes	36	27	68	56	40
3R/3R+5R terpanes	0.00	0.00	0.00	0.05	0.20
Ts/Tm	0.23	0.84	not detectable	not detectable	0.72
20S/20(R+S) C29 steranes	0.22	not detectable	0.65	0.17	0.37
iso/(iso+normal) C29 steranes	0.50	1.00	0.34	0.53	0.41
Carbon isotope ratios (per mil):					
total oil	-31.0	-26.5	-27.1	-26.6	-27.3
saturates	no data	no data	-28.0	-28.6	-28.6
aromatics	-28.4	no data	no data	no data	no data

Summary of the Geochemical Data of the extract from well 6407/09-08 (1617.7 m.), Norway

Gravity and Gross Composition

% Extract :	0.39
% TOC after extract :	6.93
Extract/TOC :	0.06
Gross Composition (W%)	
Saturates :	1
Aromatics :	15
Heterocompounds :	82
Rest (High molecular) :	2
Sulphur (%) :	no data
Vanadium (ppm) :	no data
Nickel (ppm) :	no data

Saturates Distributions

(Gaschromatography)

Pristane / Phytane :	not detectable
Pristane / n-C17 :	not detectable
Phytane / n-C18 :	not detectable
ACI :	not detectable
Corr. Coeff. :	not detectable

C-7 Distributions

(Gaschromatography)

C-7 Alkanes (%)	
Normal C-7 :	42
Mono Branched :	42
Poly Branched :	16
C-7 Alkanes / Cyclo Alkanes (%)	
Normal C-7 :	11
Cyclo Alkanes :	74
Branched Alkanes :	15
C-7 Alk. / Cyclo Alk. / Aromatics (%)	
Alkanes :	22
Cyclo Alkanes :	63
Aromatics :	15

Carbon Isotope Ratios

(Mass Spectrometry)

Total Sample (topped) :	-31.0
Saturates :	no data
Aromatics :	-28.4

Distribution of Ring Compounds

(Field Ionisation Mass Spectrometry)

C-15 Ring Compounds (%)	
1 ring :	no data
2 ring :	
3 ring :	
C-30 Ring Compounds (%)	
3 ring :	no data
4 ring :	
5 ring :	
C-29 VR/E :	no data

Sterane and Triterpane Distributions

(Gaschromatography / Mass Spectrometry)

Steranes/Triterpanes (%)	
Iso Steranes :	67
Rearranged Steranes :	11
Triterpanes :	22
Steranes (%)	
Iso Steranes :	50
Rearranged Steranes :	6
Normal Steranes :	44
Triterpanes (%)	
C-30 Hopanes :	100
Oleanane (α+ β) :	0
W + T :	0
Steranes Carbon No. Dist. (%)	
C-27 :	35
C-28 :	29
C-29 :	36
C-29 Sterane Ratios	
20S / 20R + 20S :	0.22
Iso / Iso + Normal :	0.50
Triterpane Ratios	
TS / TM :	0.23
3R / 3R + 5R :	0.00

S16155002

Summary of the Geochemical Data of the extract from well 6407/09-08 (1683.5 m.), Norway

Gravity and Gross Composition

% Extract :	0.16
% TOC after extract :	6.53
Extract/TOC :	0.02
Gross Composition (W%)	
Saturates :	3
Aromatics :	21
Heterocompounds :	72
Rest (High molecular) :	4
Sulphur (%) :	no data
Vanadium (ppm) :	no data
Nickel (ppm) :	no data

Saturates Distributions
(Gaschromatography)

Pristane / Phytane :	not detectable
Pristane / n-C17 :	not detectable
Phytane / n-C18 :	0.2
ACI :	not detectable
Corr. Coeff. :	not detectable

C-7 Distributions
(Gaschromatography)

C-7 Alkanes (%)	
Normal C-7 :	30
Mono Branched :	45
Poly Branched :	25
C-7 Alkanes / Cyclo Alkanes (%)	
Normal C-7 :	6
Cyclo Alkanes :	81
Branched Alkanes :	13
C-7 Alk. / Cyclo Alk. / Aromatics (%)	
Alkanes :	16
Cyclo Alkanes :	69
Aromatics :	15

Carbon Isotope Ratios
(Mass Spectrometry)

Total Sample (topped) :	-26.5
Saturates :	no data
Aromatics :	no data

Distribution of Ring Compounds
(Field Ionisation Mass Spectrometry)

C-15 Ring Compounds (%)	
1 ring :	no data
2 ring :	
3 ring :	
C-30 Ring Compounds (%)	
3 ring :	no data
4 ring :	
5 ring :	
C-29 VR/E :	no data

Sterane and Triterpane Distributions
(Gaschromatography / Mass Spectrometry)

Steranes/Triterpanes (%)	
Iso Steranes :	41
Rearranged Steranes :	37
Triterpanes :	22
Steranes (%)	
Iso Steranes :	42
Rearranged Steranes :	25
Normal Steranes :	33
Triterpanes (%)	
C-30 Hopanes :	100
Oleanane (α+ β) :	0
W + T :	0
Steranes Carbon No. Dist. (%)	
C-27 :	52
C-28 :	21
C-29 :	27
C-29 Sterane Ratios	
20S / 20R + 20S :	not detectable
Iso / Iso + Normal :	1.00
Triterpane Ratios	
TS / TM :	0.84
3R / 3R + 5R :	0.00

S16155202

Summary of the Geochemical Data of the extract from well 6407/09-08 (1713 m.), Norway

Gravity and Gross Composition

% Extract :	0.08
% TOC after extract :	3.79
Extract/TOC :	0.02
Gross Composition (W%)	
Saturates :	3
Aromatics :	22
Heterocompounds :	73
Rest (High molecular) :	2
Sulphur (%) :	no data
Vanadium (ppm) :	no data
Nickel (ppm) :	no data

Saturates Distributions
(Gaschromatography)

Pristane / Phytane :	not detectable
Pristane / n-C17 :	not detectable
Phytane / n-C18 :	not detectable
ACI :	not detectable
Corr. Coeff. :	not detectable

C-7 Distributions
(Gaschromatography)

C-7 Alkanes (%)	
Normal C-7 :	38
Mono Branched :	40
Poly Branched :	22
C-7 Alkanes / Cyclo Alkanes (%)	
Normal C-7 :	9
Cyclo Alkanes :	77
Branched Alkanes :	14
C-7 Alk. / Cyclo Alk. / Aromatics (%)	
Alkanes :	14
Cyclo Alkanes :	47
Aromatics :	39

Carbon Isotope Ratios
(Mass Spectrometry)

Total Sample (topped) :	-27.1
Saturates :	-28.0
Aromatics :	no data

Distribution of Ring Compounds
(Field Ionisation Mass Spectrometry)

C-15 Ring Compounds (%)	
1 ring :	no data
2 ring :	
3 ring :	
C-30 Ring Compounds (%)	
3 ring :	no data
4 ring :	
5 ring :	
C-29 VR/E :	no data

Sterane and Triterpane Distributions
(Gaschromatography / Mass Spectrometry)

Steranes/Triterpanes (%)	
Iso Steranes :	21
Rearranged Steranes :	20
Triterpanes :	59
Steranes (%)	
Iso Steranes :	29
Rearranged Steranes :	18
Normal Steranes :	53
Triterpanes (%)	
C-30 Hopanes :	100
Oleanane (α+ β) :	0
W + T :	0
Steranes Carbon No. Dist. (%)	
C-27 :	32
C-28 :	0
C-29 :	68
C-29 Sterane Ratios	
20S / 20R + 20S :	0.65
Iso / Iso + Normal :	0.34
Triterpane Ratios	
TS / TM :	not detectable
3R / 3R + 5R :	0.00

S16155402

Summary of the Geochemical Data of the extract from well 6407/09-08 (1887 m.), Norway

Gravity and Gross Composition

% Extract :	0.13
% TOC after extract :	5.82
Extract/TOC :	0.02
Gross Composition (W%)	
Saturates :	3
Aromatics :	29
Heterocompounds :	66
Rest (High molecular) :	2
Sulphur (%) :	no data
Vanadium (ppm) :	no data
Nickel (ppm) :	no data

Saturates Distributions
(Gaschromatography)

Pristane / Phytane :	2.4
Pristane / n-C17 :	4.1
Phytane / n-C18 :	1.4
ACI :	10
Corr. Coeff. :	-0.6465

C-7 Distributions
(Gaschromatography)

C-7 Alkanes (%)	
Normal C-7 :	35
Mono Branched :	37
Poly Branched :	28
C-7 Alkanes / Cyclo Alkanes (%)	
Normal C-7 :	9
Cyclo Alkanes :	73
Branched Alkanes :	18
C-7 Alk. / Cyclo Alk. / Aromatics (%)	
Alkanes :	16
Cyclo Alkanes :	43
Aromatics :	41

Carbon Isotope Ratios
(Mass Spectrometry)

Total Sample (topped) :	-26.6
Saturates :	-28.6
Aromatics :	no data

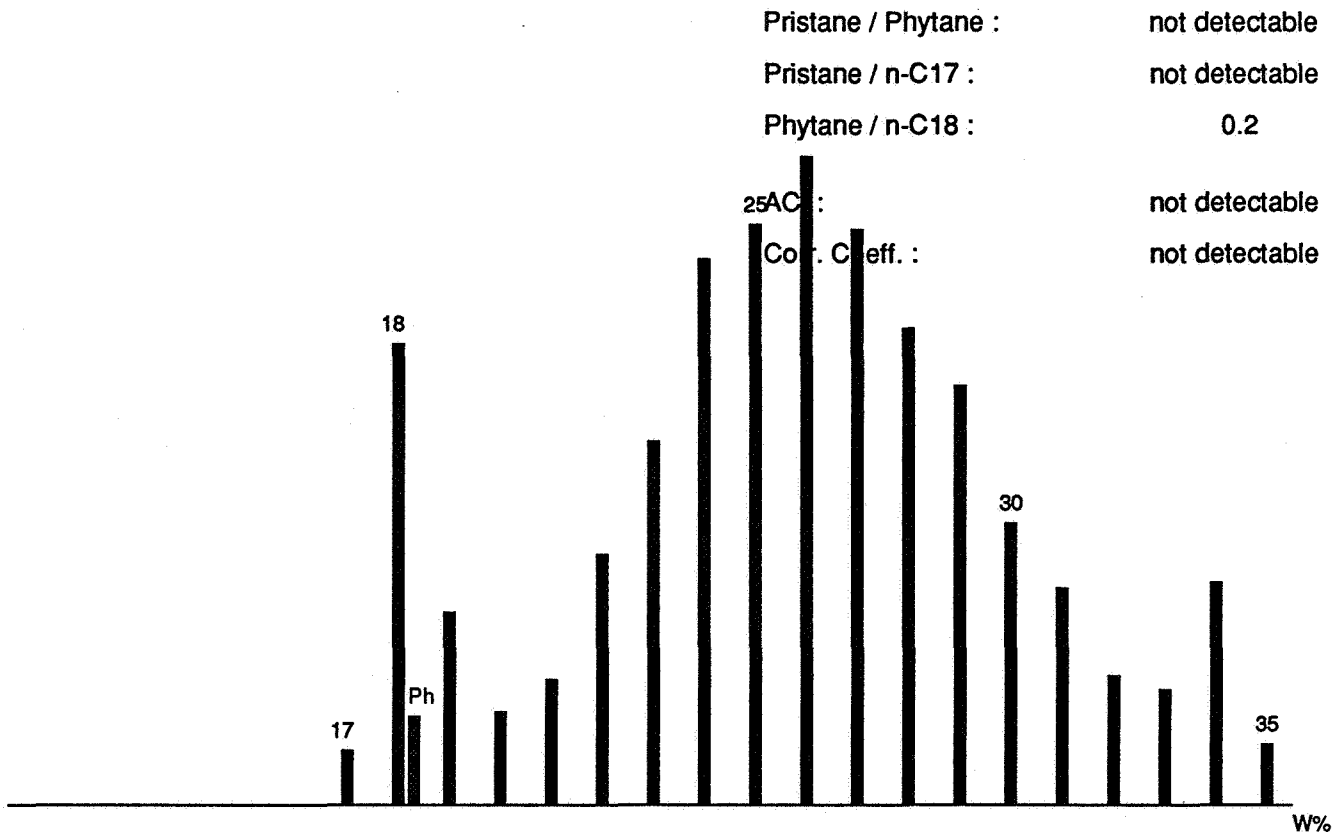
Distribution of Ring Compounds
(Field Ionisation Mass Spectrometry)

C-15 Ring Compounds (%)	
1 ring :	no data
2 ring :	
3 ring :	
C-30 Ring Compounds (%)	
3 ring :	no data
4 ring :	
5 ring :	
C-29 VR/E :	no data

Sterane and Triterpane Distributions
(Gaschromatography / Mass Spectrometry)

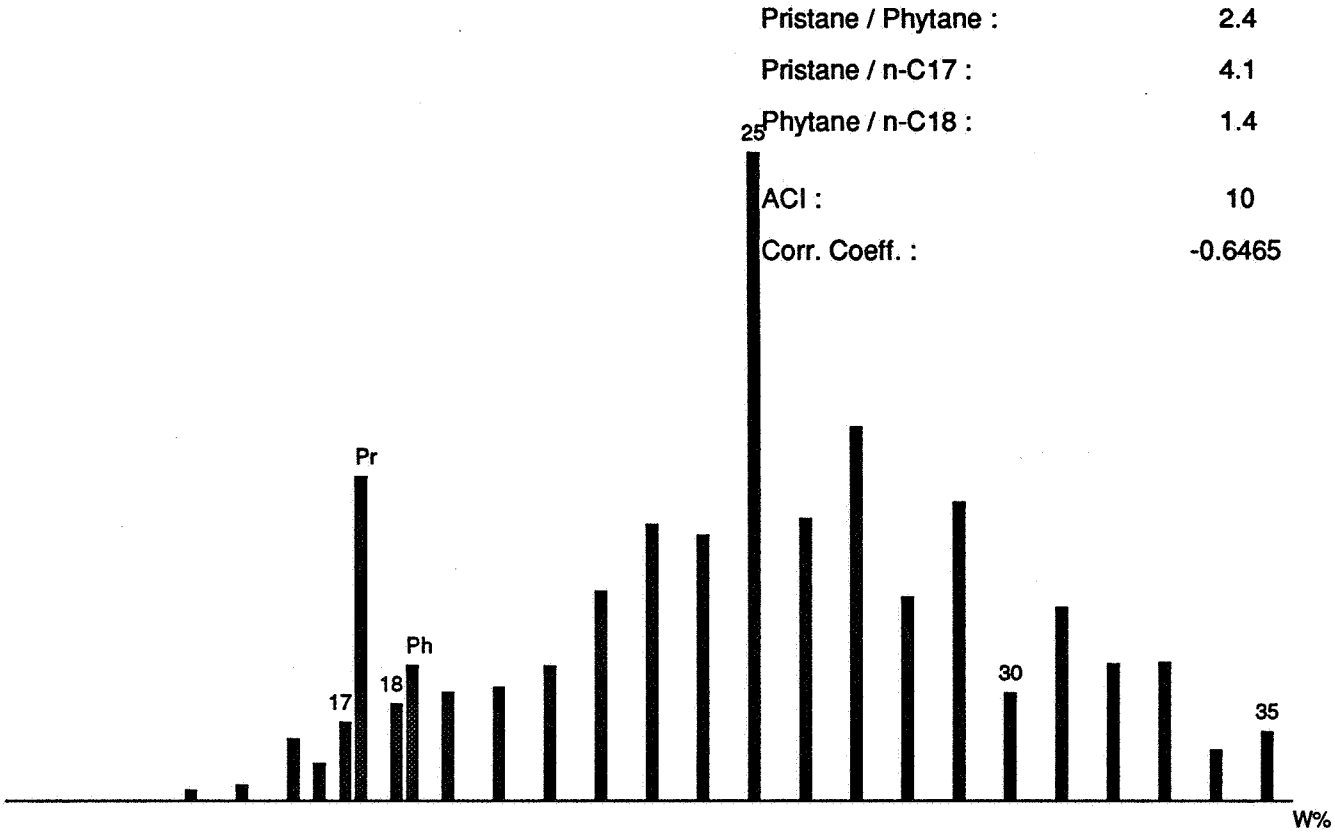
Steranes/Triterpanes (%)	
Iso Steranes :	40
Rearranged Steranes :	34
Triterpanes :	26
Steranes (%)	
Iso Steranes :	42
Rearranged Steranes :	24
Normal Steranes :	34
Triterpanes (%)	
C-30 Hopanes :	100
Oleanane (α+ β) :	0
W + T :	0
Steranes Carbon No. Dist. (%)	
C-27 :	16
C-28 :	28
C-29 :	56
C-29 Sterane Ratios	
20S / 20R + 20S :	0.17
Iso / Iso + Normal :	0.53
Triterpane Ratios	
TS / TM :	not detectable
3R / 3R + 5R :	0.05

Bar diagram of Normal-alkanes & Isoprenoids of the extract from well 6407/09-08 (1683.5 m.), Norway



S16155202

Bar diagram of Normal-alkanes & Isoprenoids of the extract from well 6407/09-08 (1887 m.), Norway



S16155602

The Light Fraction (< 120 C.) of the extract from well 6407/09-08 (1617.7 m.), Norway

C-7 ALKANES (%)

Normal C-7 :	42
Mono Branched :	42
Poly Branched :	16

C-7 ALKANES / CYCLO ALKANES (%)

Normal C-7 :	11
Cyclo Alkanes :	74
Branched Alkanes :	15

C-7 ALK. / CYCLO ALK. / AROMATICS (%)

Alkanes :	22
Cyclo Alkanes :	63
Aromatics :	15

S16155002

The Light Fraction (< 120 C.) of the extract from well 6407/09-08 (1683.5 m.), Norway

C-7 ALKANES (%)

Normal C-7 :	30
Mono Branched :	45
Poly Branched :	25

C-7 ALKANES / CYCLO ALKANES (%)

Normal C-7 :	6
Cyclo Alkanes :	81
Branched Alkanes :	13

C-7 ALK. / CYCLO ALK. / AROMATICS (%)

Alkanes :	16
Cyclo Alkanes :	69
Aromatics :	15

The Light Fraction (< 120 C.) of the extract from well 6407/09-08 (1713 m.), Norway

C-7 ALKANES (%)

Normal C-7 :	38
Mono Branched :	40
Poly Branched :	22

C-7 ALKANES / CYCLO ALKANES (%)

Normal C-7 :	9
Cyclo Alkanes :	77
Branched Alkanes :	14

C-7 ALK. / CYCLO ALK. / AROMATICS (%)

Alkanes :	14
Cyclo Alkanes :	47
Aromatics :	39

The Light Fraction (< 120 C.) of the extract from well 6407/09-08 (1887 m.), Norway

C-7 ALKANES (%)

Normal C-7 :	35
Mono Branched :	37
Poly Branched :	28

C-7 ALKANES / CYCLO ALKANES (%)

Normal C-7 :	9
Cyclo Alkanes :	73
Branched Alkanes :	18

C-7 ALK. / CYCLO ALK. / AROMATICS (%)

Alkanes :	16
Cyclo Alkanes :	43
Aromatics :	41

S16155602

GCMS Sterane typing of the extract from well 6407/09-08 (1617.7 m.), Norway

STERANE DISTRIBUTION (ppm)	*(%)*
Iso Steranes :	50
Rearranged Steranes :	6
Normal Steranes :	44
CARBON NUMBER DISTRIBUTION	
C-27 :	35
C-28 :	29
C-29 :	36
C-29 STERANE CONVERSION RATIOS	
20S / 20R + 20S :	0.22
Iso / Iso + Normal :	0.50

S16155002

GCMS Sterane typing of the extract from well 6407/09-08 (1683.5 m.), Norway

STERANE DISTRIBUTION	*(ppm)*	*(%)*
Iso Steranes :		42
Rearranged Steranes :		25
Normal Steranes :		33
CARBON NUMBER DISTRIBUTION		
C-27 :		52
C-28 :		21
C-29 :		27
C-29 STERANE CONVERSION RATIOS		
20S / 20R + 20S :		not detectable
Iso / Iso + Normal :		1.00

S16155202

GCMS Sterane typing of the extract from well 6407/09-08 (1713 m.), Norway

STERANE DISTRIBUTION	(ppm)	(%)
Iso Steranes :	122	29
Rearranged Steranes :	77	18
Normal Steranes :	217	53
CARBON NUMBER DISTRIBUTION		
C-27 :	134	32
C-28 :	0	0
C-29 :	282	68
C-29 STERANE CONVERSION RATIOS		
20S / 20R + 20S :		0.65
Iso / Iso + Normal :		0.34

S16155402

GCMS Sterane typing of the extract from well 6407/09-08 (1887 m.), Norway

STERANE DISTRIBUTION	*(ppm)*	*(%)*
Iso Steranes :	210	42
Rearranged Steranes :	120	24
Normal Steranes :	173	34
CARBON NUMBER DISTRIBUTION		
C-27 :	81	16
C-28 :	142	28
C-29 :	279	56
C-29 STERANE CONVERSION RATIOS		
20S / 20R + 20S :		0.17
Iso / Iso + Normal :		0.53

S16155602

GCMS Triterpane typing of the extract from well 6407/09-08 (1617.7 m.), Norway

STERANES/TRITERPANES (calculated %)

Iso Steranes :	67
Rearranged Steranes :	11
Triterpanes :	22

TRITERPANE CONVERSION RATIOS

TS / TM :	0.23
3R / 3R + 5R :	0.00

C30 Hopane (ppm) : not detectable

S16155002

GCMS Triterpane typing of the extract from well 6407/09-08 (1683.5 m.), Norway

STERANES/TRITERPANES (calculated %)

Iso Steranes :	41
Rearranged Steranes :	37
Triterpanes :	22

TRITERPANE CONVERSION RATIOS

TS / TM :	0.84
3R / 3R + 5R :	0.00

C30 Hopane (ppm) : not detectable

S16155202

GCMS Triterpane typing of the extract from well 6407/09-08 (1713 m.), Norway

STERANES/TRITERPANES (calculated %)

Iso Steranes :	21
Rearranged Steranes :	20
Triterpanes :	59

TRITERPANE CONVERSION RATIOS

TS / TM :	not detectable
3R / 3R + 5R :	0.00
C30 Hopane (ppm) :	415

S16155402

GCMS Triterpane typing of the extract from well 6407/09-08 (1887 m.), Norway

STERANES/TRITERPANES (calculated %)

Iso Steranes :	40
Rearranged Steranes :	34
Triterpanes :	26

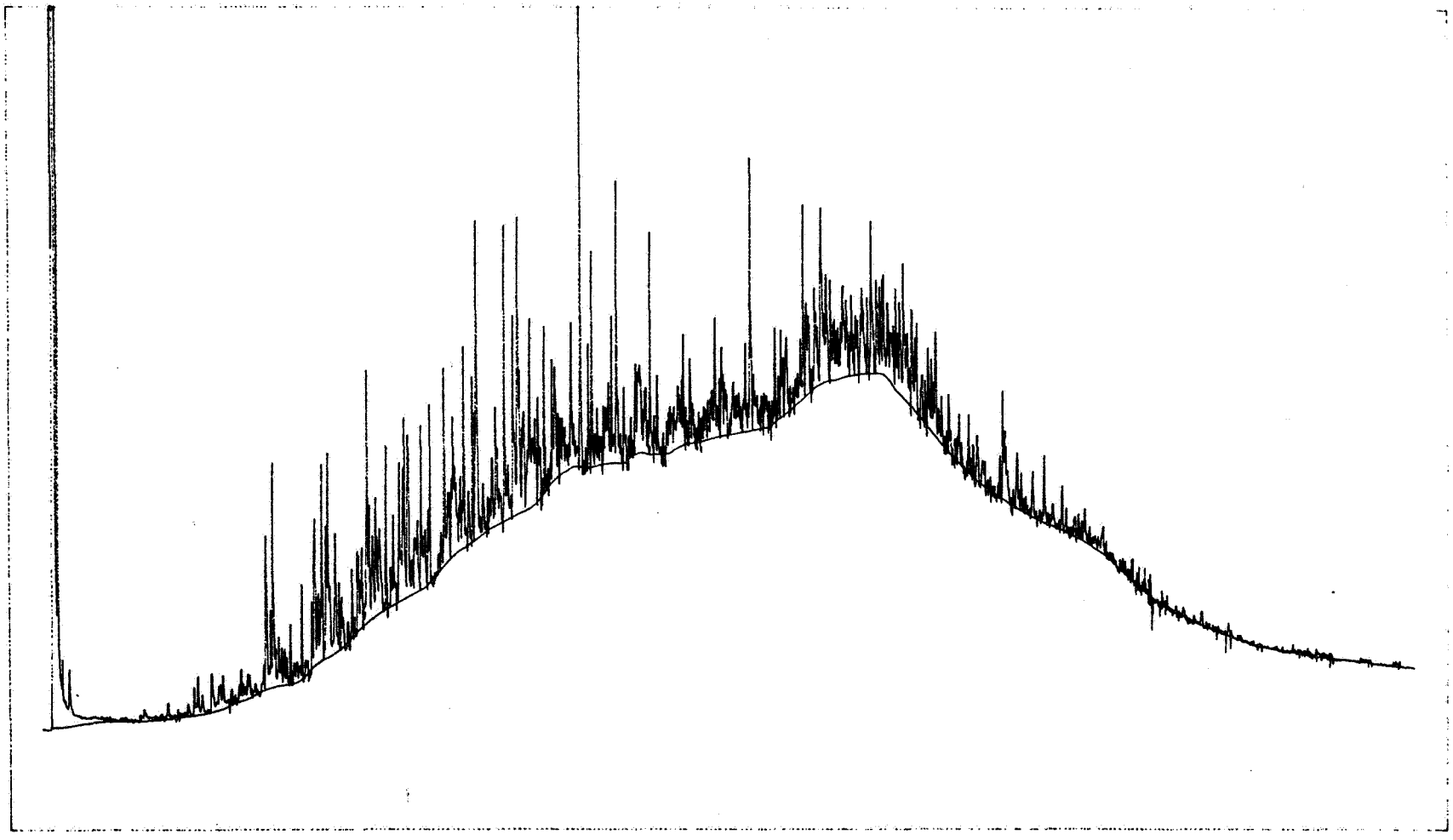
TRITERPANE CONVERSION RATIOS

TS / TM :	not detectable
3R / 3R + 5R :	0.05
C30 Hopane (ppm) :	173

S16155602

81615002

Gas chromatogram of the saturated hydrocarbons of the extract from well 6407/09-08 (1617.7 m.), Norway



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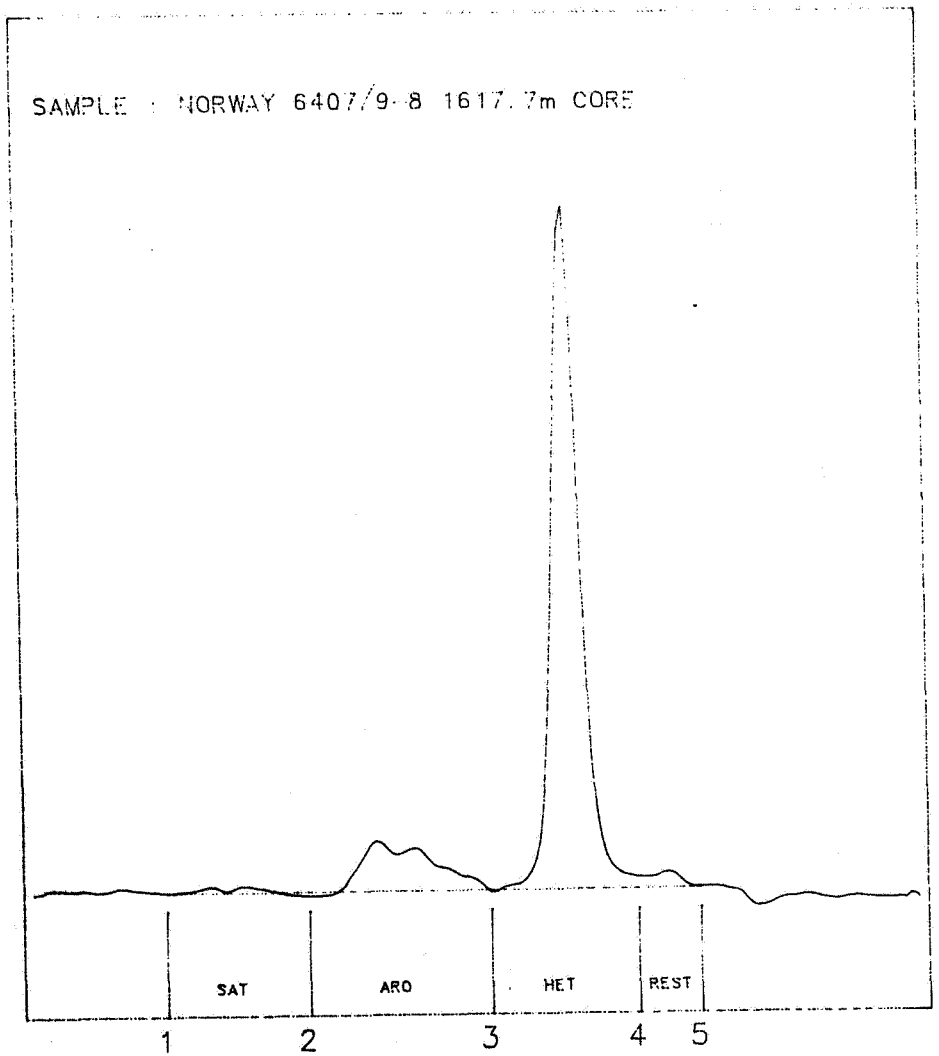
S161550-2

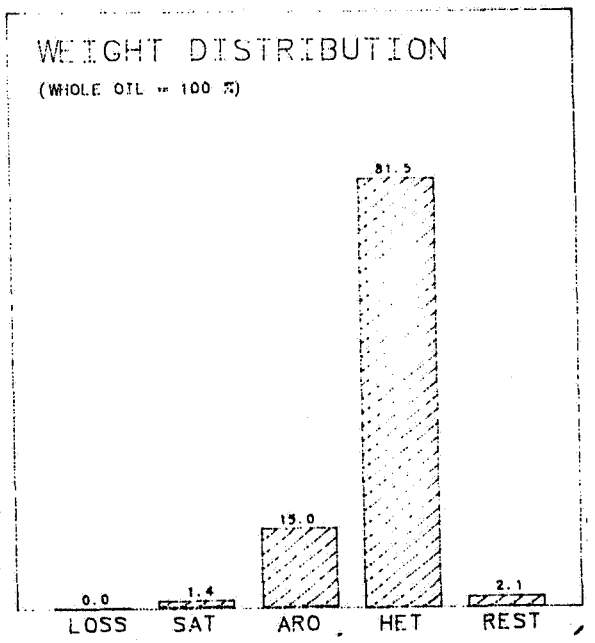
Gross Composition of the extract from well 6407/09-08 (1617.7 m.), Norway



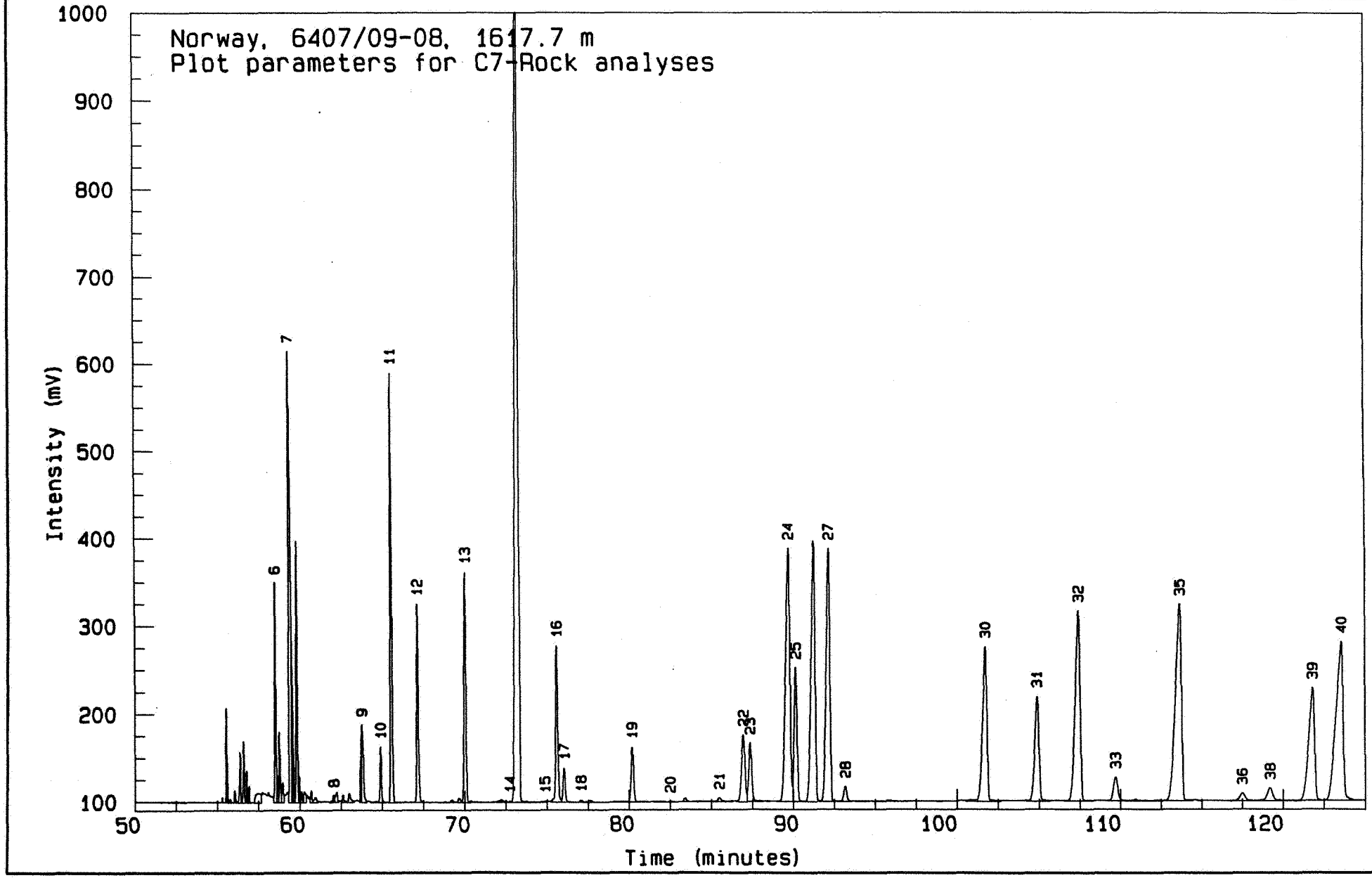
SAMPLE : S161550-2

WEIGHT LOST ON TOPPING	:	0.0 %
-- SATURATES	:	1.4 %
-- AROMATICS	:	15.0 %
-- HETEROCOMPOUNDS	:	81.5 %
-- REST (HIGH MOL.)	:	2.1 %

* WEIGHT PERCENTAGES CALCULATED FROM FID RESPONSE



Gas chromatogram of the light fraction (< 120 C.) of the extract from well 6407/09-08 (1617.7 m.), Norway



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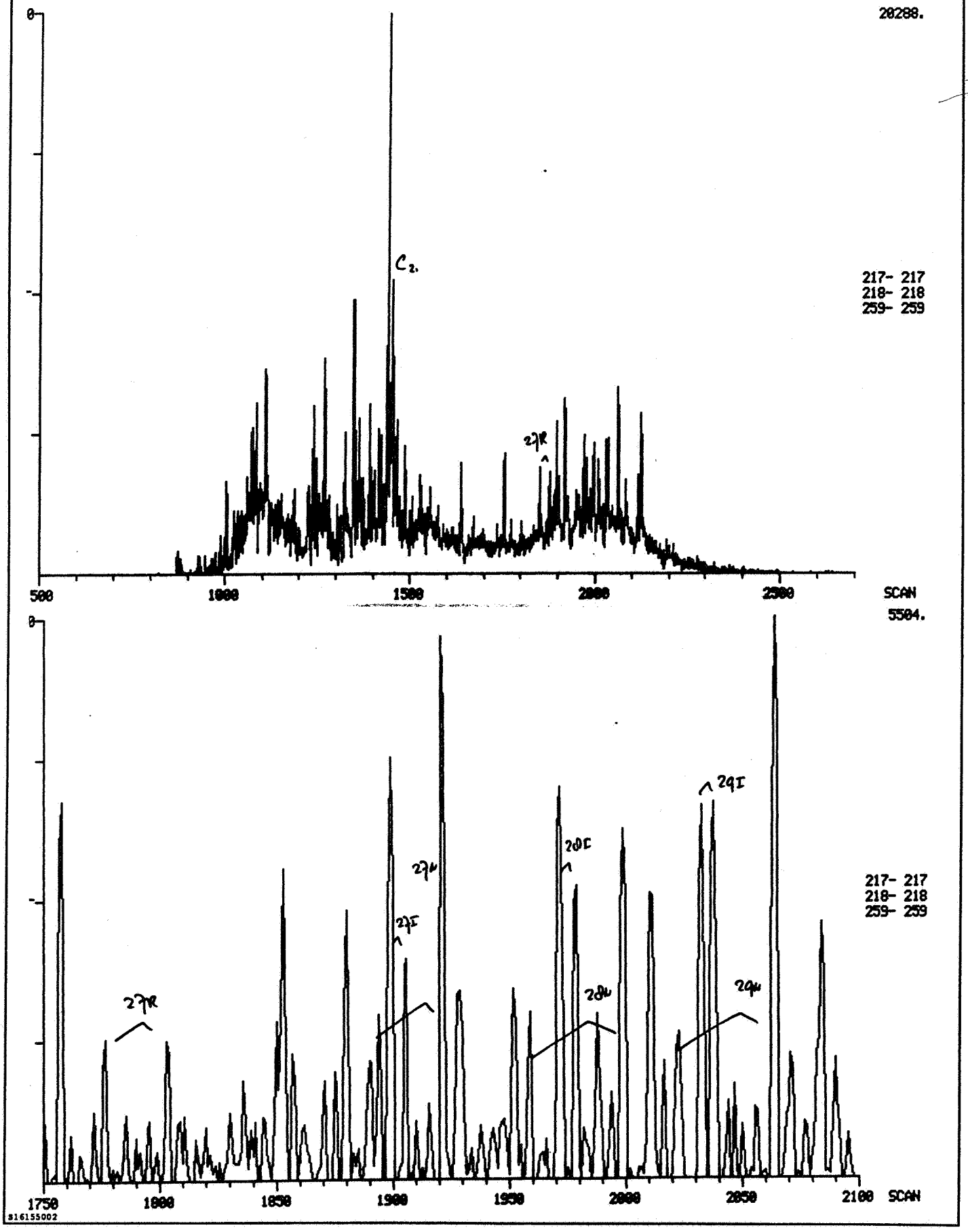
Gas chromatographic hydrocarbons analysis (< 120 C.) well 6407/09-08 (1617.7 m.), Norway

GAS CHROMATOGRAPHICS ANALYSIS OF THE FRACTION BOILING BELOW 120 DEGREES CENTIGRADE

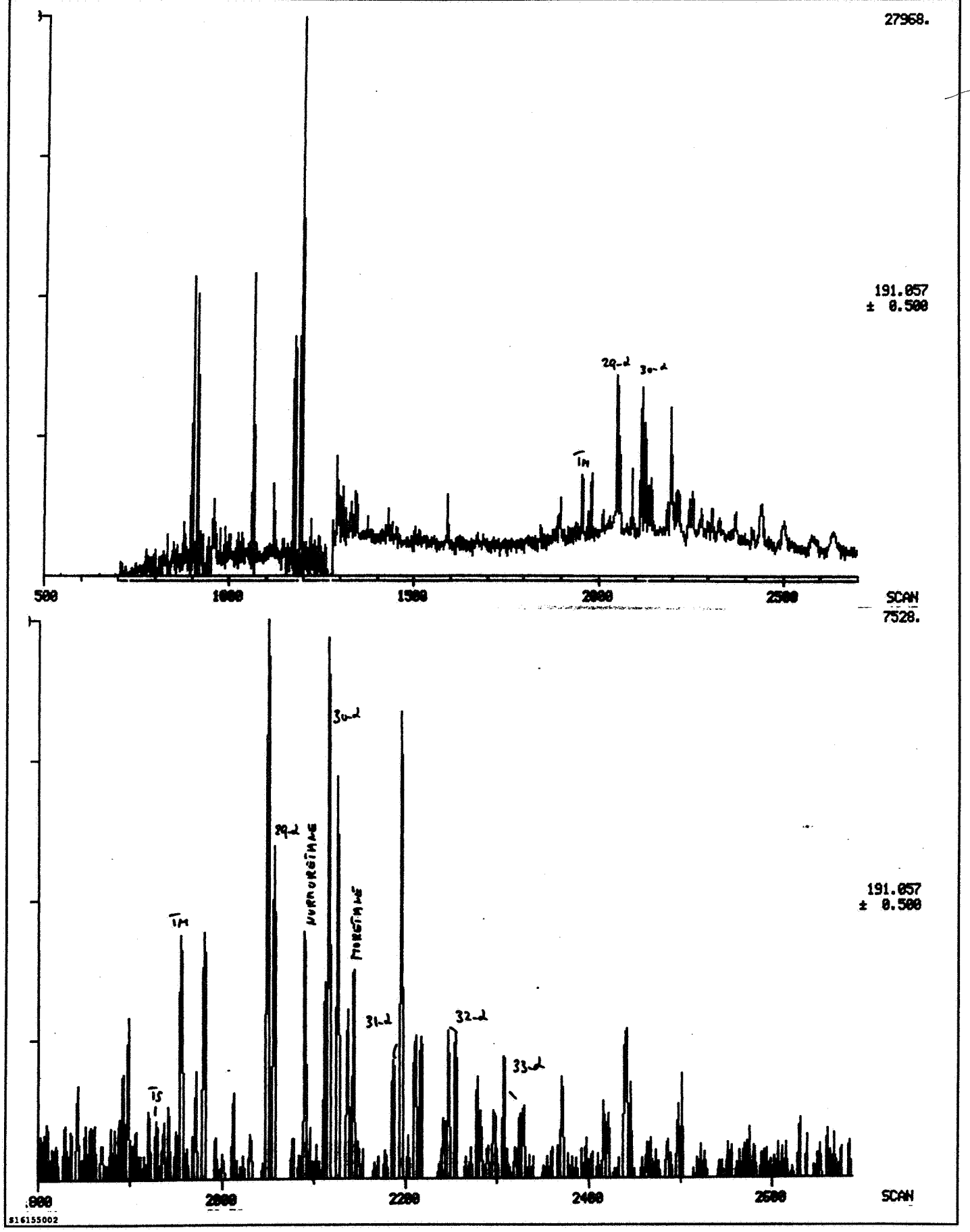
Sample: Norway, 6407/09-08, 1617.7 m

COMPONENT No.	Name	RET.TIME (min)	HEIGHT (uV)	AREA (uVs)
1	methane	0.00	0	0
2	ethane	0.00	0	0
3	propane	0.00	0	0
4	i-butane	0.00	0	0
5	n-butane	0.00	0	0
6	i-pentane	58.54	250862	1054958
7	n-pentane	59.38	515569	3740680
8	2.2-dimethylbutane	62.06	8104	51196
9	cyclopentane	63.77	88527	723019
10	2.3-dimethylbutane	64.90	63140	343677
11	2-methylpentane	65.56	490159	2976181
12	3-methylpentane	67.15	225569	1438957
13	n-hexane	70.04	262253	1954462
14	methylcyclopentane	72.72	1525	10451
15	2.2-dimethylpentane	74.87	1077	13701
16	benzene	75.61	177801	1584923
17	2.4-dimethylpentane	76.04	38714	346462
18	2.2.3-trimethylbutane	77.05	2311	21264
19	cyclohexane	80.20	62584	647369
20	3.3-dimethylpentane	82.49	911	10661
21	1.1-dimethylcylopentane	85.48	4817	74687
22	2-methylhexane	86.96	76747	1154667
23	2.3-dimethylpentane	87.37	67222	854334
24	1-c-3-dimethylcyclopentane	89.77	288753	5349588
25	3-methylhexane	90.19	152747	1869702
26	1-tr-3-dimethylcyclopentane	0.00	0	0
27	1-tr-2-dimethylcyclopentane	92.23	288233	4554686
28	3-ethylpentane	93.17	17257	225417
29	reference peak	0.00	0	0
30	n-heptane	101.79	176002	3253568
31	1-c-2-dimethylcyclopentane	104.93	119574	2160005
32	methylcyclohexane	107.50	217091	4588020
33	1.1.3-trimethylcyclopentane	109.70	27357	514584
34	2.2-dimethylhexane	0.00	0	0
35	ethylcyclopentane	113.71	224243	5810549
36	2.5-dimethylhexane	117.48	8715	209790
37	not present	0.00	0	0
38	2.2.3-trimethylpentane	119.20	14704	364798
39	1-tr-2-c-4-trimethylcyclopentane	121.82	128834	3246981
40	toluene	123.57	181905	5531235

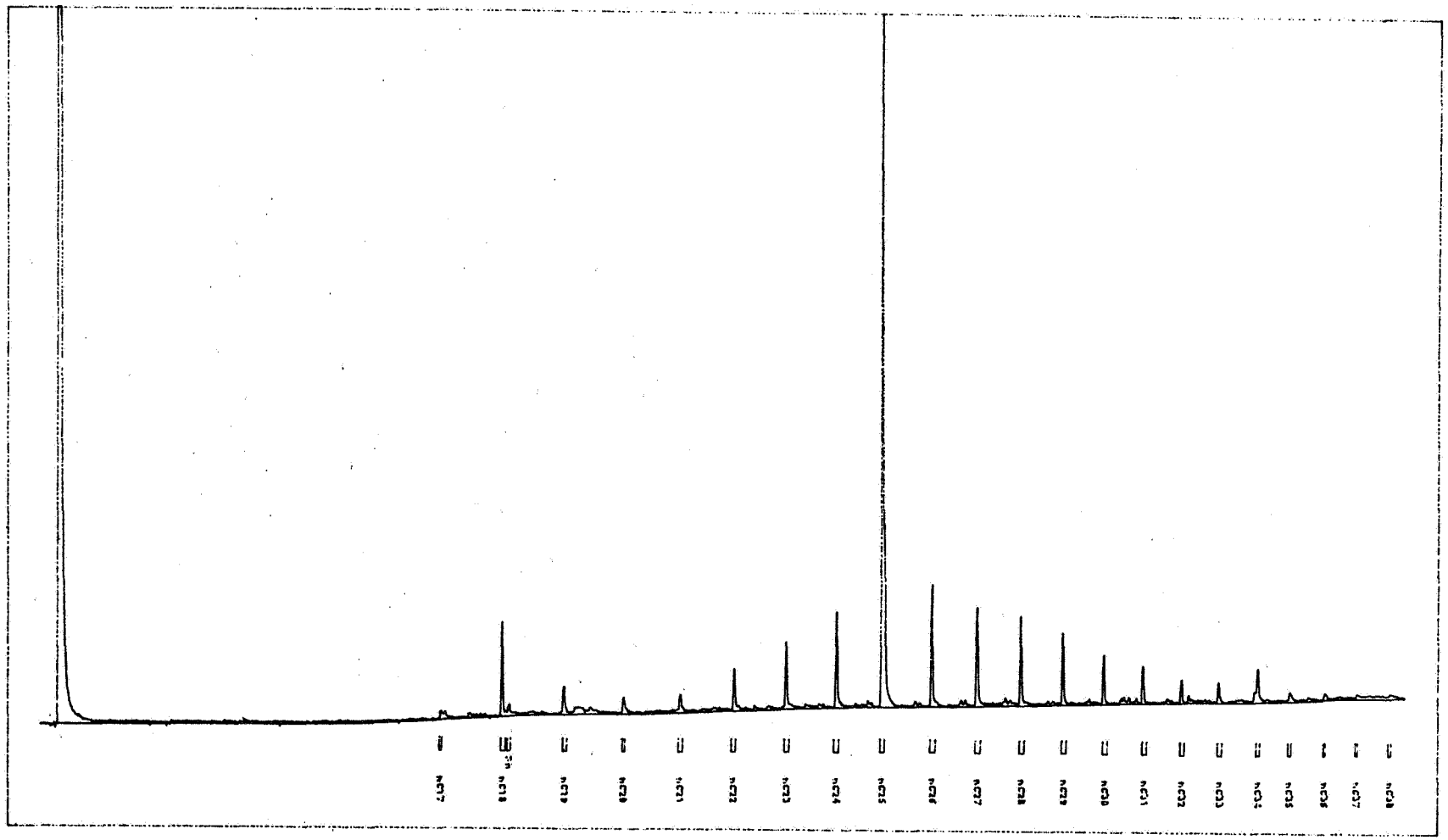
Sterane Fragmentograms of the extract from well 6407/09-08 (1617.7 m.), Norway



Triterpane Fragmentograms of the extract from well 6407/09-08 (1617.7 m.), Norway



Gas chromatogram of the saturated hydrocarbons of the extract from well 6407/09-08 (1683.5 m.), Norway



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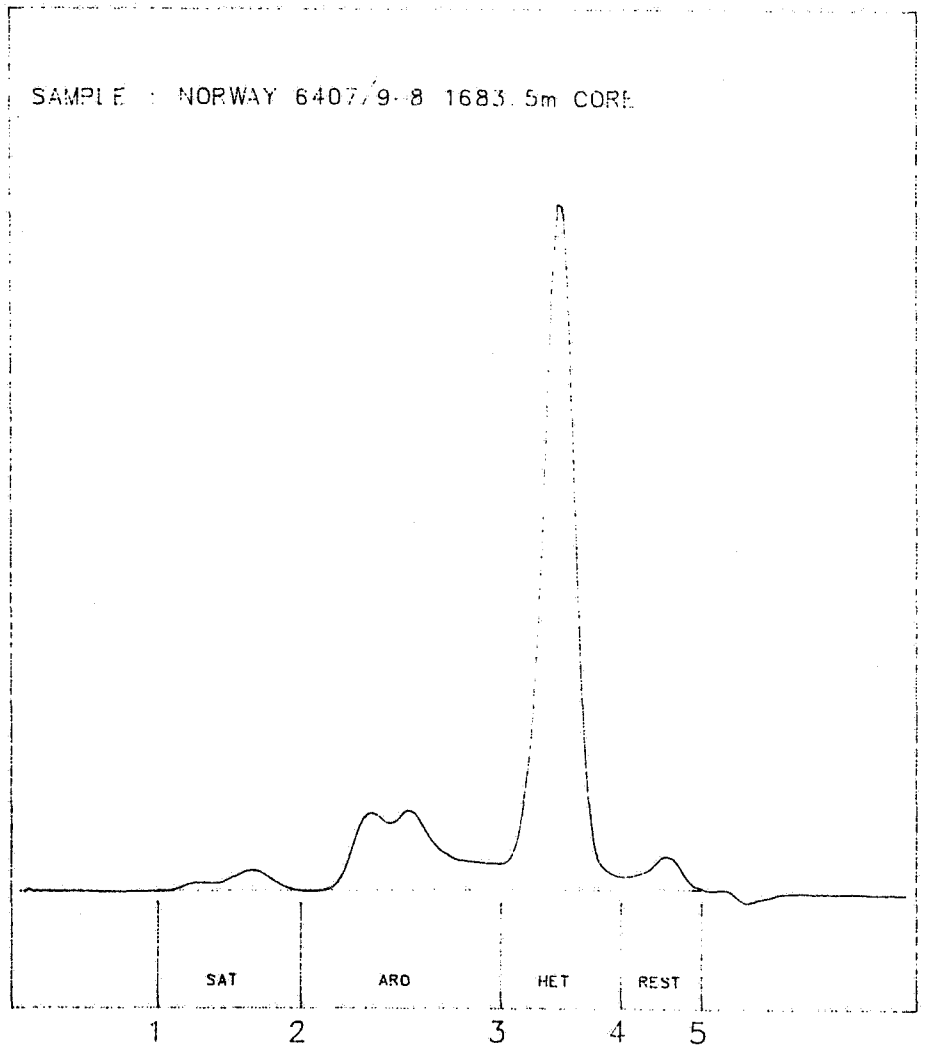
S161552#2

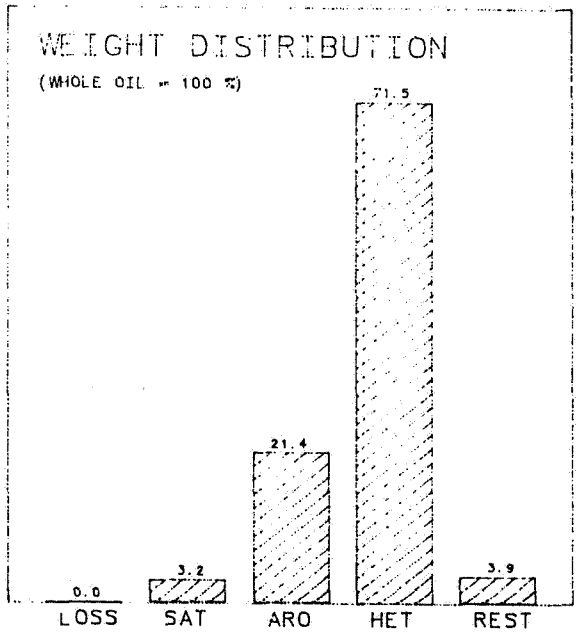
Gross Composition of the extract from well 6407/09-08 (1683.5 m.), Norway



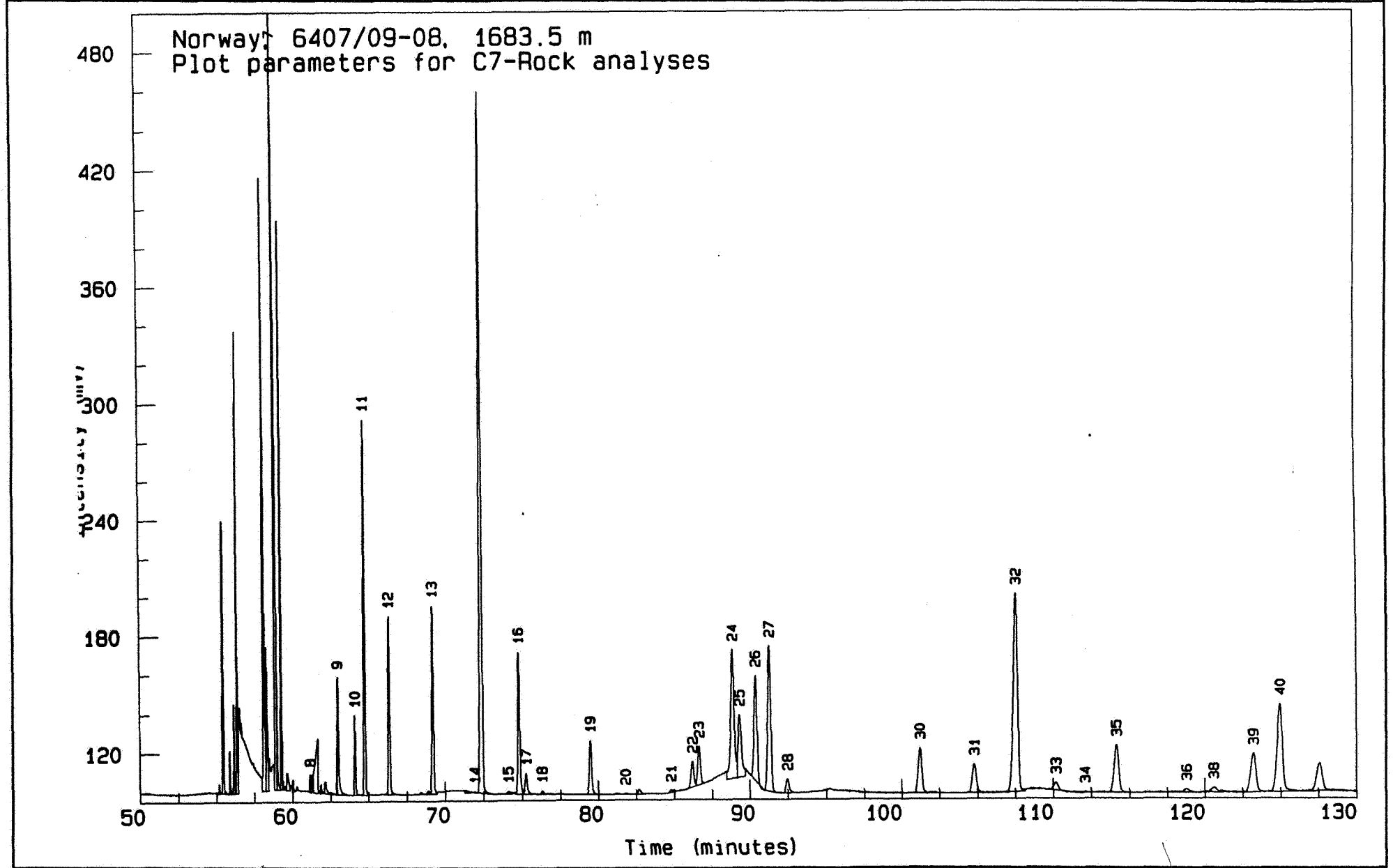
SAMPLE : S161552-2

WEIGHT LOST ON TOPPING	0.0 %
-- SATURATES	3.2 %
-- AROMATICS	21.4 %
-- HETEROCOMPOUNDS	71.5 %
-- REST (HIGH MOL.)	3.9 %

* WEIGHT PERCENTAGES CALCULATED FROM FID RESPONSE



Gas chromatogram of the light fraction (< 120 C.) of the extract from well 6407/09-08 (1683.5 m.), Norway



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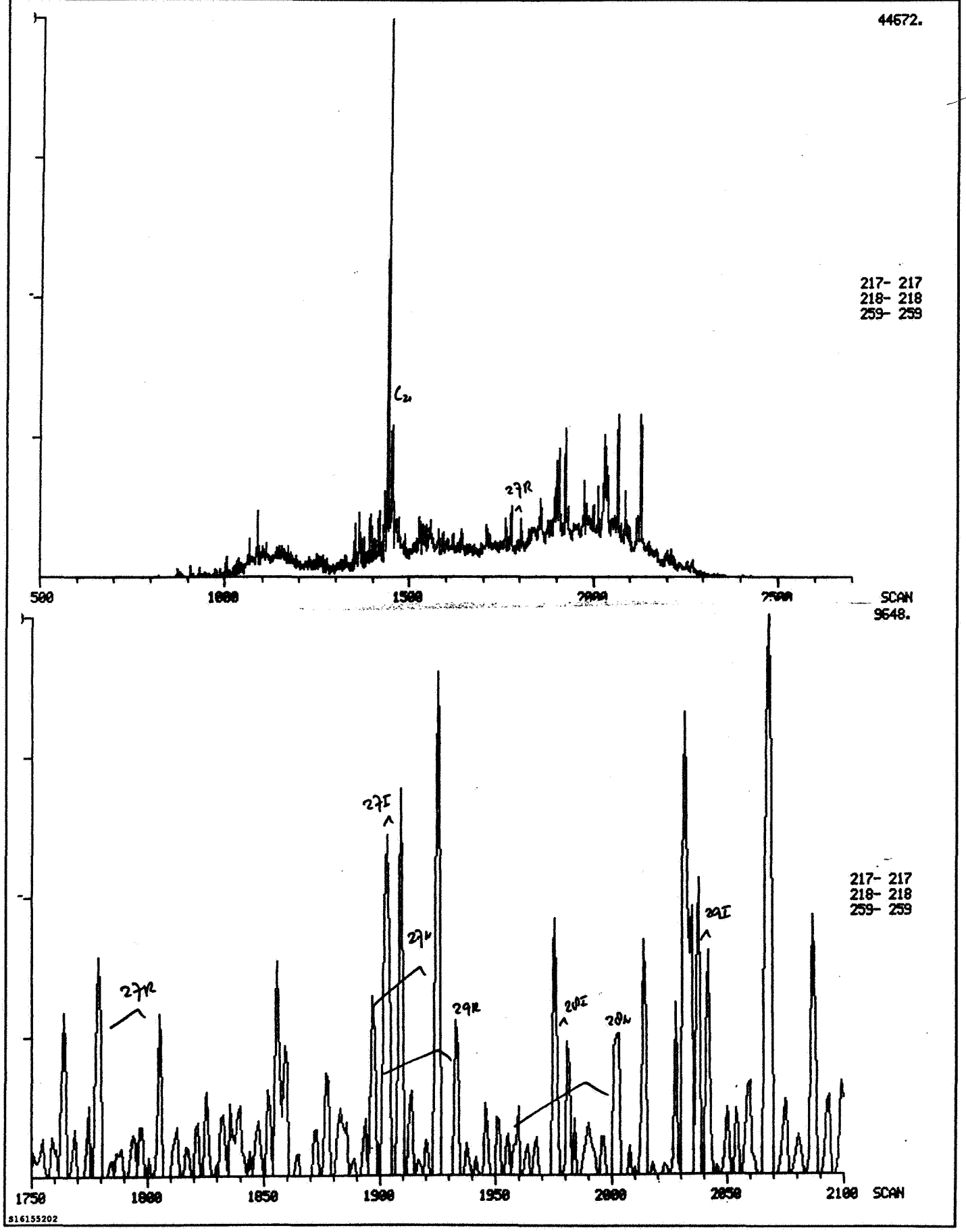
Gas chromatographic hydrocarbons analysis (< 120 C.) well 6407/09-08 (1683.5 m.), Norway

GAS CHROMATOGRAPHICS ANALYSIS OF THE FRACTION BOILING BELOW 120 DEGREES CENTIGRADE

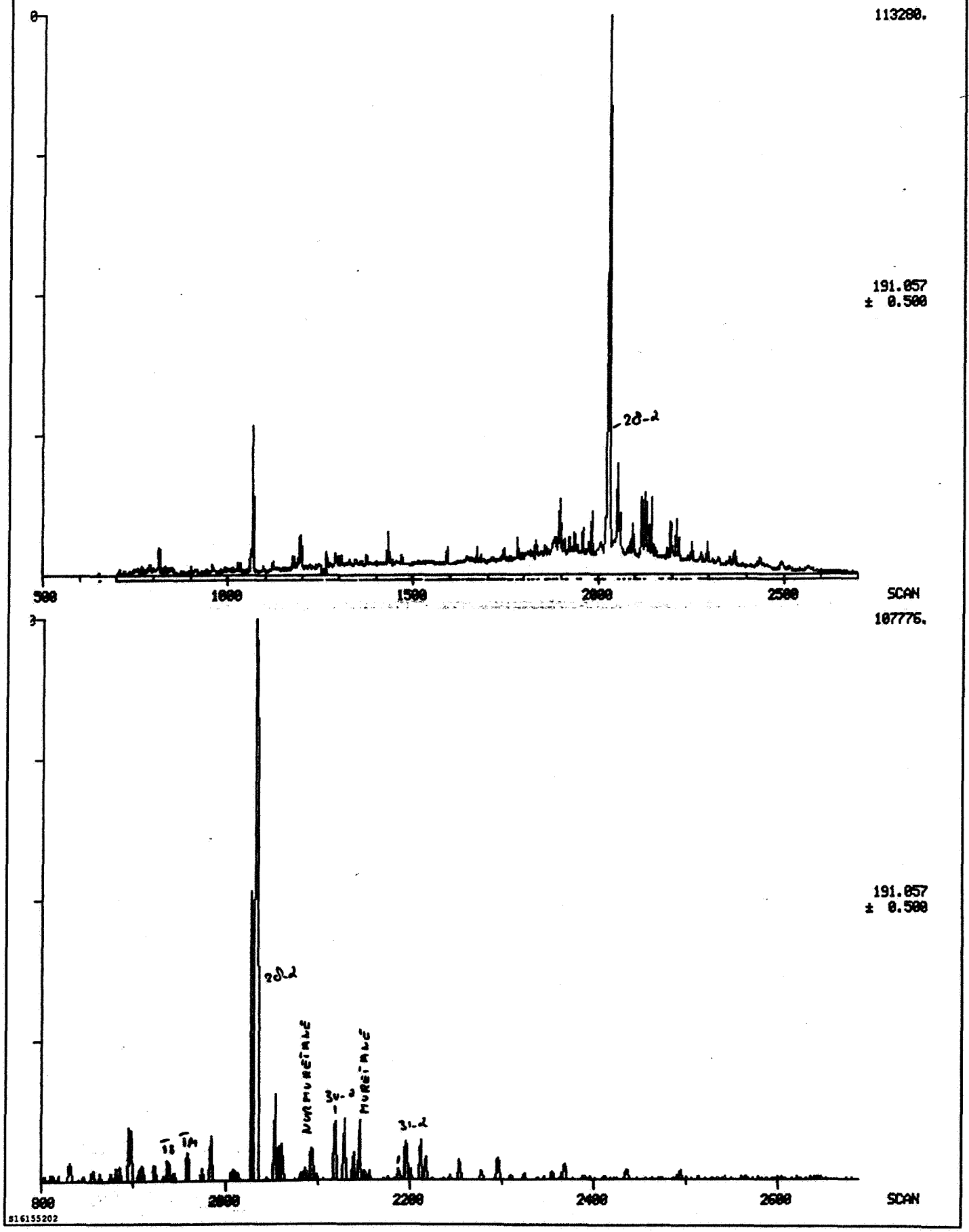
Sample: Norway, 6407/09-08, 1683.5 m

COMPONENT No.	Name	RET.TIME (min)	HEIGHT (uV)	AREA (uVs)
1	methane	0.00	0	0
2	ethane	0.00	0	0
3	propane	0.00	0	0
4	i-butane	0.00	0	0
5	n-butane	0.00	0	0
6	i-pentane	0.00	0	0
7	n-pentane	58.85	425597	2017785
8	2.2-dimethylbutane	61.17	9166	62464
9	cyclopentane	62.99	60239	353716
10	2.3-dimethylbutane	64.11	40902	218300
11	2-methylpentane	64.76	192872	1080817
12	3-methylpentane	66.36	91212	578189
13	n-hexane	69.22	96356	674330
14	methylcyclopentane	71.94	347	1
15	2.2-dimethylpentane	74.12	1383	19990
16	benzene	74.82	72600	662308
17	2.4-dimethylpentane	75.27	10528	108764
18	2.2.3-trimethylbutane	76.32	1652	17061
19	cyclohexane	79.50	27376	298200
20	3.3-dimethylpentane	81.79	317	3893
21	1.1-dimethylcylopentane	84.80	1687	5357
22	2-methylhexane	86.22	14567	99515
23	2.3-dimethylpentane	86.66	20310	173524
24	1-c-3-dimethylcyclopentane	88.89	66496	911739
25	3-methylhexane	89.34	32364	372238
26	1-tr-3-dimethylcyclopentane	90.41	51068	590078
27	1-tr-2-dimethylcyclopentane	91.32	74071	1014463
28	3-ethylpentane	92.47	7380	106305
29	reference peak	0.00	0	0
30	n-heptane	101.23	23191	392154
31	1-c-2-dimethylcyclopentane	104.81	14792	281251
32	methylcyclohexane	107.62	102033	2041087
33	1.1.3-trimethylcyclopentane	110.18	3708	42563
34	2.2-dimethylhexane	112.10	469	3003
35	ethylcyclopentane	114.17	24414	520323
36	2.5-dimethylhexane	118.78	1629	40555
37	not present	0.00	0	0
38	2.2.3-trimethylpentane	120.58	2437	69000
39	1-tr-2-c-4-trimethylcyclopentane	123.20	20073	496489
40	toluene	124.97	45511	1136187

Sterane Fragmentograms of the extract from well 6407/09-08 (1683.5 m.), Norway

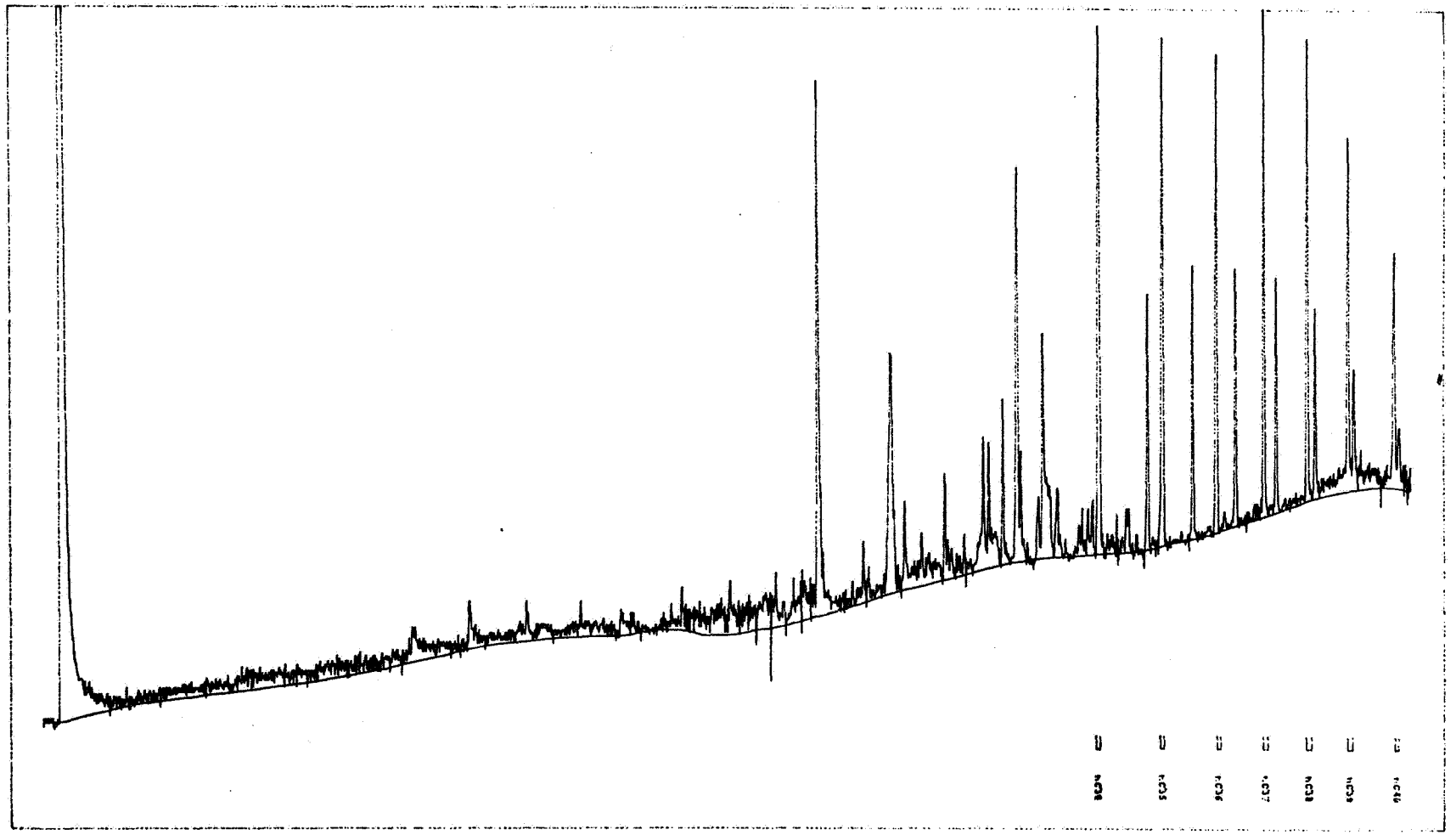


Triterpane Fragmentograms of the extract from well 6407/09-08 (1683.5 m.), Norway



81615402

Gas chromatogram of the saturated hydrocarbons of the extract from well 6407/09-08 (1713 m.), Norway



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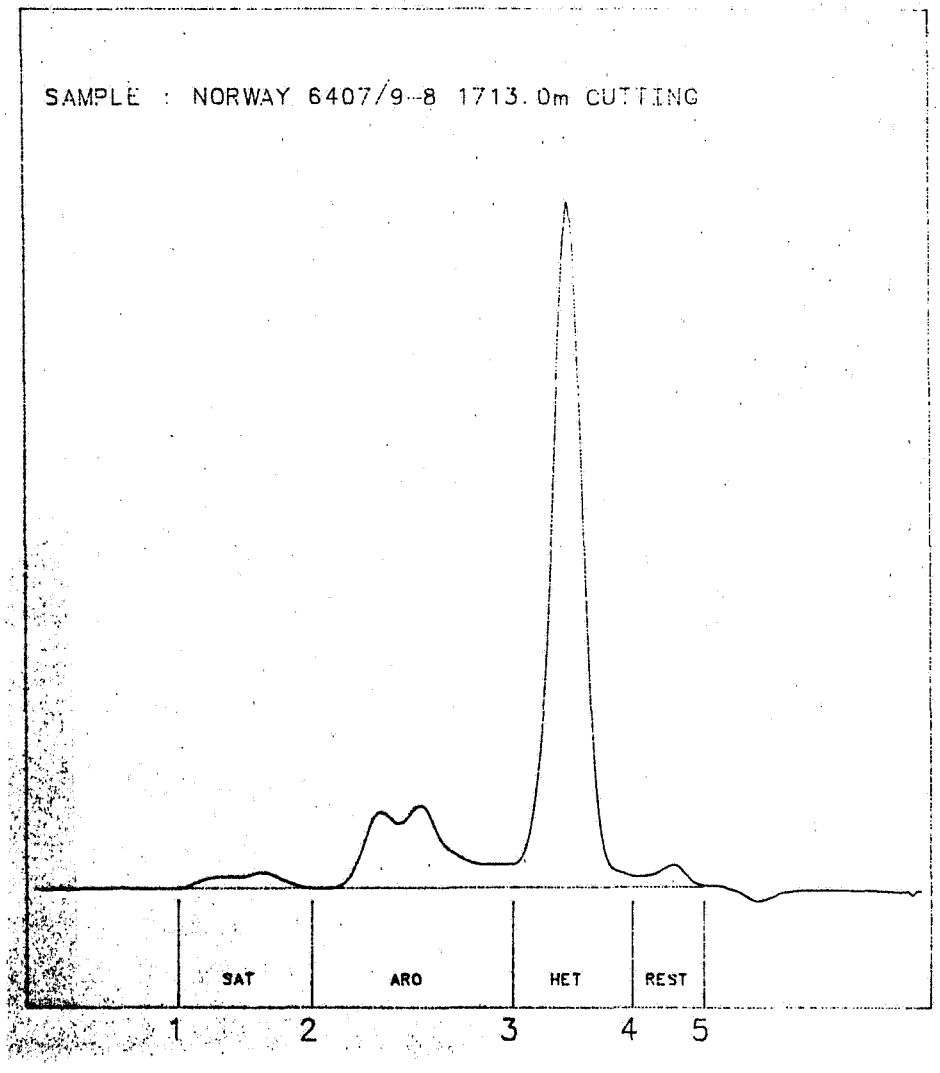
S1615402

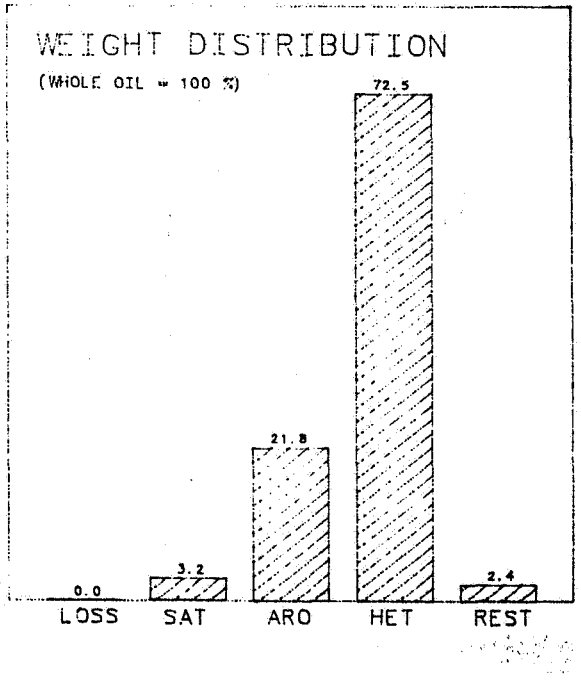
Gross Composition of the extract from well 6407/09-08 (1713 m.), Norway



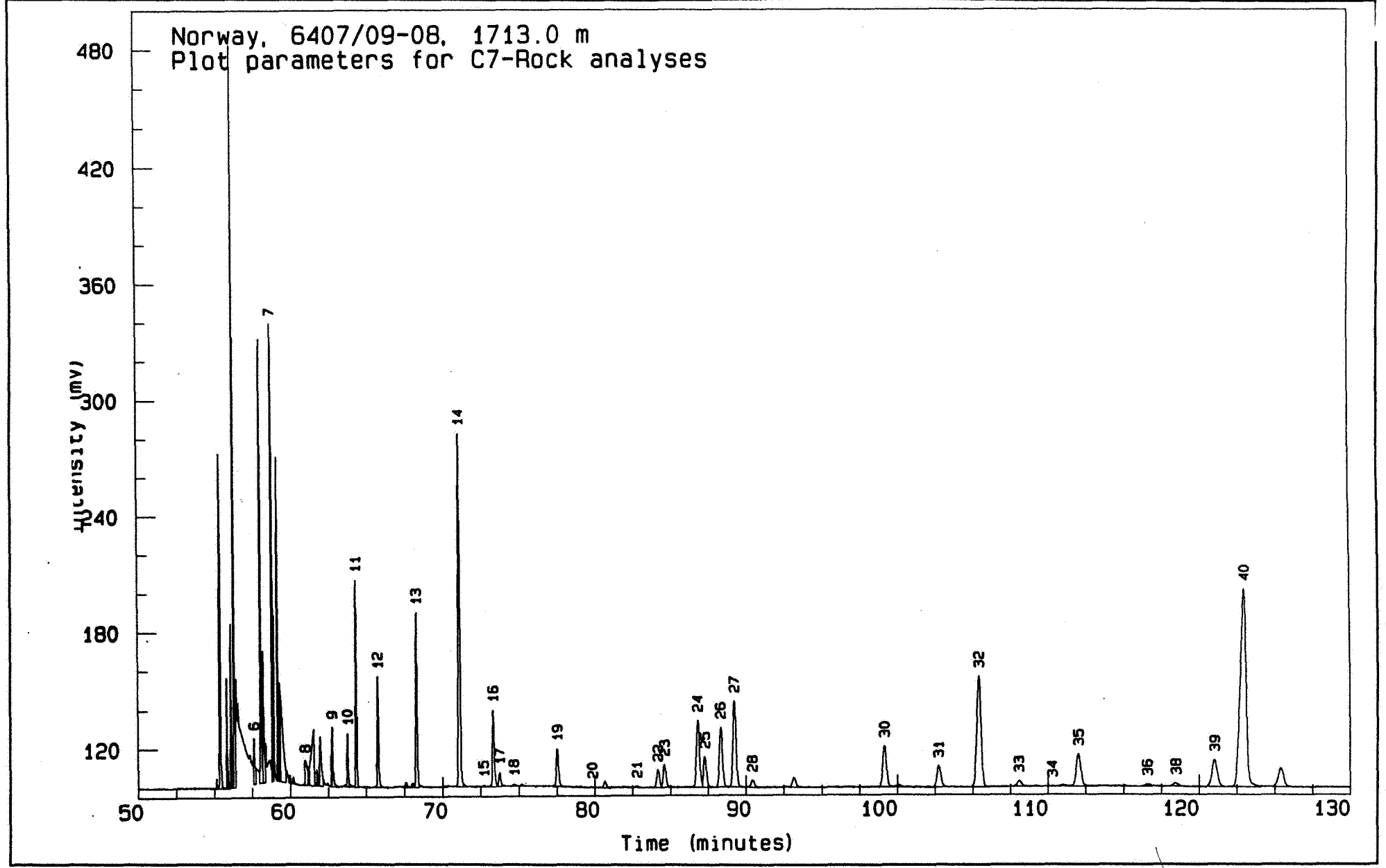
SAMPLE : S161554-2

WEIGHT LOST ON TOPPING	:	0.0 %
- SATURATES	:	3.2 %
- AROMATICS	:	21.8 %
- HETEROCOMPOUNDS	:	72.5 %
- REST (HIGH MOL.)	:	2.4 %

* WEIGHT PERCENTAGES CALCULATED FROM FID RESPONSE



Gas chromatogram of the light fraction (< 120 C.) of the extract from well 6407/09-08 (1713 m.), Norway



Confidential

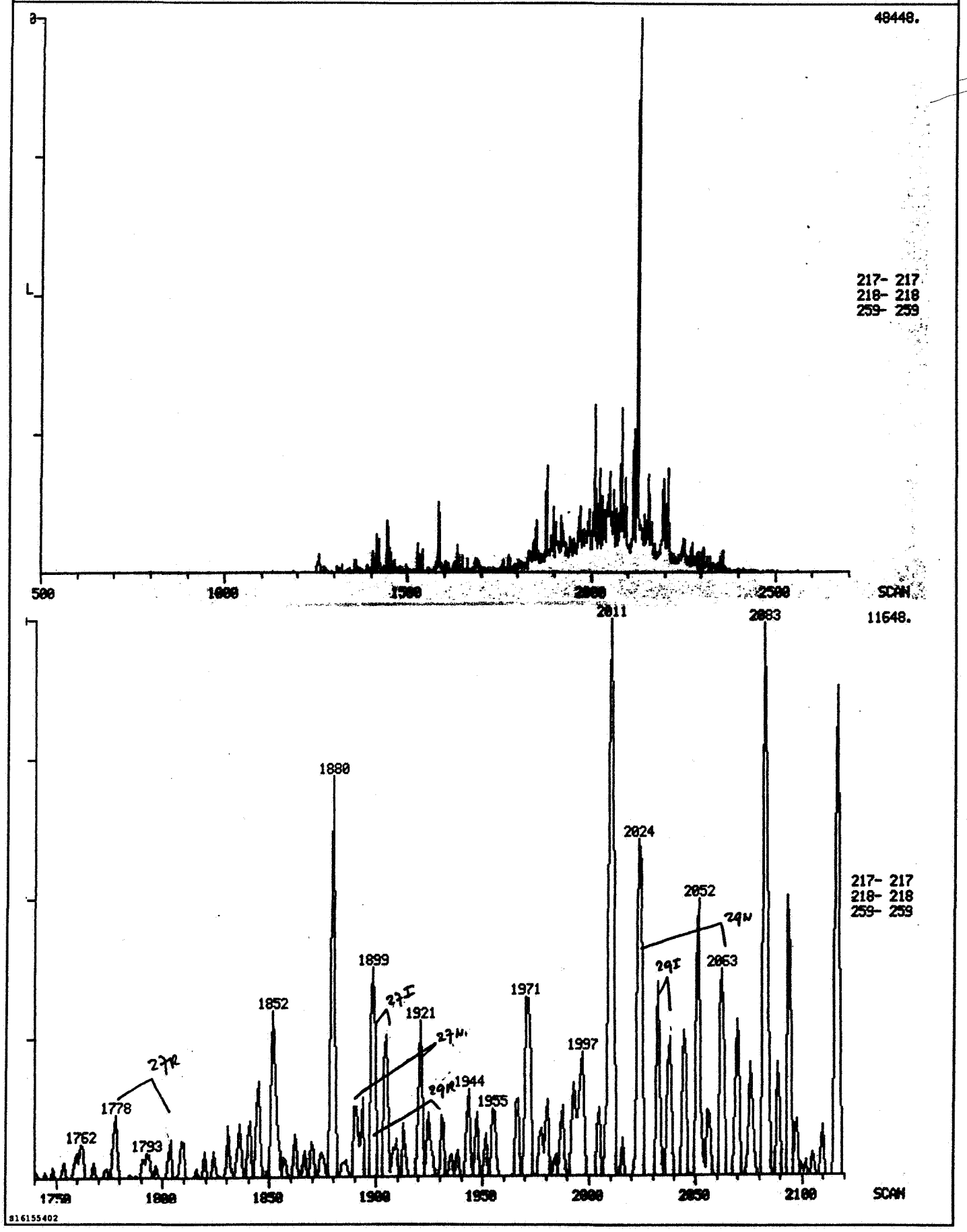
Gas chromatographic hydrocarbons analysis (< 120 C.) well 6407/09-08 (1713 m.), Norway

GAS CHROMATOGRAPHICS ANALYSIS OF THE FRACTION BOILING BELOW 120 DEGREES CENTIGRADE

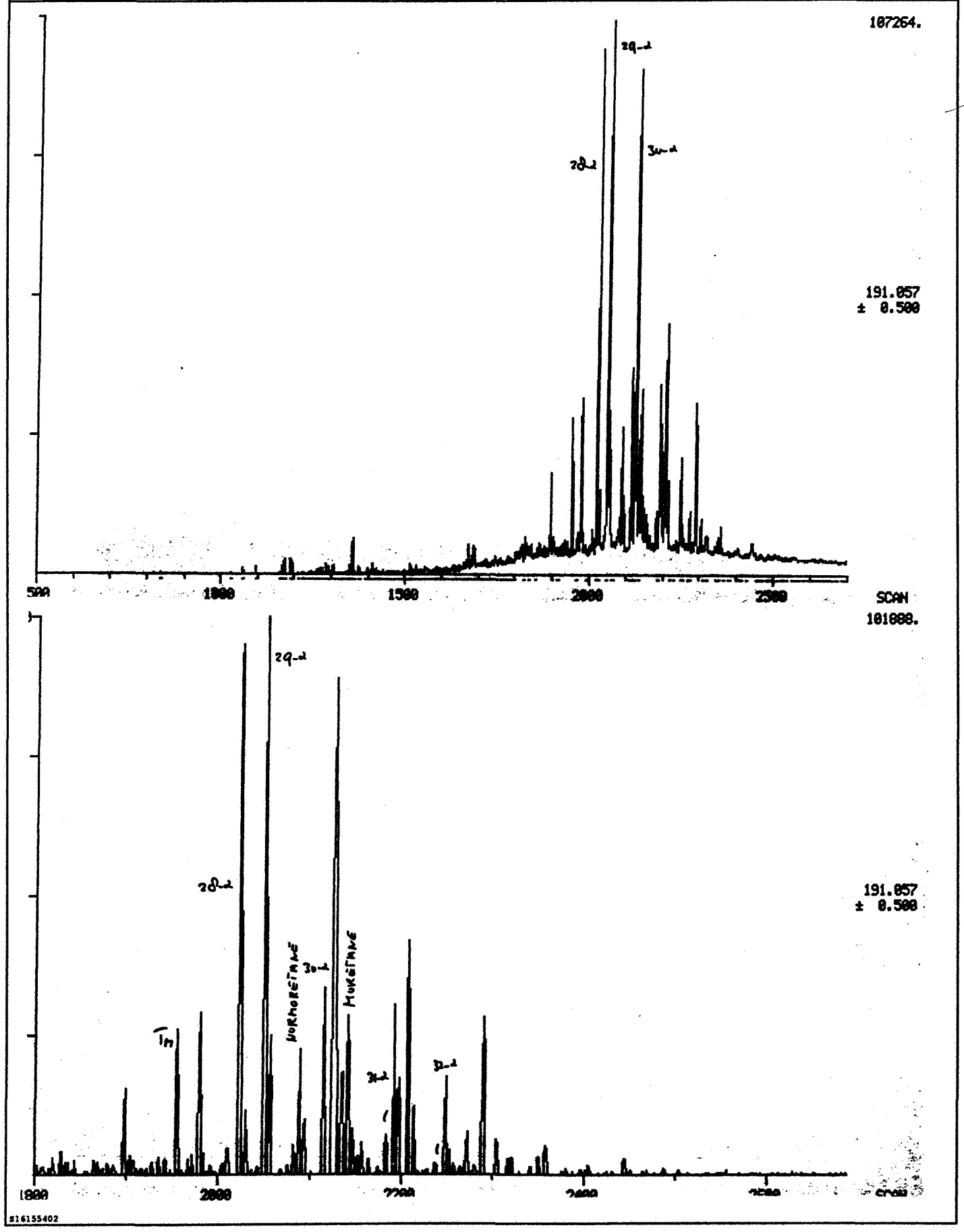
Sample: Norway, 6407/09-08, 1713.0 m

COMPONENT No.	Name	RET.TIME (min)	HEIGHT (uV)	AREA (uVs)
1	methane	0.00	0	0
2	ethane	0.00	0	0
3	propane	0.00	0	0
4	i-butane	0.00	0	0
5	n-butane	0.00	0	0
6	i-pentane	57.62	23828	117107
7	n-pentane	58.82	236039	915127
8	2.2-dimethylbutane	60.99	12658	127196
9	cyclopentane	62.78	30735	153668
10	2.3-dimethylbutane	63.78	27384	131972
11	2-methylpentane	64.35	106132	510412
12	3-methylpentane	65.78	56678	319808
13	n-hexane	68.32	89471	554951
14	methylcyclopentane	71.14	181840	1391383
15	2.2-dimethylpentane	72.70	790	2
16	benzene	73.33	39244	310632
17	2.4-dimethylpentane	73.75	7201	54646
18	2.2.3-trimethylbutane	74.69	1012	2
19	cyclohexane	77.54	19258	195400
20	3.3-dimethylpentane	79.85	389	1944
21	1.1-dimethylcylopentane	82.79	743	10790
22	2-methylhexane	84.19	9146	121147
23	2.3-dimethylpentane	84.63	11844	155899
24	1-c-3-dimethylcyclopentane	86.85	34502	491234
25	3-methylhexane	87.31	15811	209340
26	1-tr-3-dimethylcyclopentane	88.37	30876	440044
27	1-tr-2-dimethylcyclopentane	89.27	44204	642006
28	3-ethylpentane	90.44	3757	56585
29	reference peak	0.00	0	0
30	n-heptane	99.16	21328	372046
31	1-c-2-dimethylcyclopentane	102.75	10953	210172
32	methylcyclohexane	105.47	57027	1108954
33	1.1.3-trimethylcyclopentane	108.09	3105	54891
34	2.2-dimethylhexane	110.28	318	1
35	ethylcyclopentane	112.05	16672	331039
36	2.5-dimethylhexane	116.58	1265	17379
37	not present	0.00	0	0
38	2.2.3-trimethylpentane	118.48	1780	32662
39	1-tr-2-c-4-trimethylcyclopentane	121.04	13934	336848
40	toluene	123.02	102094	2737431

Sterane Fragmentograms of the extract from well 6407/09-08 (1713 m.), Norway

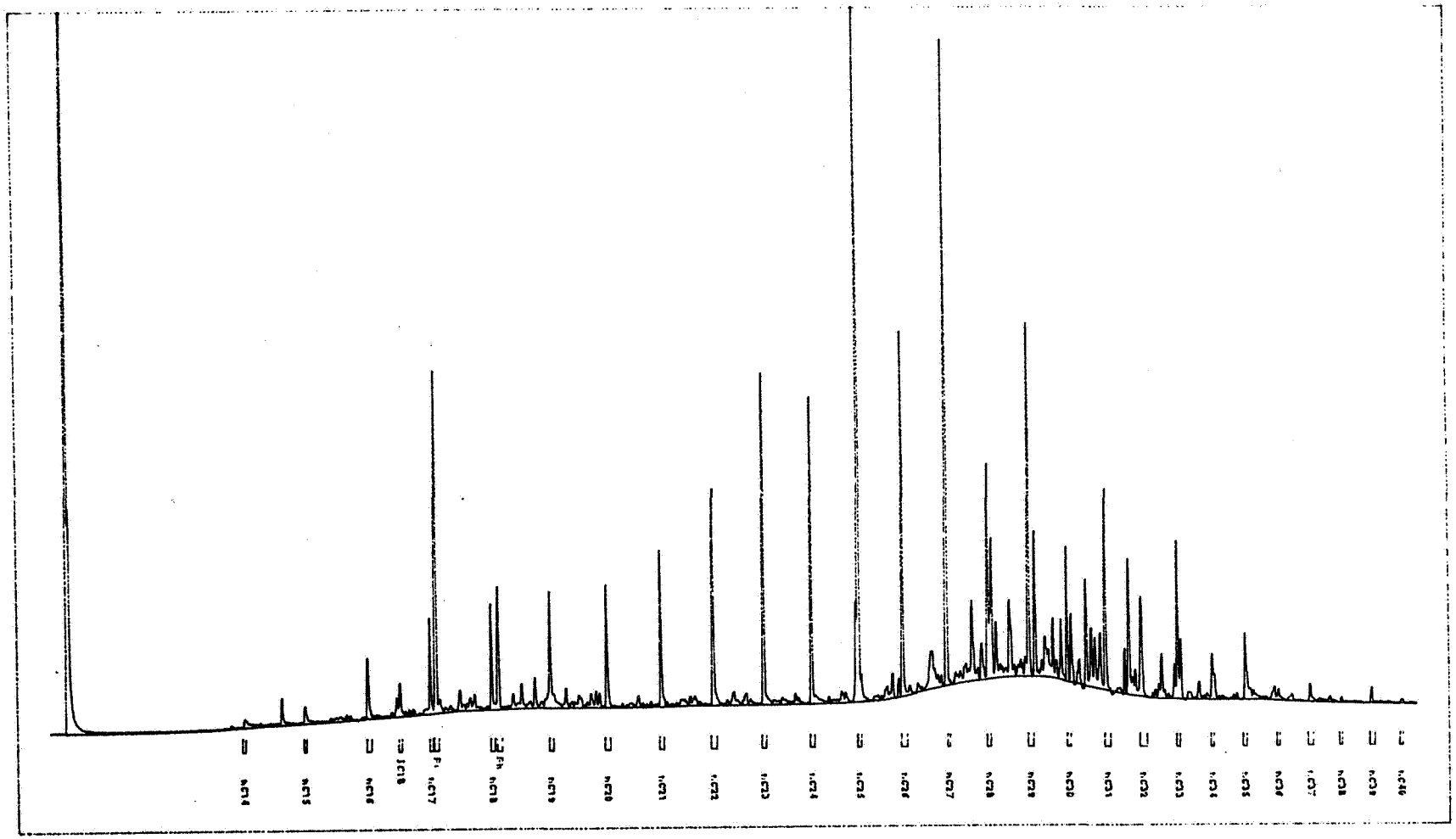


Triterpane Fragmentograms of the extract from well 6407/09-08 (1713 m.), Norway



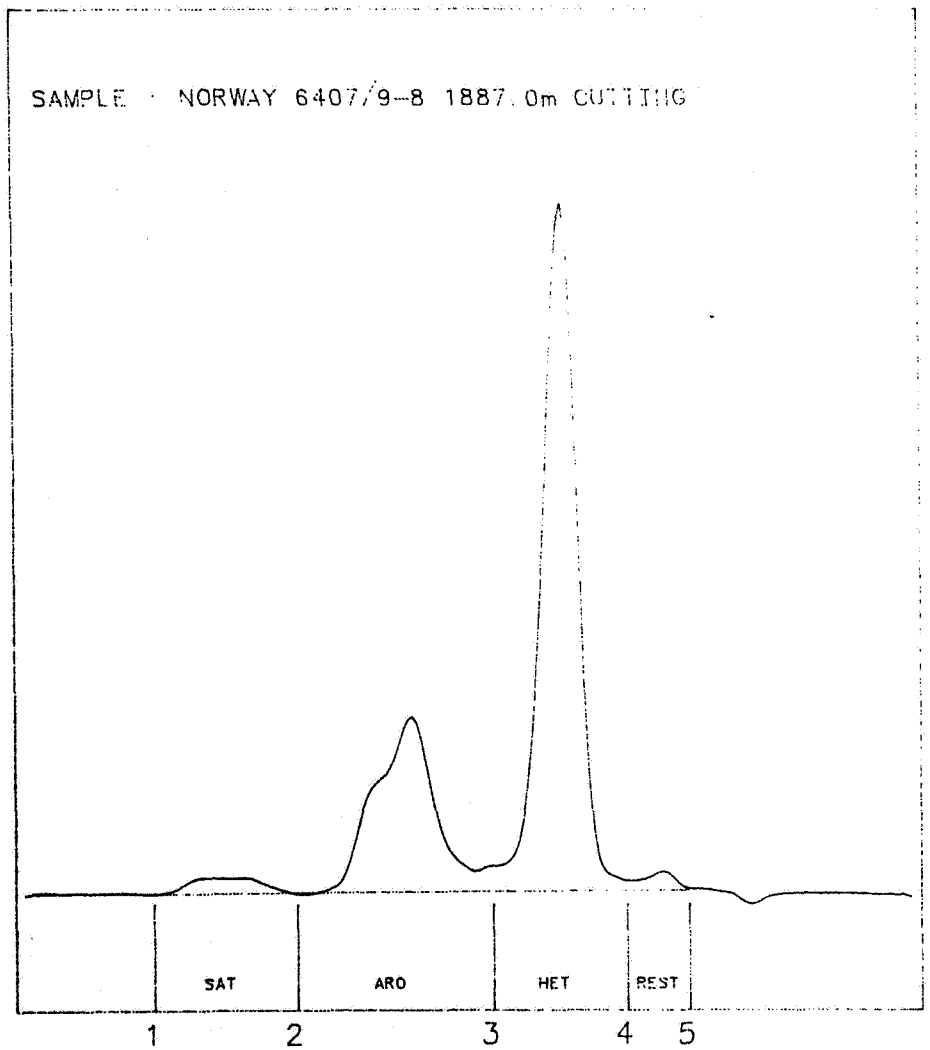
S1615602

Gas chromatogram of the saturated hydrocarbons of the extract from well 6407/09-08 (1887 m.), Norway



Confidential

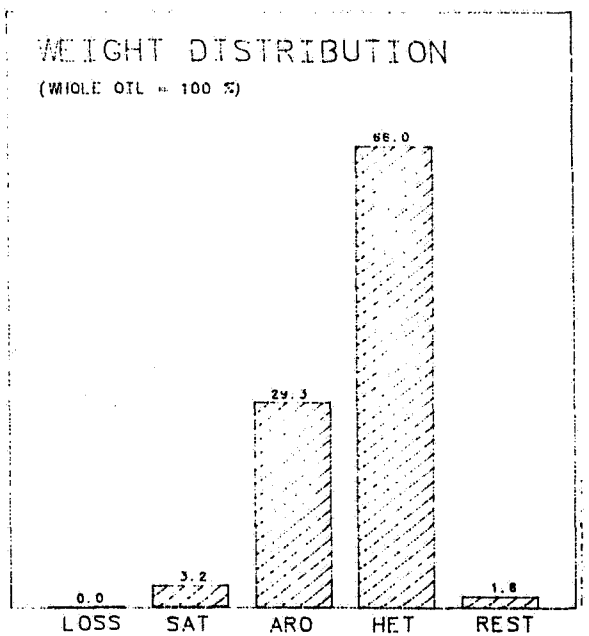
Gross Composition of the extract from well 6407/09-08 (1887 m.), Norway



SAMPLE : S161556-2

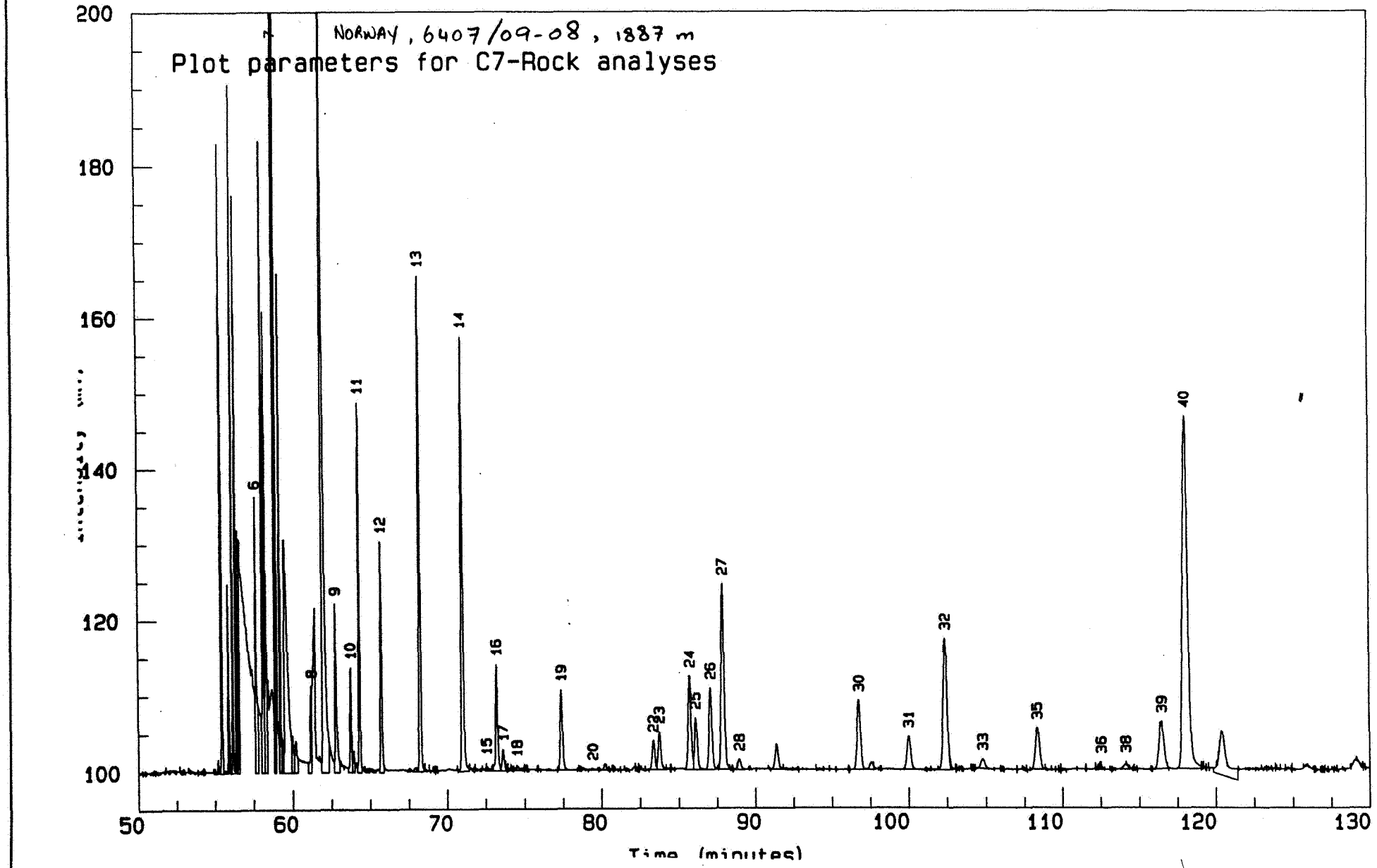
WEIGHT LOST ON TOPPING	:	0.0 %
- SATURATES	:	3.2 %
- AROMATICS	:	29.3 %
- HETEROCOMPOUNDS	:	66.0 %
- REST (HIGH MOL.)	:	1.6 %

* WEIGHT PERCENTAGES CALCULATED FROM FID RESPONSE



Confidential

Gas chromatogram of the light fraction (< 120 C.) of the extract from well 6407/09-08 (1887 m.), Norway



Confidential

Gas chromatographic hydrocarbons analysis (< 120 C.) well 6407/09-08 (1887 m.), Norway

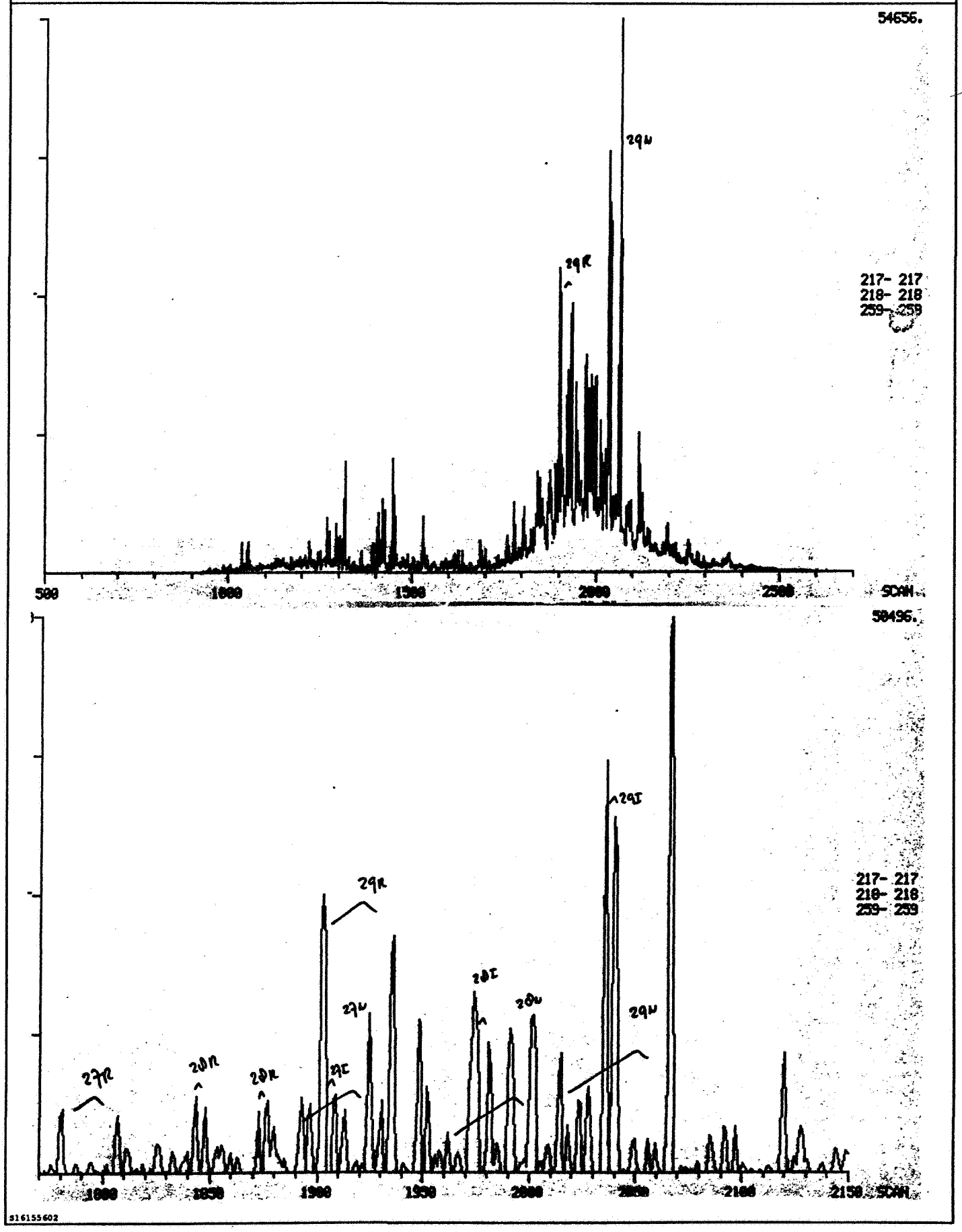
GAS CHROMATOGRAPHICS ANALYSIS OF THE FRACTION BOILING BELOW 120 DEGREES CENTIGRADE

Sample: Norway, 6407/09-08 , 1887 m

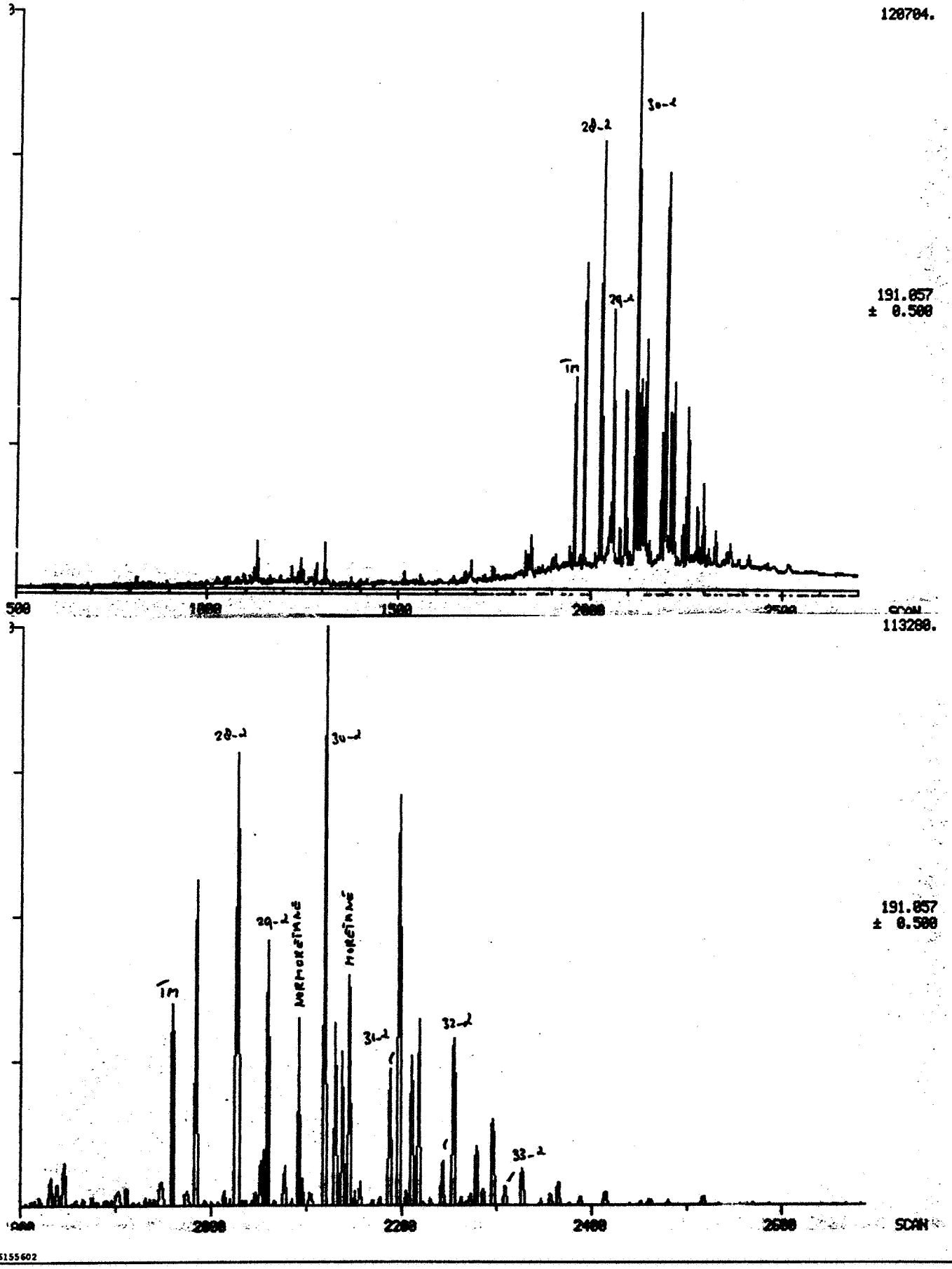
COMPONENT No.	Name	RET.TIME (min)	HEIGHT (uV)	AREA (uVs)
1	methane	0.00	0	0
2	ethane	0.00	0	0
3	propane	0.00	0	0
4	i-butane	0.00	0	0
5	n-butane	0.00	0	0
6	i-pentane	57.63	36393	189626
7	n-pentane	58.85	186151	713815
8	2.2-dimethylbutane	61.20	11394	78193
9	cyclopentane	62.74	22202	150104
10	2.3-dimethylbutane	63.72	13733	76270
11	2-methylpentane	64.29	48719	254015
12	3-methylpentane	65.71	30310	181924
13	n-hexane	68.23	65417	411342
14	methylcyclopentane	71.01	57305	463142
15	2.2-dimethylpentane	72.53	976	7866
16	benzene	73.21	13946	123892
17	2.4-dimethylpentane	73.61	2746	30490
18	2.2.3-trimethylbutane	74.50	689	7884
19	cyclohexane	77.39	10477	107883
20	3.3-dimethylpentane	79.42	219	2390
21	1.1-dimethylcylopentane	0.00	0	0
22	2-methylhexane	83.35	3842	46337
23	2.3-dimethylpentane	83.74	4956	62634
24	1-c-3-dimethylcyclopentane	85.72	12303	160956
25	3-methylhexane	86.10	6833	85592
26	1-tr-3-dimethylcyclopentane	87.07	10721	142382
27	1-tr-2-dimethylcyclopentane	87.88	24452	328623
28	3-ethylpentane	88.93	1374	19883
29	reference peak	0.00	0	0
30	n-heptane	96.75	9092	142943
31	1-c-2-dimethylcyclopentane	99.99	4325	74011
32	methylcyclohexane	102.38	17221	313570
33	1.1.3-trimethylcyclopentane	104.78	1259	22759
34	2.2-dimethylhexane	0.00	0	0
35	ethylcyclopentane	108.36	5384	103004
36	2.5-dimethylhexane	112.52	987	8319
37	not present	0.00	0	0
38	2.2.3-trimethylpentane	114.12	1039	15914
39	1-tr-2-c-4-trimethylcyclopentane	116.49	6211	138609
40	toluene	118.10	46505	1078461

S16155602

Sterane Fragmentograms of the extract from well 6407/09-08 (1887 m.), Norway

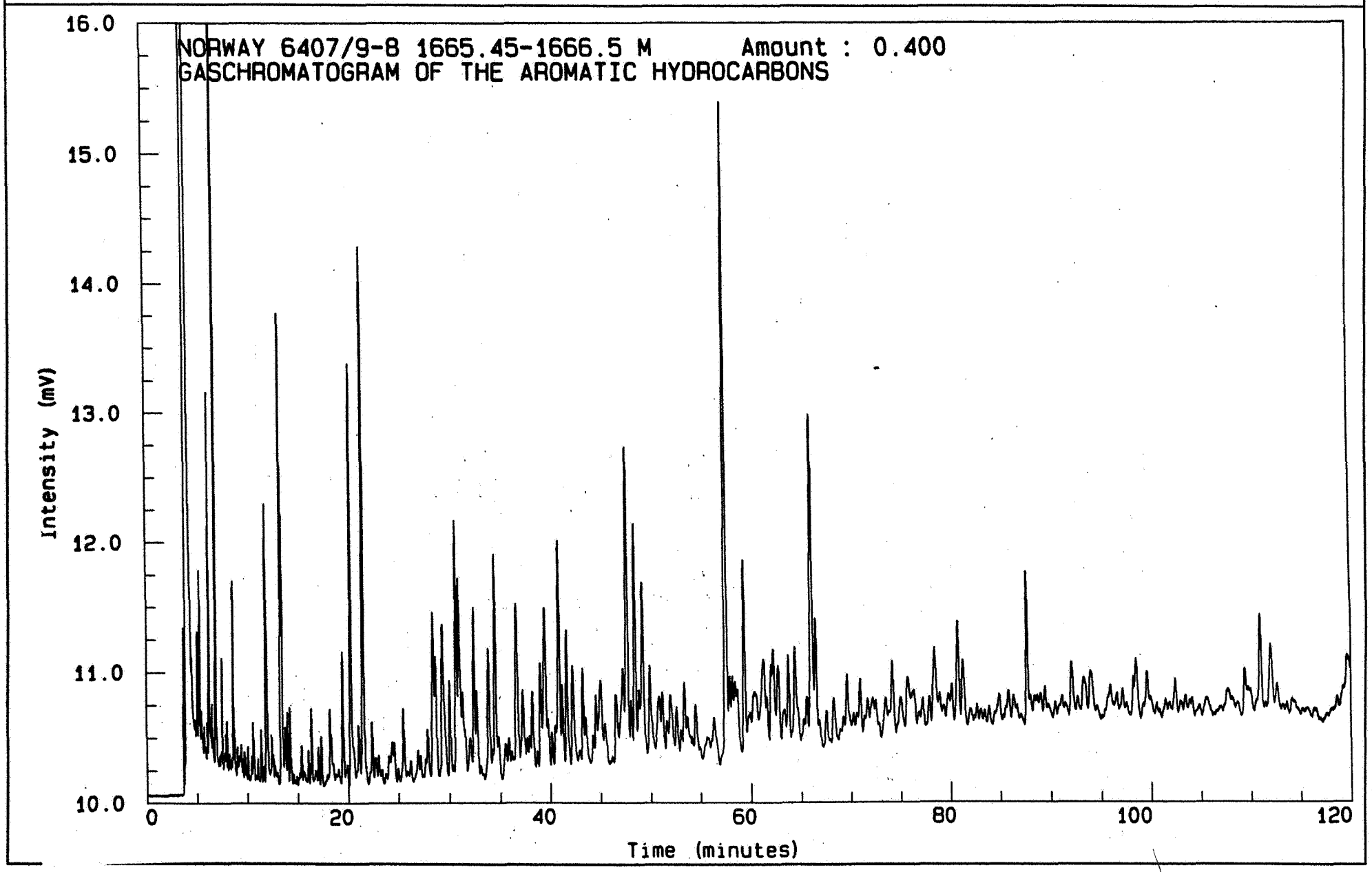


Triterpane Fragmentograms of the extract from well 6407/09-08 (1887 m.), Norway



S1613710I

Gas chromatogram of the aromatic hydrocarbons of the extract from well 6407/09-08 (1665.45 m.), Norway



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GCMS data of the aromatic fraction well 6407/09-08 (1665.45 m.), Norway

Report of sample S161371/1 Norway 6407/9-8 1665.45-1666.50m CORE Extr.W. Te

Acquired at 25-JAN-1993 21:08:09

I) NAPHTHALENES

a) Concentrations (ppm)	
2-MN	210
1-MN	376
2,6+2,7-DMN	65
1,6-DMN	124
1,5-DMN	52
1,3,6+1,4,6-TMN	53
2,3,6-TMN	23
1,2,5-TMN	50
C4-NAPH	15
THN	171
CAD	441
Total Naphtalenes	1581

b) Parameters	
2-MN/1-MN (MNR)	0.56
2,6+2,7-DMN/1,5-DMN (DNR-1)	1.26
2,3,6-TMN/1,3,6+1,4,6-TMN (TNR-1)	0.44
2,3,6-TMN/1,2,5-TMN (TNR-2)	0.46
2,3,6-TMN/THN	0.13
2,3,6-TMN/CADALENE	0.05

II) PHENANTRENES

a) Concentrations (ppm)	
P	120
3-MP	23
2-MP	23
9-MP	46
1-MP	38
Total Phenantrenes	251

b) Parameters	
2-MP/1-MP	0.61
1.5(2-MP+3-MP)/(P+1-MP+9-MP) (MPI	0.34
3(2-MP)/(P+1-MP+9-MP)	0.34
(2-MP+3-MP)/(1-MP+9-MP)	0.55
(2-MP+3-MP)/(1-MP+9-MP+2-MP+3-MP)	0.35

III) DIBENZOTHIOPHENES

a) Concentrations (ppm)	
DBT	24
4-MDBT	14
2+3-MDBT	10
1-MDBT	23
Total Dibenzothiophenes	70

b) Parameters	
4-MDBT/2+3-MDBT	1.45
4-MDBT/1-MDBT	0.61
2+3-MDBT/1-MDBT	0.42
4-MDBT/DBT	0.60
2+3-MDBT/DBT	0.41
1-MDBT/DBT	0.97

IV) BIPHENYLS

a) Concentrations (ppm)	
BP	15
2-MBP	4
3-MBP	13
4-MBP	6
Total Biphenyls	38

b) Parameters	
3-MBP/BP	0.85
3-MBP/4-MBP	2.21
3-MBP/2-MBP	3.24

V) DIBENZOFURANS

a) Concentrations (ppm)	
DBF	25
4-MDBF	12
2+3-MDBF	14
1-MDBF	14
Total Dibenzofurans	65

b) Parameters	
4-MDBF/2+3-MDBF	0.87
4-MDBF/1-MDBF	0.85
2+3-MDBF/1-MDBF	0.97
4-MDBF/DBF	0.48
2+3-MDBF/DBF	0.54
1-MDBF/DBF	0.56

VI) OVERALL RATIOS

Biphenyls/NAPH*	0.20
Dibenzothiophenes/NAP	0.36
Dibenzofurans/NAPH*	0.34

MN = methylnaphtalene
DMN = dimethylnaphtalene
TMN = trimethylnaphtalene
THN = tetrahyronaphtalene
DBF = methyldibenzofuran
MDBF = methyldibenzofuran

P = phenantrene
MP = methylphenantrene
DBT = dibenzothiophene
MDBT = methyldibenzothiophene
BP = biphenyl
MBP = methylbiphenyl

NAPH* = 2,6+2,7-DMN + 1,5-DMN + 1,4,6+1,3,6-TMN + 2,3,6-TMN

Standard used for calculations: PDP
Discrimination factor : 0.77

MACERAL DESCRIPTION OF WELL/OUTCROP
Norway, 6407/09-08

Sample(s)

Sample(s)	ORGANIC MATTER																													MINERAL MATTER		
	SOM				VITRINITE						LIPTINITE													INERTINITE									
	LOAD BEARING			NON-L. B.	VIT.-1				VIT.-2								ALGAE																	
	DENSE	LAYERS	LENSES	DIFFUSE / INTERGRANULAR	LAYERS / LENSES TELOCOLLINITE	DETRITAL TELOCOLLINITE	LAYERS / LENSES TELINITE	DETRITAL TELINITE	LAYERS / LENSES DESMOCOLLINITE	DETRITAL DESMOCOLLINITE	SPORINITE (MICRO-)	SPORINITE (MEGA-)	CUTINITE	SUBERINITE	RESINITE (+ FLUORINITE)	LIPTODETRINITE	BOTRYOCOCCUS	TASMANITES	OTHER ALGAE	MICROPLANKTON	EXSUDATINITE (FLUORESCING)	EXSUDATINITE (NON-FLUORESING) S.HYDR.	SCLEROTINITE	(SEMI-) FUSINITE (+ INERTODETRINITE)	MICRINITE (+ OXY-MICRINITE)	UNDEFINED MINERALS	FRAMBOIDAL PYRITE	AGGREGATES / CRYSTALS PYRITE
1617.70 m/R		/	/	/						–	–					/		–		/				/	+	*	+	/
1683.50 m/R		+	+	+						–	/					/		–		–				+	/	*	+	/
1713.00 m/C		/	/	/						–	/					/		–		–				/	/	*	/	/
1887.00 m/C		/	/	/			/		+	/	–		–		–	/	–			–				/	/	*	/	+

L E G E N D	
*	ABUNDANT
+	COMMON
/	FEW
–	RARE

L i s t i n g o f C o m m e n t l i n e s

Country : Norway (203)
Well/Outcrop : 6407/09-08 (203/0216)
Order seq.nr. : ALL orders

Depth (m)	Sample Type	Comment
1617.70 (S 161551)	R	SOM partly micrinised Micrinite = oxy-micrinite ? Sample slightly oxidised Moderate Type II source rock Pinkish white-light yellow fluorescence -> immature
1683.50 (S 161553)	R	SOM partly micrinised Micrinite = oxy-micrinite ? Sample slightly oxidised Good Type II/IV source rock White-light yellow fluorescence -> immature
1713.00 (S 161555)	C	SOM partly micrinised Micrinite = oxy-micrinite ? Sample partly oxidised Sample severely oxidised Fossil remains Inhom. sample; Few good Type II/(IV) source rock particles Few plankt. forams; White-(light)yellow fluor.->immature
1887.00 (S 161557)	C	SOM partly micrinised Micrinite = oxy-micrinite ? Sample partly oxidised Inhom. sample; Large pyrite crystals Large Botryocc. algae; Light yellow fluor.-> im/just mature

a

VISUAL VOLUME PERCENTAGE ESTIMATION

Norway, 6407/09-08

Date : 23-DEC-92

Sample(s)	ORGANIC MATTER																												MINERAL MATTER		
	SOM			VITRINITE						LIPTINITE													INERTINITE								
	LOAD BEARING			NON-L. B.	VIT.-1				VIT.-2								ALGAE														
	DENSE	LAYERS	LENSES	DIFFUSE / INTERGRANULAR	LAYERS / LENSES TELOCOLLINITE	DETRITAL TELOCOLLINITE	LAYERS / LENSES TELINITE	DETRITAL TELINITE	LAYERS / LENSES DESMOCOLLINITE	DETRITAL DESMOCOLLINITE	SPORINITE (MICRO-)	SPORINITE (MEGA-)	CUTINITE	SUBERINITE	RESINITE (+ FLUORINITE)	LIPTODETRINITE	BOTRYOCOCCUS	TASMANITES	OTHER ALGAE	MICROPLANKTON	EXSUDATINITE (FLUORESCING)	EXSUDATINITE (NON-FLUORESING) S.HYDR.	SCLEROTINITE	(SEMI-) FUSINITE (+ INERTODETRINITE)	MICRINITE (+ OXY-MICRINITE)	UNDEFINED MINERALS	FRAMBOIDAL PYRITE	AGGREGATES / CRYSTALS PYRITE
1617.70 m/R		1	2	2						<1	<1					2		<1		1				1	C	86	3	2
1683.50 m/R		3	3	3						<1	2					2		<1		<1				3	F	80	3	1
1713.00 m/C		2	2	2						<1	1					2		<1		<1				2	F	86	2	1
1887.00 m/C		1	1	1			1		3	1	<1		<1		<1	1	<1			<1				2	F	78	1	10

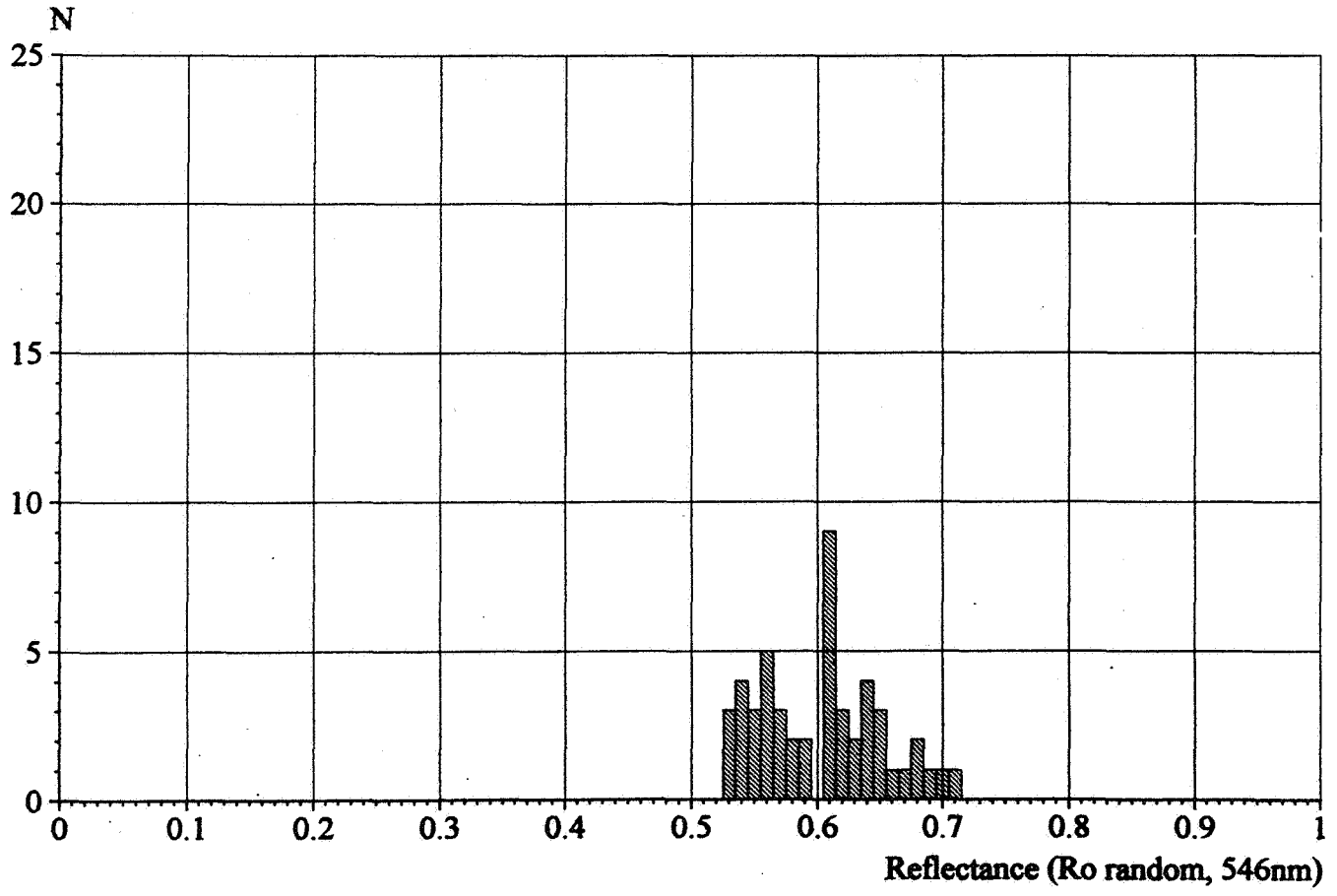
Page : 1

Fig. b

Reflectance histogram

Country	*Norway*	Sample type	*Cutting*
Well	*6407/09-08*	Sample/Order	*S161557/03*
Depth	*1887*	Analyst	*KMR*
Reference	*Derrick floor*	Date	*17-12-1992*

	Mean	Std	Min	Max	Mode	Measurements
Desmocollinite	*0.6*	*0.05*	*0.53*	*0.71*	*0.61*	*50*



Schlumberger GECO-PRAKLA

GEOLAB NOR

BA-92-2525-1

01 DES. 1992

REGISTRERT

OLJEDIREKTORATET

Geochemical Report for

Well NOCS 6407/9-8

Author: Sunil Bharati

Geolab Nor A/S

P.O. Box 5740 Fossegrenda

7002 Trondheim

Norway

Date : 13.11.92

Chapter 1

INTRODUCTION

1.1 General Comments

The organic geochemical screening analyses for the well NOCS 6407/9-8 were performed on behalf of A/S Norske Shell. The project was authorised by Kari Berge. The cuttings samples were received by Geolab Nor in bags and were washed and described. The subsequent analytical program was suggested by Norske Shell and executed accordingly by Geolab Nor. This is outlined below:

1.2 Analytical Program

Analysis type	No of samples	Figures	Tables
Lithology description	93	1	1
TOC	93	1	1,2
Rock-Eval pyrolysis	47	2,3,4	2
Thermal extraction GC (GHM, S_1)	8	5a-b	
Pyrolysis GC (GHM, S_2)	8	6a-b, 7	3

Abbreviations

List of abbreviations used for lithology description
(sorted alphabetically)

ang	= angular
bar	= Baryte (mud additive)
bit	= bituminous
bl	= blue/blueish
blk	= black
br	= brittle
brn	= brown/brownish
Ca	= Carbonate (limestone/chalk/dolomite/siderite)
calc	= calcareous
carb	= carbonaceous
cem	= cement used as additive (under "cont") or to describe cemented S/Sst
Chert	= Chert
chk	= Chalk/chalky
cly	= clayey/shaly
cngl	= conglomeratic
Coal	= Coal
Coal-ad	= Coal-like additive (e.g. chromlignosulfonate)
Congl	= Conglomerat
Cont	= Contamination(s)
crs	= coarse grained
dd	= dried drilling mud
dol	= Dolomite/dolomitic
drk	= dark (colour)
dsk	= dusk/dusky (colour)
evap	= Salt/Gypsum/Halite (natural "Other" or as additive "Cont"
f	= fine grained
fe	= ferruginous
fib	= fibres (mud additive/contamination)
fis	= fissile
fos	= fossiliferous
glauc	= glauconite/glauconitic
gn	= green/greenish
gy	= grey/greyish
hd	= hard
ign	= Igneous (material derived from igneous source)
Kaolin	= Kaolin(ite)
kln	= kaolinitic
l	= loose
lam	= laminated/laminae
lt	= light (colour)
m	= medium (colour or grain size)
Marl	= Marl (calcareous claystone/mudstone)

mic	= micaceous
Mica-ad	= Mica used as mud additive
mrl	= marly
No Mat.	= No material left over after washing
ns	= nutshells (mud additive)
ol	= olive
ool	= Oolite/oolitic
or	= orange
Other	= Other lithology/mineral, specified after this word
pi	= pink/pinkish
pl	= pale (colour)
prp	= paint/rust/plastic contaminations/additives
pu	= purple
pyr	= Pyrite/pyritic
red	= red/reddish
rnd	= round/rounded
s	= sandy
sft	= soft
S/Sst	= Sand and/or sandstone
Sh/Clst	= Shale and/or claystone
sid	= Siderite/sideritic
sil	= siliceous/cherty
slt	= silty
Sltst	= siltstone
st	= stained (with natural oil or oil-like additive)
tar-ad	= Tar-like additive (e.g. "Black Magic")
trbfgs	= turbodrilled fragments
Tuff	= Tuff
tuff	= tuffaceous
v col	= various colours
w	= white
wx	= waxy
y	= yellow/yellowish

List of abbreviations used for parameters, ratios and analytical methods
(sorted alphabetically)

CPI = Carbon Preference Index,
0.5 x $\frac{C25+C27+C29+C31+C33}{C24+C26+C28+C30+C32}$ + $\frac{C25+C27+C29+C31+C33}{C26+C28+C30+C32+C34}$

EOM = Extractable Organic Matter
FID = Flame Ionisation Detector
FPD = Flame Photometric Detector
GC = Gas Chromatograph
GC-MS = Gas Chromatograph - Mass Spectrometer
GHM = Geofina Hydrocarbon Meter (combined thermal extraction - pyrolysis gas chromatograph)
HC = Hydrocarbons
HI = Hydrogen Index (100 x S2/TOC)
HPLC = High Pressure Liquid Chromatograph
MDBT(4/1) = Ratio of 4-/1-methyl dibenzothiophene
MNR = Ratio of 2-/1-methyl naphthalene
MP = Methyl phenanthrene
MPI1 = Methyl phenanthrene Index,
1.5x(3MP+2MP) / P+9MP+1MP
MPLC = Medium Pressure Liquid Chromatograph
NSO = Nitrogen-, Sulphur- and Oxygen-compounds
OI = Oxygen Index (100 x S3/TOC)
P = Phenanthrene
PI = Production Index (S1/(S1+S2))
PP = Petroleum Potential (S1+S2)
Ro (%) = Measured Vitrinite Reflectance in Percent
Rock-Eval = Oil show and source rock evaluation instrument
S1 = Amount of Free Hydrocarbons, Rock-Eval
S2 = Amount of Kerogen pyrolysate, Rock-Eval
S3 = Amount of Oxidised Organic Material
SCI = Spore Colour Index (maturity indicator)
TCD = Thermal Conductivity Detector
TAI = Thermal Alteration Index (maturity indicator)
Tmax = Temperature of maximum pyrolysate yield, Rock-Eval
TOC = Total Organic Carbon

Analytical Methods

This is a brief description of the various analytical methods and instruments used by Geolab Nor, the importance and use of the results. Interpretation limits of numeric values are given in the "Interpretation Limits".

TOC
Total organic carbon analysis of a rock indicates how much organic material is present in wt %. Either from a LECO or Rock-Eval instrument. Important for quantifying source rocks.

Rock-Eval
This instrument determines the amounts of free hydrocarbons (S1), the amounts of material (pyrolysate) generated from kerogen (S2) and oxidised organic material (S3) plus gives a maturity indication (Tmax). It is used to identify zones of migrated hydrocarbons (high S1), rich source rocks (high S2), oxidized kerogen (high S3) and to get a first estimate of the maturity (empirical Tmax scale). Kerogen type can be estimated by the hydrogen index (HI). This parameter is however, maturity dependent. See "Interpretation Limits" for interpretation of values.

GHM
The Geofina Hydrocarbon Meter is a combined thermal extraction and pyrolysis gas chromatography instrument. It will give a chromatogram of the free hydrocarbons as well as of the pyrolysis products of the kerogen for small (< 20 mg) samples. Useful for determining the type of free hydrocarbons present (e.g. light oil, heavy oil, residual oil, biodegraded oil, condensate, oil based mud) and to evaluate the source rock (type and maturity, e.g. immature oil-prone, immature gas-prone, mature oil-prone etc.). Gas prone source rocks will show compounds mainly in the C1 - C5 range, oil prone source rocks will show abundant compounds in the C8 - C25 range. With maturation the long peaks representing the long-chained molecules will diminish.

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age Lithology description	Trb	Sample
1590.00						0001
		3.95	90	Other : w, calc, l, ang		0001-1L
			10	Sh/Clst: brn, m gy		0001-2L
1593.00						0002
		0.26	90	Other : w, calc, l, ang		0002-1L
			10	Sh/Clst: brn, m gy		0002-2L
1596.00						0003
		0.21	75	Sh/Clst: red brn		0003-2L
			20	Ca : w, l, ang		0003-1L
			5	Sh/Clst: m gn gy		0003-3L
1599.00						0004
			80	Cont : w, bar		0004-1L
		0.17	15	Sh/Clst: red brn, m gn gy		0004-2L
			5	Cont : lt ol y, fib		0004-3L
1602.00						0005
			60	Cont : w, bar		0005-1L
			40	Cont : lt ol y, fib		0005-3L
			tr	Sh/Clst: red brn, m gn gy		0005-2L
1606.60	ccp					0006
		4.28	100	Sh/Clst: m lt gy		0006-1L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure; m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age Lithology description	Trb	Sample
1607.60		ccp				0007
		5.19	100	Sh/Clst: m drk gy		0007-1L
1609.50		ccp				0008
		7.04	100	Sh/Clst: drk gy		0008-1L
1612.65		ccp				0009
		5.27	100	Sh/Clst: drk gy		0009-1L
1615.00		ccp				0010
		7.77	100	Sh/Clst: drk gy		0010-1L
1615.45		ccp				0011
		5.67	100	Sh/Clst: m drk gy		0011-1L
1618.70		ccp				0012
		7.69	100	Sh/Clst: drk gy		0012-1L
1621.70		ccp				0013
		6.61	100	Sh/Clst: drk gy		0013-1L
1624.50		ccp				0096
		5.48	100	Sh/Clst: drk gy		0096-1L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
1627.75		ccp						0014
		5.90	100			Sh/Clst: drk gy, fis		0014-1L
1630.50		ccp						0015
		6.54	100			Sh/Clst: drk gy		0015-1L
1633.75		ccp						0016
		6.08	100			Sh/Clst: drk gy		0016-1L
1636.70		ccp						0017
		6.17	100			Sh/Clst: drk gy		0017-1L
1639.80		ccp						0018
		7.44	100			Sh/Clst: m drk gy		0018-1L
1641.80		ccp						0019
		7.45	100			Sh/Clst: m drk gy		0019-1L
1650.90		ccp						0020
		4.07	100			Sh/Clst: m drk gy		0020-1L
1653.50		ccp						0021
		4.07	100			Sh/Clst: m drk gy		0021-1L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
1656.50	ccp						0022
	3.97	100	Sh/Clst: drk gy				0022-1L
1659.60	ccp						0023
	3.52	100	Sh/Clst: drk gy				0023-1L
1662.80	ccp						0024
	2.28	100	Sh/Clst: m gy, slt				0024-1L
1664.50	ccp						0025
	2.61	100	Sh/Clst: m gy, slt				0025-1L
1667.55	ccp						0026
	2.79	100	Sh/Clst: m drk gy, slt				0026-1L
1673.80	ccp						0027
	4.88	100	Sh/Clst: m drk gy				0027-1L
1676.70	ccp						0028
	5.19	100	Sh/Clst: drk gy				0028-1L
1679.60	ccp						0029
	6.33	100	Sh/Clst: drk gy				0029-1L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
1682.50	ccp						0030
	5.00	100	Sh/Clst: drk gy				0030-1L
1684.50	ccp						0031
	6.57	100	Sh/Clst: drk gy				0031-1L
1689.00							0034
	6.55	90	Sh/Clst: drk gy				0034-1L
		5	Sh/Clst: red brn				0034-2L
		5	Sh/Clst: lt gy to lt gy w				0034-3L
1692.00							0035
	6.37	90	Sh/Clst: drk gy				0035-1L
		5	Sh/Clst: red brn				0035-2L
		5	Sh/Clst: lt gy to lt gy w				0035-3L
1698.00							0036
	7.06	80	Sh/Clst: drk gy				0036-1L
		15	Sh/Clst: red brn				0036-2L
		5	Sh/Clst: lt gy to lt gy w, calc				0036-3L
		tr	Other : y, pyr				0036-4L
		tr	Cont : w, cem				0036-5L
1707.00							0037
	6.09	60	Sh/Clst: drk gy				0037-1L
		25	Sh/Clst: red brn				0037-2L
		15	Sh/Clst: lt gy to lt gy w, calc				0037-3L
		tr	Cont : w, cem				0037-4L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
1713.00							0038
	5.70	50	Sh/Clst: drk gy				0038-1L
		30	Sh/Clst: lt gy to lt gn gy, calc				0038-3L
		10	Sh/Clst: red brn				0038-2L
		10	Cont : w, lt ol y, calc, fib				0038-4L
		tr	Other : y, pyr				0038-5L
1719.00							0039
	1.33	80	Sh/Clst: m gy to m brn gy				0039-3L
		10	Sh/Clst: drk gy				0039-1L
		5	Sh/Clst: red brn				0039-2L
		5	Cont : w, calc, bar				0039-4L
1723.40 ccp							0032
	1.46	100	Sh/Clst: m gy				0032-1L
1725.00							0040
	1.27	80	Sh/Clst: m gy to m ol gy				0040-3L
		10	Sh/Clst: drk gy				0040-1L
		5	Sh/Clst: red brn				0040-2L
		5	Cont : w, calc, bar				0040-4L
1728.80 ccp							0033
	0.72	100	Sh/Clst: lt gy				0033-1L
1761.00							0041
		90	Other : w, l, calc, crs				0041-1L
	2.89	10	Sh/Clst: m gy to drk gy				0041-3L
		tr	Sh/Clst: red brn				0041-2L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
1767.00							0042
		90	Other	:	w, l, calc, crs		0042-1L
	3.42	10	Sh/Clst	:	m gy to drk gy		0042-3L
		tr	Sh/Clst	:	red brn		0042-2L
		tr	Other	:	y, pyr		0042-4L
1773.00							0043
		50	Ca	:	w, dol, cly		0043-6L
	1.28	20	Sh/Clst	:	m lt ol gy		0043-5L
		10	Other	:	w, l, calc, crs		0043-1L
		10	Sh/Clst	:	red brn		0043-2L
		10	Sh/Clst	:	m gy to drk gy		0043-3L
		tr	Other	:	y, pyr		0043-4L
		tr	Cont	:	blk, Mica-ad		0043-7L
1779.00							0044
	1.34	60	Ca	:	w, dol, cly		0044-5L
		20	Other	:	w, l, calc, crs		0044-1L
		10	Sh/Clst	:	m lt ol gy		0044-4L
		5	Sh/Clst	:	red brn		0044-2L
		5	Sh/Clst	:	m gy to drk gy		0044-3L
		tr	Cont	:	blk, Mica-ad		0044-6L
1785.00							0045
	1.23	70	Ca	:	w, dol, cly		0045-1L
		15	Sh/Clst	:	drk gy to m gy		0045-2L
		10	Cont	:	w, bar		0045-4L
		5	Sh/Clst	:	red brn, lt gy		0045-3L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
1791.00							0047
		55	Other	:	w, l, calc, bar		0047-4L
	0.88	25	Ca	:	w, dol, cly		0047-1L
		15	Sh/Clst	:	drk gy to m gy		0047-2L
		5	Sh/Clst	:	red brn		0047-3L
1797.00							0048
	6.30	60	Sh/Clst	:	drk gy		0048-2L
		20	Other	:	w, l, calc, bar		0048-4L
		15	Ca	:	w, dol, cly		0048-1L
		5	Sh/Clst	:	red brn		0048-3L
		tr	Cont	:	blk, Mica-ad		0048-5L
1803.00							0049
	6.47	75	Sh/Clst	:	drk gy		0049-1L
		15	Sh/Clst	:	lt gy to m gy		0049-4L
		5	Sh/Clst	:	red brn		0049-2L
		5	Other	:	w, l, calc, bar		0049-3L
1812.00							0050
		35	Sh/Clst	:	drk gy		0050-1L
	0.99	25	Sh/Clst	:	lt gy to m gy		0050-4L
		20	Sltst	:	w		0050-5L
		15	Other	:	w, l, calc, bar		0050-3L
		5	Ca	:	w, chk		0050-6L
		tr	Sh/Clst	:	red brn		0050-2L
1818.00							0051
	0.97	50	Sltst	:	w, calc		0051-5L
		20	Sh/Clst	:	drk gy		0051-1L
		15	Other	:	w, l, calc, bar		0051-3L
		10	Sh/Clst	:	lt gy to m gy		0051-4L
		5	Ca	:	w, chk		0051-6L
		tr	Sh/Clst	:	red brn		0051-2L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp Frm Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description		
1824.00					0052
	0.64	70	Sltst : w, calc, dol		0052-4L
		20	Sh/Clst: drk gy		0052-1L
		10	Sh/Clst: lt gy to m gy		0052-3L
		tr	Sh/Clst: red brn		0052-2L
1830.00					0053
	6.13	75	Sh/Clst: drk gy		0053-1L
		15	Sltst : w, calc, dol		0053-4L
		10	Sh/Clst: lt gy to m gy		0053-3L
		tr	Sh/Clst: red brn		0053-2L
1839.00					0054
	1.34	50	Sh/Clst: m gy to m ol gy		0054-3L
		40	Sh/Clst: drk gy		0054-1L
		10	Sltst : w, calc, dol		0054-4L
		tr	Sh/Clst: red brn		0054-2L
1848.00					0055
	0.25	50	Sltst : w, mic, cly		0055-4L
		25	Sh/Clst: drk gy		0055-1L
		20	Sh/Clst: m gy to m ol gy		0055-3L
		5	Other : w, mic		0055-5L
		tr	Sh/Clst: red brn		0055-2L
1854.00					0056
	0.15	75	Sltst : w, mic, cly		0056-4L
		10	Sh/Clst: drk gy		0056-1L
		10	Sh/Clst: m gy to m ol gy		0056-3L
		5	Other : w, mic		0056-5L
		tr	Sh/Clst: red brn		0056-2L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
1860.00								0057
		0.20	70	Sltst		: w, mic, cly		0057-4L
			10	Sh/Clst		: drk gy		0057-1L
			10	Sh/Clst		: m gy to m ol gy		0057-3L
			5	Other		: w, mic		0057-5L
			5	Other		: y, pyr		0057-6L
			tr	Sh/Clst		: red brn		0057-2L
1869.00								0058
		0.86	75	Ca		: w, cly, chk		0058-3L
			10	Sh/Clst		: lt gy		0058-1L
			10	Other		: y, pyr		0058-4L
			5	Sltst		: w, mic, cly		0058-2L
1875.00								0060
		1.22	45	Sh/Clst		: m gy to m lt gy		0060-1L
			30	Ca		: w, cly, chk		0060-2L
			10	Other		: y, pyr		0060-3L
			10	Sh/Clst		: red brn		0060-5L
			5	Sh/Clst		: lt gy		0060-4L
1881.00								0062
		1.16	60	Sh/Clst		: m gy to m lt gy		0062-1L
			20	Sh/Clst		: lt gy		0062-2L
			10	Other		: w, l		0062-5L
			5	Sh/Clst		: red brn		0062-3L
			5	Other		: y, pyr		0062-4L
1887.00								0063
			25	Other		: w, l, chk, cly		0063-7L
			20	Sh/Clst		: lt gy, lt gn gy		0063-2L
			20	Other		: w, l, calc		0063-5L
		50.50	20	Sh/Clst		: blk, carb		0063-6L
			5	Sh/Clst		: m gy to m lt gy		0063-1L
			5	Sh/Clst		: red brn		0063-3L
			5	Other		: y, pyr		0063-4L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
1893.00							0064
	1.38	30	Sh/Clst: lt gy, lt gn gy				0064-2L
		30	Other : w, l, calc				0064-5L
		25	Sltst : w, calc, cly				0064-8L
		10	Other : w, l, chk, cly				0064-7L
		5	Sh/Clst: m gy to m lt gy				0064-1L
		tr	Sh/Clst: red brn				0064-3L
		tr	Other : y, pyr				0064-4L
		tr	Sh/Clst: blk, carb				0064-6L
1899.00							0065
	0.19	50	Sltst : w, calc, mic, cly				0065-6L
		20	Sh/Clst: lt gy, lt ol gy				0065-2L
		10	Sh/Clst: m gy to m lt gy				0065-1L
		10	Other : w, l, calc				0065-4L
		5	Sh/Clst: red brn				0065-3L
		5	Other : w, l, chk, cly				0065-5L
1905.00							0067
	0.21	60	Sltst : w, l, mic, calc				0067-6L
		20	Sh/Clst: m gy to m lt gy				0067-1L
		10	Other : w, l, calc				0067-4L
		5	Other : w, l, chk, cly				0067-3L
		5	Other : y, pyr				0067-5L
		tr	Sh/Clst: red brn				0067-2L
1911.00							0068
	0.35	45	Sltst : w, l, mic, calc				0068-6L
		25	Sh/Clst: m gy to m lt gy to m lt ol gy				0068-1L
		10	Other : w, chk, cly				0068-3L
		10	Other : w, l, calc				0068-4L
		5	Sh/Clst: red brn				0068-2L
		5	Other : y, pyr				0068-5L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth		Type		Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description				
1917.00								0069
		0.25	40	Sltst	:	w, l, mic, calc		0069-4L
			30	S/Sst	:	w, l, crs		0069-5L
			15	Sh/Clst	:	m gy to m lt gy to m lt ol gy		0069-1L
			10	Other	:	w, chk, cly		0069-3L
			5	Sh/Clst	:	red brn		0069-2L
1923.00								0070
		0.05	65	S/Sst	:	w, l, crs		0070-4L
			20	Sh/Clst	:	m gy to m lt gy to m lt ol gy		0070-1L
			10	Sltst	:	w, l, mic, calc		0070-3L
			5	Sh/Clst	:	red brn		0070-2L
1929.00								0071
		0.06	70	S/Sst	:	w, l		0071-4L
			15	Sh/Clst	:	m gy to m lt gy to m lt ol gy		0071-1L
			10	Sltst	:	w, l, mic, calc		0071-3L
			5	Sh/Clst	:	blk, carb		0071-5L
			tr	Sh/Clst	:	red brn		0071-2L
1935.00								0072
		0.03	85	S/Sst	:	w, l		0072-3L
			10	Sh/Clst	:	m lt gy to m lt ol gy, lt gy		0072-1L
			5	Sltst	:	w, calc, mic		0072-4L
			tr	Sh/Clst	:	red brn		0072-2L
1941.00								0073
		0.06	70	S/Sst	:	w, l		0073-3L
			10	Sh/Clst	:	m lt gy to m lt ol gy		0073-1L
			10	Sltst	:	w, calc, mic		0073-4L
			5	Sh/Clst	:	red brn		0073-2L
			5	Sh/Clst	:	blk, carb		0073-5L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
1947.00							0074
	0.06	80	S/Sst : w, l				0074-2L
		10	Sltst : w, calc, mic				0074-3L
		5	Sh/Clst: m lt gy to m lt ol gy				0074-1L
		5	Sh/Clst: blk, carb				0074-4L
1953.00							0075
	0.08	90	S/Sst : w, l, mic				0075-2L
		5	Sh/Clst: m lt gy to m lt ol gy				0075-1L
		5	Sh/Clst: blk, carb				0075-3L
1959.00							0076
	0.09	85	S/Sst : w, l, mic				0076-2L
		10	Sh/Clst: m drk gy to m lt ol gy				0076-1L
		5	Sh/Clst: blk, carb				0076-3L
		tr	Sh/Clst: red brn				0076-4L
1965.00							0077
	5.90	70	Sh/Clst: m drk gy to m lt ol gy				0077-1L
		10	S/Sst : w, l, mic				0077-2L
		10	Sh/Clst: lt gy to lt y gy				0077-4L
		5	Sh/Clst: red brn				0077-3L
		5	Ca : w				0077-5L
1974.00							0078
	0.18	70	S/Sst : w, l, mic				0078-2L
		10	Sh/Clst: m drk gy to m lt ol gy				0078-1L
		10	Sh/Clst: lt gy to lt y gy				0078-4L
		5	Sh/Clst: red brn				0078-3L
		5	Ca : w				0078-5L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age Lithology description	Trb	Sample
1980.00						0079
		0.14	75	S/Sst : w, l, mic		0079-2L
			10	Sh/Clst: m drk gy to m lt ol gy		0079-1L
			5	Sh/Clst: red brn		0079-3L
			5	Sh/Clst: lt gy to lt y gy		0079-4L
			5	Ca : w		0079-5L
1986.00						0080
		0.10	85	S/Sst : w, l, mic		0080-2L
			10	Sh/Clst: m drk gy to m lt ol gy		0080-1L
			5	Sh/Clst: lt gy to lt y gy		0080-4L
			tr	Sh/Clst: red brn		0080-3L
1992.00						0066
		0.15	65	S/Sst : w, l, mic, kln		0066-4L
			30	Sh/Clst: m gy to m drk gy		0066-1L
			5	Other : w, l, chk, cly		0066-3L
			tr	Sh/Clst: red brn		0066-2L
2001.00						0081
		0.11	70	S/Sst : w, l, mic		0081-2L
			15	Sh/Clst: m drk gy to m lt ol gy		0081-1L
			10	Sh/Clst: lt gy to lt y gy		0081-4L
			5	Ca : w		0081-5L
			tr	Sh/Clst: red brn		0081-3L
2007.00						0082
		0.07	80	S/Sst : w, l, mic		0082-2L
			10	Sh/Clst: m drk gy to m lt ol gy		0082-1L
			5	Sh/Clst: lt gy to lt y gy		0082-4L
			5	Ca : w		0082-5L
			tr	Sh/Clst: red brn		0082-3L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
2013.00							0083
	0.14	70	S/Sst	: w, l, mic			0083-2L
		15	Sh/Clst	: lt gy to lt y gy			0083-4L
		10	Sh/Clst	: m drk gy to m lt ol gy			0083-1L
		5	Other	: y, pyr			0083-5L
		tr	Sh/Clst	: red brn			0083-3L
2019.00							0084
		55	S/Sst	: w, l, mic			0084-2L
	4.53	35	Sh/Clst	: m drk gy to m lt ol gy			0084-1L
		10	Sh/Clst	: lt gy to lt y gy			0084-4L
		tr	Sh/Clst	: red brn			0084-3L
		tr	Other	: y, pyr			0084-5L
2025.00							0085
	0.17	85	S/Sst	: w, l, mic			0085-2L
		10	Sh/Clst	: m drk gy to m lt ol gy			0085-1L
		5	Sh/Clst	: lt gy to lt y gy			0085-3L
		tr	Other	: y, pyr			0085-4L
2034.00							0086
	0.10	90	S/Sst	: w, l, mic			0086-2L
		5	Sh/Clst	: m drk gy to m lt ol gy			0086-1L
		5	Sh/Clst	: lt gy to lt y gy			0086-3L
		tr	Other	: y, pyr			0086-4L
2040.00							0087
		40	S/Sst	: w, l, mic			0087-2L
	4.16	35	Sh/Clst	: m drk gy to m lt ol gy			0087-1L
		25	Sh/Clst	: lt gy to lt y gy			0087-3L
		tr	Other	: y, pyr			0087-4L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
2046.00							0088
	1.51	65	Sh/Clst: lt gy to lt y gy				0088-3L
		20	S/Sst : w, l, mic				0088-2L
		15	Sh/Clst: m drk gy to m lt ol gy				0088-1L
		tr	Other : y, pyr				0088-4L
2052.00							0089
	1.05	55	Sh/Clst: lt gy to lt gn gy				0089-3L
		25	Sh/Clst: m drk gy to m lt ol gy				0089-1L
		20	S/Sst : w, l, mic				0089-2L
2058.00							0090
	1.16	50	Sh/Clst: lt gy to lt gn gy				0090-3L
		35	Sh/Clst: m drk gy to m lt ol gy				0090-1L
		10	S/Sst : w, l, mic				0090-2L
		5	Ca : w				0090-4L
2067.00							0091
	0.14	90	S/Sst : w, l, mic				0091-1L
		10	Sh/Clst: lt gy to lt gn gy				0091-2L
		tr	Sh/Clst: blk				0091-3L
2073.00							0092
	0.20	85	S/Sst : w, l, mic				0092-1L
		10	Sh/Clst: lt gy to lt gn gy				0092-2L
		5	Coal : blk				0092-3L

Table 1 : Lithology description for well NOCS 6407/9-8

Depth unit of measure: m

Depth		Type		Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description				
2079.00								0093
			50	S/Sst	: w, l, crs			0093-1L
		0.10	45	Sltst	: w, kln			0093-3L
			5	Sh/Clst	: lt gy to lt gn gy			0093-2L
2088.00								0094
		0.13	65	S/Sst	: w, kln, f			0094-3L
			30	S/Sst	: w, l, crs			0094-1L
			5	Sh/Clst	: lt gy to lt gn gy, m drk gy			0094-2L
2091.00								0095
		0.13	85	S/Sst	: w, kln, f			0095-3L
			10	S/Sst	: w, l, crs			0095-1L
			5	Sh/Clst	: lt gy to lt gn gy, m drk gy			0095-2L

Table 2 : Rock-Eval table for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
1606.60	ccp	Sh/Clst: m lt gy	0.57	22.99	0.98	23.46	4.28	537	23	23.6	0.02	411	0006-1L
1607.60	ccp	Sh/Clst: m drk gy	0.56	18.73	0.52	36.02	5.19	361	10	19.3	0.03	412	0007-1L
1609.50	ccp	Sh/Clst: drk gy	1.19	39.92	0.95	42.02	7.04	567	13	41.1	0.03	413	0008-1L
1612.65	ccp	Sh/Clst: drk gy	1.14	27.73	0.71	39.06	5.27	526	13	28.9	0.04	414	0009-1L
1615.00	ccp	Sh/Clst: drk gy	1.89	46.52	0.57	81.61	7.77	599	7	48.4	0.04	404	0010-1L
1615.45	ccp	Sh/Clst: m drk gy	1.09	32.29	0.53	60.92	5.67	569	9	33.4	0.03	409	0011-1L
1618.70	ccp	Sh/Clst: drk gy	1.60	38.35	0.53	72.36	7.69	499	7	39.9	0.04	403	0012-1L
1621.70	ccp	Sh/Clst: drk gy	1.42	34.80	0.51	68.24	6.61	526	8	36.2	0.04	404	0013-1L
1624.50	ccp	Sh/Clst: drk gy	1.27	25.57	0.50	51.14	5.48	467	9	26.8	0.05	404	0096-1L
1630.50	ccp	Sh/Clst: drk gy	1.66	32.07	0.64	50.11	6.54	490	10	33.7	0.05	404	0015-1L
1633.75	ccp	Sh/Clst: drk gy	1.57	33.55	0.62	54.11	6.08	552	10	35.1	0.04	406	0016-1L
1636.70	ccp	Sh/Clst: drk gy	1.20	26.44	0.75	35.25	6.17	429	12	27.6	0.04	409	0017-1L
1639.80	ccp	Sh/Clst: m drk gy	1.71	33.18	0.80	41.47	7.44	446	11	34.9	0.05	402	0018-1L
1641.80	ccp	Sh/Clst: m drk gy	1.42	37.77	0.75	50.36	7.45	507	10	39.2	0.04	406	0019-1L
1650.90	ccp	Sh/Clst: m drk gy	0.42	11.55	0.82	14.09	4.07	284	20	12.0	0.04	412	0020-1L

Table 2 : Rock-Eval table for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
1653.50	ccp	Sh/Clst: m drk gy	0.36	12.22	0.80	15.28	4.07	300	20	12.6	0.03	409	0021-1L
1656.50	ccp	Sh/Clst: drk gy	0.24	9.17	0.76	12.07	3.97	231	19	9.4	0.03	417	0022-1L
1659.60	ccp	Sh/Clst: drk gy	0.16	8.71	0.93	9.37	3.52	247	26	8.9	0.02	418	0023-1L
1662.80	ccp	Sh/Clst: m gy	0.80	3.19	0.77	4.14	2.28	140	34	4.0	0.20	424	0024-1L
1664.50	ccp	Sh/Clst: m gy	0.20	5.65	0.84	6.73	2.61	216	32	5.8	0.03	419	0025-1L
1667.55	ccp	Sh/Clst: m drk gy	0.13	5.98	0.66	9.06	2.79	214	24	6.1	0.02	419	0026-1L
1673.80	ccp	Sh/Clst: m drk gy	0.27	12.66	0.90	14.07	4.88	259	18	12.9	0.02	418	0027-1L
1676.70	ccp	Sh/Clst: drk gy	0.28	11.64	0.58	20.07	5.19	224	11	11.9	0.02	419	0028-1L
1679.60	ccp	Sh/Clst: drk gy	0.33	15.86	0.84	18.88	6.33	251	13	16.2	0.02	418	0029-1L
1682.50	ccp	Sh/Clst: drk gy	0.20	8.50	0.73	11.64	5.00	170	15	8.7	0.02	420	0030-1L
1684.50	ccp	Sh/Clst: drk gy	0.34	18.67	0.90	20.74	6.57	284	14	19.0	0.02	417	0031-1L
1689.00	cut	Sh/Clst: drk gy	0.31	19.45	0.97	20.05	6.55	297	15	19.8	0.02	414	0034-1L
1692.00	cut	Sh/Clst: drk gy	0.22	16.91	0.95	17.80	6.37	265	15	17.1	0.01	415	0035-1L
1698.00	cut	Sh/Clst: drk gy	0.23	21.12	0.95	22.23	7.06	299	13	21.4	0.01	414	0036-1L
1707.00	cut	Sh/Clst: drk gy	0.20	17.25	1.10	15.68	6.09	283	18	17.5	0.01	414	0037-1L

Table 2 : Rock-Eval table for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
1713.00	cut	Sh/Clst: drk gy	0.14	13.85	1.00	13.85	5.70	243	18	14.0	0.01	418	0038-1L
1719.00	cut	Sh/Clst: m gy to m brn gy	0.01	1.30	0.72	1.81	1.33	98	54	1.3	0.01	434	0039-3L
1723.40	ccp	Sh/Clst: m gy	0.05	1.88	0.60	3.13	1.46	129	41	1.9	0.03	431	0032-1L
1725.00	cut	Sh/Clst: m gy to m ol gy	0.02	1.03	0.66	1.56	1.27	81	52	1.0	0.02	437	0040-3L
1779.00	cut	Ca : w	-	0.05	0.55	0.09	1.34	4	41	0.1	-	442	0044-5L
1785.00	cut	Ca : w	-	0.03	0.45	0.07	1.23	2	37	-	-	365	0045-1L
1797.00	cut	Sh/Clst: drk gy	0.39	18.93	0.91	20.80	6.30	300	14	19.3	0.02	415	0048-2L
1803.00	cut	Sh/Clst: drk gy	0.41	21.55	1.13	19.07	6.47	333	17	22.0	0.02	413	0049-1L
1818.00	cut	Sltst : w	-	0.01	0.26	0.04	0.97	1	27	-	-	416	0051-5L
1830.00	cut	Sh/Clst: drk gy	0.28	16.78	1.00	16.78	6.13	274	16	17.1	0.02	415	0053-1L
1839.00	cut	Sh/Clst: m gy to m ol gy	0.03	1.46	0.78	1.87	1.34	109	58	1.5	0.02	432	0054-3L
1887.00	cut	Sh/Clst: blk	1.12	92.78	4.97	18.67	50.50	184	10	93.9	0.01	424	0063-6L
1965.00	cut	Sh/Clst: m drk gy to m lt ol gy	0.39	18.28	1.57	11.64	5.90	310	27	18.7	0.02	411	0077-1L
2019.00	cut	Sh/Clst: m drk gy to m lt ol gy	0.31	17.15	0.62	27.66	4.53	379	14	17.5	0.02	420	0084-1L
2040.00	cut	Sh/Clst: m drk gy to m lt ol gy	0.18	13.05	0.97	13.45	4.16	314	23	13.2	0.01	422	0087-1L

Table 2 : Rock-Eval table for well NOCS 6407/9-8

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2046.00	cut	Sh/Clst: lt gy to lt y gy	0.03	3.72	0.84	4.43	1.51	246	56	3.8	0.01	433	0088-3L
2058.00	cut	Sh/Clst: lt gy to lt gn gy	0.03	2.05	0.43	4.77	1.16	177	37	2.1	0.01	434	0090-3L

Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 6407/9-8

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
1615.00	ccp	Sh/Clst: drk gy	2.10	8.79	26.66	62.45	46.52	0010-1L
1653.50	ccp	Sh/Clst: m drk gy	3.44	11.30	30.12	55.14	12.22	0021-1L
1676.70	ccp	Sh/Clst: drk gy	5.53	13.03	31.78	49.67	11.64	0028-1L
1698.00	cut	Sh/Clst: drk gy	4.18	11.74	29.19	54.89	21.12	0036-1L
1803.00	cut	Sh/Clst: drk gy	4.08	11.32	29.64	54.95	21.55	0049-1L
1887.00	cut	Sh/Clst: blk	11.67	13.79	26.05	48.48	92.78	0063-6L
1965.00	cut	Sh/Clst: m drk gy to m lt ol gy	3.88	10.75	31.23	54.14	18.28	0077-1L
2046.00	cut	Sh/Clst: lt gy to lt y gy	4.35	20.71	47.85	27.09	3.72	0088-3L