

Table 2 : Lithology description for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Type		Trb	Sample
Int Cvd	TOC%	%		
Lithology description				
4000.00				0273
	4.48	100		0273-1L
				Sh/Clst: drk ol gy to gy blk, slt, s, dd
4010.00				0274
		100		0274-1L
				Sh/Clst: drk ol gy to gy blk, slt, s, dd
4020.00				0275
		100		0275-1L
				Sh/Clst: drk ol gy to gy blk, slt, dd
4030.00				0276
	3.88	100		0276-1L
				Sh/Clst: drk ol gy to gy blk, slt, dd
4040.00				0277
		100		0277-1L
				Sh/Clst: drk ol gy to gy blk, slt, dd
4050.00				0278
		100		0278-1L
				Sh/Clst: drk ol gy to gy blk, slt, dd
4060.00				0279
	3.85	100		0279-1L
				Sh/Clst: drk ol gy to gy blk, slt, dd
4070.00				0280
		100		0280-1L
				Sh/Clst: drk ol gy to gy blk, slt, dd
4080.00				0281
		100		0281-1L
				Sh/Clst: drk ol gy to gy blk, slt, dd

Table 2 : Lithology description for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Type			Trb	Sample
Int	Cvd	TOC%	%	Lithology description	
4090.00					0282
		3.73	100	Sh/Clst: drk ol gy to gy blk, slt, dd	0282-1L
4100.00					0283
			100	Sh/Clst: drk ol gy to drk gy, slt, s, dd	0283-1L
4110.00					0284
			100	Sh/Clst: drk ol gy to drk gy, slt, s, dd	0284-1L
4120.00					0285
		3.92	100	Sh/Clst: drk ol gy to drk gy, slt, s, dd	0285-1L
4130.00					0286
			100	Sh/Clst: drk ol gy to drk gy, slt, s, dd	0286-1L
4140.00					0287
			100	Sh/Clst: drk ol gy to drk gy, slt, s, dd	0287-1L
4150.00					0288
		4.52	100	Sh/Clst: drk ol gy to drk gy, slt, s, dd	0288-1L
4160.00					0289
			100	Sh/Clst: drk ol gy to drk gy, slt, s, dd	0289-1L
4170.00					0290
			100	Sh/Clst: drk ol gy to drk gy, slt, s, dd	0290-1L

Table 2 : Lithology description for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
4180.00			0291
	4.30	100	Sh/Clst: drk ol gy to drk gy, slt, s, dd 0291-1L
4190.00			0292
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0292-1L
4200.00			0293
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0293-1L
4210.00			0294
	4.82	100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0294-1L
4220.00			0295
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0295-1L
4230.00			0296
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0296-1L
4240.00			0297
	4.03	100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0297-1L
4250.00			0298
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0298-1L
4260.00			0299
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0299-1L

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Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%		
Lithology description			
4270.00			0300
	4.89	100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0300-1L
4300.00			0301
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0301-1L
4310.00			0302
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0302-1L
4320.00			0303
	4.50	100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0303-1L
4330.00			0304
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0304-1L
4340.00			0305
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0305-1L
4350.00			0306
	4.71	100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0306-1L
4360.00			0307
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0307-1L
4370.00			0308
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0308-1L

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Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
4380.00			0309
	5.57	100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0309-1L
4390.00			0310
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0310-1L
4400.00			0311
		100	Sh/Clst: drk ol gy to gy blk, slt, s, dd 0311-1L
4410.00			0312
	5.25	100	Sh/Clst: drk ol gy to gy blk, slt, dd 0312-1L
4420.00			0313
		100	Sh/Clst: drk ol gy to gy blk, slt, dd 0313-1L
4430.00			0314
		100	Sh/Clst: drk ol gy to gy blk, slt, dd 0314-1L
4440.00			0315
	5.50	100	Sh/Clst: drk ol gy to gy blk, slt, dd 0315-1L
4450.00			0316
		100	Sh/Clst: drk ol gy to gy blk, slt, dd 0316-1L
4460.00			0317
		100	Sh/Clst: drk ol gy to gy blk, slt, dd 0317-1L

Table 2 : Lithology description for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Type		Trb	Sample
Int Cvd	TOC%	% Lithology description		
4470.00				0318
	5.41	100 Sh/Clst: drk ol gy to gy blk, slt, dd		0318-1L
4480.00				0319
		100 Sh/Clst: drk ol gy to gy blk, slt, dd		0319-1L
4490.00				0320
		100 Sh/Clst: drk ol gy to gy blk, slt, dd		0320-1L
4500.00				0321
	5.72	100 Sh/Clst: drk ol gy to gy blk, slt, dd		0321-1L
4510.00				0322
		100 Sh/Clst: drk ol gy to gy blk, slt, dd		0322-1L
4520.00				0323
		100 Sh/Clst: drk ol gy to gy blk, slt, dd		0323-1L
4530.00				0324
	4.93	100 Sh/Clst: drk ol gy to gy blk, slt, dd		0324-1L
4540.00				0325
		100 Sh/Clst: drk ol gy to gy blk, slt, dd		0325-1L

Table 3A: Rock-Eval table for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
1130.00	cut		Sltst : lt ol gy to lt gy	0.39	0.80	1.35	0.59	0.45	178	300	1.2	0.33	369	0069-2L
1160.00	cut		Sltst : lt ol gy to lt gy	0.35	0.84	1.40	0.60	0.39	215	359	1.2	0.29	368	0072-2L
1190.00	cut		Sltst : lt ol gy to lt gy	0.29	0.83	1.26	0.66	0.43	193	293	1.1	0.26	367	0075-2L
1220.00	cut		Sltst : lt ol gy to lt gy	0.33	1.11	1.51	0.74	0.50	222	302	1.4	0.23	366	0078-2L
1250.00	cut		Sltst : lt ol gy to lt gy	0.25	1.34	1.17	1.15	0.61	220	192	1.6	0.16	371	0081-2L
1280.00	cut		Sltst : lt ol gy to lt gy	0.35	1.40	1.47	0.95	0.50	280	294	1.7	0.20	369	0084-2L
1320.00	cut		Sltst : lt ol gy to lt gy	0.28	1.32	1.31	1.01	0.50	264	262	1.6	0.17	371	0087-2L
1350.00	cut		Sltst : lt ol gy to lt gy	0.31	1.20	1.21	0.99	0.54	222	224	1.5	0.21	369	0090-2L
1390.00	cut		Sltst : lt ol gy to lt gy	0.30	0.96	1.17	0.82	0.44	218	266	1.3	0.24	376	0094-2L
1420.00	cut		Sltst : lt ol gy to lt gy	0.21	0.78	1.08	0.72	0.46	170	235	1.0	0.21	365	0097-2L
1450.00	cut		Sltst : lt ol gy to lt gy	0.33	1.49	1.29	1.16	0.54	276	239	1.8	0.18	366	0100-2L
1480.00	cut		Sltst : lt ol gy to lt gy	0.16	0.57	0.87	0.66	0.37	154	235	0.7	0.22	381	0103-2L
1510.00	cut		Sltst : lt ol gy to lt gy	0.20	0.44	1.02	0.43	0.35	126	291	0.6	0.31	367	0106-2L
1540.00	cut		Sltst : lt ol gy to lt gy	0.27	0.80	1.24	0.65	0.39	205	318	1.1	0.25	367	0109-2L
1570.00	cut		Sltst : lt ol gy to lt gy	0.24	0.79	1.12	0.71	0.38	208	295	1.0	0.23	370	0112-2L
1600.00	cut		Sltst : lt ol gy to lt gy	0.43	1.47	1.52	0.97	0.51	288	298	1.9	0.23	370	0115-2L

Table 3A: Rock-Eval table for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
1630.00	cut		Sltst : lt ol gy to lt gy	0.43	1.53	1.32	1.16	0.64	239	206	2.0	0.22	371	0118-2L
1660.00	cut		Sltst : lt ol gy to lt gy	0.77	3.06	1.56	1.96	0.86	356	181	3.8	0.20	372	0121-1L
1690.00	cut		Sltst : lt ol gy to lt gy	0.76	3.04	1.94	1.57	0.77	395	252	3.8	0.20	370	0124-1L
1720.00	cut		Sh/Clst: lt ol gy to lt gy	0.91	2.54	2.14	1.19	0.69	368	310	3.5	0.26	371	0127-1L
1750.00	cut		Sh/Clst: lt ol gy to lt gy	0.76	2.66	2.25	1.18	0.83	320	271	3.4	0.22	373	0130-1L
1780.00	cut		Sh/Clst: lt ol gy to lt gy	1.34	3.87	2.12	1.83	1.08	358	196	5.2	0.26	374	0133-1L
1810.00	cut		Sh/Clst: lt ol gy to lt gy to brn gy	1.41	4.27	2.45	1.74	1.22	350	201	5.7	0.25	378	0136-1L
1840.00	cut		Sh/Clst: lt ol gy to lt gy to brn gy	1.00	3.60	2.13	1.69	1.56	231	137	4.6	0.22	376	0139-1L
1870.00	cut		Sh/Clst: lt ol gy to lt gy to brn gy	1.06	3.76	2.27	1.66	1.51	249	150	4.8	0.22	380	0142-1L
1900.00	cut		Sh/Clst: lt ol gy to lt gy to brn gy	1.15	3.37	2.12	1.59	1.37	246	155	4.5	0.25	365	0145-1L
1930.00	cut		Sh/Clst: lt ol gy to lt gy to brn gy	1.70	5.67	2.69	2.11	2.21	257	122	7.4	0.23	382	0148-1L
1970.00	cut		Sh/Clst: lt ol gy to lt gy to brn gy	2.44	8.55	2.66	3.21	3.52	243	76	11.0	0.22	389	0151-1L
2030.00	cut		Sh/Clst: lt ol gy to lt gy	2.33	5.09	1.94	2.62	1.79	284	108	7.4	0.31	372	0154-1L

Table 3A: Rock-Eval table for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2080.00	cut		Sh/Clst: ol gy to lt gy	2.51	5.96	2.18	2.73	1.30	458	168	8.5	0.30	358	0157-1L
2110.00	cut		Sh/Clst: ol gy to lt gy	2.84	8.33	2.07	4.02	1.85	450	112	11.2	0.25	366	0160-1L
2150.00	cut		Sh/Clst: ol gy to lt gy	1.16	5.20	2.07	2.51	1.65	315	125	6.4	0.18	361	0003-1L
2180.00	cut		Sh/Clst: ol gy to m gy	1.61	4.30	2.82	1.52	1.49	289	189	5.9	0.27	362	0006-1L
2210.00	cut		Sh/Clst: ol gy to m gy	2.37	8.33	2.56	3.25	2.22	375	115	10.7	0.22	366	0009-1L
2240.00	cut		Sh/Clst: lt gn gy to lt ol gy to lt gy	1.81	5.98	2.23	2.68	1.07	559	208	7.8	0.23	362	0012-1L
2270.00	cut		Sh/Clst: lt gn gy to lt ol gy to lt gy	13.33	1.30	0.87	1.49	1.40	93	62	14.6	0.91	346	0015-1L
2310.00	cut		Sh/Clst: lt gn gy to lt gy	1.22	1.93	0.70	2.76	0.75	257	93	3.2	0.39	367	0018-1L
2340.00	cut		Sh/Clst: lt gn gy to lt ol gy	2.28	0.85	0.73	1.16	0.47	181	155	3.1	0.73	338	0021-1L
2370.00	cut		Sh/Clst: lt gn gy to lt ol gy to m gy	24.34	1.71	1.06	1.61	1.93	89	55	26.1	0.93	350	0024-1L
2400.00	cut		Sh/Clst: lt gn gy to lt ol gy	8.94	1.02	0.94	1.09	0.86	119	109	10.0	0.90	338	0027-1L
2430.00	cut		Sh/Clst: lt gn gy to lt ol gy	14.25	3.05	0.95	3.21	1.90	161	50	17.3	0.82	389	0030-1L
2460.00	cut		Sh/Clst: lt gn gy to lt ol gy	8.10	1.00	0.86	1.16	0.87	115	99	9.1	0.89	340	0033-1L
2490.00	cut		Sh/Clst: ol gy to m gy	38.33	0.54	0.85	0.64	2.48	22	34	38.9	0.99	407	0036-1L

Table 3A: Rock-Eval table for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2520.00	cut		Sh/Clst: ol gy to m gy	46.84	3.27	0.84	3.89	4.30	76	20	50.1	0.93	406	0039-1L
2550.00	cut		Sh/Clst: ol gy to drk gy	31.57	1.53	0.87	1.76	2.59	59	34	33.1	0.95	400	0042-1L
2580.00	cut		Sh/Clst: ol gy to drk gy	32.71	3.48	0.97	3.59	3.15	110	31	36.2	0.90	419	0045-1L
2610.00	cut		Sh/Clst: lt ol gy to m gy	40.35	2.16	1.28	1.69	2.67	81	48	42.5	0.95	373	0048-1L
2640.00	cut		Sh/Clst: lt ol gy to m gy	20.91	1.98	1.27	1.56	1.74	114	73	22.9	0.91	348	0051-1L
2670.00	cut		Sh/Clst: lt ol gy to m gy	31.39	1.83	1.07	1.71	2.56	71	42	33.2	0.94	404	0054-1L
2720.00	cut		Sh/Clst: lt ol gy to m gy	26.33	2.13	1.31	1.63	2.24	95	58	28.5	0.93	390	0057-1L
2750.00	cut		Sh/Clst: lt ol gy to drk gy	33.82	2.01	0.93	2.16	2.63	76	35	35.8	0.94	421	0060-1L
2780.00	cut		Sh/Clst: lt ol gy to drk gy	40.58	1.91	1.11	1.72	3.28	58	34	42.5	0.96	423	0063-1L
2810.00	cut		Sh/Clst: lt ol gy to drk gy	37.29	2.32	1.00	2.32	2.91	80	34	39.6	0.94	431	0066-1L
2840.00	cut		Sh/Clst: lt ol gy to drk gy	31.08	2.62	1.09	2.40	2.74	96	40	33.7	0.92	427	0162-1L
2870.00	cut		Sh/Clst: lt ol gy to drk gy	32.96	1.72	0.96	1.79	2.66	65	36	34.7	0.95	429	0165-1L
2900.00	cut		Sh/Clst: lt ol gy to drk gy	33.69	1.83	1.16	1.58	2.46	74	47	35.5	0.95	425	0168-1L
2930.00	cut		Sh/Clst: lt ol gy to drk gy	36.55	1.59	1.00	1.59	2.77	57	36	38.1	0.96	427	0171-1L
2960.00	cut		Sh/Clst: lt ol gy to drk gy	39.15	1.09	2.12	0.51	2.95	37	72	40.2	0.97	420	0174-1L
2990.00	cut		Sh/Clst: lt ol gy to drk gy	35.67	1.71	0.92	1.86	2.73	63	34	37.4	0.95	428	0177-1L

Table 3A: Rock-Eval table for well NOCS 6406/2-4S

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Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3020.00	cut		Sh/Clst: lt ol gy to drk gy	31.97	2.39	1.66	1.44	2.56	93	65	34.4	0.93	427	0180-1L
3050.00	cut		Sh/Clst: lt ol gy to drk gy	27.80	2.27	0.89	2.55	2.49	91	36	30.1	0.92	428	0183-1L
3080.00	cut		Sh/Clst: lt ol gy to drk gy	33.04	2.10	0.94	2.23	2.83	74	33	35.1	0.94	389	0186-1L
3110.00	cut		Sh/Clst: lt ol gy to drk gy	26.21	1.87	0.92	2.03	2.36	79	39	28.1	0.93	425	0189-1L
3140.00	cut		Sh/Clst: lt ol gy to drk gy	28.84	2.03	1.00	2.03	2.50	81	40	30.9	0.93	429	0192-1L
3170.00	cut		Sh/Clst: lt ol gy to drk gy	37.50	2.69	0.98	2.74	3.07	88	32	40.2	0.93	430	0195-1L
3200.00	cut		Sh/Clst: lt ol gy to drk gy	32.80	1.97	0.80	2.46	3.14	63	25	34.8	0.94	427	0198-1L
3230.00	cut		Sh/Clst: lt ol gy to drk gy	33.47	2.72	0.99	2.75	3.04	89	33	36.2	0.92	409	0201-1L
3270.00	cut		Sh/Clst: lt ol gy to drk gy	40.65	2.91	0.92	3.16	3.32	88	28	43.6	0.93	430	0204-1L
3300.00	cut		Sh/Clst: ol gy to drk gy	37.72	2.86	0.99	2.89	3.48	82	28	40.6	0.93	429	0207-1L
3330.00	cut		Sh/Clst: ol gy to drk gy	39.24	3.23	0.97	3.33	3.30	98	29	42.5	0.92	431	0210-1L
3360.00	cut		Sh/Clst: ol gy to drk gy	31.40	3.16	1.15	2.75	2.71	117	42	34.6	0.91	431	0213-1L
3390.00	cut		Sh/Clst: ol gy to drk gy	32.94	2.63	1.19	2.21	2.79	94	43	35.6	0.93	431	0216-1L
3420.00	cut		Sh/Clst: ol gy to drk gy	38.05	3.47	0.97	3.58	3.16	110	31	41.5	0.92	436	0219-1L
3450.00	cut		Sh/Clst: ol gy to drk gy	28.99	2.73	0.92	2.97	2.67	102	34	31.7	0.91	430	0222-1L
3480.00	cut		Sh/Clst: ol gy to drk gy	40.83	2.99	0.88	3.40	3.65	82	24	43.8	0.93	430	0225-1L

Table 3A: Rock-Eval table for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3510.00	cut		Sh/Clst: drk ol gy to gy blk	51.81	3.10	1.51	2.05	3.86	80	39	54.9	0.94	434	0228-1L
3540.00	cut		Sh/Clst: drk ol gy to gy blk	40.66	1.60	1.01	1.58	3.58	45	28	42.3	0.96	436	0231-1L
3570.00	cut		Sh/Clst: drk ol gy to gy blk	32.26	1.44	1.31	1.10	2.94	49	45	33.7	0.96	384	0234-1L
3600.00	cut		Sh/Clst: drk ol gy to gy blk	53.01	1.87	1.28	1.46	4.00	47	32	54.9	0.97	434	0237-1L
3640.00	cut		Sh/Clst: drk ol gy to gy blk	54.24	2.58	1.16	2.22	4.15	62	28	56.8	0.95	434	0240-1L
3680.00	cut		Sh/Clst: drk ol gy to gy blk	51.61	3.01	1.06	2.84	3.82	79	28	54.6	0.94	440	0243-1L
3710.00	cut		Sh/Clst: drk ol gy to gy blk	41.64	2.96	1.62	1.83	3.41	87	48	44.6	0.93	436	0246-1L
3740.00	cut		Sh/Clst: drk ol gy to drk gy	44.14	4.91	2.44	2.01	3.86	127	63	49.0	0.90	429	0249-1L
3780.00	cut		Sh/Clst: drk ol gy to drk gy	38.87	2.99	1.14	2.62	3.37	89	34	41.9	0.93	433	0252-1L
3810.00	cut		Sh/Clst: drk ol gy to drk gy	39.27	3.21	0.70	4.59	3.24	99	22	42.5	0.92	430	0255-1L
3840.00	cut		Sh/Clst: drk ol gy to drk gy	30.37	2.43	1.64	1.48	2.58	94	64	32.8	0.93	429	0258-1L
3870.00	cut		Sh/Clst: drk ol gy to drk gy	42.62	3.57	0.90	3.97	3.70	96	24	46.2	0.92	431	0261-1L
3900.00	cut		Sh/Clst: drk ol gy to drk gy	36.93	2.89	1.14	2.54	3.07	94	37	39.8	0.93	433	0264-1L
3930.00	cut		Sh/Clst: drk ol gy to drk gy	43.23	4.37	1.06	4.12	3.92	111	27	47.6	0.91	433	0267-1L
3970.00	cut		Sh/Clst: drk ol gy to drk gy	43.19	3.47	0.89	3.90	3.95	88	23	46.7	0.93	434	0270-1L
4000.00	cut		Sh/Clst: drk ol gy to gy blk	56.14	2.90	1.10	2.64	4.48	65	25	59.0	0.95	433	0273-1L

Table 3A: Rock-Eval table for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
4030.00	cut		Sh/Clst: drk ol gy to gy blk	51.57	1.60	1.57	1.02	3.88	41	40	53.2	0.97	439	0276-1L
4060.00	cut		Sh/Clst: drk ol gy to gy blk	44.56	2.90	0.79	3.67	3.85	75	21	47.5	0.94	432	0279-1L
4090.00	cut		Sh/Clst: drk ol gy to gy blk	53.50	2.56	0.99	2.59	3.73	69	27	56.1	0.95	438	0282-1L
4120.00	cut		Sh/Clst: drk ol gy to drk gy	45.20	3.52	0.72	4.89	3.92	90	18	48.7	0.93	432	0285-1L
4150.00	cut		Sh/Clst: drk ol gy to drk gy	39.86	2.85	0.59	4.83	4.52	63	13	42.7	0.93	430	0288-1L
4180.00	cut		Sh/Clst: drk ol gy to drk gy	48.28	3.86	0.74	5.22	4.30	90	17	52.1	0.93	435	0291-1L
4210.00	cut		Sh/Clst: drk ol gy to gy blk	57.50	2.91	1.06	2.75	4.82	60	22	60.4	0.95	436	0294-1L
4240.00	cut		Sh/Clst: drk ol gy to gy blk	48.08	3.26	1.10	2.96	4.03	81	27	51.3	0.94	422	0297-1L
4270.00	cut		Sh/Clst: drk ol gy to gy blk	63.45	4.10	1.37	2.99	4.89	84	28	67.6	0.94	435	0300-1L
4320.00	cut		Sh/Clst: drk ol gy to gy blk	58.80	3.09	1.09	2.83	4.50	69	24	61.9	0.95	419	0303-1L
4350.00	cut		Sh/Clst: drk ol gy to gy blk	64.90	4.42	1.30	3.40	4.71	94	28	69.3	0.94	428	0306-1L
4380.00	cut		Sh/Clst: drk ol gy to gy blk	60.00	5.20	1.46	3.56	5.57	93	26	65.2	0.92	441	0309-1L
4410.00	cut		Sh/Clst: drk ol gy to gy blk	70.07	8.21	0.95	8.64	5.25	156	18	78.3	0.90	441	0312-1L
4440.00	cut		Sh/Clst: drk ol gy to gy blk	59.06	5.62	0.96	5.85	5.50	102	17	64.7	0.91	439	0315-1L
4470.00	cut		Sh/Clst: drk ol gy to gy blk	61.51	5.44	1.39	3.91	5.41	101	26	66.9	0.92	436	0318-1L
4500.00	cut		Sh/Clst: drk ol gy to gy blk	63.25	6.37	1.56	4.08	5.72	111	27	69.6	0.91	438	0321-1L

Table 3A: Rock-Eval table for well NOCS 6406/2-4S

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
4530.00	cut		Sh/Clst: drk ol gy to gy blk	49.14	5.17	1.20	4.31	4.93	105	24	54.3	0.90	441	0324-1L

Table 3B: Rock-Eval table for well RE, STD

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
1.00	std		bulk	0.54	19.34	2.13	9.08	-	-	-	19.9	0.03	424	0168-0B
2.00	std		bulk	0.46	17.99	2.44	7.37	-	-	-	18.4	0.02	421	0169-0B
3.00	std		bulk	0.48	18.67	2.18	8.56	-	-	-	19.1	0.03	423	0170-0B
4.00	std		bulk	0.43	18.00	2.11	8.53	-	-	-	18.4	0.02	420	0171-0B
5.00	std		bulk	0.48	19.51	2.06	9.47	-	-	-	20.0	0.02	423	0172-0B
6.00	std		bulk	0.41	18.36	2.07	8.87	-	-	-	18.8	0.02	424	0173-0B



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**Datareport on stable isotopes,
gas samples from well 6406/2-4S**

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Institute for Energy Technology

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SUMMARY 23 headspace gas samples from well 6406/2-4S are analysed for isotopic composition. The work is done in accordance with the "The Norwegian Industry Guide to Organic Geochemical Analyses", Third Edition 1993.		DISTRIBUTION Geolab Nor/Saga (3) Andresen, B. Bjørnstad, T. Johansen, H. Johansen, I. Siegé, S. File (3)	
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1 Introduction

Twenty three headspace gas samples from Saga Petroleum well 6406/2-4S are analysed for isotopic composition. The gas composition is given by Geolab Nor.

The $\delta^{13}\text{C}$ value is measured on methane, ethane, propane, the butanes and CO_2 when possible. In addition the δD value is measured on methane when possible.

2 Analytical procedures

Due to the low hydrocarbon concentration two different approaches are used for the isotope determination.

2.1 Preparative sampling

For samples with higher methane concentration aliquots of 10 ml is sampled with a syringe and then separated into the different gas components by a Carlo Erba 4200 gas chromatograph. Methane is oxidised in a separate CuO-oven and the combustion products CO_2 and H_2O are frozen into collection vessels and separated. If possible CO_2 in the headspace gas is separated and collected for isotope determination (samples in the range 1750m - 2200m).

The combustion water is reduced with zinc metal in a sealed quartz tube to prepare hydrogen for isotopic analysis. The isotopic measurements are performed on a Finnigan MAT 251 and a Finnigan Delta mass spectrometer.

IFEs value on NBS 22 is $-29.77 \pm .06\text{‰}$ PDB.

The uncertainty in the $\delta^{13}\text{C}$ value is estimated to be $\pm 0.3\text{‰}$ PDB and includes all the different analytical steps. The estimate is based on repeated analysis of a laboratory standard gas mixture. The uncertainty in the δD value is likewise estimated to be $\pm 5\text{‰}$.

2.2 GC-C-IRMS

For isotope determination of all low concentration hydrocarbon components (all determined ethane, propane and butane isotope values in addition to most of the CO₂ carbon isotope values) aliquots are sampled with a syringe and analysed on a VG Isochrom connected on line to a VG Optima Mass spectrometer. A HP 5890 II with a Poraplot Q column is used for the separation and helium is used as a carrier gas. The injections are performed either in splitless or in split mode depending on the hydrocarbon concentrations. No hydrogen or oxygen isotopic composition is included in the analytical procedure.

Based on repeated analysis of a laboratory standard gas mixture, the reproducibility in the $\delta^{13}\text{C}$ value is better than 0.5‰ PDB.

3 Results

The gas composition of the headspace gas is shown in Table 1 (determined by Geolab Nor) and the stable isotope composition is shown in Table 2.

Some of the samples are characterised by a rather strange isotopic composition with methane carbon isotope values enriched in the heavy isotope (marked with * in Table 2). An isotopic fractionation due to bacterial attack cannot be excluded. All analysed samples showed a significant unidentified component eluting together with the butanes. The isotope composition of the component was about -34‰ PDB from all samples, and a contribution from traces of a solvent cannot be excluded.

Due to low hydrocarbon concentrations the uncertainty in the reported values most probably are larger than indicated by repeated analysis of a standard gas mixture.

The carbon and hydrogen variations in methane are plotted in Figure 1 (Schoell, 1983) and the carbon isotope variation in ethane related to the carbon isotope variations in methane in Figure 2 (Schoell, 1983).

4 Literature

Schoell, M. (1983). Genetic characterisation of natural gases. *The American Association of Petroleum Geologists Bulletin*, **67**,2225-2238.

Table 1 Gas composition of samples from well 6406/2-4S

Depth (m)	IFE no GEO	C ₁ µl gas /kg rock	C ₂ µl gas /kg rock	C ₃ µl gas /kg rock	nC ₄ µl gas /kg rock
1140	971305	6250	-	2	-
1310	971306	16910	21	18	2
1450	971307	22595	32	15	1
1600	971308	35785	104	64	3
1750	971309	45619	186	189	22
1900	971310	28899	184	102	9
2050	971311	31559	242	103	13
2200	971312	28132	813	158	14
2350	971313	18407	497	89	6
2500	971314	46	27	13	6
2650	971315	4501	573	505	145
2800	971316	7331	1237	729	108
2950	971317	9782	1284	539	69
3100	971318	4765	663	234	29
3250	971319	3098	607	260	33
3400	971320	187	56	40	8
3550	971321	939	252	216	64
3700	971322	107	20	32	10
3850	971323	3821	843	944	1897
4000	971324	325	62	99	20
4150	971325	146	36	85	26
4300	971326	1993	419	199	39
4450	971327	133	23	12	3

Table 2 Isotopic composition of gas samples from well 6406/2-4S

Depth (m)	IFE no GEO	C ₁	C ₁	C ₂	C ₃	iC ₄	nC ₄	CO ₂	CO ₂
		$\delta^{13}\text{C}$ ‰ PDB	δD ‰ SMOW	$\delta^{13}\text{C}$ ‰ PDB	$\delta^{13}\text{C}$ ‰ PDB	$\delta^{13}\text{C}$ ‰ PDB	$\delta^{13}\text{C}$ ‰ PDB	$\delta^{13}\text{C}$ ‰ PDB	$\delta^{18}\text{O}$ ‰ PDB
1140	971305	-68.1	-183	-	-	-	-	-21.2	-
1310	971306	-56.7	-183	-	-	-	-	-25.7	-
1450	971307	-65.4	-215	-57.5	-	-	-	-28.0	-
1600	971308	-62.4	-195	-48.2	-38.4	-	-	-26.8	-
1750	971309	-65.7	-173	-56.1	-40.9	-	-	-28.2	-2.6
1900	971310*	-20.1	-	-41.4	-36.0	-	-	-20.4	5.4
2050	971311	-62.8	-207	-44.8	-31.8	-	-	-18.1	1.0
2200	971312	-58.3	-197	-39.8	-38.3	-	-	-21.4	2.5
2350	971313*	-26.7	-168	-29.0	-33.8	-	-	-19.9	-
2500	971314	-	-	-	-	-	-	-20.5	-
2650	971315	-45.1	-192	-31.2	-29.3	-32.1	-29.8	-24.1	-
2800	971316*	-35.0	-173	-29.2	-29.9	-	-	-21.8	-
2950	971317	-44.3	-168	-33.6	-33.2	-	-	-25.4	-
3100	971318	-44.3	-172	-34.1	-35.6	-	-	-24.9	-
3250	971319*	-26.9	-	-27.4	-33.8	-	-	-20.2	-
3400	971320	-51.8	-	-29.7	-31.1	-	-	-22.5	-
3550	971321	-54.7	-	-29.4	-30.8	-	-	-20.2	-
3700	971322	-	-	-40.4	-31.7	-	-	-23.8	-
3850	971323	-41.8	-	-26.2	-27.9	-	-	-16.2	-
4000	971324	-	-	-	-	-	-	-16.2	-
4150	971325	-	-	-	-	-	-	-22.3	-
4300	971326*	-17.5	-	-21.4	-24.2	-	-	-26.6	-
4450	971327	-53.0	-	-34.3	-32.7	-	-	-31.8	-