

Conventional core analysis on GANE#1 and GANE#1A cores: plug lithology descriptions

Eqalulik, Nuussuaq, West Greenland

Morten Kildevang Jensen



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1. Introduction

This report lists plug lithologies of core plugs from the well GANE#1 and sidetrack GANE#1A. Conventional core analysis based on these plugs were reported in the report *Conventional Core Analysis on GANE#1 and GANE1A cores, Danmarks og Grønlands Geologiske Undersøgelse rapport 1996/117*. For description of analytical procedures, commenting on the results, etc, please confer with this report.

In May 1995 grønArctic Energy Inc., Canada was awarded an exclusive licence to explore for hydrocarbons on the southern and western part of the Nuussuaq peninsula, West Greenland. As part of the commitments under this licence three slim core holes GANE#1, GANK#1 and GANT#1 were drilled in July and August 1995.

The GANE#1 well was drilled in two sections. The upper part GANE#1 and a side-track GANE#1A below.

The Core Analysis Laboratory at The Geological Survey of Denmark and Greenland has received parts of these two cores for conventional core analysis. Table 1.1 show box numbers, depth intervals and measured core size for the analyzed cores:

Table 1.1: List of analyzed cores.

Core	Box numbers	Top	Bottom	Core size
GANE#1	156 - part of 204	487,28 m		ø47mm
GANE#1	Part of 204 - 205		636,86 m *	ø36mm
GANE#1A	206 - 258	535,57 m	706,68 m	ø36mm

* Corrected due to error on bottom depth on box 204 and top/bottom depth on box 205.

2. Data tabulation

2.1 Laboratory analysis, GANE#1

2.1.1 General information on the analysis

Company:	GEUS	Location:	Nuussuaq, W. Greenland
Depth interval:	487.28 - 636.86 m	Core no. :	156-204
Depth reference:	KB	Analysts:	GG,HJL,MJ,LB,PET,GA
Depths are in:	METRES	Date:	301296
Well:	GANE#1		

REMARKS TO TABULATED VALUES

- 0 : Permeability measured, but gas flow less than 0.06 ml/min. Exact permeability value is not measurable.
 - : Permeability not measured.

The Geological Survey of Denmark and Greenland is fully responsible for the analytical results in the present report. The survey, however, bears no responsibility for decisions and interpretations based on the data presented.

2.1.2 Abbreviations for lithological descriptions

Rock type	carb	Carbonate	Miscellaneous	ab	Abundant
	cly	Claystone		arg	Argillaceous
	cl	Clay		art	Artificial
	slt	Siltstone		bit	Bituminous
	sst	Sandstone		calc	Calcareous
	sd	Sand		ccem	Calcite cemented
	cngrl	Conglomerate		cem	Cemented
	htrl	Heterolith		dom	Dominantly
	mud	mudstone	hrd	Hard	
Grain size	vf-	Very fine grained		hom	Homogeneous
	f-	Fine grained		ids	Indistinct
		ex. fsst = fine grained sst		mot	Mottled
	m-	Medium grained		prt	Partly
	c-	Coarse grained		slg	Slightly
	vc-	Very coarse grained		sme	Some
	unsrt	Unsorted		sort	Sorting
				str	Strongly
Colour	blk	Black		sp	Sparse
	br	Brown		thn	Thin
	gn	Green		thk	Thick
	gy	Grey		tot	Total
	ol	Olive		w	With
	rd	Red			
	wh	White	Fractures	FRC	Fracture
	vl-	Very light		FT FRC	Fatal fracture
l-	Light, ex. lgy = light grey	SG FRC		Significant fracture	
ml-	Medium light	F FRC		Fine fracture	
m-	Medium	H FRC		Hairline	
md-	Medium dark				
d-	Dark	Minerals		cal	Calcite
-sh	-ish, ex. brsh = brownish			carb	Carbonate
var	Varioloured		kaol	Kaolinite	
			mica	Mica flakes	
Structures	bed	Bedding		qtz	Quartz/silica
	bio	Bioturbation		py	Pyrite
	bur	Burrow(-s)		sid	Siderite
	cla	Clast(-s)			
	crs	Crossbedding			
	cvn	Calcite vein(-s)			
	concr	Concretion			
	domn	Domains			
	fos	Fossil (-s)			
	frg	Fragment(-s)			
	lam	Lamina/lamination			
	pynd	Pyrite nodule(-s)			
	shl	Shell fragment(-s)			
	slmp	Slumped			
	sly clv	Slaty cleavage			
	sol sm	Solution seam(-s)			
	strp	Stripe			
	sty	Stylolite seam(-s)			
vn	Vein				
lms	lens				



2.1.3 Data

Plug no.	Depth m	Plug type	Gas perm. mD	Porosity %	Density g/ccm	Comment
740	487.78	Hor	21.2	5.42	2.690	hyaloclastite
741	488.78	Hor	27.8	5.09	2.695	hyaloclastite
742	489.80	Hor	16.1	5.79	2.640	hyaloclastite
743	491.03	Hor	17.4	5.51	2.676	hyaloclastite
744	491.94	Hor	4.71	5.25	2.774	hyaloclastite
745	492.94	Hor	5.53	5.10	2.613	hyaloclastite
746	494.21	Hor	2.96	3.10	2.711	hyaloclastite
747	495.21	Hor	4.71	3.50	2.620	hyaloclastite
748	496.28	Hor	0.042	0.44	2.677	hyaloclastite
749	500.67	Hor	0.047	6.11	2.667	mud, mdgy, w 10% msd
750	501.86	Hor	-	6.00	2.618	mud, mdgy, w 10% msd, FT FRC
751	505.01	Hor	-	1.55	2.675	mud, mdgy
752	514.35	Hor	0.104	6.96	2.672	vfsst, mdgy, w 10% cly cla
753	515.15	Hor	0.59	7.67	2.666	mud, mdgy
754	516.47	Hor	-			mud, mgy, w 30% cla of msd
755	516.76	Hor	-	11.06	2.852	mud, mgy
756	518.18	Hor	-	5.28	2.630	mud, mgy, w 20% cla of msd & csd
757	519.00	Hor	0	0.70	2.669	vfsst, lgy, w ab qtz
758	519.78	Hor	0	3.60	2.662	mud, mgy, w ab qtz
759	520.44	Hor	-	4.25	2.621	mud, mgy
760	521.55	Hor	6.03	2.71	2.574	mud, mgy, FRC
761	522.60	Hor	0.014	2.59	2.577	mud, mgy, w thn sd lam
762	523.61	Hor	0.005	1.82	2.698	msst, lgy, bio
763	524.76	Hor	0.005	4.87	2.710	mud, mgy
764	526.18	Hor	0.005	3.03	2.699	fsst, lgy
765	527.18	Hor	0.732	4.33	2.623	mud, mgy, w 10% vfsd
766	528.12	Hor	0.008	5.55	2.660	fsst & msst, mgy
767	529.12	Hor	0.013	4.74	2.654	csst, lgy, w 5% cl cla
768	530.52	Hor	0.015	5.71	2.692	msst, lgy
769	530.70	Hor	0.015	2.28	2.652	vcsst, lgy
770	532.33	Hor	0.728	1.80	2.588	mud, mgy, w ab br qtz
771	532.88	Hor	0.022	1.90	2.599	mud, dgy, w ab qtz
772	534.15	Hor	0.004	1.32	2.669	fsst, mgy
773	535.27	Hor	1.38	3.29	2.608	mud, mgy, w ab qtz, sly clv
774	535.53	Hor	0.006	0.46	2.691	mud, mgy
775	538.81	Hor	0.037	3.54	2.660	msst, lgy, w 10% cl
776	539.66	Hor	2.2	2.22	2.606	mud, mgy, sly clv

Plug no.	Depth m	Plug type	Gas perm. mD	Porosity %	Density g/ccm	Comment
777	540.06	Hor	0.307	2.28	2.547	mud, mgy
778	540.69	Hor	-	3.57	2.632	mud, mgy
779	541.95	Hor	0	0.43	2.689	fsst, lgy
780	542.88	Hor	0.03	2.28	2.601	csst, mgy
781	545.14	Hor	-	4.71	2.617	mud, dgy, FT FRC
782	545.57	Hor	4.47	3.65	2.622	msst, mgy, FRC
783	546.74	Hor	9.37	5.59	2.574	fsst, mgy, w 30% cl, SG FRC
784	547.88	Hor	0	3.23	2.678	csst, lgy
785	548.72	Hor	-	3.51	2.631	fsst & msst, lgy, w 15% cly cla, py
786	549.78	Hor	0.057	7.46	2.642	csst, lgy, py
787	550.84	Hor	0.026	8.98	2.645	csst, lgy, py
788	552.13	Hor	0.016	8.95	2.676	msst & csst, unsrt, lgy
789	556.16	Hor	0.012	5.32	2.688	msst & csst, unsrt, lgy
790	555.05	Hor	0.03	6.43	2.662	csst, mgy
791	556.19	Hor	0.049	8.90	2.653	csst, mgy
792	557.24	Hor	0.059	6.76	2.646	csst, mgy
793	558.53	Hor	0.082	10.59	2.654	msst to csst, unsrt, lgy
794	559.97	Hor	0.214	12.57	2.648	msst to csst, unsrt, lgy
795	560.58	Hor	0.057	9.35	2.673	msst to csst, unsrt, mgy
796	561.81	Hor	0.016	7.40	2.675	msst, lgy
797	562.75	Hor	0.017	4.17	2.659	csst to vcsst, mgy, unsrt
798	563.84	Hor	-	7.46	2.629	mud, dgy, w 5% sd, FT FRC
799	567.41	Hor	0.009	2.18	2.693	fsst to msst, mgy
800	566.93	Hor	0.012	8.07	2.743	vcsst to csst, unsrt, mgy
801	569.06	Hor	0.01	2.41	2.691	csst, mgy
802	570.00	Hor	0.009	5.07	2.660	csst, mgy
803	570.10	Hor	-	5.27	2.632	msst & csst, dgy
804	570.60	Hor	0.009	4.28	2.687	msst, lgy
805	570.98	Hor	0.005	0.57	2.681	msst, mgy, tot carb cem
806	572.26	Hor	0.986	9.78	2.644	msst, lgy
807	572.73	Hor	0.69	9.22	2.645	msst, lgy
808	573.08	Hor	2.24	5.77	2.629	msst, dgy, c cly strp, FRC
809	574.88	Hor	0.481	6.05	2.602	msst, mdgy, w cla, py, sly clv, FRC
810	574.99	Hor	0.393	3.70	2.614	slt, mgy, fin lam, sly clv, FRC
811	576.60	Hor	0.442	3.57	2.593	slt, mgy, fin lam, sly clv
812	577.31	Hor	-	4.04	2.680	msst, lgy, tot carb cem
813	578.06	Hor	0.002	0.91	2.670	vcsst, mgy, tot carb cem
814	578.70	Hor	0.005	1.18	2.668	vcsst, dgy, tot carb cem
815	579.40	Hor	0.004	4.48	2.652	csst, lgy

Plug no.	Depth m	Plug type	Gas perm. mD	Porosity %	Density g/ccm	Comment
816	580.47	Hor	0.67	5.77	2.641	fsst, dgy, thn lam, THN FRC
817	581.49	Hor	0.059	1.67	2.679	msst, lgy, tot carb cem
818	594.28	Hor	0	1.34	2.669	msst, lgy, tot carb cem
819	594.37	Hor	0	1.59	2.662	fsst, mlg
820	595.99	Hor	0	2.30	2.618	fsst/slt, mdgy, w cly cla & cly strp
821	597.06	Hor	-	1.70	2.695	fsst, mdgy, prt carb cem, w sly strp, FT FRC
822	598.53	Hor	1.22	6.37	2.857	csst to vcsst, unsrt, lgy
823	598.94	Hor	0	0.48	2.674	slt, mgy, cly srtp, sly slv, prt carb cem
824	599.19	Hor	0	0.43	2.688	fsst, mgy, tot carb cem
825	599.79	Hor	0.01	3.80	2.667	msst, mgy
826	600.23	Hor	0.007	3.73	2.666	htrl, fsst/msst/slt, mgy/lgy/lgy
827	600.33	Hor	0.004	4.36	2.690	msst, lgy, w 5% cly cla
828	601.79	Hor	0.004	3.29	2.670	vfsst, lgy, thm cly lam
829	602.69	Hor	13.9	6.67	2.518	htrl. fsst/slt, lgy/mdgy, w cly cla, SG FRC
830	602.72	Hor	0.009	5.29	2.649	msst, lgy
831	603.58	Hor	0.01	3.87	2.703	fsst, mdgy, thn cl lam, w sid concr
832	604.53	Hor	0.015	5.03	2.644	htrl, fsst/slt, mgy/lgy, w 10% cly cla
833	604.77	Hor	0.485	4.24	2.643	slt, lgy, fnt, thn cl lam
834	605.63	Hor	1.8	4.72	2.559	htrl, vfsst/slt/mud, lgy/dgy/bgy
835	607.21	Hor	0.017	3.40	2.593	htrl, slt/mud, dgy/bgy, w cl lns
836	608.12	Hor	0.012	4.73	2.628	msst, dgy, w cl lns, & 10% cl cla
837	608.13	Hor	0.025	4.86	2.604	msst, mlg
838	608.73	Hor	0.036	5.91	2.654	msst, lgy
839	609.03	Hor	0.056	9.68	2.718	msst & fsst, mgy/lgy, unsrt
840	609.23	Hor	0.113	8.04	2.639	csst, lgy
841	609.49	Hor	0.038	7.08	2.678	vcsst to csst, lgy
842	610.73	Hor	0.004	2.01	2.715	csst, dgy, w cly cla
843	611.09	Hor	-	3.18	2.674	msst, dgy
844	611.60	Hor	0.021	4.41	2.632	csst to msst, dgy
845	612.85	Hor	0.015	3.97	2.671	csst to msst, dgy
846	613.36	Hor	0.008	2.25	2.680	msst, mdgy
847	613.96	Hor	0	2.66	2.625	csst, dgy
848	615.71	Hor	0.355	12.26	2.655	msst, lgy
849	616.02	Hor	0.234	11.56	2.652	csst to msst
850	617.43	Hor	0	2.88	2.606	csst, dgy, tot carb cem
851	618.27	Hor	0.116	4.66	2.636	vfsst, lgy, thn lam
852	618.87	Hor	0.138	10.03	2.644	msst, lgy
853	619.55	Hor	0.191	8.63	2.649	vfsst to csst, lgy
854	621.28	Hor	0.194	12.27	2.654	csst, lgy, w sid concr

Plug no.	Depth m	Plug type	Gas perm. mD	Porosity %	Density g/ccm	Comment
855	621.80	Hor	0.278	10.91	2.649	csst, lgy
856	623.32	Hor	0	3.18	2.694	msst, mgy
857	623.78	Hor	0.021	7.77	2.679	csst, mgy
858	625.19	Hor	0.033	4.15	2.626	csst to msst, unsrt, w 10% cly cla
859	626.82	Hor	0	4.06	2.694	vcsst, mgy
860	627.35	Hor	0.07	5.76	2.659	vcsst, mgy
861	627.75	Hor	0.087	5.42	2.640	vcsst, mgy
862	628.23	Hor	0.053	5.15	2.633	vcsst, mgy
863	628.73	Hor	0.019	6.49	2.658	fsst, lgy, w cl strp, sly clv
864	629.04	Hor	0	4.79	2.743	fsst, lgy
865	629.44	Hor	0.022	7.31	2.693	csst, lgy
866	630.92	Hor	0.076	11.10	2.663	csst, lgy
867	631.36	Hor	0.05	10.13	2.644	csst, lgy
868	632.90	Hor	0	3.15	2.629	msst to csst, unsrt, dgy
869	635.22	Hor	0.017	7.54	2.640	msst, lgy
870	635.72	Hor	0	1.39	2.596	vfsst, dgy, w thn cl lam

2.2 Laboratory analysis, GANE#1A

2.2.1 General information on the analysis

Company:	GEUS	Location:	Nuussuaq, W. Greenland
Depth interval:	636.02 - 706.68 m	Core no. :	206 - 258
Depth reference:	KB	Analysts:	GG,HJL,MJ,LB,PET,GA
Depths are in:	METRES	Date:	301296
Well:	GANE#1A		

REMARKS TO TABULATED VALUES

- 0 : Permeability measured, but gas flow less than 0.06 ml/min. Exact permeability value is not measurable.
- : Permeability not measured.

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2.2.2 Abbreviations for lithological descriptions

Rock type	carb	Carbonate	Miscellaneous	ab	Abundant
	cly	Claystone		arg	Argillaceous
	cl	Clay		art	Artificial
	slt	Siltstone		bit	Bituminous
	sst	Sandstone		calc	Calcareous
	sd	Sand		ccem	Calcite cemented
	cngr	Conglomerate		cem	Cemented
	htrl	Heterolith		dom	Dominantly
	mud	mudstone	hrd	Hard	
Grain size	vf-	Very fine grained		hom	Homogeneous
	f-	Fine grained		ids	Indistinct
		ex. fsst = fine grained sst		mot	Mottled
	m-	Medium grained		prt	Partly
	c-	Coarse grained		slg	Slightly
	vc-	Very coarse grained		sme	Some
	unsrt	Unsorted		sort	Sorting
				str	Strongly
				sp	Sparse
				thn	Thin
Colour	blk	Black		thk	Thick
	br	Brown		tot	Total
	gn	Green		w	With
	gy	Grey			
	ol	Olive			
	rd	Red			
	wh	White	Fractures	FRC	Fracture
	vl-	Very light		FT FRC	Fatal fracture
	l-	Light, ex. lgy = light grey		SG FRC	Significant fracture
	ml-	Medium light		F FRC	Fine fracture
	m-	Medium		H FRC	Hairline
	md-	Medium dark			
	d-	Dark	Minerals	cal	Calcite
-sh	-ish, ex. brsh = brownish	carb		Carbonate	
var	Varioloured	kaol		Kaolinite	
		mica		Mica flakes	
		qtz		Quartz/silica	
		py		Pyrite	
		sid		Siderite	
Structures	bed	Bedding			
	bio	Bioturbation			
	bur	Burrow(-s)			
	cla	Clast(-s)			
	crs	Crossbedding			
	cvn	Calcite vein(-s)			
	concr	Concretion			
	domn	Domains			
	fos	Fossil (-s)			
	frg	Fragment(-s)			
	lam	Lamina/lamination			
	pynd	Pyrite nodule(-s)			
	shl	Shell fragment(-s)			
	slmp	Slumped			
	sly clv	Slaty cleavage			
	sol sm	Solution seam(-s)			
	strp	Stripe			
	sty	Stylolite seam(-s)			
	vn	Vein			
	lns	lens			

2.2.3 Data

Plug no.	Depth m	Plug type	Gas perm. mD	Porosity %	Density g/ccm	Comment
871	633.23	Hor	0.006	3.52	2.635	msst, mgy, w 50% cly cla, tot carb cem
872	635.42	Hor	0.006	5.40	2.663	msst, mgy, tot carb cem
873	636.15	Hor	0	2.54	2.617	vffst, mdgy, thn cl lam, tot carb cem
874	637.59	Hor	0	2.62	2.656	fsst, mgy, thn cl strp, tot carb cem
875	644.11	Hor	0.016	4.57	2.610	vfsst to slt, w msst lns, dgy, cl strps
876	645.23	Hor	0.44	6.12	2.611	htrl, msst/ slt, mdgy, dgy, cl strps
877	646.36	Hor	0.061	7.62	2.673	csst, lgy
878	646.51	Hor	0.015	6.38	2.669	csst, lgy
879	646.78	Hor	0.043	7.14	2.688	vcsst, lgy
880	646.88	Hor	35.1	6.56	2.715	vcsst, lgy, w sid concr, SG FRC
881	647.27	Hor	0.259	1.31	2.683	vcsst, lgy
882	648.89	Hor	0.007	3.87	2.623	msst, mdgy, thn vcl strp
883	649.48	Hor	2.15	4.35	2.608	msst, mdgy, thn cl lam, SG FRC
884	651.09	Hor	0	1.23	2.662	fsst, mgy, thn lam, cl strps
885	651.29	Hor	0.524	0.83	2.670	fsst, mlgy, thn cal vn, FRC
886	653.07	Hor	0	1.14	2.649	msst, mdgy, thn cal vn, tot carb cem
887	654.41	Hor	0	0.91	2.972	slt, mgy
888	654.78	Hor	0.005	2.60	2.695	sill
889	656.79	Hor	0.006	3.47	2.607	slt, dgy, w 10% cly cla
890	657.44	Hor	0.01	4.07	2.616	msst, mdgy, w 15% cly cla
891	658.09	Hor	0.007	4.15	2.631	csst, mgy, w cl strp
892	658.61	Hor	0	0.65	2.792	sill
893	659.17	Hor	0.003	2.31	2.693	fsst, mgy, thn to thk lam
894	660.68	Hor	0.007	5.36	2.612	msst, mgy, w 10% cly cla
895	661.25	Hor	0.008	4.37	2.606	fsst, mgy, w sp cl strp
896	662.10	Hor	0.126	5.20	2.650	csst, lgy
897	663.51	Hor	0.103	9.48	2.674	msst, lgy
898	664.81	Hor	9.08	16.76	2.650	vcsst, lgy
899	665.44	Hor	2.47	15.13	2.649	csst, lgy
900	666.58	Hor	1.81	14.33	2.850	vcsst to csst, lgy
901	667.43	Hor	2.69	15.08	2.652	vcsst to csst, lgy
902	669.31	Hor	0.681	10.60	2.654	csst, mlgy
903	670.37	Hor	0.223	11.00	2.679	msst, lgy
904	671.48	Hor	2.91	15.52	2.656	msst, lgy
905	672.17	Hor	1.37	15.65	2.647	msst, lgy
906	673.05	Hor	1.6	14.97	2.653	csst, lgy
907	674.46	Hor	0.763	13.58	2.656	csst, lgy

Plug no.	Depth m	Plug type	Gas perm. mD	Porosity %	Density g/ccm	Comment
908	675.68	Hor	0.817	13.11	2.654	csst, lgy
909	676.75	Hor	0.071	6.43	2.650	vcsst, lgy
910	677.71	Hor	1.27	13.57	2.656	csst, mlgy
911	678.63	Hor	0.273	12.21	2.659	vcsst, mlgy
912	679.86	Hor	-	12.11	2.540	msst, mdgy, w 40% cly cla, FT FRC
913	680.78	Hor	-	20.55	2.594	vfsst, dgy, w sly clv, FT FRC
914	681.62	Hor	0.8	11.71	2.608	msst, mdgy, w 10% cly cla
915	682.26	Hor	0.054	6.83	2.659	msst, mlgy, w cl strp
916	683.74	Hor	0.036	8.75	2.660	msst, lgy
917	684.26	Hor	0.134	8.95	2.656	csst, lgy
918	685.03	Hor	0.133	10.05	2.655	csst, lgy
919	686.00	Hor	0.154	10.02	2.649	csst, lgy
920	687.11	Hor	0.266	11.81	2.648	csst, lgy
921	688.07	Hor	0.062	9.54	2.648	csst to vcsst, lgy
922	688.96	Hor	0	0.28	2.995	dolerite, lgn
923	690.90	Hor	0	0.15	2.989	dolerite, lgn
924	691.84	Hor	0	0.23	3.066	dolerite, lgn
925	693.18	Hor	-	12.27	2.691	dolerite, lgn, FT FRC
926	694.34	Hor	0	0.53	3.056	dolerite, lgn
927	695.23	Hor	0	0.24	3.111	sill, lgn
928	696.59	Hor	0.048	9.35	2.655	msst, lgy
929	697.41	Hor	0.034	7.61	2.651	csst, lgy
930	698.46	Hor	0.101	7.24	2.656	vcsst, mlgy
931	699.29	Hor	0.353	8.32	2.650	csst, mlgy
932	700.62	Hor	1.06	10.25	2.638	csst, mlgy
933	701.86	Hor	0.094	5.73	2.653	msst, mdgy
934	702.60	Hor	0.328	9.82	2.644	msst, lgy
935	703.71	Hor	0.143	6.30	2.672	msst, lgy, w sp cl lam
936	704.92	Hor	0.635	9.43	2.647	vcsst, mlgy
937	706.20	Hor	2.54	10.93	2.642	vcsst, lgy