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HYDROGEOLOGY, GEOPRESSURES, AND HYDROCARBON OCCURRENCES, BEAUFORT-MACKENZIE BASIN

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APPENDIX

Basin Analysis Group
Alberta Geological Survey
Alberta Research Council

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INTRODUCTION

This Appendix contains both raw and interpreted information from selected wells in the Beaufort-Mackenzie basin. The raw data were obtained from the files of the ISPG and were entered into the data base of the Basin Analysis Group, Alberta Geological Survey, Alberta Research Council. There are several types of data, but each type is not always available for each well. Only information entered and interpreted to 1988-03-31 is present in the data base.

The general structure of the data base has been described by Bachu et al. (1987) and a reprint of this paper is bound in at the end of this Appendix. In the case of the Beaufort-Mackenzie basin, only formation water analyses, drillstem test data and temperature data were entered, together with a record of the depths of the geopressure zones as determined from sonic and density logs. A magnetic tape of the data is available from ISPG.

The Appendix comprises five tables and two sets of computer plots. Preceding each table and set of plots is a brief description of the information contained therein and pertinent references, if appropriate.

Table A1.

Chemical composition and physical properties of formation waters, Beaufort-Mackenzie basin

NOTES:

This table comprises information entered into the Basin Analysis Group data base at 1988-03-31. It is in two sections. The first section reports the physical properties and the second section reports the chemical composition. The data are ordered by well number (A-01 to 20-61) and depth interval (m), and cross reference between the sections is by the unique identifier of the well number and location. All numerical data entered have been verified. Purely descriptive information and data such as the temperature at which the density, refractive index and resistivity were determined can be found in the magnetic tape of this information supplied to ISPG. The data are unprocessed except that Na (by difference) and total dissolved solids have been recalculated based on the data entered. Note that where one or more of Ca, Mg, Cl, HCO_3 or SO_4 was not reported, Na (by difference) has not been calculated and hence neither has total dissolved solids. The absence of a drillstem test number generally indicates a production test or swab test. Where multiple analyses are given for a drillstem test, production test or swab test the order of the samples or position in the recovery can be obtained from the magnetic tape.

The analyses selected as representative of formation water, that is, uncontaminated samples, are given in the report accompanying this Appendix, together with a brief description of the selection and culling criteria used.

Table A1.
Chemical composition and physical properties of formation waters, Beaufort-Mackenzie basin

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivity (ohm m)
300A016850134000	EAST REINDEER A-01	2	2367.38	2407.92	7.90	1.0120	1.3355	0.5140
		5	2490.22	2504.24	8.70	1.0085	1.3344	0.5300
300A066930134300	MALLIK A-06		3998.67	4001.72	8.20	1.0120	1.3391	0.3650
		1	3998.67	4001.72	8.00	1.0114	1.3354	0.4030
		1	3998.67	4001.72	9.70	1.0111	1.3351	0.3760
		1	3998.67	4001.72	7.90	1.0117	1.3352	0.3820
		1	3998.67	4001.72	10.30	1.0149	1.3365	0.4800
		1	3998.67	4001.72	8.80	1.0189	1.3396	0.5570
		1	3998.67	4001.72	9.60	1.0120	1.3351	0.4000
		2	3948.68	3954.78	9.80	1.0075	1.3354	0.5900
		2	3948.68	3954.78	9.65	1.0061	1.3336	0.8040
		2	3948.68	3954.78	8.35	1.0051	1.3332	0.9520
		2	3948.68	3954.78	9.65	1.0049	1.3331	0.9620
		2	3948.68	3954.78	8.80	1.0055	1.3333	0.8820
		3	3824.02	3827.07	10.00	1.0142	1.3353	0.7730
		3	3824.02	3827.07	8.35	1.0054	1.3334	0.8360
		3	3824.02	3827.07	8.40	1.0059	1.3334	0.8280
		3	3824.02	3827.07	8.35	1.0061	1.3336	0.8390
		3	3824.02	3827.07	8.30	1.0061	1.3334	0.8420
		3	3824.02	3827.07	8.35	1.0060	1.3337	0.8220
		4	3118.10	3124.20	8.80	1.0124	1.3347	0.9380
		4	3118.10	3124.20	9.10	1.0063	1.3336	0.8400
		4	3118.10	3124.20	9.10	1.0069	1.3335	0.8500
		4	3118.10	3124.20	8.80	1.0078	1.3339	0.7950
		4	3118.10	3124.20	8.90	1.0067	1.3338	0.7540
		6	2937.97	2942.54	8.80	1.0119	1.3343	0.9390
		6	2937.97	2942.54	8.65	1.0068	1.3336	0.8600
		6	2937.97	2942.54	8.70	1.0061	1.3333	0.8620
		6	2937.97	2942.54	8.70	1.0063	1.3335	0.8580
		6	2937.97	2942.54	8.65	1.0065	1.3334	0.8560
		6	2937.97	2942.54	8.50	1.0061	1.3336	0.9200
		6	2937.97	2942.54	8.65	1.0064	1.3333	0.8600
		6	2937.97	2942.54	8.60	1.0076	1.3332	0.9130

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		7	2855.37	2861.46	8.90	1.0065	1.3341	0.9400
		7	2855.37	2861.46	12.40	1.0084	1.3335	0.7480
		7	2855.37	2861.46	12.40	1.0083	1.3332	0.7050
		7	2855.37	2861.46	12.20	1.0066	1.3335	0.8000
		8	2706.62	2715.77	9.20	1.0100	1.3342	0.8050
		8	2706.62	2715.77	9.60	1.0090	1.3345	0.7860
		10	2616.71	2649.93	9.00	1.0096	1.3342	0.9820
		10	2616.71	2649.93	9.40	1.0088	1.3346	0.9430
		10	2616.71	2649.93	8.90	1.0096	1.3342	0.9960
		11	2524.66	2530.75	9.00	1.0088	1.3343	0.9360
		11	2524.66	2530.75	9.00	1.0101	1.3341	0.9030
		12	2350.62	2356.71	9.00	1.0096	1.3340	0.8470
		12	2350.62	2356.71	8.70	1.0078	1.3338	1.1200
		12	2350.62	2356.71	9.60	1.0087	1.3341	0.8180
		12	2350.62	2356.71	9.50	1.0088	1.3340	0.8360
300A126910133300	SIKU A-12	2	2880.36	2886.46	12.20	1.1063	1.3526	0.0480
		3	2833.12	2836.47	9.80	0.8111	1.3288	4.9500
		4	2718.21	2724.91	6.60	1.0322	1.3400	0.1230
		5	2701.44	2708.45	11.80	1.1125	1.3560	0.0490
		1	2959.00	2968.14	7.10	1.0494	1.3480	0.0900
		2	2880.36	2886.46	7.90	1.0092	1.3434	0.1890
		3	2833.12	2836.47	8.30	1.0944	1.3514	0.0580
		5	2701.44	2708.45	7.20	1.0046	1.3414	0.2480
		6	2658.47	2663.95	8.30	1.1046	1.3542	0.0560
		6	2658.47	2663.95	8.50	1.1044	1.3533	0.0560
		1	2959.00	2968.14				0.0530
		2	2880.36	2886.46				0.0520
		3	2833.12	2836.47				0.0560
		4	2718.21	2724.91				0.0570
		5	2701.44	2708.45				0.0480
		6	2658.47	2663.95				0.0490
300A257000136150	TARSIUT A-25	1	4376.93	4389.12				0.0580
		1	4376.93	4389.12				0.0560
		1	4376.93	4389.12				0.0600
		1	4376.93	4389.12				0.0560
		1	4376.93	4389.12				0.0590
		1	4376.93	4389.12				0.0590
		2	4319.93	4333.95	7.80	1.0479	1.3411	0.1300
300A286920134300	YAYA A-28	7	2055.57	2059.84	8.50	1.0046	1.3331	1.3500
		8	1959.86	1967.79	8.20	0.9742	1.3356	1.7800
		9	1915.36	1919.94	8.30	1.0029	1.3329	1.2900

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		9	1915.36	1919.94	7.60	0.9373	1.3403	2.1000
		10	1874.52	1879.09	8.10	1.0182	1.3361	0.2290
		11	1858.67	1863.24	9.40	1.0031	1.3325	1.1700
300A326940132000	MAGAK A-32	2	1487.42	1522.48	6.60	1.0240		
		2	1485.90	1522.48	7.10	1.0270	1.3400	0.1850
300A356850135450	ULU A-35	1	2455.47	2474.98	7.90	1.0170	1.3420	0.3160
		1	2455.47	2474.98	8.20	1.0170	1.3420	0.3220
		1	2455.47	2474.98	7.70	1.0160	1.3420	0.3250
		1	2455.47	2474.98	8.00	1.0180	1.3420	0.3240
		2	923.54	929.64	7.80	1.0250	1.3430	0.2060
		2	923.54	929.64	7.70	1.0210	1.3430	0.2220
		2	923.54	929.64	8.00	1.0220	1.3430	0.2240
		2	923.54	929.64	7.90	1.0200	1.3430	0.2220
300A376820135000	AKLAVIK A-37	3	1517.90	1528.57	7.80	1.0080	1.3347	0.7740
300A416910134300	REINDEER A-41	2	1717.55	1828.80	8.20	1.0099	1.3344	0.4180
		2	1717.55	1828.80	8.60	1.0055	1.3339	0.6600
		2	1717.55	1828.80	8.50	1.0103	1.3344	0.4600
		2	1717.55	1828.80	9.30	1.0030	1.3331	1.2300
		3	971.70	976.58	8.40	1.0045	1.3327	0.0980
		3	971.70	976.58	8.40	1.0046	1.3327	0.9000
		3	971.70	976.58	7.60	1.0001	1.3317	22.8000
		4	875.08	879.65	8.60	1.0053	1.3328	0.9200
		4	875.08	879.65	8.70	1.0054	1.3329	0.7450
		4	875.08	879.65	7.30	0.9918	1.3324	25.8000
		5	771.75	777.24	8.40	1.0036	1.3322	1.3200
		5	771.75	777.24	8.70	1.0036	1.3324	1.1600
		5	771.75	777.24	8.60	1.0037	1.3320	1.1500
		5	771.75	777.24	8.70	1.0078	1.3345	0.4720
		6	713.23	718.72	8.50	1.0037	1.3323	1.1000
		6	713.23	718.72	8.40	1.0037	1.3325	0.9450
		6	713.23	718.72	8.50	1.0046	1.3344	0.5150
		7	585.83	592.53	7.90	1.0112	1.3343	0.3400
		7	585.83	592.53	8.50	1.0159	1.3355	0.2400
		7	585.83	592.53	9.00	1.0142	1.3355	0.2490
300A556950131450	ATKINSON A-55	1	1966.26	2005.28	12.10	1.0160		0.2820
		1	1966.26	2005.28	12.30	1.0111	1.3345	0.3060
		4	1988.82	2007.11	11.20	1.0120		0.4020
		4	1988.82	2007.11	10.40	1.0123	1.3345	0.3600
		4	1988.82	2007.11	8.80	1.0173	1.3360	0.2490
		4	1988.82	2007.11	10.00	1.0110		0.4050
		4	1988.82	2007.11	7.70	1.0183	1.3363	0.2350

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi[ty] (ohm m)
300B116850135150	UNAK B-11	1	1541.37	1546.86	8.70	1.0131	1.3342	0.3170
		1	1541.37	1546.86			1.3387	
		1	1541.37	1546.86			1.3368	
		1	1541.37	1546.86			1.3360	
		1	1541.37	1546.86			1.3358	
		2	1181.10	1185.67			1.3387	
		2	1181.10	1185.67			1.3361	
		2	1181.10	1185.67			1.3364	
		1	1541.37	1546.86	9.00	1.0151	1.3347	0.2940
		1	1541.37	1546.86	8.90	1.0146	1.3347	0.3010
		1	1541.37	1546.86	9.30	1.0211	1.3364	0.2170
		1	1541.37	1546.86	9.20	1.0195	1.3360	0.2390
		1	1541.37	1546.86	9.10	1.0168	1.3353	0.2620
		1	1541.37	1546.86	9.00	1.0152	1.3350	0.2890
		1	1541.37	1546.86	9.00	1.0151	1.3346	0.2960
		1	1541.37	1546.86	9.80	1.0260	1.3378	0.1810
		2	1181.10	1185.67	9.20	1.0248	1.3374	0.1840
		2	1181.10	1185.67	8.30	1.0155	1.3353	0.2580
		2	1181.10	1185.67	8.30	1.0151	1.3347	0.2780
		2	1181.10	1185.67	8.30	1.0137	1.3343	0.2830
		2	1181.10	1185.67	8.30	1.0133	1.3343	0.3000
		2	1181.10	1185.67	8.30	1.0133	1.3343	0.2970
		2	1181.10	1185.67	8.30	1.0137	1.3344	0.2800
300B356930136150	SARPIK B-35	1	3113.53	3122.68	9.10	1.0257	1.3378	0.4500
		4	2974.85	2981.86	12.40	1.0148	1.3350	0.4000
		4	2974.85	2981.86	12.00	1.0155	1.3354	0.4550
		4	2974.85	2981.86	12.00	1.0145	1.3349	0.4200
		5	2827.93	2840.13	12.40	1.0130	1.3349	0.3600
		5	2827.93	2840.13	10.00	1.0150	1.3348	0.5400
		5	2827.93	2840.13	11.80	0.9934	1.3368	0.6400
		5	2827.93	2840.13	12.40	1.0152	1.3350	0.3900
		5	2827.93	2840.13	12.30	1.0160	1.3352	0.3950
		5	2827.93	2840.13	12.30	1.0185	1.3344	0.4100
		5	2827.93	2840.13	12.30	1.0145	1.3349	0.4200
		4	2974.85	2981.86				0.5120
		5	2827.93	2840.13				0.3400
300B356940135150	PELLY B-35	1	2470.40	2473.45	9.20	1.0030	1.3334	3.1400
300B446940135450	NETSERK B-44	1	3274.77	3305.56	11.30	1.0102	1.3350	0.7300
		2	3274.77	3305.56	10.70	1.0102	1.3352	0.7600
		4	3258.92	3271.11	8.90	1.0143	1.3357	0.7200
		4	3258.92	3271.11	10.50	1.0100	1.3346	0.7800

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
		4	3258.92	3271.11	9.80	1.0113	1.3347	0.6500
		5	3151.02	3160.17				0.4950
		5	3149.80	3158.95				0.5380
		5	3151.02	3160.17	9.20	1.0108	1.3347	0.8000
		5	3151.02	3160.17	8.90	1.0065	1.3334	1.2200
		5	3149.80	3158.95	9.80	1.0147	1.3355	0.5200
		5	3151.02	3160.17	9.40	1.0100	1.3345	0.8200
		5	3151.02	3160.17	9.35	1.0126	1.3351	0.4350
		6	2877.31	2889.50	8.75	1.0072	1.3335	1.3500
		6	2877.31	2889.50	8.75	1.0064	1.3330	1.2500
		7	2877.31	2889.50	9.10	1.0069	1.3328	1.2500
		7	2877.31	2889.50	10.20	1.0152	1.3348	0.5700
300C216930135150	UPLUK C-21	1	1013.46	1022.60	12.20	1.0130	1.3355	0.2740
		2	1013.46	1022.60	12.00	1.0130	1.3352	0.4330
		3	1492.61	1501.75	12.10	1.0120	1.3351	0.3930
		4	1014.68	1021.38	12.30	1.0130	1.3355	0.2430
		5	1014.68	1021.38	12.30	1.0110	1.3352	0.2780
		6	1138.12	1147.27	12.30	1.0130	1.3354	0.2620
		7	1138.12	1147.27	12.00	1.0110	1.3348	0.4560
300C386850133300	REINDEER C-38	1	1154.58	1167.38	8.51	1.0030		2.1700
300C426930134450	TAGLU C-42		2957.17	2960.22	8.30	1.0058	1.3334	1.2000
			2957.17	2960.22	8.40	1.0060	1.3330	1.1500
			2957.17	2960.22	8.50	1.0057	1.3333	1.1700
			2957.17	2960.22	8.30	1.0058	1.3332	1.1500
			2957.17	2960.22	8.30	1.0058	1.3333	1.1200
			2957.17	2960.22	8.30	1.0059	1.3334	1.1200
			2957.17	2960.22	8.40	1.0061	1.3332	1.1200
			2957.17	2960.22	8.40	1.0056	1.3334	1.1300
			2957.17	2960.22	8.40	1.0056	1.3334	1.1300
			2957.17	2960.22	8.50	1.0057	1.3333	1.1400
			2926.08	2932.18	8.50	1.0035	1.3326	2.4500
			2926.08	2932.18	8.20	1.0054	1.3330	1.2300
			2926.08	2932.18	8.50	1.0058	1.3328	1.1200
			2926.08	2932.18	8.30	1.0058	1.3328	1.1300
			2926.08	2932.18	8.30	1.0059	1.3331	1.1200
			2901.09	2907.18	7.80	1.0051	1.3330	1.2400
			2901.09	2907.18	8.10	1.0056	1.3330	1.1500
			2901.09	2907.18	8.10	1.0058	1.3330	1.1500
			2901.09	2907.18	8.00	1.0058	1.3330	1.1600
			2901.09	2907.18	8.10	1.0056	1.3329	1.1500
			2901.09	2907.18	8.20	1.0057	1.3329	1.1600

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
			2901.09	2907.18	8.20	1.0054	1.3330	1.1500
			2888.28	2891.33	8.70	1.0064	1.3328	1.1600
			2888.28	2891.33	8.60	1.0056	1.3329	1.1600
			2888.28	2891.33	8.60	1.0054	1.3328	1.1600
			2888.28	2891.33	8.50	1.0057	1.3329	1.1800
			2888.28	2891.33	8.50	1.0054	1.3328	1.2000
			2880.36	2883.41	8.60	1.0050	1.3328	1.1800
			2880.36	2883.41	8.30	1.0065	1.3330	1.1700
		11	2880.36	2883.41				1.8400
		1	3311.65	3317.75	8.40	1.0046	1.3328	1.7700
		1	3311.65	3317.75	8.70	1.0052	1.3328	1.7600
		1	3311.65	3317.75	9.10	1.0051	1.3332	1.8100
		1	3311.65	3317.75	8.90	1.0041	1.3331	1.8100
		3	3267.76	3277.21	8.00	1.0056	1.3331	1.1600
		3	3267.76	3277.21	7.80	1.0049	1.3330	1.1500
		3	3267.76	3277.21	8.10	1.0063	1.3333	1.1300
		3	3267.76	3277.21	8.10	1.0061	1.3333	1.1200
		3	3267.76	3272.03	8.60	1.0063	1.3333	1.1500
		3	3267.76	3272.03	8.00	1.0061	1.3330	1.1200
		3	3267.76	3277.21	8.90	1.0041	1.3326	2.3300
		4	3233.93	3236.98	8.40	1.0044	1.3332	1.5300
		4	3233.93	3236.98	8.20	1.0061	1.3332	1.0200
		4	3233.93	3236.98	8.10	1.0068	1.3332	1.0100
		4	3233.93	3236.98	8.33	1.0020		1.1300
		4	3233.93	3236.98	8.39	1.0030		1.2500
		5	3194.30	3202.53	8.30	1.0062	1.3334	1.0300
		5	3194.30	3202.53	8.40	1.0062	1.3334	1.0000
		5	3194.30	3202.53	8.20	1.0052	1.3332	1.0200
		5	3194.30	3202.53	8.20	1.0064	1.3333	1.0000
		5	3194.30	3202.53	8.30	1.0067	1.3333	1.0000
		5	3194.30	3202.53	8.40	1.0062	1.3333	1.0000
		5	3194.30	3202.53	8.30	1.0065	1.3335	1.0000
		5	3194.30	3202.53	8.50	1.0067	1.3335	1.0000
		6	3169.92	3176.02	8.50	1.0032	1.3328	2.2400
		6	3169.92	3176.02	8.40	1.0061	1.3333	1.0700
		6	3169.92	3176.02	8.40	1.0060	1.3333	1.0000
		6	3169.92	3176.02	8.20	1.0060	1.3333	0.9800
		6	3169.92	3176.02	8.30	1.0058	1.3334	0.9900
		6	3169.92	3176.02	8.20	1.0062	1.3334	0.9900
		6	3169.92	3176.02	8.10	1.0059	1.3334	0.9800
		12	2866.64	2872.44	8.25	1.0022	1.3332	3.0000

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
300C556910133300	SIKU C-55	1	3945.64	4506.47	8.25	1.0010	1.3320	34.9000
		1	3945.64	4506.47	9.00	1.0007	1.3318	50.9000
		1	3945.64	4506.47				2.1200
		1	3945.64	4506.47				1.8400
		2	4009.64	4019.70	10.70	1.0003	1.3317	18.4000
		2	4009.64	4019.70				1.8000
		2	4009.64	4019.70	8.35	1.0057	1.3333	1.0300
		2	4009.64	4019.70	7.75	1.0098	1.3340	0.5950
		2	4009.64	4019.70				1.0900
300C586920135000	KUMAK C-58		1252.42	1253.03	8.50	1.0155	1.3357	0.4700
			1025.04	1025.65	8.20	1.0300	1.3385	0.2300
			2154.02	2154.63	11.80	1.0445	1.3418	0.1300
			1882.14	1882.75	11.90	1.0480	1.3423	0.1200
			1391.11	1391.72	10.10	1.0470	1.3420	0.1300
300D026900126450	SADENE D-02		1758.70	1770.89	7.40	1.0120	1.3355	0.5210
		1	1790.70	1805.94	8.20	1.0150	1.3355	0.4490
		2	850.39	865.63	8.10	1.0070	1.3340	0.7640
		2	850.39	865.63	8.10	1.0070	1.3340	0.7640
300D206900133300	PARSONS D-20	1	3708.81	3714.90	6.90	1.0018	1.3473	0.1620
		3	3596.03	3602.13	6.90	1.0123	1.3438	0.1400
		3	3596.03	3602.13	6.90	1.0111	1.3494	0.1400
		6	3560.67	3562.81	7.60	1.1445	1.3604	0.0410
		7	3444.24	3450.34	6.10	1.0846	1.3492	0.0580
		8	3418.03	3424.12	7.40	1.1416	1.3602	0.0430
		6	3560.67	3562.81	7.30	1.1473	1.3612	0.0450
		7	3444.24	3450.34	8.00	1.0063	1.3424	0.1850
		8	3418.03	3424.12	7.10	1.1406	1.3600	0.0450
		8	3418.03	3424.12	6.90	1.1406	1.3600	0.0430
300D276910134300	REINDEER D-27	11	3401.57	3425.95	7.56	1.0050		0.6800
		11	3401.57	3425.95	8.10	1.0060	1.3378	0.8830
		11	3401.57	3425.95	8.00	1.0060	1.3378	0.8880
		11	3401.57	3425.95	8.10	1.0060	1.3378	0.8830
		11	3401.57	3425.95	8.10	1.0060	1.3378	0.8870
		11	3401.57	3425.95	7.90	1.0060	1.3378	0.8830
		11	3401.57	3425.95	7.80	1.0060	1.3378	0.8830
		11	3401.57	3425.95	8.00	1.0060	1.3378	0.8880
300D296940132150	KIMIK D-29	1	2610.61	2628.60	7.20	1.0160		
		2	2641.09	2657.86	8.10	1.0080		
300D556930134450	TAGLU D-55	6	3587.50	3590.54	8.45	1.0084	1.3350	0.8390
		7	3561.28	3573.48				0.5000
		7	3561.28	3573.48	9.90	0.9458	1.3426	2.4400

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
		7	3561.28	3573.48				1.6800
		7	3561.28	3573.48	9.70	0.9732	1.3417	1.8100
		8	3529.58	3532.63				0.8300
		8	3529.58	3532.63	8.40	1.0073	1.3344	0.8430
		8	3529.58	3532.63	8.40	1.0077	1.3339	0.8590
		8	3529.58	3532.63	8.50	1.0080	1.3342	0.8700
		8	3529.58	3532.63	9.50	1.0076	1.3340	0.9440
		9	3514.34	3520.44	8.30	1.0070	1.3339	0.8200
		9	3514.34	3520.44	8.00	1.0059	1.3333	0.8700
		9	3514.34	3520.44	8.20	1.0068	1.3335	0.8600
		9	3514.34	3520.44	8.10	1.0070	1.3337	0.8800
		9	3514.34	3520.44	8.20	1.0066	1.3339	0.8000
		9	3514.34	3520.44				0.9800
		9	3514.34	3520.44				0.9100
		9	3514.34	3520.44				0.5620
		10	3424.43	3430.52				0.5100
		10	3424.43	3430.52	8.20	1.0070	1.3338	0.7900
		10	3424.43	3430.52	7.85	1.0069	1.3334	0.8400
		10	3424.43	3430.52	8.30	1.0076	1.3336	0.7800
		10	3424.43	3430.52	7.90	1.0065	1.3332	0.8000
		10	3424.43	3430.52	8.10	1.0065	1.3334	0.8200
		10	3424.43	3430.52	7.85	1.0069	1.3333	0.7900
		10	3424.43	3430.52	8.10	1.0076	1.3338	0.7800
		10	3424.43	3430.52	8.30	1.0080	1.3344	0.7900
		13	3218.69	3221.74				0.5000
		13	3218.69	3221.74	7.90	1.0069	1.3341	0.9300
		13	3218.69	3221.74	7.90	1.0072	1.3340	0.9200
		13	3218.69	3221.74	7.80	1.0065	1.3340	0.9200
		13	3218.69	3221.74	7.80	1.0074	1.3340	0.9000
		13	3218.69	3221.74	7.80	1.0074	1.3340	0.9100
		14	3191.26	3194.30				0.5150
		14	3191.26	3194.30	7.50	1.0001	1.3321	33.4000
		14	3191.26	3194.30	9.30	0.9309	1.3424	3.1800
		14	3191.26	3194.30	8.80	0.9802	1.3383	1.5000
		14	3191.26	3194.30	7.90	1.0072	1.3339	0.9200
		14	3191.26	3194.30	7.90	1.0071	1.3339	0.9000
		14	3191.26	3194.30	8.00	1.0069	1.3339	0.9200
		14	3191.26	3194.30	7.75	1.0077	1.3338	0.9200
		17	3168.40	3174.49	8.60	1.0065	1.3337	0.9000
			3587.50	3590.54	9.72	1.0100		0.7300
			3587.50	3590.54	9.77	1.0030		1.2700

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
			3587.50	3590.54	9.19	1.0100		0.7100
			3587.50	3590.54	8.40	1.0090		0.7640
			3587.50	3590.54	8.47	1.0100		0.8350
			3587.50	3590.54	8.49	1.0110		0.8620
			3587.50	3590.54	8.51	1.0080		0.9120
			3587.50	3590.54	8.59	1.0070		0.9110
			3587.50	3590.54	7.70	1.0100		
			3587.50	3590.54	7.70	1.0100		
			3587.50	3590.54	7.50	1.0100		
300D586900133150	KAMIK D-58	1	2990.09	2996.18	6.80	1.0160	1.3364	0.3470
		2	2923.03	2929.13	8.40	1.0280	1.3388	0.2070
		6	2844.39	2851.10	8.90	1.0270	1.3384	0.2000
		4	2913.89	2920.59	8.80	1.0290	1.3388	0.1920
		7	2802.33	2807.82	10.70	1.0200	1.3381	0.2160
300E176950134150	PULLEN E-17		3590.54	3591.15	11.30	1.0160		0.5240
		2	3560.06	3566.16	8.90	1.0063	1.3336	1.1300
		2	3560.06	3566.16	8.10	1.0048	1.3332	1.0600
		2	3560.06	3566.16	10.10	1.0037	1.3337	1.3700
		2	3560.06	3566.16	7.90	1.0052	1.3334	1.0800
		2	3560.06	3566.16	8.90	1.0048	1.3334	1.0800
		2	3560.06	3566.16	8.40	1.0051	1.3334	1.0600
		2	3560.06	3566.16	8.50	1.0055	1.3333	1.0500
		2	3560.06	3566.16	8.00	1.0046	1.3326	1.0400
		2	3560.06	3566.16	9.80	1.0041	1.3333	1.1200
		2	3560.06	3566.16	8.40	1.0056	1.3334	1.0500
		4	3539.34	3545.43	10.10	1.0041	1.3326	1.0700
		4	3539.34	3545.43	10.10	1.0040	1.3326	1.1100
		4	3539.34	3545.43	9.90	1.0038	1.3323	1.1600
		4	3539.34	3545.43	10.00	1.0037	1.3323	1.1800
		4	3539.34	3545.43	10.00	1.0040	1.3323	1.1100
		4	3539.34	3545.43	10.00	1.0039	1.3323	1.1300
		4	3539.34	3545.43	10.70	1.0036	1.3323	1.2300
		4	3539.34	3545.43	10.40	1.0038	1.3323	1.2100
		4	3539.34	3545.43	11.30	1.0080		1.0990
		4	3539.34	3545.43	8.40	1.0070		1.0530
300E546930132300	PIKIOLIK E-54	1	717.80	803.76	9.40	1.0010		
		3	2599.94	2630.42	6.75	1.0200		
300F286930135450	ADGO F-28	4	1357.88	1365.50	8.50	1.0064	1.3330	0.5390
		4	1357.88	1365.50	8.70	1.0084	1.3332	0.4510
		4	1357.88	1365.50	8.80	1.0077	1.3328	0.4650
		4	1357.88	1365.50	8.90	1.0065	1.3328	0.5280

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistiv (ohm m)
		4	1357.88	1365.50	10.10	1.0038	1.3328	1.1200
		4	1357.88	1365.50	9.20	1.0031	1.3328	1.3900
		5	1246.63	1258.82	9.00	1.0031	1.3328	1.3200
		5	1246.63	1258.82	8.90	0.0034	1.3328	1.2900
		8	1095.76	1101.85	8.50	1.0057	1.3337	0.7320
		8	1095.76	1101.85	8.40	1.0059	1.3338	0.7350
		8	1095.76	1101.85	8.30	1.0058	1.3337	0.7380
		8	1095.76	1101.85	8.20	1.0064	1.3334	0.6800
		8	1095.76	1101.85	8.20	1.0059	1.3332	0.6760
		8	1095.76	1101.85	8.30	1.0064	1.3334	0.6480
		8	1095.76	1101.85	9.70	1.9750	1.3359	2.9900
		8	1095.76	1101.85	9.20	1.0029	1.3328	1.7100
		8	1095.76	1101.85	9.00	1.0005	1.3328	1.1300
		8	1095.76	1101.85	9.40	1.0028	1.3328	1.9000
		3	1714.50	1719.07	9.50	1.0037	1.3331	1.2100
			1765.10	1765.71	10.00	1.0038	1.3328	1.0500
		6	1222.25	1231.39	9.60	1.0033	1.3329	1.3400
		7	1202.13	1208.23	9.40	1.0031	1.3328	1.3100
		8	1095.76	1101.85	8.40	1.0057	1.3337	0.7490
		8	1095.76	1101.85	8.50	1.0055	1.3332	0.7310
		4	1357.88	1365.50	8.70	1.0075	1.3328	0.4500
		4	1357.88	1365.50	8.90	1.0077	1.3328	0.4440
			2307.64	2308.25	10.20	1.0042	1.3328	0.8990
		8	1095.76	1101.85	8.50	1.0053	1.3329	0.7600
		8	1095.76	1101.85	8.50	1.0028	1.3323	1.4200
300F316830134450	NAPOIAK F-31	2	1347.22	1383.79	8.30	1.0110	1.3350	0.4000
		2	1347.22	1383.79	8.00	1.0100	1.3350	0.5000
		3	1159.46	1167.38	7.80	1.0080	1.3340	0.6000
		3	1159.46	1167.38	7.90	1.0090	1.3350	0.5000
		3	1159.46	1167.38	8.00	1.0140	1.3350	0.4000
		5	1231.39	1255.78	8.10	1.0140	1.3350	0.4000
		5	1231.39	1255.78	8.00	1.0130	1.3360	0.4000
		6	868.07	890.02	8.10	1.0070	1.3340	0.8000
		6	868.07	890.02	8.80	1.0160	1.3360	0.3000
		6	868.07	890.02	8.20	1.0090	1.3340	0.6000
		6	868.07	890.02	8.20	1.0070	1.3340	0.8000
		7	823.57	834.54	8.20	1.0060	1.3340	0.9000
		8	692.81	713.23	9.20	1.0120	1.3350	0.5000
		7	823.57	834.54	8.60	1.0150	1.3360	0.3000
		7	823.57	834.54	8.10	1.0010	1.3310	0.4000
		7	823.57	834.54	8.20	1.0090	1.3340	0.5000

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
		7	823.57	832.10	8.30	1.0060	1.3330	0.8000
		8	692.81	713.23	8.90	1.0110	1.3350	0.5000
		8	692.81	713.23	9.10	1.0130	1.3350	0.4000
300F366910134300	REINDEER F-36	1	1167.69	1172.87	8.50	1.0092	1.3340	0.4750
		2	903.73	911.35	8.10	1.0053	1.3325	0.9800
		2	903.73	911.35	8.40	1.0048	1.3325	1.0100
		2	903.73	911.35	8.40	1.0047	1.3324	0.9500
		2	903.73	911.35	9.00	1.0051	1.3325	1.4000
		2	903.73	911.35	7.90	1.0063	1.3326	1.0100
		3	830.58	833.63	8.00	1.0043	1.3325	1.2200
		3	830.58	833.63	8.20	1.0056	1.3326	1.2000
		4	733.04	736.09	8.70	1.0035	1.3324	2.0000
		6	820.52	822.05	11.10	1.0075	1.3333	0.5800
		6	820.52	822.05	8.10	1.0046	1.3327	1.1200
		6	820.52	822.05	8.20	1.0046	1.3327	1.1200
		6	820.52	822.05	8.20	1.0046	1.3327	1.1200
		7	731.52	733.04	8.70	1.0033	1.3320	1.7100
		7	731.52	733.04	8.50	1.0026	1.3325	1.8600
		7	731.52	733.04	11.10	1.0063	1.3327	0.7200
		7	731.52	733.04	9.30	1.0031	1.3327	1.4900
		8	693.42	699.52	9.50	1.0035	1.3324	1.2600
		9	693.42	699.52	8.60	1.0052	1.3330	1.0800
		9	693.42	699.52	8.70	1.0027	1.3325	2.0200
		9	693.42	699.52	11.00	1.0073	1.3329	0.6050
		9	693.42	699.52	9.30	1.0033	1.3325	1.3200
		10	693.42	699.52	8.60	1.0024	1.3325	2.0000
		10	693.42	699.52	11.40	1.0071	1.3332	0.5650
		10	693.42	699.52	8.90	1.0034	1.3325	1.6700
		11	665.99	672.08	8.90	1.0023	1.3320	2.2600
		11	665.99	672.08	8.90	1.0023	1.3325	2.3000
		11	665.99	672.08	11.20	1.0053	1.3332	0.7900
		11	665.99	672.08	9.20	1.0025	1.3326	1.7800
		12	630.94	633.98	9.10	1.0023	1.3315	2.1200
		12	630.94	633.98	10.80	1.0071	1.3328	0.5400
		12	630.94	633.98	10.50	1.0038	1.3320	1.2500
		13	630.94	633.98	8.50	1.0019	1.3320	2.5600
		13	630.94	633.98	7.80	1.0018	1.3312	2.4300
		13	630.94	633.98	8.30	1.0019	1.3315	2.2000
		14	539.50	545.59	8.90	1.0021	1.3321	1.5500
		14	539.50	545.59	8.70	1.0051	1.3320	0.9200
		14	539.50	545.59	10.40	1.0065	1.3228	0.6080

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		15	458.72	461.77	8.60	1.0033	1.3315	1.3100
		15	458.72	461.77	9.30	1.0069	1.3328	0.5810
		15	458.72	461.77	10.40	1.0062	1.3328	0.6610
		1	1167.69	1172.87				5.1100
		3	830.58	833.63				1.2400
		4	733.04	736.09				4.6300
300F386810135000	AKLAVIK F-38	1	1508.76	1514.86	8.20	1.0068	1.3336	0.5620
300F386900133150	KAMIK F-38	2	3193.39	3204.97	7.29	1.0180	1.3400	0.4640
		2	3193.39	3204.97	7.25	1.0200	1.3400	0.4570
		2	3193.39	3204.97	7.18	1.0190	1.3400	0.4550
		2	3193.39	3204.97	8.01	1.0200	1.3400	0.4800
		2	3193.39	3204.97	9.54	1.0090	1.3300	1.3870
		2	3193.39	3204.97	9.24	1.0130	1.3400	0.7890
		3	3105.30	3110.79	7.76	1.0200	1.3400	0.4550
		3	3105.30	3110.79	8.81	1.0144	1.3400	0.6660
		3	3105.30	3110.79	9.07	1.0131	1.3400	0.7040
		3	3105.30	3110.79	9.22	1.0090	1.3300	1.7440
		3	3105.30	3110.79	8.86	1.0050	1.3380	10.1840
		3	3105.30	3110.79	9.53	1.0117	1.3400	0.8450
300F406940135450	NETSERK F-40	1	4094.07	4101.08	9.00	1.0270	1.3385	0.4510
		1	4094.07	4101.08	9.30	1.0271	1.3380	0.4420
		3	4075.79	4081.88	8.50	1.0179	1.3359	0.5990
		3	4075.79	4081.88	8.70	1.0193	1.3359	0.6000
		3	4075.79	4081.88	7.90	1.0122	1.3346	0.6600
		4	4007.51	4021.53	8.40	1.0069	1.3330	0.9000
		4	4007.51	4021.53	8.60	1.0055	1.3332	0.9250
		4	4007.51	4021.53	8.70	1.0082	1.3330	0.9500
		4	4007.51	4021.53	8.00	1.0081	1.3330	0.9100
300F486930134000	KILAGMIOTAK F-48	1	2959.61	2969.67	8.10	1.0090	1.3342	1.0800
		1	2959.61	2969.67	8.20	1.0090	1.3340	1.0280
		2	3380.23	3397.30	7.90	1.0130	1.3350	0.7100
		3	4710.68	4713.73	10.40	1.0120		1.0500
		4	4710.68	4713.73	10.18	1.0100		1.2500
		5	4706.11	4718.30	10.21	1.0100		1.2700
		6	4452.52	4475.99	10.03	1.0100		0.8400
		6	4452.52	4475.99	9.96	1.0100		0.8300
		7	4352.54	4375.40	8.03	1.0120		0.6200
		7	4352.54	4375.40	7.97	1.0110		0.6500
		10	3665.22	3671.32	8.10	1.0120		0.6330
		10	3665.22	3671.32	8.10	1.0110		0.6250
		10	3627.12	3671.32	10.05	1.0080		0.7000

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
300G027000127150	HORTON RIVER G-02	1	365.76	420.62	10.80	1.0070	1.3334	1.5100
		3	780.90	799.19	7.70	1.0130	1.3358	0.5100
		3	780.90	799.19	8.10	1.0140	1.3355	0.4220
		5	1375.56	1394.16	8.30	1.0180	1.3355	0.4600
		6	1708.10	1769.36	8.20	1.0150	1.3356	0.4340
300G046900133450	EAST REINDEER G-04	3	2921.51	2940.41	9.20	1.0030	1.3333	3.4400
		4	2994.96	3014.47	6.80	1.0180	1.3364	0.3970
		5	1470.66	1475.23	9.00	1.0030	1.3334	4.2300
		6	643.13	688.85	8.40	1.0010	1.3332	7.7200
		8	3596.64	3733.80	6.40	1.0290	1.3393	0.2230
300H136830135300	BEAVER HOUSE CREEK H-13	3	361.19	403.86	8.70	1.0075		3.7500
		3	361.19	403.86	8.70	1.0090		2.1000
		4	3093.11	3136.39	7.70	1.0100		1.0300
			2085.44	2086.05	8.40	1.0070		1.1300
300H237010130000	RUSSELL H-23	2	1095.45	1105.20	8.60	1.0013	1.3357	2.7100
		2	1095.45	1105.20	8.60	1.0017	1.3358	2.3700
		3	1163.73	1172.87	8.60	1.0035	1.3329	1.5700
		3	1163.73	1172.87	9.20	0.9839	1.3326	3.4800
		3	1163.73	1172.87	9.20	0.9950	1.3325	2.5100
300H246920134450	TOAPOLOK H-24	3	1191.77	1266.14	8.30	1.0068	1.3331	0.6130
		3	1191.77	1266.14	9.00	1.0057	1.3331	0.7190
		3	1191.77	1266.14	8.40	1.0066	1.3330	0.6610
		6	2326.23	2330.81	9.00	1.0080	1.3344	0.9150
		6	2326.23	2330.81	8.60	1.0080	1.3342	0.6270
		6	2326.23	2330.81	8.80	1.0080	1.3342	0.6080
		7	2227.17	2231.75	9.10	1.0060	1.3339	1.2600
		7	2227.17	2231.75	9.00	1.0060	1.3337	1.2500
		7	2227.17	2231.75	9.10	1.0060	1.3338	1.2800
		7	2227.17	2231.75	9.10	1.0060	1.3338	1.2000
		8	2164.69	2169.26	9.10	1.0070	1.3340	0.9950
		8	2164.69	2169.26	8.60	1.0080	1.3340	0.9320
		8	2164.69	2169.26	10.80	1.0100	1.3350	0.4310
		8	2164.69	2169.26	8.60	1.0080	1.3340	0.9400
		9	2058.01	2062.58	9.40	1.0090	1.3348	0.7460
		9	2058.01	2062.58	8.20	1.0070	1.3340	0.9460
		9	2058.01	2062.58	8.10	1.0070	1.3340	0.9550
		9	2058.01	2062.58	8.50	1.0070	1.3342	0.7840
		9	2058.01	2062.58	8.70	1.0050	1.3340	1.0100
		10	1920.24	1924.81	11.20	1.0130	1.3355	0.4700
		10	1920.24	1924.81	9.00	1.0060	1.3340	1.1200
		10	1920.24	1924.81	8.60	1.0060	1.3340	1.0300

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		10	1920.24	1924.81	9.10	1.0090	1.3344	0.7840
		11	1785.21	1789.79	8.50	1.0060	1.3340	1.0700
		11	1785.21	1789.79	8.50	1.0060	1.3340	0.9900
		11	1785.21	1789.79	8.20	1.0070	1.3341	0.9720
		11	1785.21	1789.79	8.50	1.0060	1.3340	0.9720
		11	1785.21	1789.79	9.00	1.0070	1.3339	0.9570
		12	1629.77	1634.34	11.40	1.0100	1.3354	0.4880
		12	1629.77	1634.34	9.70	1.0070	1.3344	0.8340
		12	1629.77	1634.34	9.10	1.0050	1.3339	1.2000
		12	1629.77	1634.34	8.80			1.3400
		12	1629.77	1634.34	8.90	1.0050	1.3339	1.1900
		3	1191.77	1266.14				1.0600
		3	1191.77	1266.14				1.1200
		3	1191.77	1266.14				0.6590
300H256950131450	ATKINSON H-25	3	1798.62	1807.46	6.70	1.0290		
		2	1798.02	1805.94	6.60	1.0270		
		2	1798.02	1805.94	6.70	1.0270		
		3	1798.62	1807.46	6.80	1.0280		
		3	1798.62	1807.46	6.50	1.0280		
		4	1760.22	1770.89	8.50			
		4	1760.22	1770.89	8.40	1.0080		
300H306920135150	NIGLINTGAK H-30	2	1906.52	2016.86	12.50	1.0300	1.3387	0.1900
		2	1906.52	2016.86	12.50	1.0285	1.3386	0.1900
		2	1906.52	2016.86	12.50	1.0245	1.3373	0.2300
		2	1906.52	2016.86	12.50	1.0240	1.3372	0.2300
300I176920134300	YA YA I-17	1	2366.77	2371.34	8.10	1.0190	1.3373	0.2370
		2	2031.49	2049.78	9.50		1.3370	0.2970
		3	1825.75	1837.94	10.20	1.0030	1.3334	4.0100
		4	1549.60	1560.58	10.00	1.0020	1.3333	3.6900
300I226920135150	UNIPKAT I-22		1805.64	1806.24	8.90	1.0225		0.2700
			1501.14	1501.75	9.20	1.0275		0.2900
			1805.94	1806.55	8.90	1.0280		0.2100
			2306.73	2307.34	9.00	1.0440		0.1560
		1	3806.95	3810.00	12.10	1.0435		0.1500
		1	3806.95	3816.10	10.10	1.0235		0.2800
		1	3806.95	3816.10	12.50	1.0430		0.1500
		1	3806.95	3816.10	12.30	1.0450		0.1500
		1	3806.95	3816.10	11.60	1.0320		0.2100
		4	3555.49	3561.59	9.90	1.0075		0.1200
		4	3555.49	3561.59	12.20	1.0400		0.1700
		4	3555.49	3561.59	12.10	1.0390		0.1800

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
		4	3555.49	3561.59	8.00	1.0105	1.3342	0.9200
		4	3555.49	3561.59	7.50	1.0095	1.3341	0.9200
		5	3102.86	3118.71	11.90	1.0390		0.1800
		5	3102.86	3118.71	10.30	1.0165	1.3359	0.4900
		5	3102.86	3118.71	9.90	1.0155	1.3359	0.5500
		5	3102.86	3118.71	11.80	1.0315		0.2300
		6	2877.31	2891.03	8.90	1.0100	1.3348	0.7800
		6	2877.31	2891.03	8.40	1.0100	1.3348	0.8500
		8	2287.52	2311.91	8.60	1.0120	1.3350	0.6300
		9	2129.03	2135.12	8.70	1.0250	1.3378	0.2800
		10	1797.41	1810.51	8.80	1.0070	1.3342	1.3000
		11	1104.90	1133.86	9.70	1.0155	1.3361	0.4400
		12	851.92	870.20	9.90	1.0155	1.3352	0.6200
300I376850134000	IKHIL I-37	2	4216.60	4227.58	7.50	1.0215	1.3375	0.2280
		4	4042.26	4047.74	10.10	1.0028	1.3328	2.6500
		4	4042.26	4047.74	8.60	1.0100	1.3345	0.4910
		4	4042.26	4047.74	9.90	1.0051	1.3332	1.3500
		4	4042.26	4047.74	9.90	1.0046	1.3330	1.7300
		4	4042.26	4047.74	8.70	1.0107	1.3348	0.4100
		4	4042.26	4047.74	8.70	1.0101	1.3346	0.4100
		4	4042.56	4047.74	9.70	1.0057	1.3335	1.0700
		4	4042.26	4047.74	8.60	1.0098	1.3350	0.3900
		5	3897.48	3910.58	9.30	1.0019	1.3328	2.4500
		5	3897.48	3910.58	8.70	1.0012	1.3322	2.8000
		5	3897.48	3910.58	8.00	1.0025	1.3330	1.2500
		5	3897.48	3910.58	7.40	1.0069	1.3336	0.7030
		5	3897.48	3910.58	7.10	1.0080	1.3343	0.5350
		5	3897.48	3910.58	7.10	1.0083	1.3342	0.5350
		5	3897.48	3910.58	6.90	1.0090	1.3345	0.4600
		5	3897.48	3910.58	7.00	1.0098	1.3347	0.4200
		6	3693.57	3706.37	8.30	1.0084	1.3343	0.5400
		6	3693.57	3706.37	8.10	1.0083	1.3343	0.5220
		6	3693.57	3706.37	8.00	1.0092	1.3345	0.4850
		6	3693.57	3706.37	7.80	1.0092	1.3345	0.4650
		6	3693.57	3706.37	7.70	1.0092	1.3345	0.4580
		6	3693.57	3706.37	8.80	1.0082	1.3339	0.5700
		6	3693.57	3706.37	8.90	1.0080	1.3340	0.5850
		2	4216.60	4227.58				0.2300
		2	4216.60	4227.58				0.2590
		2	4216.60	4227.58				0.4990
300J066850133450	OGEOQEOQ J-06	1	1791.92	1839.16	7.20	1.0110	1.3356	0.4380

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
		2	1626.11	1644.40	7.50	1.0120	1.3354	0.4530
300J066920135000	KUMAK J-06		1453.59	1454.20	8.30	1.0690	1.3474	0.0650
			1360.93	1361.54	8.80	1.0660	1.3469	0.0660
		6	2365.55	2370.43	9.00	1.0376	1.3410	0.1300
		6	2365.55	2370.43	8.80	1.0374	1.3417	0.1200
		8	2148.23	2154.33	9.50	1.0165	1.3355	0.2950
		8	2148.23	2154.33	8.40	1.0104	1.3340	0.4150
		8	2148.23	2154.33	8.00	1.0205	1.3369	0.2060
		9	1894.03	1904.09	8.20	1.0166	1.3360	0.2420
		9	1894.03	1904.09	8.20	1.0170	1.3360	0.2440
		9	1894.03	1904.09	8.40	1.0170	1.3353	0.2750
		10	1356.66	1363.98	11.60	1.0424	1.3413	0.1180
		10	1356.66	1363.98	9.10	1.0495	1.3428	0.0970
		11	1162.81	1179.58	9.80	1.0160	1.3342	0.3850
		11	1162.81	1179.58	9.20	1.0126	1.3344	0.4090
		11	1162.81	1179.58	9.20	1.0112	1.3343	0.4220
			1167.08	1167.69	8.70	1.0390	1.3410	0.1110
300J076920132300	ESKIMO J-07		826.01	857.10	7.80	1.0146	1.3380	0.3300
		1	826.01	857.10	7.20	1.0110		
300J176920136150	IKATTOK J-17	1	2679.19	2683.76	8.90	1.0081	1.3323	0.9300
		1	2679.19	2683.76	8.30	1.0080		0.8770
		1	2679.19	2683.76	8.20	1.0080		0.9010
		1	2679.19	2683.76	9.50	1.0072	1.3341	0.9300
		2	2198.22	2203.09	8.40	1.0085	1.3337	0.5800
		2	2198.22	2203.09	8.50	1.0080	1.3341	0.5900
		3	1534.06	1539.24	9.00	1.0069	1.3337	0.8200
		3	1534.06	1539.24	9.00	1.0081	1.3337	0.8200
		3	1534.06	1539.24	8.90	1.0113	1.3335	0.8000
		3	1534.06	1539.24	8.90	1.0113	1.3335	0.8000
300J266940134150	IVIK J-26		2858.41	2859.02	11.33	1.0040		0.8000
			2649.32	2649.93	8.80	1.0057	1.3339	1.8000
			2681.33	2775.51	10.50	1.0026	1.3326	1.8300
		17	1315.52	1318.56	8.00	1.0162	1.3361	0.2970
			2573.43	2579.52	9.90	1.0023	1.3326	2.1300
			2855.98	2859.02	12.00	1.0045	1.3335	1.2300
			2780.39	2786.48	11.80	1.0035	1.3334	0.9000
			2780.39	2786.48	10.10	1.0031	1.3334	1.4900
			2573.43	2579.52	10.60	1.0034	1.3328	2.2100
			2632.25	2632.86	8.70	1.0036	1.3329	2.1000
			2632.25	2632.86	9.10	1.0051	1.3332	1.2000
			2479.55	2480.16	9.30	0.9888	1.3334	1.2000

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
			2479.55	2480.16	9.30	1.0045	1.3334	1.1900
			2898.65	2901.70	11.20	1.0035	1.3334	0.9000
			2898.65	2901.70	9.90	1.0031	1.3335	1.2000
			2898.65	2901.70	9.90	1.0034	1.3336	1.1300
			2898.65	2901.70	9.50	1.0031	1.3335	1.2300
			2898.65	2901.70	9.70	1.0034	1.3336	1.1300
		17	1315.52	1318.56	7.90	1.0150	1.3355	0.3080
		15	2393.29	2398.17	7.60	1.0185	1.3364	0.2610
			2898.65	2901.70	11.60	1.0027	1.3337	1.1800
			2898.65	2901.70	9.65	1.0039	1.3337	1.1200
			2898.65	2901.70	9.60	1.0041	1.3337	1.0200
			2898.65	2901.70	9.50	1.0039	1.3338	1.0800
			2898.65	2901.70	9.35	1.0039	1.3337	1.0300
			2898.65	2901.70	9.05	1.0042	1.3336	1.0100
			2898.65	2901.70	9.10	1.0038	1.3337	1.0200
			2898.65	2901.70	9.25	1.0038	1.3337	1.0100
			2855.98	2859.02	8.90	1.0049	1.3335	0.8990
			2855.98	2859.02	8.65	1.0045	1.3336	0.9690
			2855.98	2859.02	9.00	1.0049	1.3337	0.9720
			2855.98	2859.02	9.00	1.0049	1.3338	0.9620
			2855.98	2859.02	8.80	1.0052	1.3335	0.7250
			2855.98	2859.02	8.40	1.0050	1.3337	0.8810
			2855.98	2859.02	8.60	1.0053	1.3334	0.9030
			2780.39	2786.48	9.50	1.0060	1.3334	0.7810
			2780.39	2786.48	9.10	1.0051	1.3339	0.7850
			2780.39	2786.48	9.40	1.0067	1.3336	0.7850
			2780.39	2786.48	9.20	1.0065	1.3335	0.6820
		5	2681.33	2687.42	8.60	1.0051	1.3334	0.9490
			2706.62	2707.23	8.60	1.0019	1.3330	1.9000
			2706.62	2707.23	8.20	1.0014	1.3331	1.9100
			2855.98	2859.02	9.10	1.0050	1.3336	0.8950
			2681.33	2687.42	8.70	1.0074	1.3340	0.5130
		7	2573.43	2579.52	8.60	1.0062	1.3334	0.9300
			2573.43	2579.52	8.90	1.0033	1.3329	1.7200
			2479.85	2485.34	8.20	1.0137	1.3355	0.3200
			2479.85	2485.34	10.40	1.0064	1.3337	0.7600
		11	2479.85	2491.74	7.90	1.0137	1.3354	0.3920
			2479.85	2491.74	10.60	1.0022	1.3330	2.2800
		12	2488.69	2491.74	7.72	1.0167	1.3360	0.3000
		12	2488.69	2491.74	7.75	1.0166	1.3361	0.3100
		12	2488.69	2491.74	8.05	1.0167	1.3360	0.3000

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		12	2488.69	2491.74	8.60	1.0154	1.3362	0.3100
		15	2393.29	2398.17	7.60	1.0176	1.3366	0.2700
		15	2393.29	2398.17	7.30	1.0180	1.3364	0.2690
		15	2393.29	2398.17	8.05	1.0176	1.3365	0.2560
		15	2393.29	2398.17	8.00	1.0186	1.3365	0.2530
		16	2346.96	2350.01	7.60	1.0153	1.3362	0.2990
		16	2346.96	2350.01	7.80	1.0159	1.3359	0.2960
		17	1315.52	1318.56	8.10	1.0156	1.3361	0.3020
		17	1315.52	1318.56	7.90	1.0161	1.3358	0.3080
		14	2465.22	2468.27	8.90	1.0127	1.3348	0.4000
			2573.43	2579.52	8.70	1.0071	1.3336	0.6750
			2545.08	2554.22	8.60	1.0079	1.3344	0.6300
			2681.33	2687.42	8.60	1.0074	1.3339	0.5920
			2855.98	2859.02	8.60	1.0050	1.3334	0.8780
			2855.98	2859.02	8.60	1.0050	1.3334	0.8930
			2898.65	2901.70	8.80	1.0045	1.3350	0.8280
			2898.65	2901.70	8.60	1.0043	1.3336	0.9090
			2898.65	2901.70	11.90	1.0027	1.3337	1.1800
			2898.65	2901.70	9.60	1.0039	1.3337	1.1200
			2898.65	2901.70	9.60	1.0039	1.3338	1.0800
			2898.65	2901.70	9.40	1.0039	1.3337	1.0300
			2898.65	2901.70	9.00	1.0042	1.3336	1.0100
			2898.65	2901.70	9.00	1.0038	1.3337	1.0200
			2898.65	2901.70	9.20	1.0038	1.3337	1.0100
		3	2780.39	2786.48	8.30	1.0059	1.3342	0.7300
		9	2479.85	2485.34	7.95	1.0157	1.3357	0.3600
			2479.85	2491.74	8.20	1.0129	1.3353	0.3550
		12	2488.69	2491.74	7.75	1.0165	1.3361	0.3000
		13	2473.76	2475.28	8.00	1.0124	1.3352	0.4000
		16	2346.96	2350.01	7.90	1.0164	1.3360	0.3010
		3	2780.39	2786.48				0.7300
		4	2771.24	2775.51	8.80		1.3340	1.3300
		15	2393.29	2398.17	8.20	1.0071	1.3342	0.6560
		15	2393.29	2398.17	8.25	1.0111	1.3351	0.3820
		15	2393.29	2398.17	8.20	1.0138	1.3357	0.3270
		15	2393.29	2398.17	8.20	1.0162	1.3362	0.2850
		15	2393.29	2398.17	7.95	1.0180	1.3364	0.2720
		15	2393.29	2398.17	8.05	1.0179	1.3366	0.2620
		16	2346.96	2350.01	8.05	1.0123	1.3352	0.3860
		16	2346.96	2350.01	8.00	1.0149	1.3355	0.3340
		16	2346.96	2350.01	7.90	1.0148	1.3359	0.3190

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
		16	2346.96	2350.01	7.95	1.0160	1.3360	0.3020
		16	2346.96	2350.01	7.80	1.0162	1.3360	0.3060
		16	2346.96	2350.01	7.95	1.0172	1.3330	0.2880
		16	2346.96	2350.01	7.90	1.0151	1.3358	0.3120
		17	1315.52	1318.56	8.20	1.0119	1.3349	0.3870
		17	1315.52	1318.56	8.20	1.0158	1.3357	0.3120
300K096900133300	PARSONS K-09	4	2980.94	3017.52	6.60	1.0240	1.3377	0.3090
300K266910135000	TITALIK K-26	4	2860.24	2866.34	9.30	1.0070	1.3339	1.4700
		6	1767.84	1773.94	9.30	1.0048	1.3334	1.0900
		7	1680.06	1686.15	8.10	1.0062	1.3330	0.9800
		7	1680.06	1686.15	8.70	1.0058	1.3334	0.9500
		9	1569.72	1575.82	9.30	1.0025	1.3326	2.2600
		10	1544.73	1550.82	9.10	1.0037	1.3325	1.6400
		11	1457.55	1464.26	8.30	1.0050	1.3330	1.1100
		12	1197.86	1203.96	9.30	1.0007	1.3322	4.2000
		12	1197.86	1203.96	8.50	1.0014	1.3322	2.2200
		12	1197.86	1203.96	8.50	1.0023	1.3322	2.1800
		12	1197.86	1203.96	8.50	1.0025	1.3323	1.7000
		12	1197.86	1203.96	8.40	1.0024	1.3323	1.9300
		12	1197.86	1203.96	8.50	1.0007	1.3322	3.0400
		12	1197.86	1203.96	8.40	1.0004	1.3322	2.8500
		12	1197.86	1203.96	8.40	1.0019	1.3323	3.0600
		12	1197.86	1203.96	8.70	1.0022	1.3332	2.1000
		12	1197.86	1203.96	8.60	1.0028	1.3326	1.8000
		12	1197.86	1203.96	8.60	1.0027	1.3327	1.9900
		12	1197.86	1203.96	8.60	1.0026	1.3324	2.0000
		12	1197.86	1203.96	8.60	1.0022	1.3326	2.1900
		12	1197.86	1203.96	8.60	1.0027	1.3327	2.2500
		12	1197.86	1203.96	8.60	1.0019	1.3325	2.4300
		12	1197.86	1203.96	8.60	1.0024	1.3322	2.2500
		12	1197.86	1203.96	8.30	1.0020	1.3320	3.3500
		12	1197.86	1203.96	8.70	1.0031	1.3325	1.7500
		13	1071.37	1075.94	9.10	1.0014	1.3320	10.4000
		13	1071.37	1075.94	9.00	1.0022	1.3323	2.6000
		8	1632.51	1636.17				2.4800
300K316900135000	TULLUGAK K-31	1	2022.35	2050.24	8.20	1.0150	1.3360	0.3280
		1	2022.35	2050.24	7.90	1.0130	1.3350	0.3890
		2	2891.03	2916.94	7.60	1.0130	1.3410	0.4000
		2	2891.03	2916.94	7.60	1.0130	1.3410	0.4000
		2	2891.03	2916.94	7.80	1.0130	1.3410	0.3750
		2	2891.03	2916.94	8.80	1.0470	1.3430	0.0990

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistiv (ohm m)
		3	2569.46	2599.64	8.10	1.0180	1.3360	0.2860
		3	2569.46	2599.64	7.40	1.0230	1.3380	0.2160
		3	2569.46	2599.64	7.40	1.0250	1.3380	0.2090
		4	1200.30	1222.86	8.40	1.0510	1.3420	0.1020
		4	1200.30	1222.86	8.20	1.0520	1.3420	0.1000
		4	1200.30	1222.86	8.20	1.0540	1.3430	0.0950
		4	1200.30	1222.86	8.80	1.0420	1.3420	0.1090
		5	1199.08	1221.64	8.10	1.0410	1.3410	0.1120
		5	1199.08	1221.64	8.30	1.0420	1.3420	0.1100
		5	1199.08	1221.64	8.20	1.0430	1.3420	0.1100
		5	1199.08	1221.64	8.10	1.0430	1.3410	0.1090
300K546940134150	IVIK K-54	2	2632.86	2638.96	8.10	1.0062	1.3329	0.8600
		2	2632.86	2638.96	8.90	1.0039	1.3328	1.0900
		2	2632.86	2638.96	9.00	1.0048	1.3326	0.9500
		2	2632.86	2638.96	9.30	1.0053	1.3326	0.8000
		2	2632.86	2638.96	8.60	1.0057	1.3326	0.8950
		2	2632.86	2638.96	7.90	1.0065	1.3326	0.8900
		2	2632.86	2638.96	8.00	1.0067	1.3326	0.8700
		3	2590.80	2620.06	8.00	1.0055	1.3330	0.9300
		3	2590.80	2620.06	7.90	1.0064	1.3326	0.8800
		3	2590.80	2620.06	8.00	1.0062	1.3330	0.9600
300K597030136000	NEKTORALIK K-59	1	2695.04	2701.14	7.30	1.0182	1.3364	0.2700
300L306950133450	ARNAK L-30	7	4124.25	4138.27	8.20	1.0100	1.3341	0.5900
		7	4124.25	4138.27	8.70	1.0103	1.3339	0.5900
		7	4124.25	4138.27	9.10	1.0131	1.3350	0.4740
300L386930134300	MALLIK L-38	1	904.34	918.67	11.60	1.0190	1.3364	0.2500
		1	904.34	918.67	11.20	1.0182	1.3360	0.3000
			1791.61	1794.66	7.40	1.0038	1.3328	1.8000
		1	904.34	918.67	11.80	1.0210		
300M137030135000	KOPANOAR M-13	1	4233.67	4245.86	8.00	1.0636	1.3455	0.0830
		2	4233.67	4245.86	7.10	1.0237	1.3370	0.2000
		2	4233.67	4245.86	7.30	1.0205	1.3360	0.2400
		2	4233.67	4245.86	7.30	1.0207	1.3355	0.2400
		2	4233.67	4245.86	7.40	1.0237	1.3370	0.2000
		2	4233.67	4245.86	6.90	1.0763	1.3475	0.0660
		2	4233.67	4245.86	7.00	1.0850	1.3495	0.0580
		2	4233.67	4245.86	6.90	1.0859	1.3495	0.0580
		2	4233.67	4245.86	8.30	1.0855	1.3490	0.0590
		2	4233.67	4245.86	6.60	1.0209	1.3355	0.2300
		3	4233.67	4245.86	8.10	1.0435	1.3414	0.1050
		3	4233.67	4245.86	8.10	1.0128	1.3339	0.4900

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistiv (ohm m)
		3	4233.67	4245.86	8.50	1.0107	1.3339	0.5400
		3	4233.67	4245.86	8.40	1.0109	1.3343	0.5300
		3	4233.67	4245.86	8.30	1.0116	1.3336	0.4950
		3	4233.67	4245.86	8.40	1.0105	1.3336	0.6050
		3	4233.67	4245.86	7.60	1.0105	1.3336	0.6100
		3	4233.67	4245.86	8.20	1.0102	1.3336	0.6200
		3	4233.67	4245.86	8.30	1.0102	1.3332	0.6600
		3	4233.67	4245.86	8.30	1.0100	1.3332	0.6850
		3	4233.67	4245.86	8.50	1.0102	1.3332	0.6800
		3	4233.67	4245.86	8.60	1.0092	1.3332	0.6900
		3	4233.67	4245.86	8.50	1.0675	1.3430	0.0760
		3	4233.67	4245.86	8.10	1.0120	1.3336	0.5800
		4	3905.71	3921.86	8.50	1.0245	1.3361	0.2200
		4	3905.71	3921.86	8.40	1.0139	1.3339	0.4300
		4	3905.71	3921.86	8.40	1.0135	1.3337	0.4600
		4	3905.71	3921.86	8.70	1.0131	1.3334	0.5100
		4	3905.71	3921.86	8.60	1.0129	1.3334	0.5200
		4	3905.71	3921.86	8.50	1.0128	1.3334	0.5300
		4	3905.71	3921.86	8.40	1.0120	1.3334	0.5500
		4	3905.71	3921.86	8.30	1.0118	1.3332	0.5600
		4	3905.71	3921.86	8.50	1.0115	1.3334	0.5500
		4	3905.71	3921.86	8.50	1.0111	1.3330	0.5600
		4	3905.71	3921.86	8.50	1.0113	1.3330	0.5600
		4	3905.71	3921.86	8.60	1.0111	1.3331	0.5700
		4	3905.71	3921.86	8.70	1.0850	1.3347	0.0580
		4	3905.71	3921.86	8.50	1.0117	1.3335	0.5500
		4	3905.71	3921.86	8.40	1.0123	1.3334	0.5800
		4	3905.71	3921.86	8.60	1.0121	1.3335	0.5800
		5	3618.28	3630.47	8.70	1.0805	1.3481	0.0660
		5	3618.28	3630.47	8.40	1.0215	1.3356	0.2600
		5	3618.28	3630.47	8.40	1.0143	1.3336	0.4400
		5	3618.28	3630.47	8.50	1.0120	1.3332	0.5700
		5	3618.28	3630.47	8.60	1.0113	1.3332	0.6000
		5	3618.28	3630.47	8.50	1.0113	1.3332	0.6300
		5	3618.28	3630.47	8.40	1.0101	1.3330	0.6800
		5	3618.28	3630.47	8.20	1.0100	1.3300	0.6900
		5	3618.28	3630.47	8.40	1.0103	1.3329	0.7100
		5	3618.28	3630.47	8.50	1.0103	1.3332	0.7200
		5	3618.28	3630.47	8.40	1.0108	1.3332	0.7300
		5	3618.28	3630.47	8.40	1.0104	1.3332	0.7400
		5	3618.28	3630.47	9.30	1.0868	1.3490	0.0590

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
		5	3618.28	3630.47	8.20	1.0101	1.3332	0.7400
		5	3618.28	3630.47	8.70	1.0372	1.3389	0.1550
		5	3618.28	3630.47	8.20	1.0108	1.3335	0.7200
		5	3618.28	3630.47	8.10	1.0105	1.3332	0.7400
		5	3618.28	3630.47	8.20	1.0105	1.3331	0.7400
		5	3618.28	3630.47	8.20	1.0104	1.3331	0.7400
		5	3618.28	3630.47	9.50	1.0061	1.3334	0.5900
		6	3578.05	3590.24	4.00	1.0658	1.3454	0.0950
		6	3578.05	3590.24	9.10	1.0193	1.3355	0.3600
		6	3578.05	3590.24	9.10	1.0170	1.3347	0.4180
		6	3578.05	3590.24	9.20	1.0151	1.3340	0.5200
		6	3578.05	3590.24	9.10	1.0139	1.3340	0.0560
		6	3578.05	3590.24	9.10	1.0131	1.3340	0.5500
		6	3578.05	3590.24	9.10	1.0128	1.3336	0.6550
		6	3578.05	3590.24	9.00	1.0128	1.3337	0.6400
		6	3578.05	3590.24	8.90	1.0130	1.3338	0.6450
		6	3578.05	3590.24	9.20	1.0130	1.3337	0.6500
		6	3578.05	3590.24	8.50	1.0111	1.3334	0.5800
		7	3536.59	3555.49	9.50	1.0886	1.3524	0.0520
		9	3515.56	3524.71	9.20	1.0536	1.3427	0.0950
		9	3515.56	3524.71	9.20	1.0779	1.3480	0.0640
		10	3497.28	3506.42	10.20	1.0697	1.3447	0.0860
		10	3497.28	3506.42	10.20	1.0624	1.3444	0.0920
		10	3497.28	3506.42	10.30	1.0714	1.3464	0.0740
		10	3497.28	3506.42	10.30	1.0889	1.3499	0.0620
		11	3110.18	3116.28	9.80	1.0193	1.3359	0.2250
		11	3110.18	3116.28	8.90	1.0093	1.3335	0.5300
		11	3110.18	3116.28	8.80	1.0093	1.3335	0.5450
		11	3110.18	3116.28	8.70	1.0099	1.3333	0.5400
		11	3110.18	3116.28	8.70	1.0100	1.3333	0.5100
		11	3110.18	3116.28	8.60	0.9963	1.3347	0.6600
		11	3110.18	3116.28	8.60	1.0100	1.3336	0.5400
		11	3110.18	3116.28	8.30	1.0091	1.3338	0.5600
		11	3110.18	3116.28	8.10	1.0099	1.3338	0.5400
		11	3110.18	3116.28	8.70	1.0091	1.3339	0.4800
		11	3110.18	3116.28	8.20	1.0098	1.3340	0.5400
		11	3110.18	3116.28	8.10	1.0181	1.3360	0.2700
		11	3110.18	3116.28	8.40	1.0095	1.3336	0.5600
		11	3110.18	3116.28	9.10	1.0091	1.3340	0.5400
		11	3110.18	3116.28	8.40	1.0095	1.3336	0.5400
		12	2529.84	2545.99	7.50	1.0268	1.3379	0.1600

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
		12	2529.84	2545.99	7.30	1.0272	1.3380	0.1650
		12	2529.84	2545.99	8.50	1.0241	1.3374	0.2000
		12	2529.84	2545.99	8.30	1.0150	1.3352	0.3350
		12	2529.84	2545.99	8.70	1.0120	1.3346	0.3600
		12	2529.84	2545.99	8.30	1.0125	1.3334	0.3800
		12	2529.84	2545.99	7.80	1.0118	1.3331	0.4400
300M266930132300	PIKIOLIK M-26	1	666.60	720.85	9.00	1.0050		
		2	1965.96	1984.25	6.40	1.0190		
300M987030133000	NERLERK M-98	1	4406.00	4426.00				0.2600
		1	4406.00	4426.00				0.2700
		1	4406.00	4426.00				0.3200
		1	4406.00	4426.00				0.3500
		1	4406.00	4426.00				0.3700
		1	4406.00	4426.00				0.3800
		1	4406.00	4426.00				0.3900
		1	4406.00	4426.00	8.70	1.0140	1.3364	0.3800
		1	4406.00	4426.00				0.3400
		2	4356.00	4386.00				0.9700
		2	4356.00	4386.00				0.0560
		2	4356.00	4386.00				0.0970
		2	4356.00	4386.00				0.0670
		3	3697.00	3717.00	8.30	1.0104	1.3352	0.4600
		3	3697.00	3717.00	8.30	1.0562	1.3456	0.0720
		3	3697.00	3717.00	8.90	1.0102	1.3345	0.4400
		3	3697.00	3717.00	8.80	1.0097	1.3347	0.5000
		3	3697.00	3717.00	8.80	1.0103	1.3347	0.4800
		3	3697.00	3717.00	9.30	1.0106	1.3347	0.4400
		3	3697.00	3717.00	9.60	1.0102	1.3345	0.4400
		3	3697.00	3717.00	9.40	1.0099	1.3344	0.4600
		3	3697.00	3717.00	9.40	1.0100	1.3337	0.4400
		3	3697.00	3717.00	9.30	1.0094	1.3345	0.4400
		3	3697.00	3717.00	9.70	1.0092	1.3345	0.4800
		3	3697.00	3717.00	9.60	1.0108	1.3345	0.4700
		3	3697.00	3717.00	9.60	1.0112	1.3348	0.4600
		3	3697.00	3717.00	9.30	1.0100	1.3351	0.4600
		3	3697.00	3717.00	9.70	1.0100	1.3347	0.5000
		3	3697.00	3717.00	9.50	1.0099	1.3347	0.4600
		3	3697.00	3717.00	9.50	1.0102	1.3347	0.4400
		3	3697.00	3717.00	9.50	1.0100	1.3350	0.4400
		3	3697.00	3717.00	8.30	1.0105	1.3354	0.4600
300N106900133300	PARSONS N-10	4	2951.68	3204.97	7.50	1.0123	1.3354	0.4210

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivi (ohm m)
		4	2951.68	3204.97	7.60	1.0137	1.3347	1.0137
		4	2951.68	3204.97	8.10	1.0129	1.3347	0.4160
			1123.80	2874.26	9.30	0.9477	1.3385	5.2200
300N176900133300	PARSONS N-17	1	3135.48	3158.34	7.50	1.0156	1.3356	0.3060
		1	3135.48	3158.34	7.70	1.0168	1.3356	0.3030
		1	3135.48	3158.34	7.30	1.0160	1.3355	0.3070
		1	3135.48	3158.34	10.50	1.0884	1.3501	0.0680
		2	2975.46	2981.55	8.20	0.9940	1.3425	0.2720
		2	2975.46	2981.55	7.80	1.0232	1.3370	0.2190
		1	3135.48	3158.34				0.0760
		2	2975.46	2981.55				0.0760
300N466910134450	KIKORALOK N-46	1	1420.37	1444.75	8.70	1.0080	1.3340	0.7890
		2	1196.04	1202.13	9.00	1.0050	1.3338	0.8980
		3	1124.71	1133.86	8.90	1.0050	1.3336	1.0400
		4	835.15	841.25	9.90	1.0040	1.3336	1.2000
		5	747.98	754.08	10.80	1.0030	1.3333	1.2900
		6	747.98	752.86	9.70	1.0030	1.3333	1.8200
		7	655.32	658.37	9.60	1.0030	1.3330	1.7700
3000097000130300	NUVORAK O-09	2	1030.22	1064.97	9.40	1.0080		
		2	1030.22	1064.97	8.80	1.0100		
		2	1030.22	1064.97	8.60	1.0120		
		2	1030.22	1064.97	8.50	1.0150		
		2	1030.22	1064.97	8.00	1.0170		
		2	1030.22	1064.97	7.80	1.0150		
		2	1030.22	1064.97	7.90	1.0150		
		2	1030.22	1064.97	7.80	1.0150		
		2	1030.22	1064.97	8.00	1.0140		
		2	1030.22	1064.97	6.85	1.0030		
3000156910135000	TITALIK O-15	6	1631.29	1652.02	8.80	1.0130	1.3350	0.3560
		6	1631.29	1652.02	8.80	1.0180	1.3340	0.3560
		10	1314.30	1331.98	8.60	1.0140	1.3340	0.4200
		10	1314.30	1331.98	8.60	1.0150	1.3340	0.3980
		10	1314.30	1331.98	8.60	1.0130	1.3340	0.4070
		12	1173.48	1186.28	8.60	1.0130	1.3340	0.4370
		13	830.58	844.91	9.30	1.0180	1.3320	0.3250
3000196920132450	TUKTU O-19	1	1970.84	1994.31	8.30	1.0070		
		1	1970.84	1994.31	8.60	1.0060		
		2	2200.66	2211.02	8.90	1.0040		
		5	2186.03	2204.31	8.30	1.0070		
		5	2186.03	2204.31	8.30	1.0070		
3000276900133300	PARSONS O-27	4	3312.57	3383.28	8.90	1.0100	1.3348	0.5040

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		4	3312.57	3382.67	8.60	1.0100	1.3352	0.6260
300054692013445O	TOAPOLOK O-54	1	2741.68	2776.73	8.40	1.0074	1.3336	0.9550
		1	2741.68	2776.73	8.20	1.0072	1.3336	0.8870
		1	2741.68	2776.73	8.30	1.0071	1.3335	0.9330
		2	2164.08	2170.18	8.50	1.0061	1.3351	0.9510
		2	2164.08	2170.18	8.40	1.0058	1.3333	0.9740
		2	2164.08	2170.18	8.70	1.0060	1.3333	0.9690
			1876.04	1882.14	9.60	1.0041	1.3334	1.1200
			1876.04	1882.14	8.70	1.0041	1.3334	1.1900
			1876.04	1882.14	8.70	1.0041	1.3331	1.2800
		4	1504.19	1510.28	9.50	1.0029	1.3329	2.0300
		4	1504.19	1510.28	9.50	1.0028	1.3329	2.1900
		4	1504.19	1510.28	9.70	1.0028	1.3329	2.1800
		4	1504.19	1510.28	9.60	1.0027	1.3328	2.2100
		5	1363.98	1368.55	9.00	1.0030	1.3330	1.4700
		5	1363.98	1368.55	9.20	1.0030	1.3330	1.4900
		5	1363.98	1368.55	9.10	1.0032	1.3330	1.4200
			1876.04	1882.14				2.2900
		4	1504.19	1510.28				2.1900
		5	1363.98	1368.55				2.2100
		5	1363.98	1368.55				2.1600
300P176930132450	MAYOGIAK P-17		912.57	920.50	8.40	1.0020	1.3323	4.6500
			912.57	920.50	8.00	1.0020	1.3323	4.4500
		3	912.57	920.50	8.70	1.0002	1.3330	4.7800
		13	2932.48	2951.99	8.00	1.0110		
		12	2863.60	2920.59	7.30	1.0002	1.3320	64.8000
		13	2932.48	2951.99	10.20	1.0160		
		14	2932.18	3002.28	10.00	1.0130		
		14	2932.18	3002.28	8.60	1.0130		
		13	2935.83	2951.99	7.70	1.0115	1.3345	0.4170
300P216920133300	RED FOX P-21	1	1780.03	1810.51	9.10	1.0030	1.3334	3.9300
		1	1780.03	1810.51	9.30	1.0020	1.3332	3.9200
		1	1780.03	1810.51	8.80	1.0010	1.3331	7.1700
300P536900133300	PARSONS P-53	1	2923.03	2938.27	7.20	1.0137	1.3354	0.3000
		1	2923.03	2938.27	7.60	1.0012	1.3320	3.4500
		1	2923.03	2938.27	7.90	1.0090	1.3340	0.4600
		1	2923.03	2938.27	6.90	1.0133	1.3350	0.3310
		2	3193.69	3297.94	7.80	1.0001	1.3318	18.1000
		3	2987.04	3002.28	7.40	1.0160	1.3364	0.4700
		3	2987.04	3002.28	7.50	1.0041	1.3332	0.8710
		3	2987.04	3002.28	8.80	1.0156	1.3320	0.4480

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		3	2987.04	3002.28	6.60	1.0139	1.3345	0.3470
		3	2987.04	3002.28	7.00	1.0160	1.3364	0.4670
		4	2028.44	2033.02	8.30	1.0059	1.3326	0.9000
		7	3276.60	3435.10	7.40	1.0210	1.3374	0.2330
		11	1382.27	1386.84	10.10	1.0061	1.3330	0.6820
		11	1382.27	1386.84	10.00	1.0056	1.3330	0.7250
		11	1382.27	1386.84	10.10	1.0041	1.3329	1.0900
		11	1382.27	1386.84	10.10	1.0012	1.3323	2.8100
		11	1382.27	1386.84	9.50	1.0055	1.3331	0.9210
300P536920134300	YA-YA P-53	2	2721.25	2729.79	9.80	1.0066	1.3336	0.9400
		5	2235.40	2243.63	9.00	1.0044	1.3330	1.5500
		6	2157.37	2164.08	7.90	1.0060	1.3330	1.0400
		6	2157.37	2164.08	8.00	1.0063	1.3332	0.8600
		6	2157.37	2164.08	8.00	1.0042	1.3328	1.4000
		6	2157.37	2164.08	8.90	1.0062	1.3332	0.8900
		6	2157.37	2164.08	8.10	1.0064	1.3330	0.8500
		7	2143.35	2147.62	8.00	1.0047	1.3329	1.3100
		7	2144.57	2146.40	8.35	1.0043	1.3328	1.3100
		7	2144.57	2146.40	9.10	1.0065	1.3334	0.9420
		8	2102.21	2107.69	8.60	1.0049	1.3332	1.2100
		8	2102.21	2107.69	8.30	1.0267	1.3382	0.1780
		8	2102.21	2107.69	8.90	1.0038	1.3325	1.4300
		9	1948.89	1954.99	12.10	1.0036	1.3327	1.1400
		9	1948.89	1954.99	12.20	1.0033	1.3328	0.8400
		10	1914.75	1920.85	12.20	1.0038	1.3329	1.0400
		11	1914.75	1920.85	10.70	1.0031	1.3325	1.8700
		12	1872.08	1878.18	11.50	1.0034	1.3326	1.6200
		12	1872.08	1878.18	11.30	1.0030	1.3325	1.4600
		12	1872.08	1878.18	12.10	1.0033	1.3325	1.1700
		12	1872.08	1878.18	12.20	1.0037	1.3328	1.2500
		14	1915.97	1917.50	9.40	1.0083	1.3337	0.8700
		15	1873.91	1875.74	8.70	1.0067	1.3330	1.1300
		15	1873.91	1875.74	8.70	1.0061	1.3330	1.1000
		15	1873.91	1875.74	9.30	1.0067	1.3332	1.0000
		16	1914.75	1920.85	9.30	1.0087	1.3333	0.9200
		16	1914.75	1920.85	9.40	1.0078	1.3336	0.8400
		16	1914.75	1920.85	9.40	1.0085	1.3333	0.8700
		17	1836.12	1842.21	9.70	1.0061	1.3336	1.2400
		17	1836.12	1842.21	9.70	1.0067	1.3332	1.0900
		17	1836.12	1842.21	9.90	1.0050	1.3325	1.4300
		18	1829.41	1842.21	9.80	1.0054	1.3330	1.2300

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		18	1829.41	1842.21	9.80	1.0051	1.3327	1.4600
		18	1829.41	1842.21	9.80	1.0058	1.3335	1.3400
		19	1776.37	1782.47	9.50	1.0064	1.3330	1.1100
		20	1776.37	1782.47	9.80	1.0067	1.3330	1.0500
		21	1392.33	1400.86	11.20	1.0056	1.3328	1.2100
		21	1392.33	1400.86	10.40	1.0058	1.3332	1.1600
		6	2157.37	2164.08				0.7700
		12	1872.08	1878.18				1.6200
302C507010132300	UKALERK 2C-50	1	4721.35	4736.59	8.50	1.0725	1.3469	0.0720
		1	4721.35	4736.59	8.60	1.0255	1.3374	0.1790
		1	4721.35	4736.59	7.40	0.9985	1.3314	42.0000
		2	4721.35	4736.59				0.0630
		2	4721.35	4736.59	8.30	1.0183	1.3354	0.2550
		3	3711.85	3716.43	8.60	1.0323	1.3380	0.1600
		3	3711.85	3716.43	8.30	1.0090	1.3325	0.6200
		3	3711.85	3716.43	8.50	1.0197	1.3355	0.2750
		3	3711.85	3716.43	8.40	1.0174	1.3350	0.3050
		3	3711.85	3716.43	8.30	1.0161	1.3350	0.3600
		3	3711.85	3716.43	8.20	1.0154	1.3345	0.3800
		3	3711.85	3716.43	8.20	1.0153	1.3345	0.3750
		3	3711.85	3716.43	8.00	1.0155	1.3345	0.3800
		3	3711.85	3716.43	8.20	1.0151	1.3345	0.3800
		3	3711.85	3716.43	8.60	1.0339	1.3385	0.1550
		4	2519.48	2531.67	7.90	1.0270	1.3370	0.2000
		4	2519.48	2531.67	7.60	1.0648	1.3454	0.0790
		4	2519.48	2531.67	7.80	1.0378	1.3392	0.1290
		4	2519.48	2531.67	8.20	1.0692	1.3460	0.0730
		4	2519.48	2531.67	8.20	1.0205	1.3356	0.2700
		4	2519.48	2531.67				
		4	2519.48	2531.67				
		4	2519.48	2531.67				
		4	2519.48	2531.67				
		5	2224.43	2230.53				
		6	2022.35	2031.49				
		6	2022.35	2031.49	7.90	1.0540	1.3328	0.0920
		6	2022.35	2031.49	8.10	1.0249	1.3369	0.2100
		6	2022.35	2031.49				
		6	2022.35	2031.49				
		6	2022.35	2031.49				
		6	2022.35	2031.49				
		6	2022.35	2031.49				

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		7	2008.63	2016.25	8.20	1.0652	1.3454	0.0930
		7	2008.63	2016.25	6.70	1.0273	1.3378	0.2000
		7	2008.63	2016.25				
		7	2008.63	2016.25				
		7	2008.63	2016.25				
		8	2518.87	2586.23	7.80	1.0024	1.3316	1.8000
		9	2519.17	2524.96	8.50	1.0654	1.3451	0.0710
		9	2519.17	2524.96	8.30	1.0657	1.3456	0.0730
		9	2519.17	2524.96	8.50	1.0648	1.3450	0.0720
		9	2519.17	2524.96	8.90	1.0670	1.3454	0.0700
		10	2022.35	2031.49	7.80	1.0660	1.3454	0.0780
		10	2022.35	2031.49				
		10	2022.35	2031.49				
3020617010134150	ISSUNGNAK 20-61		2919.20	2920.20	7.40	1.0230		0.2440
			2919.20	2920.20	7.30	1.0240		0.2270
			2848.00	2849.00	8.07	1.0350		
			2595.75	2596.75	8.19	1.0240		0.2700
			3663.50	3664.50	8.15	1.0240		0.2900
			3663.50	3664.50	8.17	1.0240		0.2900
			3663.50	3664.50	8.40	1.0230		0.3200
			3608.50	3609.50	8.52	1.0200		0.3200
			3608.50	3609.50	8.53	1.0230		0.3000
			3608.50	3609.50	8.97	1.0190		0.3200
			3608.50	3609.50	8.49	1.0210		0.2800
			3579.50	3580.50	8.91	1.0260		0.2500
			3579.50	3580.50	8.86	1.0230		0.2700
			3552.50	3553.50	9.01	1.0220		0.2600
			3552.50	3553.50	9.20	1.0270		0.2600
			3526.50	3527.50	8.99	1.0090		0.9090
			3527.30	3528.30	9.95	1.0240		0.3330
			3527.30	3528.30	9.82	1.0240		0.3330
			3335.40	3336.40	9.69	1.0270		0.3030
			3335.40	3336.40	9.66	1.0240		0.3130
			2978.50	2979.50	8.34	1.0240		0.2170
			2978.50	2979.50	8.24	1.0240		0.2170
		2	4429.00	4432.00	11.89	1.0210		0.3230
		2	4429.00	4432.00	7.65	1.0110		0.9600
		2	4429.00	4432.00	7.61	1.0090		0.9600
		2	4429.00	4432.00	7.61	1.0110		1.0300
		2	4429.00	4432.00	7.25	1.0100		1.0000
		2	4429.00	4432.00	7.81	1.0090		1.0500

Table A1. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		2	4429.00	4432.00	8.40	1.0200		1.0500
		1	4437.50	4450.50	12.84	1.0330		
		1	4437.50	4450.50	7.95	1.0090		1.1400
		1	4437.50	4450.50	10.38	1.0230		0.2700
		1	4437.50	4450.50	5.67	1.0090		0.9090
		1	4437.50	4450.50	5.65	1.0090		0.9520
		1	4437.50	4450.50	5.65	1.0090		0.9760
		1	4437.50	4450.50	7.22	1.0110		1.0000
		1	4437.50	4450.50	7.21	1.0100		1.0000
		1	4437.50	4450.50	7.17	1.0110		1.0000
		1	4437.50	4450.50	7.20	1.0100		1.0000
		1	4437.50	4450.50	7.48	1.0100		1.0000
		1	4437.50	4450.50	7.48	1.0110		1.0200
		1	4437.50	4450.50	7.60	1.0110		1.0200
		2	4429.00	4432.00	7.88	1.0210		1.1800
		3	3551.00	3554.00	9.36	1.0160		0.3920
		3	3551.00	3554.00	7.77	1.0140		0.8300
		3	3551.00	3554.00	7.92	1.0130		0.5130
		3	3551.00	3554.00	7.97	1.0140		0.5260
		3	3551.00	3554.00	7.80	1.0130		0.5260
		3	3551.00	3554.00	7.76	1.0130		0.5260
		3	3551.00	3554.00	8.23	1.0130		0.5130
		3	3551.00	3554.00	7.33	1.0130		0.5380
		3	3551.00	3554.00	7.54	1.0110		0.5260
		5	3474.70	3477.70	7.97	1.0140		0.4000
		5	3474.70	3477.70	8.68	0.9890		0.5900
		5	3474.70	3477.70	13.46	1.0240		0.2500
		6	3462.50	3471.50	12.24	1.0240		0.3200
		6	3462.50	3471.50	12.24	1.0240		0.3200
		6	3462.50	3471.50	12.19	1.0230		0.2500
		6	3462.50	3471.50	12.20	1.0230		0.2600
		7	3429.50	3438.50	12.29	1.0240		0.2600
		7	3429.50	3438.50	9.48	1.0140		0.3600
		8	3415.40	3418.50	12.28	1.0260		0.2440
		8	3415.40	3418.50	8.28	1.0170		0.3330
		8	3415.40	3418.50	9.23	1.0210		0.3330
		8	3415.40	3418.50	7.63	1.0170		0.3570
		8	3415.40	3418.50	7.80	1.0170		0.4000
		8	3415.40	3418.50	8.71	1.0200		0.3570
		8	3415.40	3418.50	7.92	1.0190		0.3570
		8	3415.40	3418.50	7.51	1.0170		0.3570

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	pH (lab)	Density (g/cc)	Refractive Index	Resistivit (ohm m)
		8	3415.40	3418.50	12.09	1.0190		0.2500
		9	3397.00	3403.00	9.89	1.0200		0.3600
		10	3368.50	3372.50	8.06	1.0220		0.2440
		10	3368.50	3372.50	12.01	1.0240		0.2600
		11	3300.00	3307.00	9.86	1.0190		0.3330
		12	3260.00	3278.00	8.16	1.0100		0.4080
		14	2737.00	2742.00	12.15	1.0180		0.3680
		14	2737.00	2742.00	11.37	1.0160		0.3970
		14	2737.00	2742.00	7.58	1.0180		0.3050
		14	2737.00	2742.00	7.56	1.0190		0.2910
		14	2737.00	2742.00	7.59	1.0170		0.2940
		14	2737.00	2742.00	7.67	1.0160		0.2940
		14	2737.00	2742.00	7.71	1.0170		0.2960
		14	2737.00	2742.00	7.88	1.0200		0.2960
		15	2640.00	2646.00	8.11	1.0220		0.2530
		15	2640.00	2646.00	7.81	1.0230		0.2500
		15	2640.00	2646.00	7.77	1.0240		0.2530
		15	2640.00	2646.00	7.82	1.0210		0.2500
		15	2640.00	2646.00	7.94	1.0210		0.2530
		15	2640.00	2646.00	7.83	1.0220		0.2500
		15	2640.00	2646.00	7.81	1.0220		0.2530
		15	2640.00	2646.00	7.75	1.0220		0.2530
		17	2508.00	2521.00	8.07	1.0240		0.2350
		18	2372.00	2378.00	12.22	1.0150		
		18	2372.00	2378.00	8.19	0.9780		0.8330

Table A1. (continued)

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
300A016850134000	2	5977	129	38		8900	1100	23		15608
	5	4734	39	28		6909	678	101	62	12207
300A066930134300		6488	65	12		8243	3240	40		16441
	1	6138	36	3		7176	3470	468		15527
	1	6652	7	4		8170	2039	268	617	16721
	1	6665	61	14		8206	3704	93		16861
	1	5821	49	1		2024	1757	6006	1344	16109
	1	5711	57	10		4416	3504	2552	509	14978
	1		3			7993	2003	198	600	
	2					3312	2020	2002	480	
	2					3091	1208	292	600	
	2		16			2282	2818	95	24	
	2					2355	1208	157	612	
	2	2824	8	5		2650	2403	150	192	7011
	3	3939	208	5		626	1818	5412	660	11744
	3	3036	33	20		2650	3501	77	48	7585
	3	2967	33	20		2576	3379	72	84	7413
	3	3050	34	1		2664	3440	45	60	7546
	3	3052	25	2		2679	3526	38		7529
	3		49			2723	3489	111	72	
	4	2357	666	67		405	2843	3806	120	8819
	4			5		1766	3660	622	540	
	4					1766	3941	473	492	
	4	3318	16	10		1766	3819	1188	264	8440
	4	3442	8	5		2134	4343	383	336	8444
	6	2266	630	69		773	3148	2684	192	8162
	6	3139	8	5		1987	3709	506	300	7769
	6	3063	13	2		2061	3916	141	264	7470
	6	3094	11	1		2120	3977	68	264	7513
	6	3092	11	1		2105	3989	75	264	7509
	6	3009	7	3		2002	3958	142	216	7326
	6	3097	13	1		2105	4111	53	228	7519
	6	3147	8	5		2208	4348	62	86	7654
	7	3092	3	2		2164	3816	100	274	7511
	7		2			1472		1760	1284	
	7		7			1509		1661	1272	

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
	7		11			1369		1727	1440	
	8	3819	27	2		1730	2879	3058	240	10292
	8	3518	26	1		2024	2660	2024	348	9249
	10		36	3		2650	2342	3696	156	
	10	3041	30	2		957	2111	3014	288	8370
	10		35	3		920	2318	2453	180	
	11	3464	35	4		994	2660	3608	180	9593
	11	3320	62	6		994	2611	3360	216	9241
	12	3667	28	3		1950	3575	2035	156	9597
	12	2623	230	15		442	2574	3311	96	7982
	12	3404	22	2		1950	3160	1485	348	8764
	12	3345	16	1		2024	3074	1254	384	8535
300A126910133300	2		25	31	87000	77879		1	374	
	3		2		2200	767	654	139	115	
	4		255	39	25500	27464	205			
	5		212	258	105000	100076		3	739	
	1	35078	510	155	49500	54217	2094	15		91005
	2	15888	110	31	27000	23853	1601	2		40671
	3	46414	64	77	71000	70730	2011	14		118288
	5	11147	229	33	15000	16705	1660	27		28957
	6	60489	85	374	86500	92929	2724	5		155221
	6	58616	85	206	89000	88789	3817	1	110	149684
	1					81635				
	2					80317				
	3					81823				
	4					81823				
	5					93296				
	6					90851				
300A257000136150	1					59200				
	1					58170				
	1					55390				
	1					58490				
	1					56650				
	1					58490				
	2	17434	664	256	12100	27067	2450	426		47052
300A286920134300	7	1832	45	7		1298	2118	318	137	4679
	8		10	2		1590	307	363		
	9	1731	31	10		2060	356	660		4668
	9	1099	2	1		1411	234	209		2837
	10	10794	106	60		16629	400	198		27984
	11	1944	3	1		1979	815	242	317	4887

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
300A326940132000	2	11161	984	330		19621	427	60		32366
	2	12342	1623	134		21959	532	34		36354
300A356850135450	1					9774	3307	593		
	1					10053	3313	535		
	1					9774	3417	522		
	1					9774	3209	548		
	2	10321	352	102		15638	671	1093		27836
	2	9085	580	142		14381	702	895		25428
	2	8746	564	139		13963	580	799		24496
	2	8778	580	132		13963	628	839		24601
300A376820135000	3	3245	58	18		4810	560	31		8437
300A416910134300	2	5163	53	12		6484	2674	72		13099
	2	3186	20	7		3630	1801	319	48	8095
	2	4925	45	10		6132	2635	17	24	12449
	2	1684	8	2		1410	1098	424	216	4283
	3	2400	19	1		2414	2186	26	29	5964
	3	2618	16	3		2495	2625	26	29	6477
	3	18	42	7		16	146	29		184
	4	2626	13	4		2430	2582	39	106	6488
	4	2987	24	6		3670	1313	193	77	7603
	4	40	32	7		40	146	18		208
	5	1616	16	2		2076	722	11	19	4095
	5	1805	18	3		2334	761	11	34	4580
	5	1825	23	3		2366	737	25	43	4647
	5	4777	65	10		6599	449	820	38	12530
	6		42	3		2559	503		29	
	6	2160	63	2		3123	542	6	5	5626
	6		40			5939	522	880	19	
	7	5821	227	54		9215	454	77		15618
	7	8756	162	25		13279	405	440	19	22880
	7	8603	101	49		12877	322	633	48	22470
300A556950131450	1		500	37		8191		86	258	
	1		364			8105		76	312	
	4		84			8432	220	350	30	
	4	6745	229	17		10383	54	307	182	17890
	4	9135	514	128		15189	49	89	72	25151
	4	5120	23	8		7560	134	340	60	13177
	4	9589	692	155		16211	337	76		26889
300B116850135150	1	6303	24	5		8450	1640	121	240	15949
	1				15500	17650				
	1				9000	11450				

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	1				6200	9025				
	1				5400	8475				
	2				13800	18000				
	2				5800	9600				
	2				6500	10600				
	1		16	5		10543	1718		379	
	1		16	5		9738	1747		278	
	1	12177	81	25		17102	1371	484	624	31167
	1	9634	16	5		13279	1449	154	562	24362
	1	8410	16	5		11428	1596	143	466	21253
	1	8197	16	5		11106	1713	165	389	20720
	1	7510	16	5		10140	1708	66	374	18951
	1	12756	81	25		17906	673	517	1022	32638
	2	12469	20	12		17504	1449	506	490	31714
	2	8209	81	15		11347	2089	385		21064
	2	7496	81	20		10382	1996	297		19258
	2	7288	81	25		10060	1981	330		18758
	2	6812	73	20		9416	1889	242		17492
	2	6954	73	29		9577	2006	264		17884
	2	7357	73	15		10221	1986	193		18835
300B356930136150	1	7211	74	16		678	9216	5519	1008	19037
	4		40			2636		4721	2050	
	4		16			904	151	5799	2151	
	4		14			828		3132	2424	
	5		19			1205		3120	1260	
	5		2			904	2819	2420	1992	
	5		3			753		3519	1464	
	5		18			904		2856	2148	
	5		178			828		3330	1272	
	5		16			979		1568	2316	
	5		15			301		955	2532	
	4					1393				
	5					5421				
300B356940135150	1	968	32	16		259	1440	659	12	2654
300B446940135450	1		29	2		1324		4214	648	
	2		32	2		1324		4733	783	
	4	4001	20	3		2034	5023	288	888	9704
	4	3646	6	1		946	312	3811	1435	9998
	4	4170	37	2		1466	1445	3293	1494	11172
	5					378				
	5					473				

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	5	3042	5	1		293	3485	1153	1298	7505
	5	1925	59	1		473	991	2247	312	5504
	5	7124	4	1		331	3763	3095	5242	17647
	5	2922	3	1		322	2934	666	1689	7045
	5	5788	3	1		511	4134	4157	2499	14992
	6	1148	57	1		378	1411	667	156	3101
	6	3223	53	1		236	1330	5186	195	9548
	7	1972	44	2		341	1035	2425	332	5625
	7	5070	9	3		170	2929	823	4540	12056
300C216930135150	1		21			894		1160	492	
	2		12			1364		1366	1085	
	3		12			932		1555	740	
	4		35			992		77	935	
	5		62			930		189	15	
	6		6			903		198	332	
	7		10			1712		778	408	
300C386850133300	1	934	14	4		1032	596	134		2411
300C426930134450		2580	14	1		1457	4099	227		6294
			11			1566	4111	61	24	
			11			1597	4111	53	24	
			11			1597	4197	63		
			14			1628	4246	24		
			13			1643	4233	35		
			16			1659	4221	67	36	
		2704	11	1		1674	4185	40	48	6536
		2668	8	1		1674	4063	15	72	6436
		2662	8	2		1659	4087	8	72	6420
			39			31	1625	1177	43	
		2395	11	1		1318	3919	163		5815
		2573	11	2		1550	3758	44	192	6220
		2521	13	1		1457	4168	46		6087
		2598	8	2		1550	4148	90		6288
		2318	38	2		1333	3792	151		5707
		2533	14	2		1488	4168	36		6122
		2512	14	2		1473	4133	40		6073
		2545	14	2		1504	4172	36		6152
		2540	14	1		1504	4153	37		6138
		2560	8	1		1519	4158	40		6172
		2564	8	1		1519	4163	45		6184
		2564	16	2		1511	3543	68	312	6215
			16			1511	3699	27	216	

Table A1. (continued)

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc) (mg/L)
		2504	11	1		1457	3689	31	221	6039
		2515	13	2		1457	3748	70	187	6087
		2439	9	2		1457	3548	43	197	5892
		2552	14	3		1519	3575	25	300	6171
		2525	14	2		1488	4153	31		6102
	11					1008				
	1		8			324	1873	539	6	
	1		6			324	1981	1056	72	
	1	1321	12	1		316	1403	1144	72	3555
	1	1116	14	3		74	1440	990	96	3001
	3		9			1519	4299	64		
	3		9	3		1519	4299	51		
	3		28	1		1487	4470	60		
	3		31			1546	4465	40		
	3	2643	17	2		1501	3865	165	206	6435
	3	2641	31	2		1509	4475	33		6417
	3		2			44	1259	1375	106	
	4	1686	41	2		977	2523	264	34	4244
	4	2927	11	4		1984	4358	39		7108
	4	2863	24	4		1938	4290	52		6990
	4	2649	13	2		1514	4046	150	117	6434
	4	2866	26	3		1704	4166	251	139	7037
	5		46	2		2077	4163	64		
	5		36	3		2155	4080	26	38	
	5		22	2		2170	4109	64		
	5		25	3		2201	4143	39		
	5		24	2		2186	4143	64		
	5		24	2		2186	4085	138	24	
	5		13	5		2232	4119	138		
	5		20	3		2217	4016	25	58	
	6		20			202	1898	935	62	
	6	2812	17	4		1876	4148	103	14	6866
	6	2926	19	1		2015	4221	88	14	7139
	6	3000	16	1		2139	4270	50		7305
	6	2993	13	1		2124	4270	50		7281
	6	2997	13	2		2124	4282	51		7292
	6	2989	14	2		2139	4233	55		7280
	12	910	16	2		388	1318	385		2349
300C556910133300	1					8	132	20	5	
	1					8	15		34	
	1					62				

Table A1. (continued)

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc) (mg/L)
	1					357				
	2		31			8		6	43	
	2					116				
	2		79	6		2279	2372		110	
	2	4414	137	12		5658	2420	26		11437
	2					1473				
300C586920135000			42	38		7819	1891	1712	54	
			179	176		16755	1171	3048		
						28484		1125	2250	
						30718		1414	1500	
						29042	366	1164	2821	
300D026900126450		5228	226	33		6890	342	1990		14535
	1	5055	232	8		6470	360	2099		14041
	2		184	121		3955	305	551		
	2	2470	175	123		3908	262	564		7369
300D206900133300	1		24			32945	644	44		
	3	13872	25	3193		29518	2089	18		47653
	3	28003	30	59		42772	1054	30		71413
	6	74260	297	26		113330	3051	10		189423
	7	42695	722	26		67019	210	65		110630
	8	72641	144	21		112200	190	25		185124
	6	76460	297	77		117471	1972	48		195323
	7	17939	51	26		27109	1220	14		45739
	8	74394	170	13		114836	220	123		189644
	8	73363	110	39		113330	176	4		186933
300D276910134300	11	3140	9	3		3527	2279	20		7819
	11	3194	20	3		3460	2500	76		7982
	11	3203	18	1		3470	2490	77		7993
	11	3210	17	4		3490	2500	66		8016
	11	3214	12	3		3510	2460	64		8013
	11	3184	13	4		3460	2500	43		7933
	11	3195	13	2		3460	2530	35		7949
	11	3193	16	2		3430	2530	79		7964
300D296940132150	1	6502	200	114		10028	571	477		17601
	2	3120	40	25		4638	368	139		8143
300D556930134450	6	2391	491	25		883	4582	1375	58	7476
	7					339				
	7					74	2721	2134	240	
	7					147				
	7		8			74	3221	3256	312	
	8					1236				

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc) (mg/L)
	8	2990	90	25		1104	4314	1562	67	7959
	8	2814	143	25		1141	4343	1287	43	7588
	8	3106	41	10		1178	4236	1573	77	8068
	8	2831	8	7		1288	2550	1133	672	7193
	9		18			2488	4099	292		
	9	3174	16	3		2399	4050	242		7825
	9	3183	29	7		1840	4104	1023		8100
	9	3184	15	2		2318	4307	165		7802
	9	3173	11	1		2399	4099	183		7783
	9					280				
	9					177				
	9					257				
	10					368				
	10	3527	16	4		2502	5014	85		8599
	10	3394	29	5		2502	4797	14		8303
	10	3497	15	3		2502	5014	17		8499
	10	3469	20	7		2576	4851	14		8471
	10	3413	12	5		2502	4797	14		8305
	10	3443	16	3		2517	4851	14		8378
	10	3520	11	2		2539	4990	20		8545
	10	3485	13	1		2591	4831	3		8469
	13					221				
	13	3152	18	5		1855	5085	132		7662
	13	3156	23	3		1796	5007	286		7726
	13	3149	16	1		1899	4948	154		7652
	13	3232	16	2		1914	5187	122		7836
	13	3239	11	1		1914	5261	63		7815
	14					257				
	14	26	46	4		15	176	21		198
	14	2022	28	2		309	2460	1760	115	5445
	14	4031	29	2		2024	3714	2519	197	10629
	14	3137	33	8		1928	4919	180		7705
	14	3173	25	3		1928	5026	132		7732
	14	3172	16	2		1972	4875	163		7722
	14	3156	21	6		2017	4890	86		7691
	17	3099	7	1		2326	3794	50	192	7541
			1146			2181	4060		1154	
		4517	112	5		382	3267	6038	374	13035
			112			534	5043	6835	905	
		4735	130	11		611	5123	5252	84	13342
			93			840	4799	3292	168	

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
		3859	93	11		916	4663	3167	156	10495
		3677	112	5		992	4377	2882	187	10007
		3678	130	5		992	4282	2951	218	10079
		2872	13	2		780	4223	1659		7403
		2808	13	6		1063	3686	1580		7283
		3062	10	1		1092	4101	1718		7900
300D586900133150	1	8029	252	70		12100	1200	317		21358
	2	14691	44	15		19800	3245	1399	48	37592
	6	11719	12	15	13925	15600	2172	708	636	29758
	4	12357	27	19	14200	15750	2941	1391	569	31559
	7	10747	7	2	12000	14425	336	930	1087	27364
300E176950134150		5753	40	2		1773	1098	1699	4471	14278
	2	2275	52	2		1501	2306	411	391	5766
	2	2398	10	2		1395	3965	30		5784
	2		12			1314	747	1144	398	
	2	2385	15	4		1411	3938	23		5774
	2		8			1363	3318	134	206	
	2		74			1444	3567	70	48	
	2		16			1411	3587	73	58	
	2		10			1136	3803	42		
	2		16			1639	1069	1166	269	
	2		18			1395	3655	103	43	
	4		8			1574	503	1474	485	
	4		10			1541	615	1364	379	
	4	2049	86	10		1590	586	1342	355	5720
	4	2004	37	7		1395	615	1452	298	5495
	4	2153	16	5		1509	644	1474	331	5804
	4	2135	25	2		1557	649	1386	326	5750
	4	1905	82	15		1509	327	1188	466	5326
	4	1943	86	12		1476	390	1276	456	5441
	4	2134	39	17		1355	640	1703	360	5923
	4	2495	3	6		1461	3727	66	165	6029
300E546930132300	1	408	4	1		367	172	147	54	1066
	3	8828	216	76		13464	1137	125		23268
300F286930135450	4	3608	16	5		3259	3295	275	195	8978
	4	4496	20	5		3662	3846	363	693	11130
	4	4168	36	10		3662	3334	358	556	10429
	4	3711	20	5		2857	3158	308	722	9176
	4	1866	4	2		121	395	1128	1445	4760
	4	1345	8	2		161	1367	198	840	3226
	5	1282	36	7		161	1484	578	517	3310

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	5	1318	36	7		241	1508	556	498	3397
	8	3250	28	7		3461	2040	325	166	8241
	8	3362	32	5		3702	2280	138	107	8467
	8	3354	32	5		3662	2651	55		8411
	8	3454	57	12		3541	2831	374		8830
	8	3573	45	7		3782	2865	220		9035
	8		40	12		3984	2929			
	8		8	2		80	395		449	
	8	922	40	7		40	1474	132	439	2305
	8		4			80	1801		459	
	8	875	45	5		121	1064	204	469	2242
	3	1371	8	2		121	1992	363	498	3343
		2028	4	2		604	1176	198	1445	4860
	6	1401	28	10		121	1103	688	820	3610
	7	1309	28	12		121	1196	759	615	3432
	8	3398	28	5		3541	2748	39	117	8480
	8	3356	36	10		3380	2363	385	195	8524
	4		49	10		3782	3998		459	
	4		65	10		3541	3485		478	
		2554	4	2		121	771	176	2753	5989
	8	3146	20	5		3259	2055	264	215	7920
	8	1724	15	3		1642	1264	259	107	4372
300F316830134450	2	5293	35	28		7261	1233	444		13667
	2	4768	55	29		6609	1159	341		12372
	3	4075	71	12		5585	1287	151		10527
	3	4771	87	29		6702	1275	206		12422
	3	5895	119	24		8378	1281	336		15382
	5	6267	52	77		8936	1300	391		16362
	5	6186	56	72		8796	1294	407		16153
	6	3169	31	27		4747	378	72		8232
	6	7407	27	22		10891	488	410	48	19045
	6	3944	31	29		5864	391	175		10235
	6	2282	34	28		3351	427	83		5988
	7	2596	33	7		3770	415	96		6706
	8	5019	12	1		6004	1117	1091	258	12934
	7	7275	14	8		10332	635	640	78	18659
	7	5978	25	11		8657	561	422		15369
	7	4394	36	12		6283	549	368		11363
	7	2696	32	10		3910	452	95		6965
	8	4473	14	4		5306	1214	1039	132	11565
	8					6702	1104	1072	204	

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
300F366910134300	1	4368	291	152		6898	454	660	38	12630
	2	2758	28	15		1581	4724	28		6733
	2	2652	30	18		1550	4343	57	67	6509
	2	2596	31	8		1504	4241	77	48	6350
	2	2123	19	17		1519	1854	578	283	5451
	2	2664	39	45		1473	4782	76		6648
	3	2230	27	12		1442	3499	63		5494
	3	2208	30	5		1411	3477	55		5418
	4	1263	9	4		845	1713	59	77	3099
	6		51			4999		567	283	
	6	2573	19	10		1519	3972	275		6349
	6	2504	13	10		1519	4065	44		6089
	6	2459	16	10		1519	3963	37		5989
	7	1409	11	7		1240	1283	77	144	3519
	7	1392	17	6		992	1776	99	82	3461
	7		16			3875		424	336	
	7	1670	6	3		1426	986	176	394	4160
	8	1819	6	4		1736	483	414	427	4643
	9	2483	6	7		1566	3587	61	139	6025
	9	1273	22	8		977	1371	95	154	3203
	9		43	2		4573		264	264	
	9	1755	16	1		1876	825	202	197	4452
	10	1245	17	2		977	1435	35	101	3083
	10		35			4999		649	331	
	10	1533	25	12		1411	1225	166	168	3918
	11	1119	3	3		581	1391	176	187	2753
	11	1134	17	1		667	1259	158	226	2822
	11		24	1		3604		330	326	
	11	1371	5	6		899	854	378	394	3472
	12	1079	9	8		760	693	264	293	2754
	12		35			5348		396	288	
	12		9	6		1566		594	648	
	13	1008	7	3		628	1474	39	53	2463
	13	1019	20	12		682	1615	29		2556
	13	1057	39	24		729	1757	26		2739
	14	1431	16	7		1969	303	26	77	3675
	14	2398	35	14		3139	830	4	149	6147
	14		27			4728		660	298	
	15	1539	14	10		2139	337	17	67	3951
	15		39			5231	190	583	163	
	15		31			4611		638	221	

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	1					6975				
	3					1349				
	4					1070				
300F386810135000	1	3850	53	23		5038	1103	567		10073
300F386900133150	2	7500	304	54	740	11770	541	238		20132
	2	7417	310	55	870	11629	555	263		19947
	2	7526	311	55	880	11770	572	288		20231
	2	6871	217	40	1820	10388	692	413		18269
	2	2150	8	1	1320	2872	290	325	44	5543
	2	3683	13	4	2450	4963	568	475	60	9477
	3	6987	357	58	740	11203	548	73		18948
	3	4096	25	9	2530	5566	699	513	30	10583
	3	3910	14	5	2600	5247	674	500	50	10057
	3	1732	10	2	940	2198	368	338	29	4490
	3	306	10	2	180	355	132	78	4	819
	3	3425	14	4	2300	4325	633	688	98	8865
300F406940135450	1	4804	127	3		461	2255	7677	173	14354
	1	5188	194	2		532	2162	8406	302	15687
	3	3840	124	9		1631	2675	3994	29	10942
	3	4494	86	5		2553	2577	3958	106	12469
	3	2991	63	22		142	3456	3574		8491
	4	1730	41	6		1929	1240	23	77	4416
	4	2632	18	3		1872	3436	91	139	6445
	4	2628	21	2		2000	3119	98	178	6460
	4	2642	43	6		1914	3846	25		6521
300F486930134000	1	2803	9	5		2640	2900	38		6921
	1	2808	7	3		2650	2900	21		6914
	2	4257	21	8		4280	4010	20		10558
	3					856			1238	
	4					664	308		814	
	5					641	292		817	
	6					2809	438		980	
	6					2824	466		964	
	7	4272	67	2		4763	3229	48	31	10770
	7	4069	82	1		4580	3090	28	22	10301
	10		34			3832	4736	57	47	
	10		34			3847	4517	62	62	
	10					2893	672	957	1248	
300G027000127150	1		10			730		912	352	
	3	5007	641	248		8970	290	595		15603
	3	4854	680	199		8690	272	570		15127

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	5	4557	548	202		7930	290	660		14040
	6	4978	698	174		8900	146	588		15410
300G046900133450	3	806	22	4		92	875	486	283	2123
	4	7163	232	51		10310	1950	219		18934
	5	632	5	1		217	790	303	74	1621
	6		7			83	220	402		
	8	12518	1033	175		21100	590	267		35383
300H136830135300	3		15	2		372	708	606	24	
	3	1294	15	4		1363	634	372	24	3384
	4	2509	173	36		3602	317	669		7145
		2413	59	19		3183	537	522		6460
300H237010130000	2		31	13		467	683		146	
	2		34	14		467	708		171	
	3	1502	34	12		552	1884	770	166	3962
	3	706	15	8		422	664	198	156	1831
	3	712	16	7		438	659	176	166	1839
300H246920134450	3	3634	33	10		5191	776	66		9315
	3	3068	8	5		3975	844	31	230	7732
	3	3328	41	15		4786	615	66	48	8587
	6	3077	6	1		2400	3160	115	370	7523
	6	2895	8	2		2135	3350	105	275	7067
	6	2870	12	1		2085	3300	94	320	7005
	7	2378	6	1		1600	2440	305	370	5859
	7	1621	8	1		625	2150	398	295	4005
	7	1633	6	1		700	2150	316	295	4008
	7	1855	5	1		925	2450	237	295	4522
	8		5			1955	2600	132	590	
	8	2618	6	2		1775	3210	48	320	6347
	8	4198	12	1		3600	770	718	1625	10532
	8	2587	8	2		1725	3320	25	285	6264
	9		10			2925	1480	400	998	
	9	2783	7	3		2225	3500	74		6813
	9	2686	7	3		2125	3400	84		6576
	9	3316	12	2		2800	2780	99	552	8148
	9	2456	6	2		2350	1475	140	418	6098
	10	5325	12	12		5150	390	683	2020	13394
	10	2465	9	4		2200	1800	214	360	6137
	10	2409	7	1		2300	2120	76	120	5955
	10	3583	6	2		3100	2880	160	550	8817
	11	2497	8	2		2225	1524	146	552	6179
	11	2558	4	4		2700	1550	26	291	6345

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	11	2636	12	3		2800	2150	61		6569
	11	2545	6	4		2700	1440	35	325	6323
	11	2678	4	2		2810	1600	66	300	6647
	12	4644	12	2		4900	120	333	1670	11620
	12	2936	6	1		2900	1100	333	640	7357
	12	2200	8	4		2300	1300	107	240	5498
	12					2240				
	12	2218	4	2		2400	1300	89	180	5533
	3					1136				
	3					1119				
	3					4867				
300H256950131450	3	12574	1188	343		22056	722	20		36536
	2	12529	1200	327		21985	683	19		36396
	2	11377	819	280		19751	49	40		32291
	3	12604	1096	333		21914	693	38		36325
	3	12592	1196	334		22113	654	19		36576
	4	3248	9	50		3106	1587	1259	180	8632
	4	3085	52	33		2518	2856	849	120	8062
300H306920135150	2		285	7		16476		1607	330	
	2		340	10		16615		1415	300	
	2		112	2		13125		1330	300	
	2		212	5		12008		1413	390	
300I176920134300	1	10174	90	90		15480	1061	19		26375
	2		280	17		12900	105	128	46	
	3	1025	10	1		420	490	560	409	2666
	4	817	16	2		178	390	551	409	2165
300I226920135150		10362	18	12		14018	2453	362	270	26238
		13624	16	15		19101	1781	540	462	34634
		12954	18	9		17872	2410	551	300	32889
		20805	18	6		28903	3319	609	720	52693
	1					23736		4215	2370	
	1					11449	1220	2489	780	
	1					21782		3899	1950	
	1					22619		4359	2250	
	1					17314	488	2894	960	
	4					2625	549	668	540	
	4					19827		3778	1950	
	4					19268		3464	1980	
	4		23	5		3295	3099	72		
	4	3264	18	4		3295	3002	50		8107
	5					19827	519	3846	1650	

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	5					6702	805	772	1512	
	5					6032	1428	654	1092	
	5					14521	305	3088	1320	
	6					3574	2959	302	330	
	6		15	4		3351	3660	191		
	8					4691	3691	130	180	
	9					13404	3783	629	300	
	10					1564	3172	58	270	
	11					7819	1190	619	900	
	12					5306	1037	1146	960	
300I376850134000	2		656	44		16669	908	293		
	4	740	25	3		35	337	682	389	2039
	4	4921	65	34		6167	1215	1144	72	13000
	4		32			423	722	1628	437	
	4	1280	73	5		268	649	1403	370	3718
	4		73			7506	756	616	72	
	4		69			7506	747	517	77	
	4		28			1621	937	1144	370	
	4		77			7541	791	517	58	
	5		12	1		35	776	583	192	
	5		12			789	410	213	53	
	5		34	4		1945	649	152		
	5		76	17		4553	986	176		
	5		97	32		5568	805	154		
	5		117	29		5674	820	158		
	5		113	27		6978	634	128		
	5		134	32		7541	698	154		
	6		65			4828	1601	803		
	6		97	10		5427	1562	517		
	6		105	17		6097	1440	264		
	6		113	20		6625	1337	264		
	6		117	17		6837	1283	154		
	6		29	5		4405	1205	1238	173	
	6		32	5		4440	1220	1062	163	
	2					11836				
	2					10372				
	2					4391				
300J066850133450	1	5660	84	54		8275	1262	35		14729
	2	5447	66	48		7812	1440	11		14093
300J066920135000		31737	39	9		47000	1208	1804		81183
		31108	37	8		46000	1025	1692	180	79529

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
	6		13			24943	4286	1089	1806	
	6		20			28391	5535	1128	1699	
	8		37			10018	1321	468	1904	
	8	5331	37	10		6368	2817	138	176	13445
	8	11554	184	37		16021	3358	376		29823
	9	9895	53	17		12735	3471	880		25286
	9	9616	53	17		12776	3471	242		24411
	9	8592	33	15		11316	2851	248	166	21772
	10		12			31433		1656	955	
	10	27045	31	14		37922	2524	985	1425	68663
	11		4			7584	1655	446	2245	
	11		29			6652	2343	286	1298	
	11		49			6611	2353	248	1279	
		17757	17	3		25375	1880	810	300	45186
300J076920132300		7038	475	118		11558	752	56		19614
	1	7237	193	184		11836	335	10		19625
300J176920136150	1	2917	21	5		1688	3798	136	470	7105
	1	2991	10	14		1450	4955	463		7364
	1	3039	9	12		1585	4760	524		7510
	1	2882	20	11		1659	4486	35	187	7000
	2	4280	12	11		4680	3246	34	53	10666
	2	4287	18	5		4751	3031	26	106	10683
	3	2831	38	46		2943	2138	33	302	7244
	3	2872	17	5		2943	1967	140	240	7184
	3	5751	21	5		7268	2050	309	197	14559
	3	2923	21	5		2907	2050	309	197	7370
300J266940134150			2			2052	952	752	1997	
			7			486	2074	706	252	
			31			81		1188	233	
	17	8148	343	382		13469	1366	30		23044
			12			59	159	858	72	
			37			74		1315	804	
			35	2		88		1502	792	
			13			927	744	561	852	
			38			29	183	1381	324	
				6		324	2513	308	139	
			7			1075	2220	491	552	
			6			1089	2464	431	636	
			5			1089	2355	469	672	
			35	2		88		1502	110	
				3		1362	1205	528	902	

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
				3		1546	1005	405	998	
				3		1362	1769	528	576	
				3		1546	1293	405	816	
	17	7933	392	293		13027	1215	65		22308
	15	9767	327	154		15309	1293	38		26231
		1851	16	3		883	293	785	1066	4749
		2295	2	2		1619	1318	339	773	5678
		2619	7	3		1950	1537	427	763	6525
		2583	16	7		2024	1498	381	725	6473
		2708	25	7		2061	2064	405	576	6796
		2823	33	7		2134	2865	205	408	7019
		2699	33	5		2098	2948	53	326	6664
		2785	25	10		2134	2528	191	528	6916
		2964	11	2		2179	3355	113	312	7221
		2935	7	1		1914	3367	660	156	7329
		3079	11	5		2031	3196	578	396	7672
		3047	13	1		2090	3099	534	372	7581
		3108	13	1		2149	3562	447	228	7697
		2952	11	3		2164	3631	339	48	7303
		2429	17	5		2179	2269	158	149	6053
		3057	41	2		2458	1952	589	648	7755
		3277	43	3		2635	2625	594	456	8298
		3115	44	2		2797	1720	306	732	7842
		3216	13	2		2915	2098	216	588	7982
	5	2823	11	3		2208	2599	726	108	7157
		1487	12	1		559	2428	451	12	3716
		1471	11	1		559	2379	473		3685
		2888	22	2		2208	2916	154	408	7116
		4182	23	2		3901	3867	68	252	10330
	7	2809	20	5		2466	2501	339	180	7049
		1104	16	4		618	952	506	168	2885
		6930	141	5		8869	3404	140		17759
		3366	33	27		4011	232	622	612	8785
	11		16	35		9384	2830	182		
		958	47	1		74	98	1364	360	2852
	12	7986	98	184		10966	3450	72		21002
	12	7921	114	159		10819	3450	77		20787
	12	8195	61	89		11003	3367	60		21063
	12	8445	16	15		10930	3133	220	154	21321
	15	9554	335	134		14941	1288	35		25632
	15	9495	303	164		14867	1269	70		25523

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc) (mg/L)
	15	9501	266	198		14904	1303	51		25561
	15	9760	266	186		15272	1332	24		26163
	16	8668	368	104		13469	1308	123		23375
	16	8600	343	119		13395	1283	100		23187
	17	8155	303	347		13395	1220	26		22826
	17	7955	311	327		13027	1196	66		22274
	14	6785	20	22		7691	3650	578	274	17165
		3535	29	2		4526	1037	380	84	9066
		4083	45	7		4158	3111	315	168	10306
		4153	14	3		3864	4038	78	144	10242
		2964	13	1		2223	3767	81	106	7240
		2992	17	4		2193	3753	143	149	7343
		2787	20	5		2134	3160	128	240	6868
		2930	11	13		2076	3794	189	132	7217
		1802	16	3		883	378	785	960	4635
		2275	2	2		1619	1976	339	424	5633
		2604	16	7		2024	1684	381	660	6520
		2679	25	7		2061	2037	405	552	6731
		2792	33	7		2134	2904	205	348	6947
		2667	33	5		2098	2769	53	372	6589
		2742	25	10		2134	2464	191	504	6818
	3	2943	10	4		2223	3836	157		7223
	9	6921	98	64		9126	3162	94		17858
		6550	220	27		8501	3282	216		17127
	12	8314	57	42		10966	3479	77		21167
	13	6316	135	50		8170	2884	378		16467
	16	8444	352	129		13101	1381	157		22862
	3									
	4					833				
	15	3831	82	12		5152	800	638		10108
	15	6016	123	62		8832	1088	286		15854
	15	7239	164	124		11040	1122	165		19283
	15	8483	245	149		13064	1347	139		22743
	15	9110	286	174		14168	1440	77		24523
	15	9210	286	174		14352	1420	51		24771
	16	6549	204	74		9789	1230	233		17454
	16	7598	303	84		11629	1288	163		20411
	16	7955	368	89		12291	1352	136		21504
	16	8474	294	134		13174	1254	102		22795
	16	8617	327	129		13395	1318	111		23227
	16	8894	311	114		13910	1098	75		23839

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc) (mg/L)
	16	8200	425	84		12733	1352	167		22274
	17	6476	319	74		10378	332	265		17675
	17	7746	311	263		12586	1078	66		21502
300K096900133300	4	11129	609	114		17700	1020	377		30431
300K266910135000	4	1920	4	1		1238	1980	615	108	4859
	6	2423	8	2		1798	2572	99	331	5926
	7	3009	12	7		2403	3875	37		7373
	7	2914	8	5		2325	3274	53	216	7130
	9			3		395	1825	165	269	
	10			2		1054	1728	161	312	
	11	2496	11	3		1705	3675	50		6072
	12			3		225	752	152	120	
	12	1195	4	1		1124	1074	64	48	2964
	12		6			1070	1454	23	53	
	12		6	2		1597	1484		43	
	12		6	1		1473	1074		34	
	12		5	14		822	600		24	
	12		19	2		736	1010		29	
	12	952	5	2		767	1171	2	29	2333
	12		8	3		1155	1235		62	
	12		7	2		1426	1537		62	
	12		7	1		1287	1366		58	
	12		7	1		1232	1352		43	
	12		7	1		1147	1244		34	
	12		6	2		1116	1210		43	
	12		4	2		961	1015		29	
	12		6	1		1101	1127		29	
	12		3	1		698	737			
	12		5	1		1349	1449		43	
	13					155	224		67	
	13	1014	25	5		853	976	75	125	2577
	8					29				
300K316900135000	1	6762	42	31	4700	9308	1885	256		17326
	1	6021	57	23	2600	7763	2721	146		15347
	2				1200	7149	3478	63		
	2				1300	7149	3478	70		
	2	6249	145	9	1700	7707	3692	91		16017
	2		11	14	21800	33231	1135	1567	96	
	3	8116	155	51	5200	11589	2001	252		21147
	3	10914	285	64	7200	15638	2904	265		28594
	3	11761	318	69	7900	17034	2819	309		30878

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	4	23330	100	71	23800	34627	1586	1059	24	59990
	4	24019	109	85	24000	35744	1672	1034		61813
	4	24418	107	78	23900	36303	1635	1106		62816
	4		22	15	20600	31555	927	1380	66	
	5	19790	136	106	21000	29321	2026	769		51118
	5	19971	116	100	21300	29601	1916	784		51515
	5	20693	132	106	21300	30718	1977	793		53414
	5	20888	129	106	21600	30997	1983	809		53904
300K546940134150	2	2913	24	2		2790	2987	20		7218
	2	2112	16	12		2480	810	132	230	5380
	2	2628	16	14		2519	1654	132	461	6584
	2	2700	12	14		2596	1401	121	614	6745
	2	2720	16	14		2635	2269	121	187	6809
	2	2958	39	5		2596	3372	121		7377
	2	2969	39	7		2674	3265	132		7427
	3	2786	43	2		2403	3377	17		6911
	3	2831	43	7		2751	2777	132		7129
	3	3133	47	12		2674	3894	17		7798
300K597030136000	1	7578	423	793	478	13602	112	1462		23913
300L306950133450	7	4873	39	18		3375	5994	1055		12308
	7	4669	13	9		3339	5379	755	192	11621
	7	5560	29	2		5613	3768	401	451	13909
300L386930134300	1		201	9		14665		506	288	
	1	9136	186	9		13730	5	517	278	23858
		1214	99	17		648	522	1551		3785
	1		221			13758		574	178	
300M137030135000	1	38372	223	226	37500	56378	1448	4070		99981
	2	11229	323	660	4200	17166	400	3269		32844
	2	9140	246	1093	515	14849	281	3664		29130
	2	9151	445	932	445	15001	302	3306		28984
	2	10726	422	823	3600	17248	397	2990		32404
	2	37745	575	653	49000	57999	326	3978		101110
	2	42948	459	513	54500	65339	404	4011		113469
	2	42877	556	687	56500	66159	380	3691		114157
	2	43331	603	332	57500	64654	1030	4877		114304
	2	9304	373	1026	370	15150	107	3775		29681
	3	21352	289	81	23000	30283	5162	528		55071
	3	5698	65	30	2200	4481	7057	553		14297
	3	5274	69	18	2200	4065	6701	375	61	13157
	3	4988	59	58	1410	3949	6638	132	52	12502
	3	4650	67	33	1240	3211	7036	116		11536

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
	3	4043	51	23	1250	2470	6566	93	32	9940
	3	4134	66	68	1040	2519	7102	61		10340
	3	3848	43	44	900	1831	7318	75		9439
	3	3919	38	22	830	1840	7407	41		9502
	3	3896	26	29	730	1807	7403	40		9438
	3	3959	20	22	720	1841	7026	62	199	9557
	3	3783	34	9	630	1670	6947	76	133	9121
	3	32634	65	57	37000	47761	4280	210	170	83002
	3	4809	74	43	1450	3468	6962	216		12034
	4		71	48	10500	12509	8030	211	343	
	4		36	11	1770	4281	8210	340	101	
	4		38	13	1320	3714	8076	267	96	
	4		24	16	730	3069	7812	304	208	
	4		25	6	870	3012	7201	281	529	
	4		24	7	730	2884	7496	249	376	
	4		26	7	510	2688	7524	257	330	
	4		20	14	560	2615	7905	270	109	
	4		37	14	570	2647	7818	218	239	
	4		29	5	520	2277	7844	192	197	
	4		28	7	490	2396	8123	267	223	
	4		25	5	470	2318	7792	290	232	
	4		30	3	54000	61210	8228	3173	320	
	4		74	31	2200	2924	8134	188	169	
	4		18	8	2300	2531	8277	89	121	
	4		13	3	1700	2467	8177	47	251	
	5	40024	175	24	50000	57429	4426	2287	346	102462
	5	9590	95	18	6000	11493	5351	407	90	24324
	5	5816	44	14	2750	5318	6112	150	91	14438
	5	4635	35	4	1600	3234	6330	93	204	11318
	5	4315	27	12	650	2829	6190	47	234	10508
	5	4149	22	5	1100	2520	6158	91	242	10057
	5		23	2	950	2161	6315		119	
	5		26	1	1050	2034	6714			
	5		21	3	600	1914	6425		158	
	5	3717	14	9	1600	1781	6540	99	109	8945
	5	3687	7	15	1600	1756	6649	94	45	8873
	5	3699	18	10	1300	1727	6696	98	64	8909
	5	43333	92	251	57000	62391	3964	2835	785	111636
	5	3629	19	5	1200	1617	6824	85		8711
	5	15239	172	122	19500	18793	6237	1766	371	39530
	5	3676	24	29	900	1682	7003	61		8916

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	12		295	6	3260	9417	866	177	116	
	12		168	27	3800	8679	926	61		
	12		210	54	3230	8205	1019	62		
300M266930132300	1	1055	178	4		1070	45	1143	12	3484
	2	7997	512	181		13545	189	150		22478
300M987030133000	1				5000	9423				
	1				9150	10093				
	1				4000	6455				
	1				3400	6516				
	1				1700	6253				
	1				2150	5303				
	1				2750	6498				
	1		31	18	2050	5481	8256	735	118	
	1				3100	7643				
	2				32000	38247				
	2				90000	74502				
	2				33000	35475				
	2				65000	54721				
	3	5253	48	59	900	4008	6983	395		13196
	3	27409	353	277	24700	40314	5711	87		71248
	3	5705	35	61	515	4486	6544	295	449	14248
	3	5143	32	27	475	3724	6418	292	337	12711
	3	5022	36	84	370	3795	5685	402	557	12691
	3	5663	40	46	360	4400	5669	259	891	14087
	3	5241	45	39	430	3739	6376	349	486	13034
	3	5029	34	32	235	3608	5104	253	972	12438
	3	5567	35	20	220	4389	5652	191	754	13735
	3	5097	46	56	210	3514	5650	348	889	12728
	3	4963	48	34	200	3462	5322	204	959	12287
	3	5721	34	26	190	4629	5341	461	750	14248
	3	5496	34	25	965	4350	5117	314	891	13626
	3	5250	41	16	425	3701	5303	474	916	13005
	3	5175	44	11	380	3744	5413	267	850	12753
	3	5152	42	16	385	3690	5493	311	808	12720
	3	5339	36	27	675	4025	5289	337	871	13236
	3	5319	25	47	415	4136	5211	229	889	13207
	3	5334	45	58	815	4547	6342	328		13430
300N106900133300	4	6168	299	52		8835	2118	171		16567
	4	6752	302	55		9920	1796	193		18105
	4	6351	283	29		9106	1869	253		16941
			27	2		295	1801		86	

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
300N176900133300	1		392	73	292	12409	1328	27		
	1		422	59	345	12940	1377	91		
	1		324	87	525	12054	1294	7		
	1		38	5	74400	68070	244	110	1080	
	2	12045	126	23	18500	18081	1113	183		31005
	2	11435	264	103	16500	18081	459	71		30181
	1					86860				
	2					85087				
300N466910134450	1	2892	9	7		2602	2768	74	196	7141
	2	2325	7	11		2030	2002	239	220	5816
	3		16	12		1600	2070	176	143	
	4	1535	6	4		1360	272	202	611	3852
	5		4	45		650		375	540	
	6	1097	10	2		573	820	634	167	2886
	7	1215	8	1		1000	517	338	288	3104
3000097000130300	2	3478	76	30		4858	267	629	91	9293
	2	4828	110	52		7298	286	381	38	12847
	2	5784	164	77		9042	327	213	38	15479
	2	6790	254	102		10907	434	32	29	18327
	2	7070	300	113		11461	482	18	6	19205
	2	7048	301	116		11436	502	16		19164
	2	7138	302	117		11574	500	23		19399
	2	7087	300	111		11489	482	18		19242
	2	7117	288	117		11553	445	19		19313
	2	1330	59	21		2170	49	25		3629
3000156910135000	6					7424	3393	403	402	
	6					7707	3576	412	408	
	10					6255	3557	286	156	
	10					6814	3429	267	144	
	10					6479	3368	219	176	
	12					6032	2929	374	120	
	13					10193	635	488	168	
3000196920132450	1	2476	18	8		2464	910	1128	40	6581
	1	2526	17	4		2305	1054	1250	82	6702
	2	914	17	6		35	928	1108	55	2591
	5	1372	34	21		202	2430	734	69	3627
	5	1141	23	14		124	2072	619	48	2988
3000276900133300	4	4313	8	12		5283	1465	502	165	11003
	4	4108	30	43		5300	975	691	115	10766
3000546920134450	1	2727	24	7		2092	3650	15	38	6698
	1	2849	24	5		2052	4114	11		6964

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	1	2845	20	5		2012	4168	5		6937
	2	2723	16	5		2133	3455	6	82	6664
	2	2699	16	5		2052	3582	5	58	6597
	2	2736	16	5		2092	3601	5	62	6686
		1820	16	7		1730	1635	22	134	4532
		1887	16	5		1690	1825	22	158	4676
			16	2		1690	1810		163	
	4	1109	2	1		451	1035	55	528	2655
	4	1023	3	1		467	893	66	466	2465
	4	1137	2	1		435	932	55	629	2718
	4	1051	2	1		451	766	77	571	2530
	5	1634	8	3		1626	1020	110	206	4089
	5	1601	10	3		1642	878	88	235	4010
	5	1601	10	5		1642	927	110	202	4025
						241				
	4					322				
	5					322				
	5					322				
300P176930132450		595	7	3		147	1235	39	38	1436
		603	7	1		155	1318	33		1447
	3	619	7	3		228	1142	53	38	1509
	13	5704	138	55		8546	649	376		15138
	12		20	2		15	93			
	13		12			141	3265	1266	4532	
	14		16			124	3875	1666	2521	
	14	5508	25	19		6347	2752	810	42	14104
	13	5714	225	40		8648	830	264		15299
300P216920133300	1	598	11	2		119	903	181	144	1499
	1	701	12	4		164	708	346	240	1815
	1	309	6	1		148	500	20	31	761
300P536900133300	1	8025	206	66		11911	1723	26		21081
	1	529	29	12		32	1371	99		1375
	1	5100	45	27		6881	1635	259		13116
	1	7158	130	54		10543	1503	12		18636
	2		2	1		16	332			
	3	7374	186	61		10560	1710	439		19461
	3	1528	636	142		3219	835	259		6195
	3	3966	178	44		5714	669	352	166	10749
	3	6934	251	74		9979	2182	143		18454
	3	7417	154	83		10540	1850	456		19560
	4	2840	45	10		2777	2846	77		7148

Table A1. (continued)

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(cal (mg/L)
	7	9093	560	124		14700	674	382		25190
	11	3315	10	3		81	1098	251	3583	7782
	11	3206	13	3		211	1455	403	3065	7616
	11	2092	15	3		65	679	187	2255	4951
	11	751	3	1		49	268	37	791	1764
	11	2712	13	2		276	2411	306	1953	6447
300P536920134300	2	2682	57	10		155	2623	528	1860	6582
	5	1994	16	2		109	3160	1001	360	5036
	6	2608	23	5		2170	3216	52		6439
	6	3188	16	4		2697	3821	53		7837
	6	2091	23	6		1457	2743	314		5240
	6	3121	8	3		2697	3148	35	240	7652
	6	3215	16	4		2728	3855	40		7898
	7	2079	61	9		1287	3323	165		5235
	7	2223	39	7		1488	3221	138	48	5527
	7	3021	14	2		1938	3282	29	696	7313
	8	2389	16	6		1457	3196	314	156	5910
	8	14347	204	310		22669	1220	14		38144
	8	1965	36	22		1023	2501	405	324	5005
	9		8	3		651		264	840	
	9		11	2		1178		165	360	
	10		23	2		155		517	876	
	11	1372	15	1		70	305	517	1284	3409
	12		7			543		396	1176	
	12		10			550		528	1260	
	12		2	1		543		407	1140	
	12		8	2		481		6	804	
	14	3585	33	12		39	5405	446	1788	8560
	15	2776	25	9		1571	3953	193	288	6805
	15	2726	16	20		1473	4319	14	252	6625
	15	2812	15	14		171	4953	29	1128	6604
	16	3303	20	37		39	5283	424	1536	7956
	16	3257	41	22		78	5270	297	1524	7811
	16	3289	33	7		39	5246	413	1488	7848
	17	2118	25	7		116	1964	561	1404	5196
	17	2654	31	16		93	3306	380	1608	6408
	17	1927	23	5		62	1647	435	1428	4690
	18	2151	29	10		93	2196	385	1476	5224
	18	1926	7	2		450	1476	413	1164	4687
	18	2150	25	5		426	2208	451	1128	5271
	19	2531	11	8		163	3377	292	1358	6023

Table A1. (continued)

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
	20	2565	9	2		147	2523	484	1699	6147
	21					109	83	578	2299	
	21	2117	6	2		93	756	517	2004	5111
	6					2286				
	12					341				
302C507010132300	1		32	30	41000	46834	4562	6854	107	
	1		20	3	10100	15982	1814	772	76	
	1		5	1	10	6	33			
	2					48490				
	2		289	251	4420	13018	646	2226		
	3	14834	29	21	14000	18393	6459	634	316	37403
	3	4095	58	11	170	3537	5009	2		10166
	3	9390	71	29	4700	9918	7754	54	192	23467
	3	8401	34	58	2800	8343	7997	61	127	20957
	3	7511	29	78	1200	6813	8677	9		18707
	3	7256	43	59	665	6439	8591	9		18030
	3	7266	90	34	665	6353	8781	11		18072
	3	7377	81	20	610	6412	8882	7		18265
	3	7144	60	11	600	6214	8490	11		17615
	3	15598	32	7	15200	19441	6696	586	309	39265
	4	10369	379	1079	2100	18231	344	1864		32092
	4	30085	228	266	35000	44775	2195	2060		78494
	4	16536	183	210	12400	23793	3520	809		43262
	4	33103	168	105	38500	48072	2274	3055		85621
	4	8936	149	35	2400	11903	3730	101		22958
	4					16590				
	4					11977				
	4					16610				
	4					50205				
	5					48022				
	6					36483				
	6	25361	217	345	24800	38439	1933	1267		66580
	6	11231	306	329	2150	17108	2658	225		30506
	6					39952				
	6					40525				
	6					38363				
	6					33966				
	6					31901				
	7	30247	561	502	32000	46362	3029	1322		80484
	7	10127	795	792	3550	18967	346	221		31072
	7					43913				

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
	7					44043				
	7					42545				
	8	986	18	42	1060	1425	349	63		2705
	9	31791	179	1	34500	45650	1992	3379	34	82013
	9	33080	66	55	37000	47041	1769	4361		85473
	9	31901	110	33	41500	45175	1745	4220	151	82448
	9	33112	56	31	42500	46968	1275	4097	436	85326
	10	31811	137	70	37000	46170	1781	3109		82173
	10					50818				
	10					50488				
3020617010134150		10349	54	43	125	13744	3061	890		26585
		10868	94	102	460	15560	2807	42		28046
		13630	186	985	200	18709	7098	1878		38878
		8802	120	284	340	12500	1390	1770		24160
		9477	37	44	480	10993	4930	1288		24263
		9186	54	38	410	10461	4955	1398		23574
		9380	59	33	360	10815	4686	1297	144	24032
		9557	4	43	470	11347	4003	1276	216	24411
		9698	22	33	500	11525	3881	1314	288	24789
		8778	16	36	450	10461	3051	1137	504	22432
		9531	42	24	480	11347	4052	1275	168	24379
		11813	52	86	590	14361	4076	2132	216	30664
		11374	72	75	560	13829	4369	1825	144	29467
		10963	48	70	465	14007	2929	1783	144	28456
		10676	52	60	390	13475	2758	1816	264	27699
		3371	22	14	152	2447	3533	497	348	8436
		6881	8	3	525	7872	1416	898	1080	17438
		6701	13	3	460	7695	1526	898	948	17008
		10660	13	6	604	8936	8118	2230	999	26836
			12		600	8298	5550	2394	2672	
		12230	100	92	500	15673	3063	1740	480	31821
		12358	99	93	463	15780	3893	1980		32225
	2		25	2	260	8260	1010	2500	2040	
	2	2757	244	24	49	979	6407	69		7223
	2	2830	176	6	57	966	6346	53		7151
	2	2781	140	6	44	936	6163	49		6942
	2	2795	142	2	49	993	6071	64		6981
	2	2895	52	3	39	957	6078	103		6998
	2	2885	20	10	25	1046	5370	86	240	6927
	1		104	2	488	14500		4500	3610	
	1		3	2	38	1082	5565	80		

Table A1. (continued)

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
	1		15	2	1080	8940	1260	2810	2710	
	1	3265	68	10	83	1418	6297	146		8003
	1	2916	46	11	90	1184	5809	68		7081
	1		38	7	71	1043	5742	20		
	1	2739	40	3	41	1035	5560	51		6602
	1	2710	40	4	42	993	5565	48		6532
	1	2763	43	3	43	1014	5663	55		6662
	1	2756	44	2	48	1028	5632	44		6643
	1	2745	238	19	42	983	6346	54		7160
	1	2702	152	2	48	1007	5858	41		6784
	1	2719	128	3	40	1011	5827	43		6769
	2	3012	12	10	50	1188	5858	140		7242
	3	7729	12	10	112	8156	3344	786	1092	19430
	3	5293	8	15	55	4886	5541	156		13083
	3	5877	12	22	64	5851	5541	105		14592
	3	5535	20	14	54	5319	5516	118		13718
	3	5253	22	9	53	6206	3222	118		13192
	3	5618	23	11	53	5319	5638	191		13934
	3	5535	52	9	54	5142	5834	127	24	13758
	3	5686	16	9	52	5496	5602	97		14058
	3	5749	11	8	52	5674	5419	116		14223
	5	6928	51	73	238	8652	2856	914		18022
	5	7431	10	104	292	7801	4821	1403	120	19239
	5				425	12056		2148	1921	
	6	11365	149	2	422	12588	342	3403	2113	29788
	6	10140	110	4	415	11170	73	3045	2017	26522
	6	10539	102	5	450	11702	98	3122	2017	27535
	6	10890	80	2	405	12056	98	3081	2161	28318
	7		124	5	385	11702		3634	2233	
	7	10626	56	2	674	10283	1904	6258	408	28569
	8		158	2	510	12269		3819	1981	
	8	7644	14	9	59	8936	4796	156		19117
	8	8439	34	5	197	9822	3057	914	690	21407
	8	7550	46	8	90	8723	4943	205		18962
	8	7553	61	12	79	8688	5095	191		19010
	8	7802	12	5	90	9007	3997	375	390	19556
	8	7423	77	19	71	8596	5065	135		18741
	8	7515	40	14	66	8837	4808	94		18864
	8		44		385	11879	171	2744	1801	
	9	9104	78	1	338	10638	1269	3146	408	23999
	10		26	2	383	15673	2941	3450		

Table A1. (concluded)

Well location (unique ID)	DST #	Na(diff) (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	HCO_3 (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	TDS(calc (mg/L)
	10	11762	154	2	404	12411	122	5156	1801	31346
	11	7183	322	125	404	9135	1255	2648	163	20194
	12	7221	209	78	365	8865	2392	2002		19551
	14	4616	1296	719	370	8510	312	2240	984	18518
	14	6778	112	2	265	8510	757	1750	351	17875
	14	9146	58	32	86	12056	3593	210		23268
	14	9100	56	22	97	12056	3490	151		23101
	14	8927	43	23	88	11702	3568	180		22629
	14	8779	40	70	85	11631	3549	162		22427
	14	9055	48	28	82	11986	3485	161		22992
	14	8864	54	25	89	11702	3456	171		22515
	15	10394	80	49	140	14184	3144	409		26662
	15	10654	48	27	90	14610	3283	102		27056
	15	10874	50	26	85	14964	3266	96		27616
	15	11106	10	25	85	15319	3095	133		28114
	15	10667	44	27	87	14680	3241	57		27069
	15	10613	47	24	83	14574	3241	84		26936
	15	10462	45	25	79	14326	3241	103		26555
	15	10637	44	24	80	14610	3241	77		26985
	17	11457	65	84	310	15602	2392	1403		29787
	18		112	2	365	7730		1682	847	
	18	4961	96	39	245	5957	2031	1080		13132

Table A2.

Pore pressure, hydraulic head and pressure head from drillstem tests, Beaufort-Mackenzie basin

NOTES:

This table is based on information entered into the Basin Analysis Group data base at 1988-03-31. The data are ordered by well number (A-01 to P-53) and drillstem test number. This information, plus the unique identifier of the well number and location, allows cross-reference to additional drillstem test computations in Table A3. Where interpretation has been made of both the initial (1) and final (2) phase this is so indicated. The formation pore pressure, P_f, was calculated using the standard Horner analysis of digitized pressure-time increments. Hydraulic head, H, is given on both a freshwater (ρ=1.000) and actual density basis. Corrections of the laboratory determined density were made using the empirical equation of Long and Chierici (1959). This equation requires information on the formation pore pressure, formation temperature and salinity (equivalent NaCl solution). Because reliable data on the formation temperature and salinity were not always available, default values were substituted based on temperature-depth plots and analyses of formation waters from adjacent wells, respectively. The default formation temperatures are indicated by an asterisk in Table A4. The salinities used in the calculations are given in this table (A2) with rounded numbers representing the default values. The pressure head is (H-z) or $P_f/\rho g$, where H is hydraulic head at the elevation z, ρ is the fluid density and g is the gravity acceleration.

Reference

Long, G. and G.L. Chierici, 1959, Compressibilite et masse specifique des eaux de gisement dans les conditions des gisements: Proceedings of Fifth World Petroleum Congress, section II, p. 187-210.

Table A2.
Pore pressure, hydraulic head and pressure head from drillstem tests, Beaufort-Mackenzie basin

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Pore Pressure (kPa)	Hydraulic Head Density corrected (m)	Hydraulic Head Fresh water (m)	Pressure Head (m)	Salinity (mg/L)
300A016850134000	EAST REINDEER A-01	4	0	2882.80	2954.43	-2687.42	31178.50	444.93	491.79	3132.35	25000.00
		5	0	2490.22	2504.24	-2293.92	23240.79	60.81	75.89	2354.73	15608.00
		8	0	2080.56	2093.98	-1891.28	19425.79	71.52	89.52	1962.80	15608.00
300A066930134300	MALLIK A-06	1	0	3998.67	4001.72	-3939.11	69527.75	3055.75	3150.49	8994.86	16441.00
		2	0	3948.68	3954.78	-3893.70	60308.72	2207.97	2255.86	6101.67	16441.00
		3	0	3824.02	3827.07	-3769.03	61309.53	2416.09	2482.58	6185.12	16441.00
		6	0	2937.97	2942.54	-2849.15	43602.37	1557.72	1596.89	4406.87	10000.00
		7	0	2855.37	2861.46	-2773.56	42831.03	1549.31	1593.83	4322.87	10000.00
		8	0	2706.62	2715.77	-2617.81	36239.78	1039.79	1077.48	3657.60	10000.00
		10	0	2616.71	2649.93	-2528.50	34102.64	915.26	948.86	3443.76	10000.00
		11	0	2524.66	2530.75	-2463.27	31160.40	678.81	714.09	3142.08	10000.00
		12	0	2350.62	2356.71	-2291.67	26296.18	361.54	389.69	2653.21	10000.00
300A126910133300	SIKU A-12	1	0	2959.00	2968.14	-2888.89	29172.73	80.62	85.79	2969.51	18100.00
		2	0	2880.36	2886.46	-2808.12	29083.48	147.58	157.46	2955.70	18100.00
		3	0	2833.12	2836.47	-2763.62	31690.11	445.78	467.76	3209.40	18100.00
		4	0	2718.21	2724.91	-2677.06	28627.31	221.83	242.01	2898.89	18100.00
		5	0	2701.44	2708.45	-2625.24	28588.40	265.19	289.86	2890.43	18100.00
		6	0	2658.47	2663.95	-2587.14	29268.75	367.67	397.33	2954.81	18100.00
300A257000136150	TARSIUT A-25	5	0	1800.00	1810.00	-1780.50	21568.08	410.23	418.74	2190.73	6640.00
		6	0	1500.00	1514.00	-1429.10	18376.99	431.13	444.76	1860.23	6640.00
300A286920134300	YAYA A-28	1	0	3444.85	3587.80	-3386.02	33876.79		68.32	3378.18	27984.00
		2	1	2451.81	2455.16	-2395.12	25156.54	90.33	170.04	2485.45	27984.00
		2	2	2451.81	2455.16	-2395.12	24441.34	20.39	97.11	2415.51	27984.00
		3	0	2406.70	2410.36	-2360.37	23614.68		47.56	2333.67	27984.00
		7	0	2055.57	2059.84	-1986.08	20223.93	10.12	76.11	1996.20	27984.00
		8	0	1959.86	1967.79	-1903.48	19443.80	15.30	79.17	1918.78	27984.00
		9	1	1914.75	1919.33	-1851.96	18630.30		47.73	1837.97	27984.00
		9	2	1914.75	1919.33	-1851.96	18661.74		50.94	1841.04	27984.00
		10	0	1874.52	1879.09	-1813.26	17762.90		2.01	1752.81	27984.00
		11	0	1858.67	1863.24	-1785.21	18217.07	11.56	72.34	1796.77	27984.00

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Pore Pressure (kPa)	Hydraulic Head Density corrected (m)	Hydraulic Head Fresh water (m)	Pressure Head (m)	Salinity (mg/L)
		12	0	1851.66	1856.23	-1790.70	18361.38	20.56	81.56	1811.26	27984.00
		13	0	1821.48	1825.14	-847.04	17907.00	978.90	978.90	1825.94	27984.00
		14	1	1783.08	1787.65	-1723.03	17502.32	2.67	61.64	1725.70	27984.00
		15	1	1767.23	1771.80	-1700.48	17444.41	18.95	78.29	1719.43	27984.00
300A416910134300	REINDEER A-41	2	0	1717.55	1828.80	-1690.12	19549.52	282.73	303.30	1972.85	8000.00
		3	1	971.70	976.58	-926.29	9230.46		14.92	926.15	8000.00
		3	2	971.70	976.58	-926.29	9256.53	7.70	17.58	933.99	8000.00
		4	1	875.08	879.65	-838.66	8352.70	4.06	13.05	842.72	8000.00
		4	2	875.08	879.65	-838.66	8367.47	0.80	14.55	839.46	8000.00
		5	1	771.75	777.24	-732.86	7267.10		8.15	729.17	8000.00
		5	2	771.75	777.24	-732.86	7291.89	2.94	10.68	735.80	8000.00
		6	0	713.23	718.72	-668.43	6643.23	1.98	8.97	670.41	8000.00
300A556950131450	ATKINSON A-55	4	0	1988.82	2007.11	-1995.71	20235.60	11.88	67.67	2007.59	26889.00
300B116850135150	UNAK B-11	1	0	1541.37	1546.86	-1538.54	16527.80	93.28	146.77	1631.82	34600.00
		2	0	1181.10	1185.67	-1172.78	12896.22	119.83	142.22	1292.61	18835.00
300B196920135150	NIGLINTGAK B-19	1	0	1225.30	1254.25	-1171.96	12060.50	48.28	57.82	1220.24	6640.00
		2	0	3076.65	3088.84	-3065.37	31109.83	96.23	106.83	3161.60	6640.00
300B446940135450	NETSERK B-44	2	0	3273.25	3305.56	-3258.95	52335.56	2051.94	2077.60	5310.89	10000.00
		4	0	3258.92	3271.11	-3238.53	54197.84	2254.06	2287.91	5492.59	10000.00
		5	0	3149.80	3158.95	-3132.46	39944.80	939.56	940.63	4072.02	10000.00
		6	0	2877.92	2890.11	-2859.97	35069.91	709.76	716.04	3569.73	10000.00
		7	0	2877.92	2890.11	-2830.71	35128.53	743.35	751.27	3574.06	10000.00
300C216930135150	UPLUK C-21	3	0	1492.61	1501.75	-1458.16	15333.42	91.70	105.36	1549.86	6640.00
		7	0	1138.12	1147.27	-1105.51	11754.45	81.83	93.06	1187.34	6640.00
300C386850133300	REINDEER C-38	1	1	1154.58	1167.38	-1084.17	11103.29	31.84	48.00	1116.01	14000.00
300C386850133300	REINDEER C-38	1	2	1154.58	1167.38	-1084.17	11038.50	25.37	41.40	1109.54	14000.00
300C426930134450	TAGLU C-42	2	0	3311.65	3317.75	-3292.39	36678.60	459.35	447.65	3751.74	6102.00
		3	0	3267.76	3272.33	-3254.29	32857.54	111.01	96.12	3365.30	6102.00
		4	0	3233.93	3236.98	-3216.80	32443.62	105.65	91.41	3322.45	6102.00
		5	0	3194.30	3197.35	-3179.00	32289.92	126.82	113.54	3305.82	6102.00
		6	1	3169.92	3176.02	-3150.35	32002.31	125.64	112.86	3275.99	6102.00
		6	2	3169.92	3176.02	-3150.35	32399.60	165.67	153.37	3316.02	6102.00
		7	0	2957.17	2960.22	-2940.65	30089.12	136.53	127.47	3077.18	6102.00
		8	0	2926.08	2932.18	-2911.69	29810.21	136.59	128.00	3048.28	6102.00
		9	1	2901.09	2907.18	-2881.82	29328.37	116.41	108.73	2998.23	6102.00
		10	0	2888.28	2891.33	-2872.37	29386.96	131.59	124.15	3003.96	6102.00
		11	0	2880.36	2883.41	-2862.62	29359.51	138.46	131.11	3001.08	6102.00
		12	0	2866.64	2872.44	-2842.50	29359.87	157.49	151.26	2999.99	6102.00
300D276910134300	REINDEER D-27	11	0	3401.57	3425.95	-3372.32	55607.02	2231.64	2297.81	5603.96	7949.00

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Pore Pressure (kPa)	Hydraulic Head Density corrected (m)	Hydraulic Head Fresh water (m)	Pressure Head (m)	Salinity (mg/L)
300D296940132150	KIMIK D-29	1	0	2610.31	2628.60	-2585.92	26393.28	71.55	105.34	2657.47	17601.00
300D486900133150	KAMIK D-48	1	0	2888.89	2897.12	-2845.61	28420.10		52.33	2844.62	34600.00
		2	0	2871.83	2877.92	-2830.07	28680.15	39.21	94.38	2869.28	34600.00
		3	0	2864.21	2866.03	-2824.28	28384.88	15.48	70.06	2839.76	34600.00
		4	0	2855.98	2858.41	-2813.61	30209.85	204.69	266.82	3018.30	34600.00
300D546830133300	INUVIK D-54	1	0	704.09	719.33	-663.85	6870.05	36.67	36.67	700.52	25000.00
300D556930134450	TAGLU D-55	5	0	3657.60	3660.65	-3647.30	68448.84	3257.67	3332.29	6904.97	7815.00
		6	0	3587.50	3590.54	-1765.46	62129.20	4522.98	4569.73	6288.44	7815.00
		7	0	3561.28	3573.48	-3541.84	58244.67	2365.42	2397.24	5907.26	7815.00
		9	0	3514.34	3520.44	-3491.35	61992.58	2782.02	2829.90	6273.37	7815.00
		13	0	3218.69	3221.74	-3192.23	55337.93	2422.57	2450.46	5614.80	7815.00
		14	0	3191.26	3194.30	-3170.90	55261.37	2434.82	2463.98	5605.72	7815.00
		17	0	3168.40	3174.49	-3018.50	32524.92	312.52	298.00	3331.02	7815.00
300D586900133150	KAMIK D-58	1	0	2990.09	2996.18	-2935.83	29492.60	64.78	71.47	3000.61	21358.00
		2	0	2923.03	2929.13	-2870.00	30562.18	233.24	246.35	3103.24	21358.00
		4	0	2913.89	2920.59	-2860.24	31137.56	298.78	314.79	3159.02	21358.00
		5	0	2860.24	2868.78	-2811.17	28977.07	126.48	143.56	2937.65	21358.00
		6	0	2844.39	2851.10	-2791.66	28739.17	120.13	138.81	2911.79	21358.00
300E176950134150	PULLEN E-17	2	0	3560.06	3566.16	-3542.08	39414.80	457.72	476.97	3999.80	5774.00
		4	0	3539.34	3545.43	-3521.35	38442.37	380.78	398.53	3902.13	5774.00
300E416940132300	ATERTAK E-41	1	0	1364.28	1367.94	-1335.33	14378.53	103.32	130.82	1438.65	14770.00
		2	0	1357.58	1362.46	-1336.24	14486.59	114.49	140.92	1450.73	14770.00
		7	0	1238.71	1244.80	-1214.02	12489.78	35.61	59.53	1249.63	14770.00
		10	0	1216.76	1244.80	-1189.63	13322.71	142.02	168.86	1331.65	14770.00
300E476850137150	BLOW RIVER YT E-47	1	1	993.65	1036.62	-879.35	10176.60	147.58	158.34	1026.93	10000.00
300E476850137150	BLOW RIVER YT E-47	1	2	993.65	1036.62	-879.35	10100.81	139.96	150.61	1019.31	10000.00
300F186920133000	TUK F-18	3	0	3066.29	3109.57	-3045.87	30956.64	150.91	110.71	3196.79	7000.00
300F286930135450	ADGO F-28	2	0	1731.26	1735.84	-1706.51	17860.45	105.74	114.68	1812.25	6640.00
		4	0	1357.88	1365.50	-1302.35	13632.37	77.95	87.71	1380.30	6640.00
		5	0	1246.63	1258.82	-1193.23	12682.53	90.11	99.98	1283.34	6640.00
		8	0	1095.76	1101.85	-1042.36	10940.75	64.08	73.24	1106.44	6640.00
		10	0	1025.65	1031.44	-972.86	11081.57	147.10	157.10	1119.96	6640.00
300F306900134300	TUNUNUK F-30	4	0	2194.56	2203.70	-2154.33	22573.63	110.80	147.45	2265.13	14770.00
		5	2	1660.25	1668.48	-1617.88	15721.84	1.07	1.08	1574.19	14770.00
		6	0	896.11	905.26	-851.92	8475.32	12.29	12.29	864.21	14770.00
300F316830134450	NAPOIAK F-31	2	0	1347.22	1383.79	-1338.07	16411.77	314.86	335.40	1652.93	12372.00
		3	0	1159.46	1167.38	-1150.32	13074.93	168.4	182.90	1318.72	10572.00
		5	0	1231.39	1255.78	-1222.25	13794.08	170.34	184.30	1392.59	10000.00
		7	1	823.57	834.54	-814.43	8718.42	66.70	74.57	881.13	67060.00

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Pore Pressure (kPa)	Hydraulic Head Density corrected (m)	Hydraulic Head Fresh water (m)	Pressure Head (m)	Salinity (mg/L)
		7	2	823.57	834.54	-814.43	8773.48	72.24	80.18	886.67	67060.00
		8	0	692.81	713.23	-683.67	7535.17	78.06	84.68	761.73	67060.00
300F366910134300	REINDEER F-36	1	0	1167.69	1172.87	-1142.70	16161.92	492.19	505.30	1634.89	5418.00
		2	0	903.73	911.35	-876.91	8672.20	7.38	7.38	884.29	5418.00
		3	0	830.58	833.63	-806.20	8389.08	49.22	49.22	855.42	5418.00
		4	1	733.04	736.09	-705.92	6933.99	1.13	1.13	707.04	5418.00
		4	2	733.04	736.09	-705.92	7013.26	9.21	9.21	715.13	5418.00
		6	1	820.52	822.05	-799.79	7718.92	1.07	1.07	787.08	5418.00
		6	2	820.52	822.05	-799.79	7663.13	1.04	1.04	781.39	5418.00
		7	0	731.52	733.04	-705.61	7066.15	14.91	14.91	720.52	5418.00
		8	1	693.42	699.52	-667.82	6588.58	4.00	4.00	671.82	5418.00
		8	2	693.42	699.52	-667.82	6551.70	0.24	0.24	668.06	5418.00
		11	1	665.99	672.08	-637.64	6375.49	12.46	12.46	650.10	5418.00
		11	2	665.99	672.08	-637.64	6385.37	13.46	13.46	651.10	5418.00
		14	0	539.50	545.59	-509.93	5028.55	2.82	2.82	512.75	5418.00
300F386810135000	AKLAVIK F-38	1	0	1508.76	1516.38	-1502.05	16170.04	129.93	146.77	1631.98	10000.00
		2	0	1847.09	1928.47	-1502.05	16188.95	131.82	148.70	1633.87	10000.00
300F386900133150	KAMIK F-38	2	0	3190.34	3204.97	-3148.89	31332.69	77.32	46.03	3226.21	7000.00
300F406940135450	NETSERK F-40	1	0	4094.07	4101.08	-4079.50	79868.11	4020.94	4064.49	8100.44	6521.00
		3	0	4075.79	4081.88	-4057.25	78455.38	3907.54	3942.68	7964.79	6521.00
		4	0	4007.51	4021.53	-3990.50	74088.66	3552.17	3564.17	7542.67	6521.00
		6	1	1609.34	1615.44	-1596.60	17381.68	136.43	175.77	1733.03	22300.00
		6	3	1609.34	1615.44	-1596.60	16409.51	40.18	76.64	1636.78	22300.00
		7	1	1404.52	1413.66	-1391.78	14706.50	72.97	107.81	1464.75	23000.00
		7	2	1404.52	1413.66	-1391.78	14699.61	72.29	107.11	1464.07	23000.00
		7	4	1404.52	1413.66	-1391.78	14699.61	72.29	107.11	1464.07	23000.00
		8	1	1404.52	1413.66	-1392.08	14678.92	69.94	104.70	1462.02	23000.00
		8	2	1404.52	1413.66	-1392.08	14672.03	69.26	103.99	1461.34	23000.00
		9	0	1388.06	1390.50	-1369.53	14654.18	89.81	124.72	1459.34	23000.00
		13	0	1205.18	1211.28	-1190.00	12708.23	74.65	105.83	1264.65	23000.00
300F486930134000	KILAGMIOTAK F-48	1	0	2959.61	2969.67	-2937.36	32126.26	360.87	338.48	3298.23	6921.00
		10	0	3665.22	3671.32	-3606.39	60697.48	2531.25	2582.80	6137.62	6921.00
		11	0	3511.91	3568.29		52019.76	5303.10	5328.72	5278.72	6921.00
		12	0	3475.33	3568.29		51112.67	5212.32	5236.23	5187.94	6921.00
300G046900133450	EAST REINDEER G-04	5	2	1470.66	1475.23	-1420.06	13696.28	1.10	1.05	1372.10	18100.00
		8	0	3596.64	3733.80	-3537.51	35984.67	86.62	131.77	3624.13	35383.00
300G126920133150	WAGNARK G-12	2	0	1662.07	1668.17	-1612.09	16377.82	43.53	57.92	1655.62	12000.00
300G336930134450	TAGLU G-33	2	0	2488.39	2492.65	-2468.88	28766.99	446.73	464.42	2915.61	6640.00
		3	0	2552.40	2556.05	-2536.24	28902.27	402.43	410.86	2938.67	6640.00

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Pore Pressure (kPa)	Hydraulic Head Density corrected (m)	Hydraulic Head Fresh water (m)	Pressure Head (m)	Salinity (mg/L)
300H136830135300	BEAVER HOUSE CREEK H-13	3	1	361.19	403.86	-289.56	3896.93	111.44	107.80	401.00	7000.00
300H136830135300	BEAVER HOUSE CREEK H-13	3	2	361.19	403.86	-289.56	3847.27	106.34	102.74	395.90	7000.00
300H237010130000	RUSSELL H-23	3	0	1163.73	1172.87	-1154.83	13548.29	188.74	226.65	1343.57	25000.00
300H246920134450	TOAPOLOK H-24	3	0	1200.91	1266.14	-1188.42	12377.61	58.91	73.70	1247.33	9315.00
		6	0	2326.23	2330.81	-2295.45	23837.09	116.14	135.16	2411.59	9315.00
		7	0	2227.17	2237.84	-2197.30	23004.26	127.27	148.39	2324.57	9315.00
		8	0	2164.69	2169.26	-2143.96	22339.05	112.19	133.90	2256.15	9315.00
		9	0	2058.01	2062.58	-2043.07	21365.38	115.15	135.51	2158.22	9315.00
		10	0	1920.24	1924.81	-1899.51	19755.61	94.69	114.93	1994.20	9315.00
		11	0	1785.21	1792.83	-1764.79	18429.47	94.52	114.42	1859.31	9315.00
		12	0	1629.77	1634.34	-1610.56	16854.39	89.91	108.04	1700.47	9315.00
300H256950131450	ATKINSON H-25	1	0	1737.36	1755.65	-1735.53	17535.57		52.53	1716.74	36536.00
		4	0	1760.22	1770.89	-1756.26	17732.77		51.91	1736.18	36536.00
300H306920135150	NIGLINTGAK H-30	1	0	1030.22	1086.92	-1023.82	11570.77	147.63	156.02	1171.45	6640.00
		2	0	1906.52	2016.86	-1885.49	19890.83	144.09	142.74	2029.58	6640.00
300H346830130300	WOLVERINE H-34	1	0	1874.22	1896.47	-1730.05	18009.51	48.73	106.34	1778.78	25000.00
300H506950131300	NATAGNAK H-50	1	1	1871.47	1884.88	-1869.64	18870.93	10.37	54.59	1880.01	27500.00
300H506950131300	NATAGNAK H-50	1	2	1871.47	1884.88	-1869.64	18870.93	10.37	54.59	1880.01	27500.00
300H546930134450	TAGLU H-54	2	0	2578.61	2647.19	-2559.44	30108.99	503.86	510.70	3063.30	6640.00
		3	0	2520.70	2523.74	-2504.27	47660.28	2302.91	2355.54	4807.18	6640.00
		4	2	2487.78	2490.83	-2466.47	47731.75	2346.50	2400.64	4812.97	6640.00
		4	3	2487.78	2490.83	-2466.47	46600.93	2234.91	2285.33	4701.38	6640.00
		4	4	2487.78	2490.83	-2466.47	47802.65	2353.49	2407.86	4819.96	6640.00
		5	0	2469.49	2475.59	-2447.57	47272.23	2317.57	2372.68	4765.14	6640.00
300I176920134300	YA YA I-17	1	0	2366.77	2371.34	-2323.49	23336.45		56.08	2310.75	26370.00
		2	0	2031.49	2036.06	-1992.17	19912.04		38.22	1971.29	26370.00
300I226920135150	UNIPKAT I-22	3	0	3806.95	3816.10	-3781.35	68284.67	3181.49	3181.49	6962.84	8107.00
		4	0	3555.49	3561.59	-3523.49	62888.70	2867.35	2889.14	6390.84	8107.00
		5	0	3102.86	3118.71	-3078.48	55063.25	2509.16	2536.20	5587.64	8107.00
		7	0	2877.31	2891.03	-2865.12	52472.12	2453.39	2485.35	5318.51	8107.00
		8	0	2287.52	2311.91	-2273.50	40812.12	1854.11	1888.03	4127.61	8107.00
		9	0	2129.03	2135.12	-2114.70	36028.32	1530.07	1559.03	3644.77	8107.00
		10	0	1797.41	1810.51	-1773.02	20651.58	329.95	332.77	2102.97	8107.00
300I296930131150	KILINVAK I-29	1	1	1443.23	1485.90	-1433.78	15191.74	100.27	115.29	1534.05	10000.00
300I296930131150	KILINVAK I-29	1	2	1443.23	1485.90	-1433.78	14807.96	61.77	76.15	1495.55	10000.00
300J066850133450	OGEOQEOQ J-06	1	0	1792.53	1839.16	-1714.20	17347.63	44.18	54.70	1758.38	14000.00
300J066920135000	KUMAK J-06	1	0	591.92	731.52	-576.05	7306.77	169.01	169.01	745.06	27000.00
		2	0	2943.45	3159.25	-2905.03	53898.55	2445.43	2590.89	5350.46	27000.00
		4	0	2482.60	2493.26	-2453.92	25778.08	115.92	174.61	2569.84	27000.00

Table A2. (continued)

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Pore Pressure (kPa)	Hydraulic Head Density corrected (m)	Hydraulic Head Fresh water (m)	Pressure Head (m)	Salinity (mg/L)
		6	0	2365.55	2370.43	-2349.38	24677.94	108.08	166.98	2457.46	27000.00
		7	0	2306.12	2313.43	-2289.03	23724.36	72.65	130.09	2361.68	27000.00
		8	0	2148.23	2154.33	-2135.10	22349.26	86.54	143.80	2221.64	27000.00
		9	0	1894.03	1904.09	-1880.29	19647.35	69.07	123.11	1949.36	27000.00
		10	0	1356.66	1363.98	-1345.37	14727.02	110.52	156.31	1455.89	27000.00
300J176920136150	IKATTOK J-17	2	0	2198.22	2203.09	-2186.30	33819.10	1242.65	1262.17	3428.95	6640.00
		3	0	1534.06	1539.24	-1490.75	18771.22	408.37	423.31	1899.12	6640.00
300J176930132450	MAYOGIAK J-17	1	0	688.54	784.86	-659.28	6882.92	40.45	42.56	699.73	2000.00
		2	0	910.74	920.50	-881.48	9038.43	37.39	40.15	918.87	2000.00
		3	0	912.57	920.50	-882.70	8990.87	31.36	34.08	914.06	2000.00
		4	0	1155.19	1182.32	-1125.32	11364.89	29.53	33.53	1154.85	2000.00
		8	1	2863.60	2920.59	-2855.67	29115.16	103.84	113.14	2959.51	15000.00
		8	2	2863.60	2920.59	-2855.67	29103.90	102.72	112.00	2958.39	15000.00
		9	0	2932.48	2951.99	-2900.48	28927.82	42.37	49.23	2942.85	15000.00
300J266940134150	IVIK J-26	1	0	2898.65	2901.70	-2819.25	29788.13	160.65	218.18	2979.89	21150.00
		2	0	2855.98	2859.02	-2780.54	28089.11	28.30	83.65	2808.84	21150.00
		3	0	2780.39	2787.09	-2704.95	27740.97	63.06	123.73	2768.01	21150.00
		4	0	2771.24	2775.51	-2695.50	27697.04	66.60	128.71	2762.10	21150.00
		5	0	2681.33	2687.42	-2600.71	26347.22	27.09	85.86	2627.80	21150.00
		7	0	2573.43	2579.52	-2496.46	25540.83	45.48	107.88	2541.94	21150.00
		8	0	2545.08	2554.22	-2468.42	25455.11	65.78	127.18	2534.20	21150.00
		9	0	2479.85	2491.44	-2402.89	24390.12	24.16	84.12	2427.05	21150.00
		11	0	2479.85	2484.73	-2412.03	24391.10	15.00	75.08	2427.03	21150.00
		12	0	2488.69	2491.74	-2411.73	24368.21	13.34	73.05	2425.07	21150.00
		13	0	2473.76	2475.28	-2430.63	24312.03		48.42	2418.95	21150.00
		14	0	2465.22	2468.27	-2386.13	24174.02	18.94	78.84	2405.08	21150.00
		15	0	2393.29	2398.17	-2311.76	23464.19	19.09	80.83	2330.85	21150.00
		16	0	2346.96	2350.01	-2306.88	22991.85		37.55	2284.24	21150.00
		17	0	1315.52	1318.56	-1235.20	12549.79	12.63	44.47	1247.82	21150.00
300J276930135450	ADGO J-27	1	0	3065.07	3101.04	-3053.79	60593.59	2989.68	3124.81	6043.47	12000.00
300J296910133000	IMNAK J-29	1	0	3045.26	3081.22	-3027.46	30469.17	78.95	79.41	3106.41	8000.00
		3	0	2917.24	2993.14	-2898.34	30146.41	174.78	175.63	3073.12	7000.00
		4	0	2845.61	2848.66	-2825.50	28219.42	29.04	51.98	2854.54	14000.00
300J376930134300	MALLIK J-37	1	0	2683.46	2689.56	-2668.83	48365.94	2195.50	2262.94	4864.33	12000.00
300J947050133300	KENALOOAK J-94	1	0	4519.00	4532.80	-4498.50	79717.11	3400.90	3630.09	7899.40	22000.00
300K096900133300	PARSONS K-09	3	0	2834.64	2845.92	-2771.85	28987.42	198.39	183.94	2970.24	3460.00
		4	0	2980.94	3017.52	-2918.16	29458.76	105.45	85.68	3023.61	3043.10
300K266910135000	TITALIK K-26	4	0	2847.44	2866.34	-2831.59	41169.27	1387.22	1366.35	4218.81	6072.00
		5	0	2750.52	2756.61	-2710.59	39920.46	1379.06	1360.01	4089.66	6072.00

Table A2. (continued)

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Pore Pressure (kPa)	Hydraulic Head Density corrected (m)	Hydraulic Head Fresh water (m)	Pressure Head (m)	Salinity (mg/L)
		6	0	1767.84	1773.94	-1732.18	19146.49	225.53	220.14	1957.71	6072.00
		7	0	1680.06	1686.15	-1650.80	18250.61	214.47	210.18	1865.27	6072.00
		8	0	1632.51	1636.17	-1597.46	17236.03	160.95	160.06	1758.41	6072.00
		9	0	1569.72	1575.82	-1538.63	15445.61	34.67	36.33	1573.30	6072.00
		11	0	1457.55	1464.56	-1435.00	14361.04	27.05	29.36	1462.05	6072.00
		12	0	1197.86	1203.96	-1178.97	12158.91	56.27	60.85	1235.24	6072.00
300K316900135000	TULLUGAK K-31	1	0	2022.35	2050.08	-2015.49	20867.15	94.83	112.29	2110.32	15500.00
		3	0	2569.46	2599.33	-2560.78	27714.96	228.66	265.25	2789.44	21200.00
300K546940134150	IVIK K-54	2	0	2632.86	2638.96	-2588.36	26508.08	89.74	114.61	2678.10	7500.00
		3	0	2616.40	2620.06	-2569.16	26299.03	72.92	112.50	2642.08	7500.00
		5	0	2523.74	2526.79	-2482.90	25984.50	126.97	166.69	2609.87	7500.00
300K597030136000	NEKORALIK K-59	1	0	2695.04	2701.14	-2647.80	52359.52	2570.53	2691.19	5218.33	22300.00
		2	0	2651.76	2685.29	-2596.29	51916.75	2576.93	2697.55	5173.22	22300.00
		3	0	2607.56	2624.33	-2549.35	36509.36	1112.19	1173.43	3661.54	22300.00
		4	0	2563.37	2569.46	-2510.33	29499.53	455.54	497.67	2965.87	22300.00
		5	0	2429.26	2450.59	-2372.26	33970.64	1029.91	1091.65	3402.17	22300.00
		6	0	2374.39	2392.68	-2371.95	32700.59	902.23	962.45	3274.18	22300.00
		7	0	2258.57	2261.62	-2115.31	36049.86	1482.62	1560.62	3597.93	22300.00
300L246900135150	KUGPIK L-24	1	0	2484.73	2518.87	-2475.59	29710.93	550.15	553.97	3025.74	12400.00
		3	0	809.24	813.21	-798.58	8212.12	31.75	38.79	830.33	6640.00
		4	0	798.58	801.62	-789.43	8251.44	44.80	51.95	834.23	6640.00
300L246940134300	UNARK L-24	4	0	2740.15	2742.59	-2727.35	29607.58	237.73	291.67	2965.08	22000.00
		6	0	2719.73	2726.44	-2698.39	30111.49	315.83	372.01	3014.22	22000.00
		8	0	2204.92	2206.75	-2181.15	22173.42	33.17	79.83	2214.32	22000.00
		9	0	1773.94	1775.46	-1734.62	17529.34	11.72	52.81	1746.34	22000.00
300L306950133450	ARNAK L-30	1	0	4503.12	4514.09	-4488.94	70441.04	2549.83	2693.79	7038.77	26200.00
		3	0	4465.32	4469.89	-4449.62	79409.93	3429.41	3647.65	7879.03	26200.00
		6	0	4400.70	4408.02	-4381.65	78091.98	3367.59	3581.22	7749.24	26200.00
		8	0	3797.50	3912.41	-3875.07	70270.50	3088.16	3290.27	6963.23	26200.00
		9	0	3913.63	3928.87	-3893.06	61973.24	2278.19	2426.22	6171.25	26200.00
300L606900133150	KAMIK L-60	2	0	3047.39	3096.16	-2986.13	29362.74		7.93	2924.13	34500.00
300M137030135000	KOPANOAR M-13	4	0	3905.71	3921.86	-3845.64	67697.34	2935.28	3057.32	6780.92	22000.00
		5	0	3618.28	3630.47	-3571.93	62036.74	2642.25	2753.83	6214.18	22000.00
		6	0	3578.05	3590.24	-3549.99	62796.75	2732.71	2853.26	6282.70	22000.00
		7	0	3536.59	3555.49	-3510.18	61817.95	2676.89	2793.27	6187.07	22000.00
300M196920135150	NIGLINTGAK M-19	10	0	2106.17	2116.84	-2095.50	21846.54	125.58	132.14	2221.07	6640.00
		18	0	1758.70	1773.94	-1749.55	18619.53	135.42	149.04	1884.97	6640.00
		22	0	1324.36	1330.45	-1317.04	13792.91	74.27	89.39	1391.31	6640.00
300M266930132300	PIKIOLIK M-26	1	0	666.60	720.85	-649.53	6571.98	12.87	20.60	662.40	12000.00

Table A2. (continued)

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Pore Pressure (kPa)	Hydraulic Density corrected (m)	Head Fresh water (m)	Pressure Head (m)	Salinity (mg/L)
300M336950131450	ATKINSON M-33	4	0	1801.06	1809.29	-1773.63	17875.11		49.06	1772.29	27500.00
300M386930135150	UPLUK M-38	4	0	3683.81	3688.08	-3661.56	62602.09	2640.32	2721.84	6301.88	12000.00
300N106900133300	PARSONS N-10	3	0	2929.13	3204.97	-2857.20	29031.57	107.09	103.08	2964.29	18105.00
		4	0	2951.68	3204.97	-2856.59	28899.80	94.42	90.26	2951.01	18105.00
300N176900133300	PARSONS N-17	1	0	3135.48	3158.34	-3071.47	29928.92	1.09	1.07	3003.56	34500.00
300N466910134450	KIKOKALOK N-46	1	0	1420.37	1444.75	-1406.65	14813.29	90.91	103.82	1497.56	6070.00
		2	1	1196.04	1202.13	-1183.84	12238.07	52.47	64.04	1236.31	6070.00
		2	2	1196.04	1202.13	-1183.84	12247.34	53.40	64.99	1237.24	6070.00
		3	0	1124.71	1133.86	-1114.96	11539.25	50.94	61.67	1165.90	6070.00
		4	0	835.15	841.25	-831.49	8351.27	12.91	20.07	844.40	6070.00
		5	1	747.98	754.08	-739.75	7095.60	1.01	1.02	717.67	6070.00
		5	2	747.98	754.08	-739.75	7430.53	11.68	17.93	751.43	6070.00
		6	1	747.98	752.86	-735.18	6894.07	1.08	1.02	697.34	6070.00
300O146910135450	ELLICE O-14	7	1	1483.16	1498.40	-1480.72	15380.33	64.87	87.58	1545.59	12000.00
300O146910135450	ELLICE O-14	7	2	1483.16	1498.40	-1480.72	15313.24	58.17	80.74	1538.89	12000.00
300O196920132450	TUKTU O-19	1	0	1970.84	1994.31	-1943.71	22341.50	274.85	334.41	2218.56	19600.00
		4	0	2185.42	2203.70	-2156.16	21720.68	16.28	58.65	2172.44	19600.00
		8	0	2078.74	2097.02	-2049.48	21001.59	41.83	92.00	2091.31	19600.00
300O206850134450	KIPNIK O-20	1	0	1822.70	1831.85	-1812.04	18464.27	56.35	70.72	1868.39	12000.00
300O546920134450	TOAPOLOK O-54	1	0	2741.68	2776.73	-2681.92	39879.38	1361.49	1384.49	4043.41	6640.00
		3	0	1851.66	1857.76	-1836.40	18987.95	98.61	99.76	1935.01	6640.00
300P046930135300	GARRY P-04	1	0	3179.06	3182.11	-3176.63	34738.78	366.77	365.61	3543.40	12000.00
300P176930132450	MAYOGIAK P-17	3	0	912.57	920.50	-892.15	9024.56	1.32	28.07	893.47	2092.00
		12	1	2863.60	2920.59	-2856.89	29109.63	28.07	111.36	916.18	15299.00
		12	2	2863.60	2920.59	-2856.89	29095.85	111.36	109.95	2958.05	15299.00
		13	0	2932.48	2951.99	-2913.28	29121.20	56.15	56.15	2962.20	15299.00
300P216920133300	RED FOX P-21	1	0	1780.03	1810.51	-1750.16	17387.69		22.82	1739.47	12000.00
300P256930135450	ADGO P-25	1	1	1756.26	1798.32	-1746.29	18713.04	44.46	161.84	1790.75	6640.00
300P256930135450	ADGO P-25	1	2	1756.26	1798.32	-1746.29	18721.77	153.72	162.72	1900.00	6640.00
		2	0	1343.56	1352.70	-1291.22	14028.21	129.04	139.21	1420.26	6640.00
		3	0	1308.51	1313.08	-1252.51	13064.20	69.97	79.62	1322.48	6640.00
		4	0	1285.65	1290.52	-1233.01	12203.50	2.54	11.36	1235.55	6640.00
		5	0	1268.88	1273.45	-1214.11	12805.61	81.55	91.65	1295.66	6640.00
		6	0	1085.70	1094.84	-1030.62	11778.25	159.39	170.38	1190.01	6640.00
		8	0	1011.94	1018.03	-955.34	10449.33	100.23	110.15	1055.56	6640.00
		9	0	796.44	802.54	-740.15	8099.35	78.15	85.72	818.31	6640.00
		11	0	745.24	751.33	-689.85	8610.69	188.17	188.16	878.02	6640.00
		12	0	705.61	708.66	-649.92	8520.61	218.91	218.91	868.83	6640.00
300P416900133300	PARSONS P-41	2	0	3019.96	3026.05	-2942.84	29407.53	43.25	55.78	2986.09	25000.00

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Pore Pressure (kPa)	Hydraulic Head Density corrected (m)	Hydraulic Head Fresh water (m)	Pressure Head (m)	Salinity (mg/L)
300P536900133300	PARSONS P-53	2	0	3193.69	3297.94	-3135.48	33664.79	327.68	297.24	3463.16	25000.00
		3	0	2987.04	3002.28	-2926.69	29510.91	79.24	82.48	3005.93	19461.00
		7	2	3276.60	3435.10	-3230.58	32357.13	110.30	68.81	3340.88	25190.00
		11	0	1382.27	1386.84	-1333.50	16297.58	295.68	328.32	1629.18	15000.00
300P536920134300	YA-YA P-53	3	0	2437.79	2445.11	-2387.50	24962.31	187.65	157.85	2575.15	7898.00
		9	0	1948.89	1954.99	-1900.43	19113.13	43.56	48.49	1943.99	7898.00
		10	0	1914.75	1920.85	-1862.33	19872.46	157.19	164.02	2019.45	7898.00
		12	0	1872.08	1878.18	-1823.62	18859.59	94.27	99.45	1917.90	7898.00
		14	0	1915.97	1917.50	-1855.62	20921.40	258.87	277.69	2114.48	7898.00
		17	0	1836.12	1842.21	-1785.82	19893.24	242.65	242.65	2006.59	7898.00
		18	0	1829.41	1842.21	-1776.37	18128.52	72.16	72.16	1829.18	7898.00
		19	0	1776.37	1782.47	-1719.07	17548.81	70.35	70.35	1770.36	7898.00
		20	0	1776.37	1782.47	-1717.85	22686.63	413.22	595.46	2131.07	7898.00

Table A3.

Intrinsic permeability, porosity, total compressibility and gas parameters from drillstem tests, Beaufort-Mackenzie basin

NOTES:

This table is based on information entered into the Basin Analysis Group data base at 1988-03-31. The data are ordered by well number (A-01 to P-53) and drillstem test number. This information, plus the unique identifier of the well number and location, allows cross-reference to additional drillstem test computations in Table A2. Where interpretation has been made of both the initial (1) and final (2) phase this is so indicated. The intrinsic permeability, k, was determined directly from the digitized drillstem test chart. The porosity, n, of the rock matrix, the total compressibility, C_T, of the (rock+fluid) system, and the gas viscosity and Z factor are taken directly from the drillstem test reports.

Table A3. Intrinsic permeability, porosity, total compressibility and gas parameters from drillstem tests, Beaufort-Mackenzie basin

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Ga Z fac
300A016850134000	EAST REINDEER A-01	4	0	2882.80	2954.43	-2687.42	$3.682x10^{-18}$	0.150	$0.101x10^{-5}$		
		5	0	2490.22	2504.24	-2293.92		0.150	$0.634x10^{-6}$		
		8	0	2080.56	2093.98	-1891.28	$7.449x10^{-14}$				
300A066930134300	MALLIK A-06	1	0	3998.67	4001.72	-3939.11	$4.262x10^{-15}$				
		2	0	3948.68	3954.78	-3893.70	$1.955x10^{-14}$				
		3	0	3824.02	3827.07	-3769.03	$5.414x10^{-16}$				
		6	0	2937.97	2942.54	-2849.15	$1.835x10^{-15}$				
		7	0	2855.37	2861.46	-2773.56	$9.838x10^{-16}$				
		8	0	2706.62	2715.77	-2617.81	$2.432x10^{-17}$				
		10	0	2616.71	2649.93	-2528.50	$7.690x10^{-18}$				
		11	0	2524.66	2530.75	-2463.27	$1.077x10^{-16}$				
		12	0	2350.62	2356.71	-2291.67	$1.787x10^{-16}$				
300A126910133300	SIKU A-12	1	0	2959.00	2968.14	-2888.89		0.120	$0.858x10^{-5}$	$1.900x10^{-5}$	0.8
		2	0	2880.36	2886.46	-2808.12	$7.249x10^{-13}$	0.150	$0.152x10^{-4}$	$1.900x10^{-5}$	0.85
		3	0	2833.12	2836.47	-2763.62	$5.297x10^{-17}$	0.090	$0.116x10^{-5}$	$3.500x10^{-4}$	
		4	0	2718.21	2724.91	-2677.06	$4.742x10^{-14}$	0.080	$0.299x10^{-4}$	$1.900x10^{-5}$	0.85
		5	0	2701.44	2708.45	-2625.24	$2.589x10^{-13}$	0.130	$0.282x10^{-4}$	$1.900x10^{-5}$	0.85
		6	0	2658.47	2663.95	-2587.14	$1.097x10^{-16}$	0.080	$0.120x10^{-5}$	$4.000x10^{-4}$	
300A257000136150	TARSIUT A-25	5	0	1800.00	1810.00	-1780.50	$4.025x10^{-16}$				
		6	0	1500.00	1514.00	-1429.10	$1.011x10^{-15}$				

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Z	Gas fact
300A286920134300	YAYA A-28	1	0	3444.85	3587.80	-3386.02	5.287×10^{-18}	0.120	0.107×10^{-5}	4.000×10^{-4}		
		2	1	2451.81	2455.16	-2395.12		0.150	0.408×10^{-4}	1.500×10^{-5}		0.90
		2	2	2451.81	2455.16	-2395.12		0.150	0.408×10^{-4}	1.500×10^{-5}		0.90
		3	0	2406.70	2410.36	-2360.37	6.405×10^{-14}	0.190	0.986×10^{-6}	6.400×10^{-4}		
		7	0	2055.57	2059.84	-1986.08		0.200	0.352×10^{-4}	2.100×10^{-5}		0.88
		8	0	1959.86	1967.79	-1903.48		0.130	0.507×10^{-4}	2.100×10^{-5}		0.88
		9	1	1914.75	1919.33	-1851.96		0.120	0.672×10^{-4}	2.100×10^{-5}		0.88
		9	2	1914.75	1919.33	-1851.96		0.120	0.672×10^{-4}	2.100×10^{-5}		0.88
		10	0	1874.52	1879.09	-1813.26	6.925×10^{-16}	0.150	0.238×10^{-4}	2.100×10^{-5}		0.88
		11	0	1858.67	1863.24	-1785.21	7.208×10^{-15}	0.130	0.445×10^{-4}	2.100×10^{-5}		0.88
		12	0	1851.66	1856.23	-1790.70	7.206×10^{-16}	0.240	0.582×10^{-4}	2.100×10^{-5}		0.88
		13	0	1821.48	1825.14	-847.04		0.120	0.404×10^{-4}	2.100×10^{-5}		0.88
		14	1	1783.08	1787.65	-1723.03						
		15	1	1767.23	1771.80	-1700.48						
300A416910134300	REINDEER A-41	2	0	1717.55	1828.80	-1690.12	5.690×10^{-16}					
		3	1	971.70	976.58	-926.29	1.981×10^{-13}					
		3	2	971.70	976.58	-926.29	2.331×10^{-12}					
		4	1	875.08	879.65	-838.66	6.466×10^{-14}					
		4	2	875.08	879.65	-838.66						
		5	1	771.75	777.24	-732.86	1.313×10^{-13}					
		5	2	771.75	777.24	-732.86						
		6	0	713.23	718.72	-668.43	1.396×10^{-13}					
300A556950131450	ATKINSON A-55	4	0	1988.82	2007.11	-1995.71	5.890×10^{-15}					
300B116850135150	UNAK B-11	1	0	1541.37	1546.86	-1538.54	5.170×10^{-13}					
		2	0	1181.10	1185.67	-1172.78	5.401×10^{-14}					
300B196920135150	NIGLINTGAK B-19	1	0	1225.30	1254.25	-1171.96	8.606×10^{-14}					
		2	0	3076.65	3088.84	-3065.37	8.498×10^{-17}					

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z facto
300B446940135450	NETSERK B-44	2	0	3273.25	3305.56	-3258.95					
		4	0	3258.92	3271.11	-3238.53	6.659×10^{-18}				
		5	0	3149.80	3158.95	-3132.46	1.552×10^{-16}				
		6	0	2877.92	2890.11	-2859.97	1.394×10^{-17}				
		7	0	2877.92	2890.11	-2830.71	6.830×10^{-17}				
300C216930135150	UPLUK C-21	3	0	1492.61	1501.75	-1458.16	3.883×10^{-13}				
		7	0	1138.12	1147.27	-1105.51	1.550×10^{-14}				
300C386850133300	REINDEER C-38	1	1	1154.58	1167.38	-1084.17	4.432×10^{-14}				
300C386850133300	REINDEER C-38	1	2	1154.58	1167.38	-1084.17					
300C426930134450	TAGLU C-42	2	0	3311.65	3317.75	-3292.39	1.572×10^{-17}				
		3	0	3267.76	3272.33	-3254.29	1.400×10^{-14}				
		4	0	3233.93	3236.98	-3216.80	9.478×10^{-15}				
		5	0	3194.30	3197.35	-3179.00	1.737×10^{-13}				
		6	1	3169.92	3176.02	-3150.35	2.572×10^{-16}				
		6	2	3169.92	3176.02	-3150.35	6.315×10^{-16}				
		7	0	2957.17	2960.22	-2940.65	1.331×10^{-12}				
		8	0	2926.08	2932.18	-2911.69	2.314×10^{-13}				
		9	1	2901.09	2907.18	-2881.82	4.202×10^{-14}				
		10	0	2888.28	2891.33	-2872.37	6.288×10^{-12}				
		11	0	2880.36	2883.41	-2862.62	5.163×10^{-12}				
		12	0	2866.64	2872.44	-2842.50	2.077×10^{-11}				
300D206900133300	PARSONS D-20	1	0	3708.81	3714.90	-3621.63		0.130	0.320×10^{-4}		
		3	0	3596.03	3602.13	-3508.55		0.110	0.337×10^{-4}		
		7	0	3444.24	3450.34	-3365.91		0.130	0.242×10^{-4}		
300D276910134300	REINDEER D-27	11	0	3401.57	3425.95	-3372.32	5.725×10^{-16}				
300D296940132150	KIMIK D-29	1	0	2610.31	2628.60	-2585.92	4.611×10^{-16}				

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z fact
300D486900133150	KAMIK D-48	1	0	2888.89	2897.12	-2845.61	$1.351x10^{-15}$	0.125	$0.104x10^{-5}$	$3.400x10^{-4}$	
		2	0	2871.83	2877.92	-2830.07	$3.864x10^{-13}$	0.120	$0.224x10^{-5}$		
		3	0	2864.21	2866.03	-2824.28	$1.442x10^{-13}$	0.088	$0.216x10^{-5}$		
		4	0	2855.98	2858.41	-2813.61	$4.015x10^{-14}$	0.088	$0.116x10^{-5}$	$3.000x10^{-4}$	
300D546830133300	INUVIK D-54	1	0	704.09	719.33	-663.85	$1.028x10^{-13}$				
300D556930134450	TAGLU D-55	5	0	3657.60	3660.65	-3647.30	$2.464x10^{-17}$				
		6	0	3587.50	3590.54	-1765.46	$2.517x10^{-16}$				
		7	0	3561.28	3573.48	-3541.84					
		9	0	3514.34	3520.44	-3491.35	$5.326x10^{-16}$				
		13	0	3218.69	3221.74	-3192.23	$4.713x10^{-14}$				
		14	0	3191.26	3194.30	-3170.90	$1.385x10^{-14}$				
		17	0	3168.40	3174.49	-3018.50	$7.982x10^{-15}$				
300D586900133150	KAMIK D-58	1	0	2990.09	2996.18	-2935.83	$5.890x10^{-14}$	0.085	$0.116x10^{-5}$	$2.800x10^{-4}$	
		2	0	2923.03	2929.13	-2870.00	$5.897x10^{-17}$	0.065	$0.127x10^{-5}$	$3.000x10^{-4}$	
		3	0	2913.89	2920.59	-2860.24		0.090	$0.116x10^{-5}$		
		4	0	2913.89	2920.59	-2860.24	$3.390x10^{-17}$	0.090	$0.448x10^{-4}$	$1.500x10^{-5}$	0.890
		5	0	2860.24	2868.78	-2811.17	$9.012x10^{-15}$	0.105	$0.361x10^{-4}$	$1.500x10^{-5}$	0.900
		6	0	2844.39	2851.10	-2791.66	$8.882x10^{-15}$	0.050	$0.137x10^{-5}$	$3.000x10^{-4}$	
300E176950134150	PULLEN E-17	2	0	3560.06	3566.16	-3542.08	$4.603x10^{-15}$				
		4	0	3539.34	3545.43	-3521.35	$1.872x10^{-15}$				
300E416940132300	ATERTAK E-41	1	0	1364.28	1367.94	-1335.33	$1.442x10^{-14}$				
		2	0	1357.58	1362.46	-1336.24	$6.431x10^{-15}$				
		5	0	1261.87	1267.97	-1233.22	$3.243x10^{-15}$				
		7	0	1238.71	1244.80	-1214.02	$1.525x10^{-14}$				
		10	0	1216.76	1244.80	-1189.63	$3.308x10^{-17}$				
300E476850137150	BLOW RIVER YT E-47	1	1	993.65	1036.62	-879.35	$3.245x10^{-15}$				
300E476850137150	BLOW RIVER YT E-47	1	2	993.65	1036.62	-879.35					
300F186920133000	TUK F-18	3	0	3066.29	3109.57	-3045.87	$4.108x10^{-15}$				

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z fact
300F286930135450	ADGO F-28	2	0	1731.26	1735.84	-1706.51	$4.463x10^{-14}$				
		4	0	1357.88	1365.50	-1302.35	$2.904x10^{-14}$				
		5	0	1246.63	1258.82	-1193.23	$5.426x10^{-14}$				
		8	0	1095.76	1101.85	-1042.36	$9.356x10^{-13}$				
		10	0	1025.65	1031.44	-972.86	$2.994x10^{-14}$				
300F306900134300	TUNUNUK F-30	4	0	2194.56	2203.70	-2154.33	$1.590x10^{-14}$	0.120			
		5	2	1660.25	1668.48	-1617.88	$2.609x10^{-15}$	0.140			
		6	0	896.11	905.26	-851.92	$2.268x10^{-12}$	0.240			
300F316830134450	NAPOIAK F-31	2	0	1347.22	1383.79	-1338.07	$5.127x10^{-16}$	0.050	$0.137x10^{-5}$	$6.500x10^{-4}$	
		3	0	1159.46	1167.38	-1150.32	$3.058x10^{-14}$	0.090	$0.116x10^{-5}$	$7.100x10^{-4}$	
		5	0	1231.39	1255.78	-1222.25	$5.643x10^{-16}$	0.090	$0.116x10^{-5}$	$7.100x10^{-4}$	
		6	0	868.07	890.02	-858.93		0.145	$0.104x10^{-5}$		
		7	1	823.57	834.54	-814.43	$2.274x10^{-14}$	0.185	$0.986x10^{-6}$	$9.200x10^{-4}$	
		7	2	823.57	834.54	-814.43	$1.895x10^{-13}$	0.185	$0.986x10^{-6}$	$9.200x10^{-4}$	
		8	0	692.81	713.23	-683.67	$3.245x10^{-16}$	0.090	$0.116x10^{-5}$	$9.400x10^{-4}$	
300F366910134300	REINDEER F-36	1	0	1167.69	1172.87	-1142.70	$1.908x10^{-16}$	0.150	$0.122x10^{-3}$	$1.500x10^{-5}$	0.850
		2	0	903.73	911.35	-876.91	$1.705x10^{-14}$	0.150	$0.104x10^{-5}$	$1.140x10^{-3}$	
		3	0	830.58	833.63	-806.20	$1.636x10^{-15}$				
		4	1	733.04	736.09	-705.92	$6.539x10^{-15}$	0.150	$0.104x10^{-5}$	$1.230x10^{-3}$	
		4	2	733.04	736.09	-705.92	$3.889x10^{-14}$	0.150	$0.104x10^{-5}$	$1.230x10^{-3}$	
		6	1	820.52	822.05	-799.79	$3.542x10^{-15}$				
		6	2	820.52	822.05	-799.79	$8.786x10^{-14}$				
		7	0	731.52	733.04	-705.61	$4.903x10^{-15}$	0.150	$0.104x10^{-5}$	$1.470x10^{-3}$	
		8	1	693.42	699.52	-667.82	$1.548x10^{-15}$	0.150	$0.104x10^{-5}$	$1.178x10^{-3}$	
		8	2	693.42	699.52	-667.82	$4.007x10^{-14}$	0.150	$0.104x10^{-5}$	$1.178x10^{-3}$	
		10	0	693.42	699.52	-667.82		0.150	$0.104x10^{-5}$		

Table A3. continued

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z factor
		11	1	665.99	672.08	-637.64	$2.158x10^{-15}$	0.150	$0.104x10^{-5}$	$1.680x10^{-3}$	
		11	2	665.99	672.08	-637.64	$1.525x10^{-14}$	0.150	$0.104x10^{-5}$	$1.680x10^{-3}$	
		13	0	630.94	633.98	-608.38	$6.633x10^{-14}$	0.150	$0.104x10^{-5}$	$1.610x10^{-3}$	
		14	0	539.50	545.59	-509.93	$6.850x10^{-14}$	0.200	$0.104x10^{-5}$	$1.790x10^{-3}$	
300F386810135000	AKLAVIK F-38	1	0	1508.76	1516.38	-1502.05	$2.805x10^{-14}$	0.150	$0.101x10^{-5}$	$4.800x10^{-4}$	
		2	0	1847.09	1928.47	-1502.05	$2.809x10^{-15}$	0.150	$0.101x10^{-5}$		
300F386900133150	KAMIK F-38	2	0	3190.34	3204.97	-3148.89	$1.219x10^{-14}$	0.080	$0.120x10^{-5}$	$3.500x10^{-4}$	
		3	0	3105.30	3110.79	-3065.37		0.070	$0.124x10^{-5}$		
300F406940135450	NETSERK F-40	1	0	4094.07	4101.08	-4079.50	$1.592x10^{-18}$				
		3	0	4075.79	4081.88	-4057.25	$5.954x10^{-18}$				
		4	0	4007.51	4021.53	-3990.50	$4.620x10^{-16}$				
		6	1	1609.34	1615.44	-1596.60					
		6	3	1609.34	1615.44	-1596.60					
		7	1	1404.52	1413.66	-1391.78					
		7	2	1404.52	1413.66	-1391.78					
		7	4	1404.52	1413.66	-1391.78					
		8	1	1404.52	1413.66	-1392.08					
		8	2	1404.52	1413.66	-1392.08					
		9	0	1388.06	1390.50	-1369.53					
		13	0	1205.18	1211.28	-1190.00	$3.083x10^{-15}$				
300F486930134000	KILAGMIOTAK F-48	1	0	2959.61	2969.67	-2937.36	$1.295x10^{-13}$				
		10	0	3665.22	3671.32	-3606.39	$1.902x10^{-14}$	0.160	$0.101x10^{-6}$	0.250 ?	
		11	0	3511.91	3568.29		$2.082x10^{-14}$				
		12	0	3475.33	3568.29		$1.618x10^{-15}$				
300G046900133450	EAST REINDEER G-04	5	2	1470.66	1475.23	-1420.06	$2.316x10^{-15}$				
		8	0	3596.64	3733.80	-3537.51	$2.223x10^{-15}$	0.050	$0.136x10^{-5}$		
300G126920133150	WAGNARK G-12	2	0	1662.07	1668.17	-1612.09	$1.246x10^{-14}$				

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z fact
300G336930134450	TAGLU G-33	2	0	2488.39	2492.65	-2468.88	$7.630x10^{-11}$				
		3	0	2552.40	2556.05	-2536.24	$1.949x10^{-13}$				
300H136830135300	BEAVER HOUSE CREEK H-13	3	1	361.19	403.86	-289.56	$1.457x10^{-14}$				
300H136830135300	BEAVER HOUSE CREEK H-13	3	2	361.19	403.86	-289.56					
300H237010130000	RUSSELL H-23	3	0	1163.73	1172.87	-1154.83					
300H246920134450	TOAPOLOK H-24	3	0	1200.91	1266.14	-1188.42	$1.356x10^{-14}$				
		6	0	2326.23	2330.81	-2295.45	$3.150x10^{-14}$	0.200	$0.971x10^{-6}$		
		7	0	2227.17	2237.84	-2197.30	$2.122x10^{-15}$	0.140	$0.104x10^{-5}$		
		8	0	2164.69	2169.26	-2143.96	$1.024x10^{-14}$	0.150	$0.101x10^{-6}$		
		9	0	2058.01	2062.58	-2043.07	$1.334x10^{-14}$	0.150	$0.493x10^{-6}$		
		10	0	1920.24	1924.81	-1899.51	$1.423x10^{-14}$	0.150	$0.942x10^{-6}$		
		11	0	1785.21	1792.83	-1764.79	$1.113x10^{-14}$	0.220	$0.942x10^{-6}$		
		12	0	1629.77	1634.34	-1610.56	$2.085x10^{-15}$	0.170	$0.971x10^{-6}$		
300H256950131450	ATKINSON H-25	1	0	1737.36	1755.65	-1735.53	$6.226x10^{-14}$				
		4	0	1760.22	1770.89	-1756.26	$2.686x10^{-14}$				
300H306920135150	NIGLINTGAK H-30	1	0	1030.22	1086.92	-1023.82	$4.924x10^{-16}$				
		2	0	1906.52	2016.86	-1885.49					
300H346830130300	WOLVERINE H-34	1	0	1874.22	1896.47	-1730.05	$8.439x10^{-16}$				
300H506950131300	NATAGNAK H-50	1	1	1871.47	1884.88	-1869.64					
300H506950131300	NATAGNAK H-50	1	2	1871.47	1884.88	-1869.64					
300H546930134450	TAGLU H-54	2	0	2578.61	2647.19	-2559.44	$5.692x10^{-14}$				
		3	0	2520.70	2523.74	-2504.27	$8.097x10^{-14}$				
		4	2	2487.78	2490.83	-2466.47	$6.414x10^{-14}$				
		4	3	2487.78	2490.83	-2466.47					
		4	4	2487.78	2490.83	-2466.47	$1.472x10^{-14}$				
		5	0	2469.49	2475.59	-2447.57	$2.288x10^{-14}$				
300I176920134300	YA YA I-17	1	0	2366.77	2371.34	-2323.49	$1.044x10^{-14}$				
		2	0	2031.49	2036.06	-1992.17	$8.827x10^{-15}$	0.149	$0.102x10^{-5}$	$6.800x10^{-4}$	

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z fact
300I226920135150	UNIPKAT I-22	3	0	3806.95	3816.10	-3781.35					
		4	0	3555.49	3561.59	-3523.49					
		5	0	3102.86	3118.71	-3078.48	$2.301x10^{-15}$				
		7	0	2877.31	2891.03	-2865.12	$8.385x10^{-17}$				
		8	0	2287.52	2311.91	-2273.50	$3.391x10^{-16}$				
		9	0	2129.03	2135.12	-2114.70	$3.696x10^{-17}$				
		10	0	1797.41	1810.51	-1773.02					
300I296930131150	KILINVAK I-29	1	1	1443.23	1485.90	-1433.78	$1.371x10^{-16}$				
300I296930131150	KILINVAK I-29	1	2	1443.23	1485.90	-1433.78	$1.872x10^{-15}$				
300J066850133450	OGEOQEOQ J-06	1	0	1792.53	1839.16	-1714.20	$1.916x10^{-14}$	0.055	$0.134x10^{-5}$	$4.800x10^{-4}$	
300J066920135000	KUMAK J-06	1	0	591.92	731.52	-576.05	$5.130x10^{-20}$			$1.400x10^{-5}$	0.850
		2	0	2943.45	3159.25	-2905.03	$5.425x10^{-18}$				
		4	0	2482.60	2493.26	-2453.92	$1.821x10^{-16}$				
		6	0	2365.55	2370.43	-2349.38	$2.262x10^{-14}$				
		7	0	2306.12	2313.43	-2289.03	$4.779x10^{-14}$	0.140	$0.116x10^{-5}$		
		8	0	2148.23	2154.33	-2135.10	$2.897x10^{-14}$	0.170	$0.100x10^{-5}$		
		9	0	1894.03	1904.09	-1880.29	$6.361x10^{-14}$				
		10	0	1356.66	1363.98	-1345.37	$8.395x10^{-15}$				
300J176920136150	IKATTOK J-17	2	0	2198.22	2203.09	-2186.30	$2.517x10^{-15}$				
		3	0	1534.06	1539.24	-1490.75	$1.462x10^{-14}$				
300J176930132450	MAYOGIAK J-17	1	0	688.54	784.86	-659.28					
		2	0	910.74	920.50	-881.48					
		3	0	912.57	920.50	-882.70	$4.355x10^{-15}$				
		4	0	1155.19	1182.32	-1125.32	$1.816x10^{-14}$				
		8	1	2863.60	2920.59	-2855.67					
		8	2	2863.60	2920.59	-2855.67					
		9	0	2932.48	2951.99	-2900.48	$2.305x10^{-15}$				

Table A3. continued

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z factor
300J266940134150	IVIK J-26	1	0	2898.65	2901.70	-2819.25	$2.231x10^{-14}$				
		2	0	2855.98	2859.02	-2780.54	$5.356x10^{-15}$				
		3	0	2780.39	2787.09	-2704.95	$5.782x10^{-16}$				
		4	0	2771.24	2775.51	-2695.50	$5.918x10^{-16}$				
		5	0	2681.33	2687.42	-2600.71	$6.938x10^{-14}$				
		7	0	2573.43	2579.52	-2496.46	$6.530x10^{-15}$				
		8	0	2545.08	2554.22	-2468.42	$2.042x10^{-15}$				
		9	0	2479.85	2491.44	-2402.89					
		11	0	2479.85	2484.73	-2412.03					
		12	0	2488.69	2491.74	-2411.73	$1.177x10^{-15}$				
		13	0	2473.76	2475.28	-2430.63	$8.145x10^{-15}$				
		14	0	2465.22	2468.27	-2386.13					
		15	0	2393.29	2398.17	-2311.76	$3.014x10^{-14}$				
		16	0	2346.96	2350.01	-2306.88	$1.810x10^{-12}$				
		17	0	1315.52	1318.56	-1235.20					
300J276930135450	ADGO J-27	1	0	3065.07	3101.04	-3053.79					
300J296910133000	IMNAK J-29	1	0	3045.26	3081.22	-3027.46	$4.285x10^{-15}$				
		3	0	2917.24	2993.14	-2898.34	$3.172x10^{-17}$				
		4	0	2845.61	2848.66	-2825.50	$1.801x10^{-13}$				
300J376930134300	MALLIK J-37	1	0	2683.46	2689.56	-2668.83	$7.958x10^{-16}$				
300J947050133300	KENALOOAK J-94	1	0	4519.00	4532.80	-4498.50					
300K096900133300	PARSONS K-09	3	0	2834.64	2845.92	-2771.85	$2.011x10^{-13}$	0.150	$0.292x10^{-4}$	$3.500x10^{-5}$	
		4	0	2980.94	3017.52	-2918.16	$1.644x10^{-14}$	0.150	$0.104x10^{-5}$	$3.000x10^{-4}$	
300K266910135000	TITALIK K-26	4	0	2847.44	2866.34	-2831.59	$9.262x10^{-20}$	0.150	$0.415x10^{-4}$	$1.500x10^{-5}$	0.850
		5	0	2750.52	2756.61	-2710.59	$1.367x10^{-19}$	0.150	$0.364x10^{-4}$	$1.500x10^{-5}$	0.850
		6	0	1767.84	1773.94	-1732.18	$7.143x10^{-15}$	0.150	$0.509x10^{-4}$	$1.500x10^{-5}$	0.850
		7	0	1680.06	1686.15	-1650.80	$3.512x10^{-18}$	0.150	$0.576x10^{-4}$	$1.500x10^{-5}$	0.850
		8	0	1632.51	1636.17	-1597.46	$5.539x10^{-14}$	0.150	$0.102x10^{-5}$	$5.500x10^{-4}$	

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z fact
		9	0	1569.72	1575.82	-1538.63	$7.253x10^{-15}$	0.150	$0.102x10^{-5}$	$5.500x10^{-4}$	
		10	0	1544.73	1550.82	-1520.95		0.150	$0.102x10^{-5}$		
		11	0	1457.55	1464.56	-1435.00	$3.551x10^{-13}$	0.150	$0.102x10^{-5}$	$5.600x10^{-4}$	
		12	0	1197.86	1203.96	-1178.97	$1.368x10^{-12}$				
300K316900135000	TULLUGAK K-31	1	0	2022.35	2050.08	-2015.49	$2.539x10^{-15}$				
		3	0	2569.46	2599.33	-2560.78	$1.026x10^{-15}$				
300K546940134150	IVIK K-54	2	0	2632.86	2638.96	-2588.36	$8.082x10^{-15}$				
		3	0	2616.40	2620.06	-2569.16	$2.584x10^{-14}$				
		5	0	2523.74	2526.79	-2482.90	$8.346x10^{-15}$				
300K597030136000	NEKORALIK K-59	1	0	2695.04	2701.14	-2647.80	$6.299x10^{-16}$				
		2	0	2651.76	2685.29	-2596.29	$1.894x10^{-16}$				
		3	0	2607.56	2624.33	-2549.35	$1.095x10^{-15}$				
		4	0	2563.37	2569.46	-2510.33	$6.950x10^{-16}$				
		5	0	2429.26	2450.59	-2372.26	$1.495x10^{-16}$				
		6	0	2374.39	2392.68	-2371.95	$8.433x10^{-16}$				
		7	0	2258.57	2261.62	-2115.31					
300L246900135150	KUGPIK L-24	1	0	2484.73	2518.87	-2475.59	$1.045x10^{-16}$				
		3	0	809.24	813.21	-798.58	$3.960x10^{-13}$				
		4	0	798.58	801.62	-789.43	$3.257x10^{-14}$				
300L246940134300	UNARK L-24	4	0	2740.15	2742.59	-2727.35	$7.635x10^{-16}$				
		6	0	2719.73	2726.44	-2698.39	$6.784x10^{-16}$				
		8	0	2204.92	2206.75	-2181.15	$1.325x10^{-12}$				
		9	0	1773.94	1775.46	-1734.62	$4.682x10^{-13}$				
300L306950133450	ARNAK L-30	1	0	4503.12	4514.09	-4488.94					
		3	0	4465.32	4469.89	-4449.62					
		6	0	4400.70	4408.02	-4381.65					
		8	0	3797.50	3912.41	-3875.07					
		9	0	3913.63	3928.87	-3893.06					

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z factor
300L606900133150	KAMIK L-60	2	0	3047.39	3096.16	-2986.13	4.285×10^{-15}				
300M137030135000	KOPANOAR M-13	4	0	3905.71	3921.86	-3845.64	5.891×10^{-14}				
		5	0	3618.28	3630.47	-3571.93	1.963×10^{-15}				
		6	0	3578.05	3590.24	-3549.99	4.252×10^{-15}				
		7	0	3536.59	3555.49	-3510.18	6.767×10^{-16}				
300M196920135150	NIGLINTGAK M-19	10	0	2106.17	2116.84	-2095.50	9.727×10^{-14}	0.150			
		18	0	1758.70	1773.94	-1749.55	2.871×10^{-16}				
		22	0	1324.36	1330.45	-1317.04	1.117×10^{-15}	0.230			
300M266930132300	PIKIOLIK M-26	1	0	666.60	720.85	-649.53	3.107×10^{-15}				
300M336950131450	ATKINSON M-33	4	0	1801.06	1809.29	-1773.63	8.420×10^{-15}				
300M386930135150	UPLUK M-38	4	0	3683.81	3688.08	-3661.56	1.770×10^{-14}				
300N106900133300	PARSONS N-10	3	0	2929.13	3204.97	-2857.20	3.046×10^{-14}				
		4	0	2951.68	3204.97	-2856.59	1.696×10^{-14}				
300N176900133300	PARSONS N-17	1	0	3135.48	3158.34	-3071.47	1.464×10^{-14}	0.135	0.105×10^{-5}		
300N466910134450	KIKOKALOK N-46	1	0	1420.37	1444.75	-1406.65	5.690×10^{-16}	0.100	0.113×10^{-5}	7.000×10^{-4}	
		2	1	1196.04	1202.13	-1183.84	1.085×10^{-14}	0.180	0.986×10^{-6}	8.800×10^{-4}	
		2	2	1196.04	1202.13	-1183.84	1.128×10^{-12}	0.180	0.986×10^{-6}	8.800×10^{-4}	
		3	0	1124.71	1133.86	-1114.96	1.202×10^{-14}	0.180	0.986×10^{-6}	8.200×10^{-4}	
		4	0	835.15	841.25	-831.49	1.380×10^{-13}	0.210	0.971×10^{-6}	8.000×10^{-4}	
		5	1	747.98	754.08	-739.75		0.300	0.870×10^{-6}	9.200×10^{-4}	
		5	2	747.98	754.08	-739.75		0.300	0.870×10^{-6}	9.200×10^{-4}	
		6	1	747.98	752.86	-735.18	8.368×10^{-15}				
		7	1	655.32	658.37	-646.79		0.300	0.877×10^{-6}		
3000146910135450	ELLICE 0-14	7	1	1483.16	1498.40	-1480.72	1.280×10^{-13}				
3000146910135450	ELLICE 0-14	7	2	1483.16	1498.40	-1480.72					
3000196920132450	TUKTU 0-19	1	0	1970.84	1994.31	-1943.71	5.281×10^{-18}				
		4	0	2185.42	2203.70	-2156.16	2.409×10^{-17}				
		8	0	2078.74	2097.02	-2049.48	1.153×10^{-16}				

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z factor
3000206850134450	KIPNIK O-20	1	0	1822.70	1831.85	-1812.04	2.197×10^{-13}				
3000276900133300	PARSONS O-27	4	0	3312.57	3383.28	-3281.48		0.125	0.507×10^{-4}		
3000546920134450	TOAPOLOK O-54	1	0	2741.68	2776.73	-2681.92	3.290×10^{-15}				
		3	0	1851.66	1857.76	-1836.40	1.093×10^{-13}				
300P046930135300	GARRY P-04	1	0	3179.06	3182.11	-3176.63	2.596×10^{-15}				
300P176930132450	MAYOGIAK P-17	3	0	912.57	920.50	-892.15	4.636×10^{-15}				
		12	1	2863.60	2920.59	-2856.89					
		12	2	2863.60	2920.59	-2856.89					
		13	0	2932.48	2951.99	-2913.28	2.565×10^{-15}				
300P216920133300	RED FOX P-21	1	0	1780.03	1810.51	-1750.16	5.250×10^{-14}				
300P256930135450	ADGO P-25	1	1	1756.26	1798.32	-1746.29					
300P256930135450	ADGO P-25	1	2	1756.26	1798.32	-1746.29					
		2	0	1343.56	1352.70	-1291.22	3.568×10^{-14}				
		3	0	1308.51	1313.08	-1252.51	1.664×10^{-14}				
		4	0	1285.65	1290.52	-1233.01	1.147×10^{-15}				
		5	0	1268.88	1273.45	-1214.11	3.261×10^{-16}				
		6	0	1085.70	1094.84	-1030.62	2.499×10^{-14}				
		8	0	1011.94	1018.03	-955.34	2.438×10^{-14}				
		9	0	796.44	802.54	-740.15	5.973×10^{-14}				
		11	0	745.24	751.33	-689.85	5.169×10^{-13}				
		12	0	705.61	708.66	-649.92	2.083×10^{-13}				
300P416900133300	PARSONS P-41	2	0	3019.96	3026.05	-2942.84	1.708×10^{-15}	0.080			
300P536900133300	PARSONS P-53	2	0	3193.69	3297.94	-3135.48	3.438×10^{-18}				
		3	0	2987.04	3002.28	-2926.69	8.266×10^{-16}	0.130	0.475×10^{-4}		
		7	0	3276.60	3435.10	-3230.58	5.704×10^{-15}				
		11	0	1382.27	1386.84	-1333.50	3.103×10^{-13}	0.150	0.104×10^{-5}		

Well location (unique ID)	Well name	DST #	Phase #	Interval Top (m)	Interval Bottom (m)	Recorder elevation (m)	Intrinsic Perm. (m^2)	Porosity	Total Compressibility $(kPa)^{-1}$	Gas viscosity (PaSec)	Gas Z factor
300P536920134300	YA-YA P-53	3	0	2437.79	2445.11	-2387.50	$2.677x10^{-16}$			$1.500x10^{-5}$	0.900
		9	0	1948.89	1954.99	-1900.43	$9.777x10^{-16}$	0.150	$0.101x10^{-5}$	$5.200x10^{-4}$	
		10	0	1914.75	1920.85	-1862.33	$7.584x10^{-17}$	0.150	$0.104x10^{-5}$	$5.200x10^{-4}$	
		12	0	1872.08	1878.18	-1823.62	$1.322x10^{-15}$	0.130	$0.105x10^{-5}$	$4.700x10^{-4}$	
		14	0	1915.97	1917.50	-1855.62	$8.952x10^{-16}$				
		17	0	1836.12	1842.21	-1785.82	$1.258x10^{-16}$				
		18	0	1829.41	1842.21	-1776.37	$4.359x10^{-17}$				
		19	0	1776.37	1782.47	-1719.07	$1.301x10^{-16}$				
		20	0	1776.37	1782.47	-1717.85	$2.328x10^{-17}$	0.130	$0.105x10^{-5}$		

Table A4.

Formation temperature from drillstem tests and bottomhole temperature measurements, Beaufort-Mackenzie basin

NOTES:

This table comprises information entered into the Basin Analysis Group data base at 1988-03-31. The data are ordered by well number (A-01 to P-53) and recorder depth. The drillstem test numbers correspond to those in other tables in this Appendix. Bottomhole temperature measurements are identified as TD (total depth) in this table but by the number 99 in the temperature-depth plots. All default values used in calculating the density corrected hydraulic head (Table A2) are indicated by an asterisk.

Table A4.
Formation temperature from drillstem tests and bottomhole temperature measurements, Beaufort-Mackenzie basin

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
300A016850134000	EAST REINDEER A-01	8	2080.56	2093.98	2081.78	58.89
		5	2490.22	2504.24	2484.42	66.40*
		4	2882.80	2954.43	2877.92	76.01*
		TD			2954.40	77.60
300A066930134300	MALLIK A-06	12	2350.62	2356.71	2327.14	50.00
		11	2524.66	2530.75	2498.75	53.33
		10	2616.71	2649.93	2633.32	59.14*
		8	2706.62	2715.77	2653.28	60.00
		7	2855.37	2861.46	2809.03	66.11
		6	2937.97	2942.54	2920.45	69.62*
		3	3824.02	3827.07	3804.51	97.43*
		2	3948.68	3954.78	3951.73	102.06*
		1	3998.67	4001.72	3974.59	102.78
300A126910133300	SIKU A-12	6	2658.47	2663.95	2654.80	70.56
		5	2701.44	2708.45	2692.90	72.71*
		4	2718.21	2724.91	2744.72	75.56
		3	2833.12	2836.47	2831.28	78.33
		2	2880.36	2886.46	2875.78	82.22
		1	2959.00	2968.14	2956.56	85.00
300A257000136150	TARSIUT A-25	6	1500.00	1514.00	1440.70	41.11
		5	1800.00	1810.00	1792.10	52.22
		TD			4434.00	128.00
300A286920134300	YAYA A-28	13	1821.48	1825.14	895.81	18.12*
		15	1767.23	1771.80	1749.24	28.89
		14	1783.08	1787.65	1771.80	29.89*
		11	1858.67	1863.24	1833.98	31.67
		12	1851.66	1856.23	1839.46	32.22
		10	1874.52	1879.09	1862.02	32.43*
		9	1914.75	1919.33	1900.73	32.78
		8	1959.86	1967.79	1952.24	34.44

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
		7	2055.57	2059.84	2034.84	35.85*
		3	2406.70	2410.36	2409.13	42.22
		2	2451.81	2455.16	2443.88	43.16*
		1	3444.85	3587.80	3434.79	70.00
		TD			3944.10	76.10
300A416910134300	REINDEER A-41	6	713.23	718.72	697.38	20.00
		5	771.75	777.24	761.82	20.84*
		4	875.08	879.65	867.61	22.22
		3	971.70	976.58	955.24	24.10*
		2	1717.55	1828.80	1719.07	52.78
300A556950131450	ATKINSON A-55	4	1988.82	2007.11	2004.67	45.43*
		TD			2232.70	50.60
300B116850135150	UNAK B-11	2	1181.10	1185.67	1182.92	42.78
		1	1541.37	1546.86	1548.68	48.33
		TD			3345.20	71.10
300B196920135150	NIGLINTGAK B-19	1	1225.30	1254.25	1182.62	32.22
		8	2231.75	2236.01	2232.05	56.67
		5	2788.31	2797.45	2790.44	61.11
		2	3076.65	3088.84	3076.04	77.78
300B446940135450	NETSERK B-44	7	2877.92	2890.11	2854.01	74.58*
		6	2877.92	2890.11	2884.01	75.36*
		5	3149.80	3158.95	3154.37	82.43*
		4	3258.92	3271.11	3265.01	85.32*
		2	3273.25	3305.56	3289.40	85.95*
		TD			3528.40	92.20
300C216930135150	UPLUK C-21	7	1138.12	1147.27	1128.67	26.67
		3	1492.61	1501.75	1481.32	36.67
		TD			1637.10	36.70
300C386850133300	REINDEER C-38	1	1154.58	1167.38	1155.80	35.00
		TD			2592.60	60.60
300C426930134450	TAGLU C-42	12	2866.64	2872.44	2854.75	69.91*
		11	2880.36	2883.41	2881.88	70.60*
		10	2888.28	2891.33	2884.62	70.67
		9	2901.09	2907.18	2894.07	70.56
		8	2926.08	2932.18	2923.94	71.67
		7	2957.17	2960.22	2952.90	72.14*
		6	3169.92	3176.02	3162.60	72.22
		5	3194.30	3197.35	3191.25	71.67
		4	3233.93	3236.98	3229.05	73.89

Table A4. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
		3	3267.76	3272.33	3266.54	77.22
		2	3311.65	3317.75	3304.64	78.25*
		TD			4895.10	121.00
300D276910134300	REINDEER D-27	11	3401.57	3425.95	3404.61	71.11
		TD			3861.20	78.90
300D296940132150	KIMIK D-29	1	2610.31	2628.60	2619.45	62.10*
		TD			2657.87	62.78
300D486900133150	KAMIK D-48	4	2855.98	2858.41	2846.83	82.22
		3	2864.21	2866.03	2857.50	83.06
		2	2871.83	2877.92	2863.29	83.28*
		1	2888.89	2897.12	2878.83	83.89
		TD			3235.10	85.60
300D546830133300	INUVIK D-54	1	704.09	719.33	705.92	11.67
		TD			1562.40	33.30
300D556930134450	TAGLU D-55	17	3168.40	3174.49	3030.01	80.00
		14	3191.26	3194.30	3182.41	83.90*
		13	3218.69	3221.74	3203.75	84.44
		9	3514.34	3520.44	3502.87	86.44*
		7	3561.28	3573.48	3553.35	86.78*
		6	3587.50	3590.54	3589.02	87.02*
		5	3657.60	3660.65	3658.81	92.22
300D586900133150	KAMIK D-58	6	2844.39	2851.10	2836.46	82.39
		5	2860.24	2868.78	2855.97	83.61*
		4	2913.89	2920.59	2905.04	86.67
		2	2923.03	2929.13	2926.08	87.59*
		1	2990.09	2996.18	2980.63	90.00
300E176950134150	PULLEN E-17	4	3539.34	3545.43	3534.15	64.68*
		2	3560.06	3566.16	3554.88	65.06*
		TD			3885.00	71.10
300E416940132300	ATERTAK E-41	10	1216.76	1244.80	1209.44	23.40*
		7	1238.71	1244.80	1233.83	25.56
		1	1364.28	1367.94	1355.14	28.33
		2	1357.58	1362.46	1356.05	31.11
		TD			1984.20	45.00
300E476850137150	BLOW RIVER YT E-47	1	993.65	1036.62	996.39	32.83
		TD			4267.20	106.10
300F186920133000	TUK F-18	3	3066.29	3109.57	3071.77	91.11*
		TD			3146.10	74.40
300F286930135450	ADGO F-28	10	1025.65	1031.44	1028.54	27.44*

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
		8	1095.76	1101.85	1098.80	29.31*
		5	1246.63	1258.82	1252.72	33.42*
		4	1357.88	1365.50	1361.69	36.32*
		2	1731.26	1735.84	1733.55	46.24*
		TD			3208.90	85.60
300F306900134300	TUNUNUK F-30	6	896.11	905.26	887.88	13.61
		5	1660.25	1668.48	1653.84	32.22
		4	2194.56	2203.70	2190.29	45.22
		TD			3642.40	76.70
300F316830134450	NAPOIAK F-31	8	692.81	713.23	696.77	22.78
		7	823.57	834.54	827.53	23.89
		3	1159.46	1167.38	1163.42	36.67
		5	1231.39	1255.78	1235.35	38.40*
		2	1347.22	1383.79	1351.17	41.67
		TD			1528.60	46.70
300F366910134300	REINDEER F-36	14	539.50	545.59	525.17	9.30*
		13	630.94	633.98	632.46	11.04*
		11	665.99	672.08	652.88	11.56*
		8	693.42	699.52	683.06	12.10*
		7	731.52	733.04	720.85	12.77*
		4	733.04	736.09	721.16	12.78
		6	820.52	822.05	815.03	14.10*
		3	830.58	833.63	821.44	13.78*
		2	903.73	911.35	892.15	15.56
		1	1167.69	1172.87	1157.93	50.00
		TD			1828.80	53.30
300F386810135000	AKLAVIK F-38	1	1508.76	1516.38	1514.24	40.30*
		2	1847.09	1928.47	1887.78	43.30*
		TD			2055.90	55.00
300F386900133150	KAMIK F-38	2	3190.34	3204.97	3176.01	86.67
		TD			3566.20	97.30
300F406940135450	NETSERK F-40	13	1205.18	1211.28	1202.74	35.56
		9	1388.06	1390.50	1382.26	39.44
		7	1404.52	1413.66	1404.51	39.83*
		8	1404.52	1413.66	1404.82	39.83*
		6	1609.34	1615.44	1609.34	43.33
		4	4007.51	4021.53	4003.24	115.11*
		3	4075.79	4081.88	4069.99	117.11*
		1	4094.07	4101.08	4092.24	117.78

Table A4. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
		TD			4370.43	130.00
300F486930134000	KILAGMIOTAK F-48	12	3475.33	3568.29		78.97*
		11	3511.91	3568.29		79.40*
		10	3665.22	3671.32	3630.77	81.41*
		1	2959.61	2969.67	3668.27	82.25*
		TD			4771.90	107.00
300G046900133450	EAST REINDEER G-04	5	1470.66	1475.23	1472.18	40.56
		8	3596.64	3733.80	3589.63	102.00*
		TD			3733.80	108.90
300G126920133150	WAGNARK G-12	2	1662.07	1668.17	1665.12	49.23*
		TD			3571.60	105.60
300G336930134450	TAGLU G-33	2	2488.39	2492.65	2476.80	54.44
		3	2552.40	2556.05	2544.16	61.11
		TD			2993.70	70.00
300H136830135300	BEAVER HOUSE CREEK H-13	3	361.19	403.86	364.24	63.00*
		TD			3747.50	81.70
300H237010130000	RUSSELL H-23	3	1163.73	1172.87	1165.55	32.78
		TD			1831.80	45.60
300H246920134450	TOAPOLOK H-24	3	1200.91	1266.14	1204.26	29.44
		12	1629.77	1634.34	1626.41	38.33
		11	1785.21	1792.83	1780.64	40.00
		10	1920.24	1924.81	1915.36	42.78
		9	2058.01	2062.58	2058.92	46.11
		8	2164.69	2169.26	2159.81	46.67
		7	2227.17	2237.84	2213.15	48.53*
		6	2326.23	2330.81	2311.29	51.95*
		TD			2622.80	62.80
300H256950131450	ATKINSON H-25	1	1737.36	1755.65	1744.06	34.04*
		4	1760.22	1770.89	1764.79	34.44
		TD			1810.80	46.70
300H306920135150	NIGLINTGAK H-30	1	1030.22	1086.92	1058.57	33.51*
		2	1906.52	2016.86	1895.55	60.00
		TD			2383.60	61.10
300H346830130300	WOLVERINE H-34	1	1874.22	1896.47	1875.73	26.56*
		TD			2041.20	28.90
300H506950131300	NATAGNAK H-50	1	1871.47	1884.88	1876.04	54.44
		TD			1951.30	56.60
300H546930134450	TAGLU H-54	5	2469.49	2475.59	2458.21	60.56
		4	2487.78	2490.83	2477.11	61.67

Table A4. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
		3	2520.70	2523.74	2514.90	62.22
		2	2578.61	2647.19	2570.07	63.45*
		TD			2793.50	68.40
300I176920134300	YA YA I-17	2	2031.49	2036.06	2018.69	38.89
		1	2366.77	2371.34	2350.00	47.78
300I226920135150	UNIPKAT I-22	10	1797.41	1810.51	1782.77	59.80*
		9	2129.03	2135.12	2124.45	60.56
		8	2287.52	2311.91	2283.25	64.44
		7	2877.31	2891.03	2874.87	80.00
		5	3102.86	3118.71	3088.23	85.00
		4	3555.49	3561.59	3533.24	97.00
		TD			4361.40	113.00
300I296930131150	KILINVAK I-29	1	1443.23	1485.90	1464.56	40.55*
		TD			1965.00	54.40
300J066850133450	OGEOQEOQ J-06	1	1792.53	1839.16	1798.62	60.00
		TD			1839.20	61.40
300J066920135000	KUMAK J-06	1	591.92	731.52	593.75	11.11
		10	1356.66	1363.98	1360.32	31.18*
		9	1894.03	1904.09	1899.06	45.29*
		8	2148.23	2154.33	2151.28	51.89*
		7	2306.12	2313.43	2309.77	56.04*
		6	2365.55	2370.43	2367.99	57.56*
		4	2482.60	2493.26	2487.93	60.70*
		2	2943.45	3159.25	3051.35	77.46*
		TD			3480.80	91.70
300J176920136150	IKATTOK J-17	3	1534.06	1539.24	1499.61	40.21
		2	2198.22	2203.09	2195.17	59.95
		TD			3810.00	88.30
300J176930132450	MAYOGIAK J-17	1	688.54	784.86	681.84	22.89
		2	910.74	920.50	904.04	26.65*
		3	912.57	920.50	905.26	26.67
		4	1155.19	1182.32	1147.87	28.73*
		8	2863.60	2920.59	2878.22	77.06
		9	2932.48	2951.99	2923.03	90.00
300J266940134150	IVIK J-26	17	1315.52	1318.56	1317.04	27.50*
		16	2346.96	2350.01	2337.20	37.60*
		15	2393.29	2398.17	2342.08	37.78
		14	2465.22	2468.27	2466.74	42.28*
		13	2473.76	2475.28	2474.52	42.56*

Table A4. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
		11	2479.85	2484.73	2482.29	42.84*
		9	2479.85	2491.44	2485.64	42.96*
		12	2488.69	2491.74	2490.21	43.12*
		7	2573.43	2579.52	2526.79	44.44
		8	2545.08	2554.22	2549.65	45.08*
		5	2681.33	2687.42	2631.03	50.00*
		4	2771.24	2775.51	2725.82	51.00
		3	2780.39	2787.09	2735.27	52.22
		2	2855.98	2859.02	2857.50	57.07*
		1	2898.65	2901.70	2900.17	59.36*
		TD			3648.20	75.60
300J276930135450	ADGO J-27	1	3065.07	3101.04	3083.05	62.54*
		TD			3108.10	74.00
300J296910133000	IMNAK J-29	4	2845.61	2848.66	2847.13	65.48*
		3	2917.24	2993.14	2955.19	67.96*
		1	3045.26	3081.22	3063.24	70.45*
		TD			3404.60	78.30
300J376930134300	MALLIK J-37	1	2683.46	2689.56	2679.19	68.33
		TD			3633.20	78.90
300J947050133300	KENALOOAK J-94	1	4519.00	4532.80	4525.90	94.61*
		TD			4568.50	95.50
300K096900133300	PARSONS K-09	3	2834.64	2845.92	2834.94	121.11*
		4	2980.94	3017.52	2981.24	117.78*
		TD			3547.30	79.40
300K266910135000	TITALIK K-26	12	1197.86	1203.96	1190.54	41.67
		11	1457.55	1464.56	1446.58	48.89
		9	1569.72	1575.82	1550.21	51.11
		8	1632.51	1636.17	1609.03	56.06*
		7	1680.06	1686.15	1662.37	60.56
		6	1767.84	1773.94	1743.76	62.22
		5	2750.52	2756.61	2722.16	83.89
		4	2847.44	2866.34	2843.17	85.56
		TD			3840.50	103.90
300K316900135000	TULLUGAK K-31	1	2022.35	2050.08	2025.09	61.67
		3	2569.46	2599.33	2570.37	69.44
300K546940134150	IVIK K-54	5	2523.74	2526.79	2525.26	31.70*
		3	2616.40	2620.06	2611.52	32.78
		2	2632.86	2638.96	2630.72	47.22
		TD			3151.00	64.40

Table A4. (continued)

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
300K597030136000	NEKTORALIK K-59	7	2258.57	2261.62	2260.09	62.54*
		6	2374.39	2392.68	2383.53	65.95*
		5	2429.26	2450.59	2439.92	67.51*
		4	2563.37	2569.46	2566.41	71.01*
		3	2607.56	2624.33	2615.94	72.38*
		2	2651.76	2685.29	2668.52	73.84*
		1	2695.04	2701.14	2698.09	74.65*
		TD			2790.10	77.20
300L246900135150	KUGPIK L-24	4	798.58	801.62	801.62	24.16
		3	809.24	813.21	810.77	24.44
		1	2484.73	2518.87	2487.77	76.11
		TD			2817.00	87.80
300L246940134300	UNARK L-24	9	1773.94	1775.46	1774.70	40.84*
		8	2204.92	2206.75	2205.83	50.76*
		6	2719.73	2726.44	2723.08	62.66*
		4	2740.15	2742.59	2741.37	63.08*
		TD			3789.60	87.20
300L306950133450	ARNAK L-30	8	3797.50	3912.41	3889.85	90.56
		9	3913.63	3928.87	3907.84	91.10*
		6	4400.70	4408.02	4396.43	107.22
		3	4465.32	4469.89	4464.40	109.69*
		1	4503.12	4514.09	4503.72	111.11*
300L606900133150	KAMIK L-60	2	3047.39	3096.16	3071.77	75.57*
		TD			3207.10	78.90
300M137030135000	KOPANOAR M-13	7	3536.59	3555.49	3546.04	92.97*
		6	3578.05	3590.24	3561.58	93.38*
		5	3618.28	3630.47	3624.37	95.03*
		4	3905.71	3921.86	3913.78	102.62*
		TD			4320.20	112.80
300M196920135150	NIGLINTGAK M-19	22	1324.36	1330.45	1327.09	25.00
		18	1758.70	1773.94	1766.32	41.61*
		10	2106.17	2116.84	2105.55	54.44
		TD			4025.20	65.60
300M266930132300	PIKIOLIK M-26	1	666.60	720.85	673.61	31.11
		TD			1984.20	44.40
300M336950131450	ATKINSON M-33	4	1801.06	1809.29	1805.17	43.15*
		TD			1928.50	46.10
300M386930135150	UPLUK M-38	4	3683.81	3688.08	3687.47	85.00
		TD			3764.30	86.80

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
300N106900133300	PARSONS N-10	4	2951.68	3204.97	2924.25	90.00
		3	2929.13	3204.97	2924.86	90.02*
300N176900133300	PARSONS N-17	1	3135.48	3158.34	3125.11	89.44
		TD			3295.50	94.30
300N466910134450	KIKORALOK N-46	6	747.98	752.86	750.42	21.11
		5	747.98	754.08	754.99	21.16*
		4	835.15	841.25	846.73	22.22
		3	1124.71	1133.86	1130.19	25.00
		2	1196.04	1202.13	1199.08	25.56
		1	1420.37	1444.75	1421.89	31.67
		TD			1885.20	47.20
3000146910135450	ELLICE O-14	7	1483.16	1498.40	1490.78	33.66*
		TD			2905.00	65.60
3000196920132450	TUKTU O-19	1	1970.84	1994.31	1974.19	31.30*
		8	2078.74	2097.02	2079.95	37.22
		4	2185.42	2203.70	2186.63	48.33
		TD			2315.60	50.60
3000206850134450	KIPNIK O-20	1	1822.70	1831.85	1824.22	53.33
		TD			3556.10	84.40
3000546920134450	TOAPOLOK O-54	3	1851.66	1857.76	1848.00	56.67
		1	2741.68	2776.73	2693.51	65.56
		TD			2785.90	67.20
300P046930135300	GARRY P-04	1	3179.06	3182.11	3180.58	82.50*
		TD			3352.80	87.80
300P176930132450	MAYOGIAK P-17	3	912.57	920.50	914.70	21.67
		12	2863.60	2920.59	2879.44	77.06
300P216920133300	RED FOX P-21	1	1780.03	1810.51	1795.27	22.21*
		TD			4178.80	51.70
300P256930135450	ADGO P-25	12	705.61	708.66	658.06	18.17
		11	745.24	751.33	697.99	19.06
		9	796.44	802.54	799.49	21.24
		8	1011.94	1018.03	963.47	24.78
		6	1085.70	1094.84	1038.75	27.44
		5	1268.88	1273.45	1222.24	33.28
		4	1285.65	1290.52	1241.14	34.39
		3	1308.51	1313.08	1260.65	35.00
		2	1343.56	1352.70	1299.36	36.56
		1	1756.26	1798.32	1754.42	47.56
		TD			2538.10	65.60

Well location (unique ID)	Well name	DST #	Interval Top (m)	Interval Bottom (m)	Recorder depth (m)	Temperature (°C)
300P416900133300	PARSONS P-41	2	3019.96	3026.05	3014.16	92.78
		1	3128.77	3134.87	3552.44	93.89
300P536900133300	PARSONS P-53	11	1382.27	1386.84	1384.70	28.89
		3	2987.04	3002.28	2994.66	88.72*
		2	3193.69	3297.94	3186.68	116.67
		7	3276.60	3435.10	3281.78	121.11
300P536920134300	YA-YA P-53	20	1776.37	1782.47	1759.30	34.44
		19	1776.37	1782.47	1760.52	35.56
		18	1829.41	1842.21	1817.82	36.00*
		17	1836.12	1842.21	1827.27	37.22
		12	1872.08	1878.18	1865.07	48.89
		14	1915.97	1917.50	1897.07	43.33
		10	1914.75	1920.85	1903.78	54.44
		9	1948.89	1954.99	1941.88	55.56
		3	2437.79	2445.11	2428.95	64.44

Table A5.

Depth and thickness of geopressure zones based on sonic and density logs, Beaufort-Mackenzie basin

NOTES:

This table comprises interpretations made to 1988-03-31. The information is ordered by well number A-01 to P-66 and depth, and the unique identifier for each well is included in the table. Both sonic and density logs were obtained from the files of the ISPG. Information on the stratigraphic units was obtained from the ISPG and is based on interpretations to the end of 1987. Starred wells have no geopressure zones.

Table A5.
Depth and thickness of geopressure zones based on sonic and density logs, Beaufort-Mackenzie basin

Well location	Well Name	Depth to top (m)	Stratigraphic unit	Depth to base (m)	Stratigraphic unit	Thicknes (m)
300A016850134000	EAST REINDEER A-01	2900.0	PALEOZOIC			
300A057000136450	PITSIULAK A-05	1750.0	KUGMALLIT SEQ	2100.0	KUGMALLIT SEQ	350.0
300A066930134300	MALLIK A-06	2239.0	RICHARDS SEQ			
300A106910133150	NUNA A-10	2970.0	HUSKY FM			
300A126910133300	SIKU A-12	2027.0	SMOKING HILLS SEQ	2180.0	ARCTIC RED FM	153.0
		2576.0	SIKU MBR	2899.0	KAMIK FM	323.0
		3064.0	MARTIN CREEK FM			
300A257000136150	TARSIUT A-25	1370.0	KUGMALLIT SEQ	1920.0	KUGMALLIT SEQ	550.0
		2260.0	RICHARDS SEQ			
300A286920134300	YAYA A-28	3094.0	UPPER REINDEER SEQ	3216.0	UPPER REINDEER SEQ	122.0
		3628.0	LOWER REINDEER SEQ			
300A326910133150	NUNA A-32	****.*				
300A356850135450	ULU A-35	1625.0	FISH RIVER SEQ	2378.0	HUSKY FM	753.0
		3185.0	PERMIAN			
300A416910134300	REINDEER A-41	1800.0	LOWER REINDEER SEQ			
300A437000135450	KIGGAVIK A-43	2250.0	KUGMALLIT SEQ	2370.0	KUGMALLIT SEQ	120.0
		2650.0	TERTIARY	2750.0	TERTIARY	100.0
		2910.0	TERTIARY			
300A556950131450	ATKINSON A-55	1478.0	TERTIARY	1957.0	ATKINSON POINT FM	479.0
300B116850135150	UNAK B-11	1616.0	MCGUIRE FM	2122.0	HUSKY FM	506.0
		3015.0	PERMIAN			
300B357040134000	IRKALUK B-35	****.*				
300B356940135150	PELLY B-35	2424.0	RICHARDS SEQ			
300B356930136150	SARPIK B-35	****.*				
300B417020132130	HAVIK B-41	2340.0	MACKENZIE BAY SEQ	2420.0	MACKENZIE BAY SEQ	80.0
		4250.0	KOPANOAR SEQ			
300B446940135450	NETSERK B-44	2301.0	RICHARDS SEQ			

Table A5. (continued)

Well location	Well Name	Depth to top (m)	Stratigraphic unit	Depth to base (m)	Stratigraphic unit	Thickness (m)
300B486940135000	IMMERK B-48	2149.0	KUGMALLIT SEQ			
300B606840136000	FISH RIVER B-60	1371.0	TENT ISLAND FM	2073.0	TENT ISLAND FM	702.0
		2973.0	MOUNT GOODENOUGH FM			
300C216930135150	UPLUK C-21	****.*				
300C226950134450	NUKTAK C-22	2274.0	RICHARDS SEQ			
300C236920133150	WAGNARK C-23	3445.0	ARCTIC RED FM			
300C426930134450	TAGLU C-42	2682.0	RICHARDS SEQ			
300C526940134150	IVIK C-52	2060.0	RICHARDS SEQ			
300C556910133300	SIKU C-55	2835.0	SMOKING HILLS FM	3445.0	ARCTIC RED FM	610.0
300C586920135000	KUMAK C-58	3140.0	LOWER REINDEER SEQ			
302C507010132300	UKALERK 2C-50	4664.0	KUGMALLIT SEQ			
300D276910134300	REINDEER D-27	2378.0	REINDEER SEQ	2652.0	REINDEER SEQ	274.0
		3536.0	ALBIAN			
300D296940132150	KIMIK D-29	2341.0	SMOKING HILLS SEQ/FM	2414.0	ARCTIC RED FM	73.0
300D486900133150	KAMIK D-48	1506.0	SMOKING HILLS SEQ/FM	2073.0	ARCTIC RED FM	567.0
		2850.0	KAMIK FM	2865.0	KAMIK FM	15.0
300D546830133300	INUVIK D-54	1152.0	RONNING GP	1463.0	PRECAMBRIAN	371.0
300D556930134450	TAGLU D-55	3018.0	RICHARDS SEQ			
300D586900133150	KAMIK D-58	1661.0	SMOKING HILLS SEQ/FM	2073.0	ARCTIC RED FM	412.0
		2134.0	ARCTIC RED FM	2179.0	ARCTIC RED FM	45.0
		2707.0	SIKU MBR	2927.0	KAMIK FM	220.0
300E176950134150	PULLEN E-17	3475.0	RICHARDS SEQ			
300E277000134150	ISSERK E-27	3902.0	KUGMALLIT SEQ			
300E296920135300	LANGLEY E-29	****.*				
300E546930132300	PIKIOLIK E-54	1829.0	MASON RIVER GRP	2744.0	LANDRY FM	895.0
300E586920135000	KUMAK E-58	1052.0	REINDEER SEQ/FM	1235.0	REINDEER SEQ/FM	183.0
300F186920133000	TUK F-18	2165.0	REINDEER SEQ	2317.0	FISH RIVER SEQ	152.0
		2439.0	SMOKING HILLS SEQ/FM	2750.0	MOUNT GOODENOUGH FM	311.0
300F286930135450	ADGO F-28	2576.0	UPPER REINDEER SEQ	2701.0	UPPER REINDEER SEQ	125.0
300F316830134450	NAPOIAK F-31	304.0	ARCTIC RED FM	671.0	MOUNT GOODENOUGH FM	367.0
		945.0	HUSKY FM			
300F366910134300	REINDEER F-36	1201.0	MINISTICOOG MBR			
300F386810135000	AKLAVIK F-38	1067.0	MOUNT GOODENOUGH FM	1235.0	MCGUIRE FM	168.0
		1311.0	HUSKY FM	1570.0	RICHARDSON MOUNTAINS FM	259.0

Well location	Well Name	Depth to top (m)	Stratigraphic unit	Depth to base (m)	Stratigraphic unit	Thickness (m)
300F406940135450	NETSERK F-40	2426.0	RICHARDS SEQ	2738.0	RICHARDS SEQ	312.0
		3567.0	RICHARDS SEQ			
300F486930134000	KILAGMIOTAK F-48	2957.0	REINDEER SEQ			
300G046900133450	EAST REINDEER G-04	1478.0	SMOKING HILLS FM	1927.0	ARCTIC RED FM	449.0
		3231.0	KAMIK FM	3500.0	HUSKY FM	269.0
300G126920133150	WAGNARK G-12	1661.0	REINDEER SEQ	1753.0	REINDEER SEQ	92.0
		2378.0	SMOKING HILLS FM	2500.0	SMOKING HILLS FM	122.0
300G336930134450	TAGLU G-33	2317.0	RICHARDS SEQ			
300H237010130000	RUSSELL H-23	1158.0	IMPERIAL FM	1494.0	IMPERIAL FM	336.0
300H246920134450	TOAPOLOK H-24	****.*				
300H256950131450	ATKINSON H-25	****.*				
300H306920135150	NIGLINTGAK H-30	1546.0	REINDEER SEQ	1585.0	REINDEER SEQ	39.0
300H546930134450	TAGLU H-54	2317.0	RICHARDS SEQ	2591.0	REINDEER SEQ/FM	274.0
300H596940133150	KUGMALLIT H-59	****.*				
300I057030134300	SIULIK I-05	4230.0	KUGMALLIT SEQ			
300I176920134300	YA YA I-17	****.*				
300I226920135150	UNIPKAT I-22	1493.0	UPPER REINDEER SEQ			
300I247000131000	KANGUK I-24	****.*				
300I277000134000	ITIYOK I-27	****.*				
300I376850134000	IKHIL I-37	1622.0	REINDEER SEQ/FM	1845.0	ARCTIC RED FM	223.0
		4268.0	HUSKY FM			
302I447030135000	KOPANOAR 2I-44	3290.0	KOPANOAR SUB SEQ			
302I457030133300	AIVERK 2I-45	2970.0	AKPAK	3400.0	KUGMALLIT SEQ	430.0
300J066920135000	KUMAK J-06	1067.0	RICHARDS SEQ	1143.0	UPPER REINDEER SEQ	76.0
		2393.0	UPPER REINDEER SEQ			
300J076920132300	ESKIMO J-07	533.5	TERTIARY	823.0	ATKINSON POINT FM	289.5
300J176920136150	IKATTOK J-17	1432.0	LOWER REINDEER SEQ	2530.0	LOWER REINDEER SEQ	1098.0
		3658.0	LOWER REINDEER SEQ			
300J266940134150	IVIK J-26	2880.0	RICHARDS SEQ			
300J296910133000	IMNAK J-29	1250.0	REINDEER SEQ	1524.0	REINDEER SEQ	274.0
		2378.0	SMOKING HILLS SEQ/FM	2774.0	MOUNT GOODENOUGH FM	396.0
		2987.0	KAMIK FM	3292.0	HUSKY FM	305.0
300J376930134150	UMIAK J-37	****.*				
300J947050133300	KENALOOAK J-94	3530.0	IPERK SEQ	4010.0	KOPANOAR SUBSEQ	480.0

Well location	Well Name	Depth to top (m)	Stratigraphic unit	Depth to base (m)	Stratigraphic unit	Thickness (m)
300K266910135000	TITALIK K-26	1609.0	UPPER REINDEER SEQ			
300K316900135000	TULLUGAK K-31	1356.0	FISH RIVER SEQ	1981.0	BOUNDARY CREEK SEQ/FM	625.0
		2225.0	HUSKY FM			
300K457000131150	LOUTH K-45	1451.0	TERTIARY	2012.0	ARCTIC RED FM	561.0
300K546940134150	IVIK K-54	2506.0	RICHARDS SEQ			1910.0
300K597030136000	NEKORALIK K-59	2103.0	IPERK SEQ			
300K917020132300	TINGMIARK K-91	****.*				
300L246900135150	KUGPIK L-24	990.0	REINDEER SEQ/FM	1244.0	FISH RIVER SEQ	254.0
		1573.0	TENT ISLAND FM	2225.0	PERMIAN	652.0
		2408.0	PERMIAN			
300L306950133450	ARNAK L-30	2975.0	KUGMALLIT SEQ			
300L386930134300	MALLIK L-38	1478.0	KUGMALLIT SEQ	1600.0	KUGMALLIT SEQ	122.0
300L867010134000	NORTH ISSUNGNAK L-86	****.*				
300M096920133000	TUK M-09	2300.0	FISH RIVER SEQ			
300M137030135000	KOPANOAR M-13	3400.0	KOPANOAR SUBSEQ			
300M166930134000	KILAGMIOTAK M-16	2500.0	REINDEER SEQ/FM			
300M166930132450	MAYOGIAK M-16	2500.0	SMOKING HILLS SEQ/FM			
300M196920135150	NIGLINTGAK M-19	****.*				
300M266930132300	PIKIOLIK M-26	801.0	REINDEER SEQ	853.0	REINDEER SEQ	52.0
300M316900134150	OGRUKNANG M-31	2926.0	SIKU MBR	3293.0	PARSONS GRP	367.0
		3841.0	PARSONS GRP			
300M336920134300	YA YA M-33	****.*				
300M396910135150	KURK M-39	****.*				
300M987030133000	NERLERK M-98	****.*				
300N176900133300	PARSONS N-17	1784.0	MASON RIVER FM	2027.0	BOUNDARY CREEK SEQ/FM	243.0
		2807.0	MOUNT GOODENOUGH FM			
300N447000130450	AMOROK N-44	1036.0	ARCTIC RED FM			
300N447000136300	TARSIUT N-44	2430.0	RICHARDS SEQ			
300O037030136300	ORVILRUK O-03	****.*				
300O097000133300	AMERK O-09	3950.0	REINDEER SEQ	4140.0	REINDEER SEQ	190.0
		4450.0	REINDEER SEQ			
300O097000130300	NUVORAK O-09	****.*				
300O136900135150	KUGPIK O-13	1524.0	TENT ISLAND FM	2170.0	SMOKING HILLS SEQ/FM	646.0
		2506.0	MARTIN CREEK FM			
300O146910135450	ELLICE O-14	2426.0	LOWER REINDEER SEQ			
300O156910135000	TITALIK O-15	1631.0	UPPER REINDEER SEQ			

Well location	Well Name	Depth to top (m)	Stratigraphic unit	Depth to base (m)	Stratigraphic unit	Thickness (m)
3000196920132450	TUKTU O-19	1409.0	MASON RIVER FM	2073.0	MOUNT GOODENOUGH FM	664.0
3000206850134450	KIPNIK O-20	990.0	MOUNT GOODENOUGH FM	1234.0	UNDEFINED	244.0
		1859.0	MOUNT GOODENOUGH/ ATKINSON POINT FM.			
3000227030134000	KOAKOAK O-22	2825.0	AKPAK SEQ	3320.0	KUGMALLIT	495.0
		4040.0	KOPANOAR SUBSEQ			
3000447010137000	NATIAK O-44	2110.0	MACKENZIE BAY SEQ			
3000486900133450	ATIGI O-48	****.*				
3000546920134450	TOAPOLOK O-54	2408.0	UPPER REINDEER SEQ			
3000596950131300	NATAGRAK O-59	1280.0	QUATERNARY	1985.0	ATKINSON POINT FM	705.0
3000617010134000	ISSUNGNAK O-61	****.*				
300P046930135300	GARRY P-04	1341.0	RICHARDS SEQ	1692.0	REINDEER SEQ	351.0
		2841.0	REINDEER SEQ			
300P216920133300	RED FOX P-21	2948.0	REINDEER SEQ			
300P416900133300	PARSONS P-41	1128.0	REINDEER SEQ	1799.0	ARCTIC RED FM	671.0
		3323.0	HUSKY FM			
300P536920134300	YA-YA P-53	1112.0	RICHARDS SEQ	1799.0	LOWER RAINDEER SEQ	687.0
300P606840133300	EAST REINDEER P-60	****.*				
300P667020132200	UVILUK P-66	2200.0	IPERK SEQ	2550.0	MACKENZIE BAY SEQ	350.0
		3525.0	KOPANOAR SUBSEQ	3675.0	KOPANOAR SUBSEQ	150.0

Pressure-head/depth plots, Beaufort-Mackenzie basin

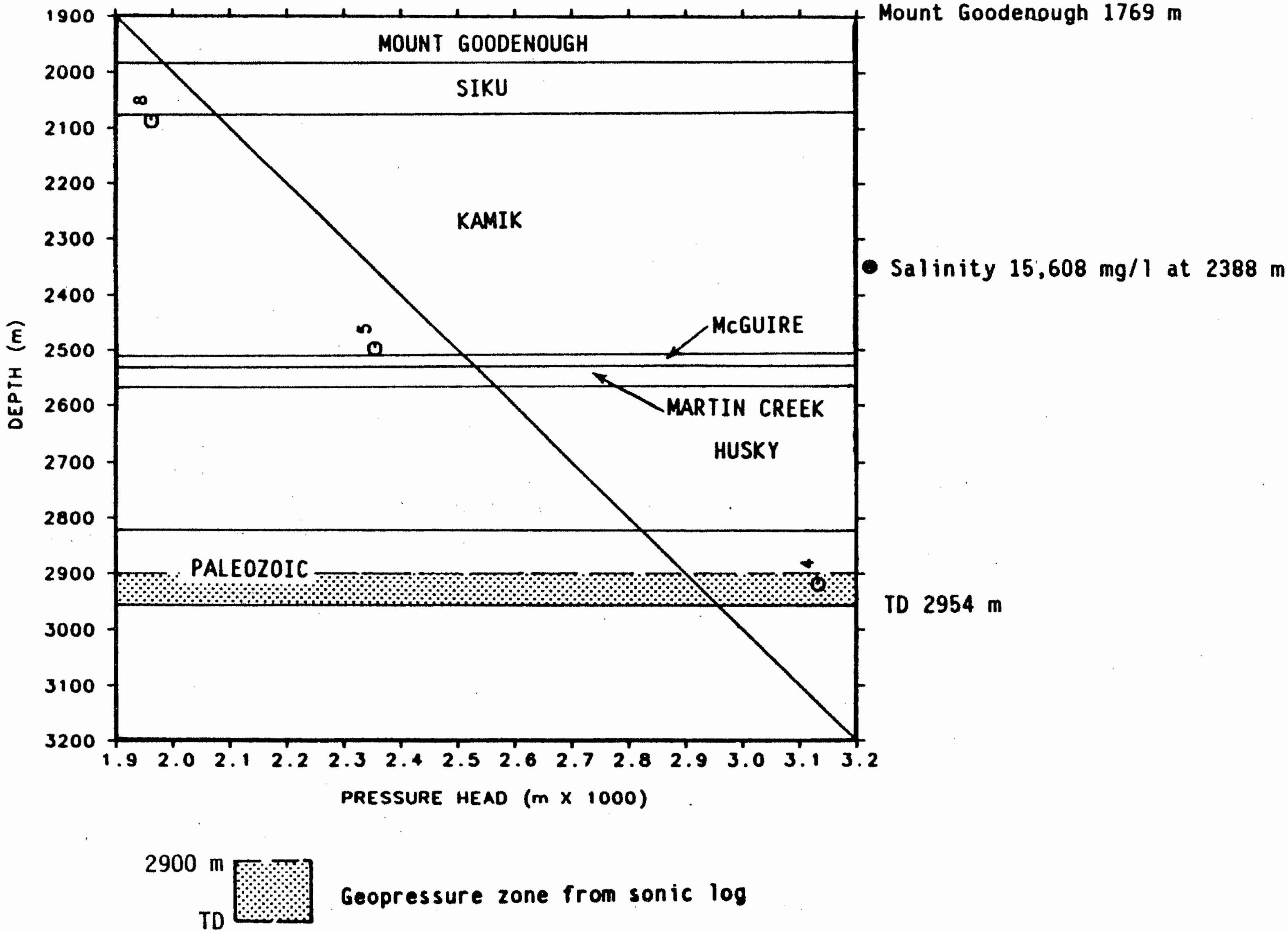
NOTES:

This section of the Appendix contains plots of pressure-head against depth for all wells for which appropriate data were available based on information entered into the Basin Analysis Group data base at 1988-03-31. Each plot is identified by the full well name and unique identifier based on well number and location. The line with slope=1 is hydrostatic. Drillstem test numbers correspond to those in Table A2. Drillstem tests for which a selected representative formation water is available (see table in report accompanying this Appendix) are solid dots. Depth to permafrost was obtained from Judge et al. (1981). All stratigraphic information came from the files of the ISPG and represents interpretations to the end of 1987. The geopressure zones determined from sonic and density logs are reported in Table A5. For many wells there is a corresponding temperature-depth plot in the next section of this Appendix.

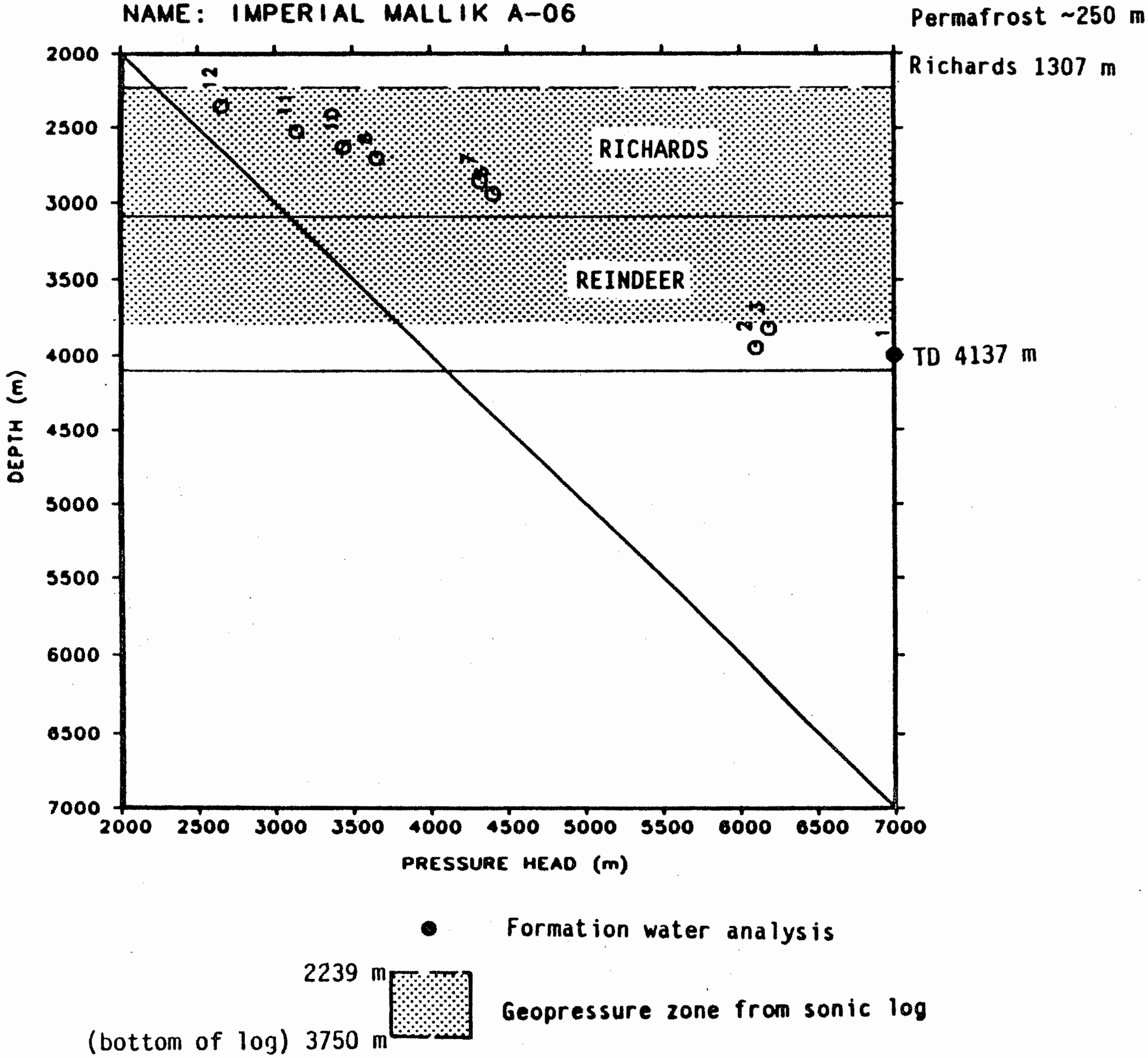
Reference

Judge, A.S., A.E. Taylor, M. Burgess, and V.S. Allen, 1981, Canadian geothermal data collection -- northern wells 1978-80: Energy, Mines and Resources Canada, Geothermal Series no. 12.

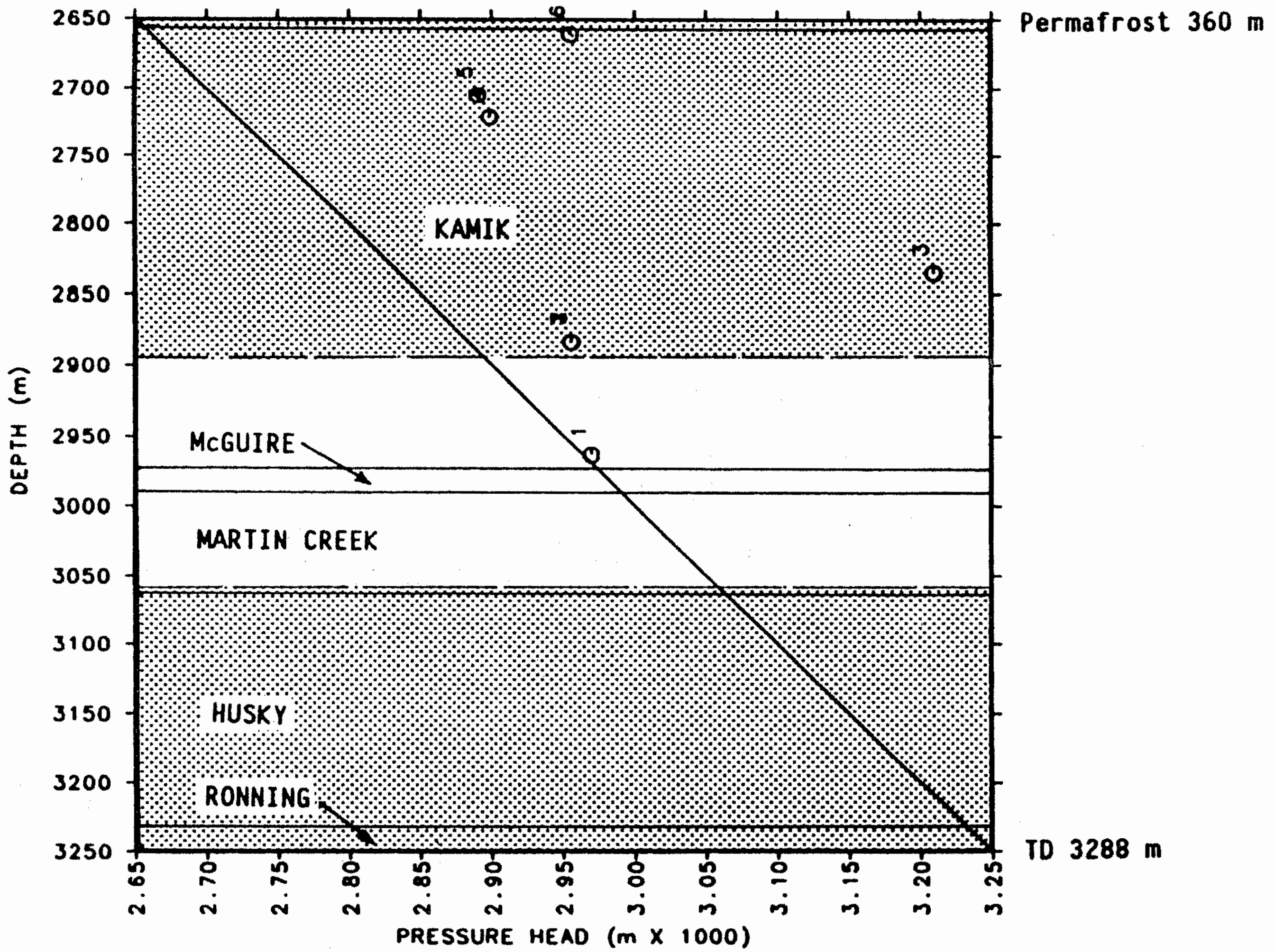
WELL IDENTIFIER: 300A016850134000
NAME: GULF MOBIL EAST REINDEER A-01



WELL IDENTIFIER: 300A066930134300
NAME: IMPERIAL MALLIK A-06

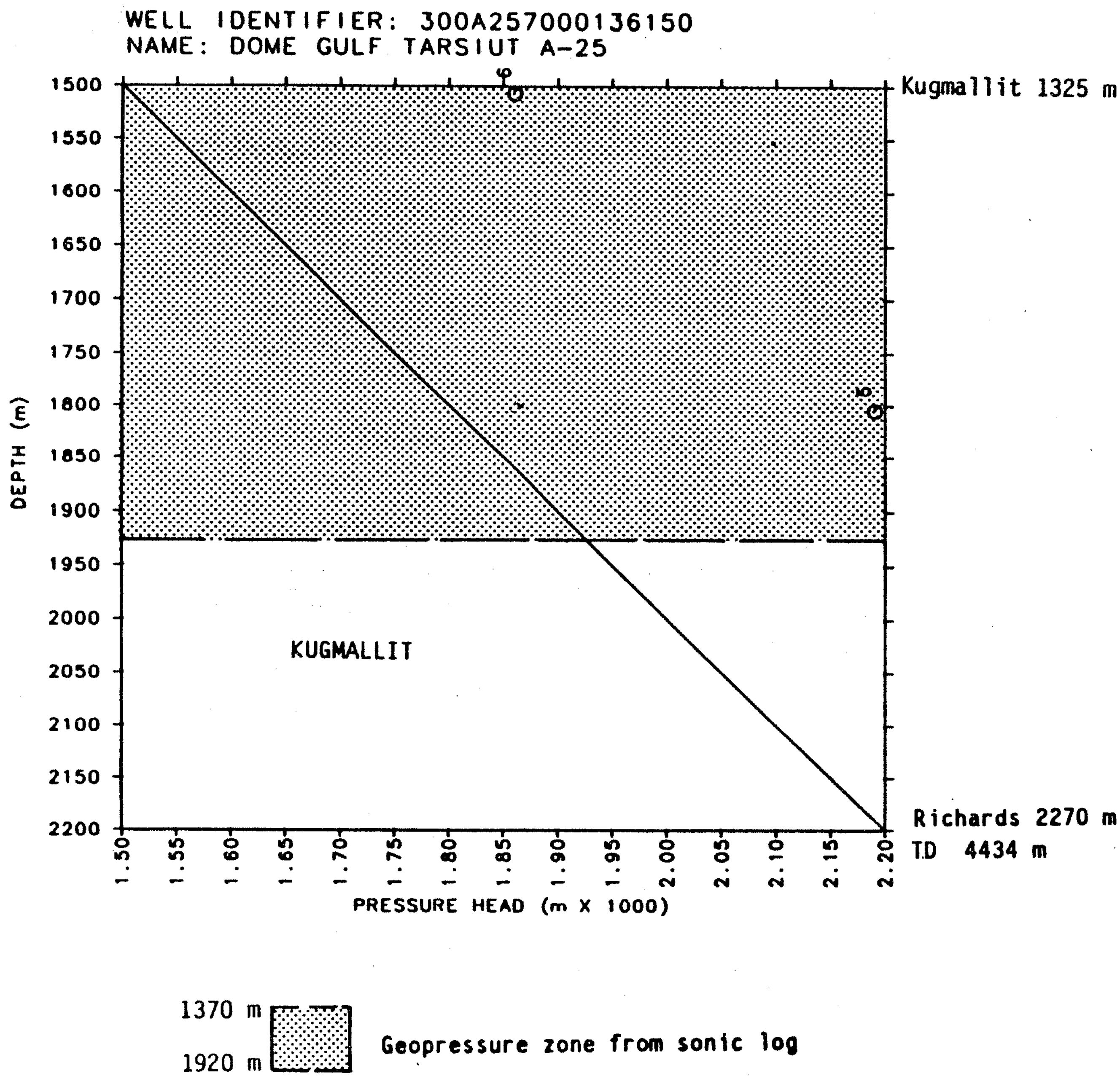


WELL IDENTIFIER: 300A126910133300
NAME: GULF MOBIL SIKU A-12

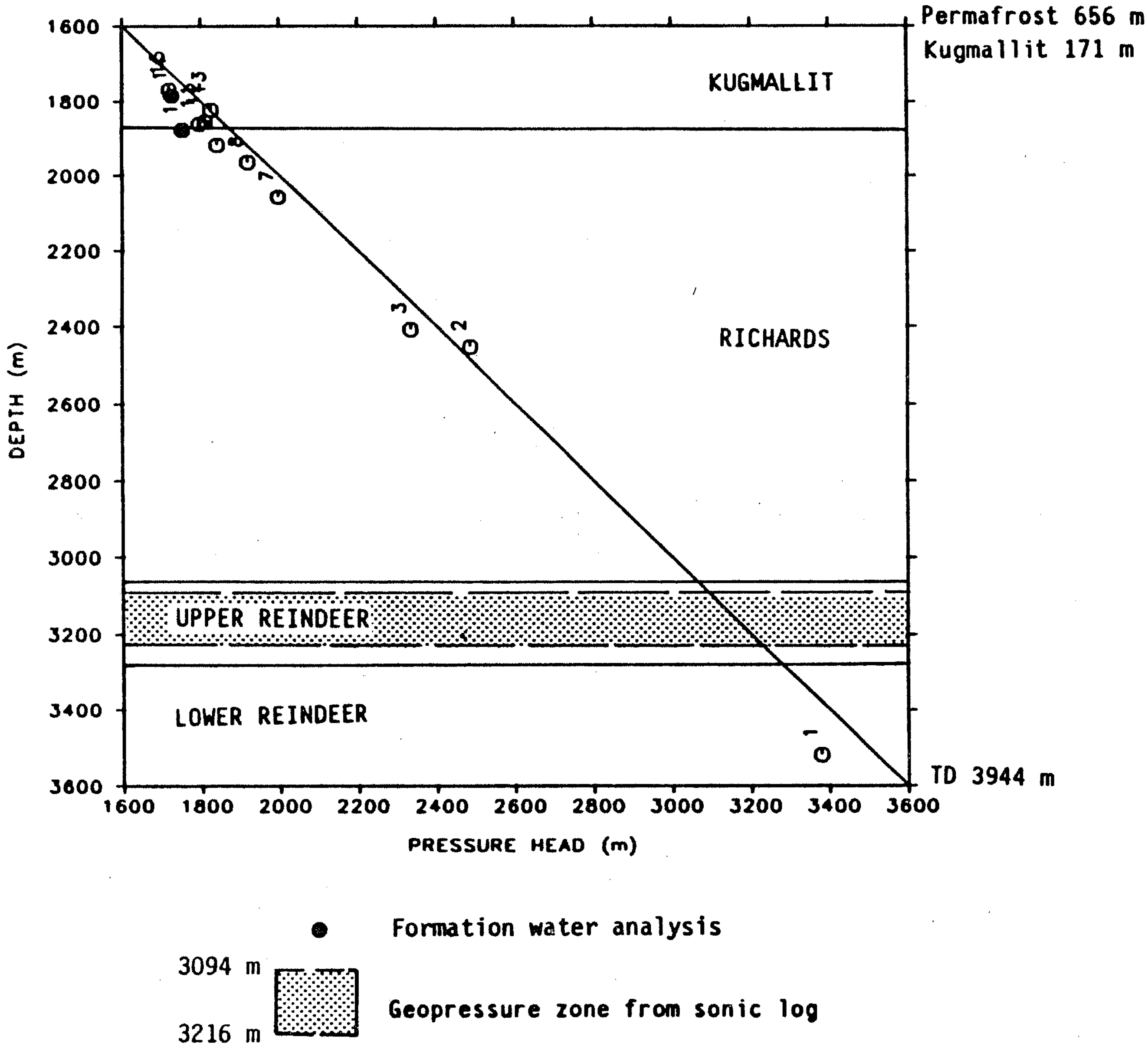


2576 m – 2899 m: Geopressure zone from sonic log

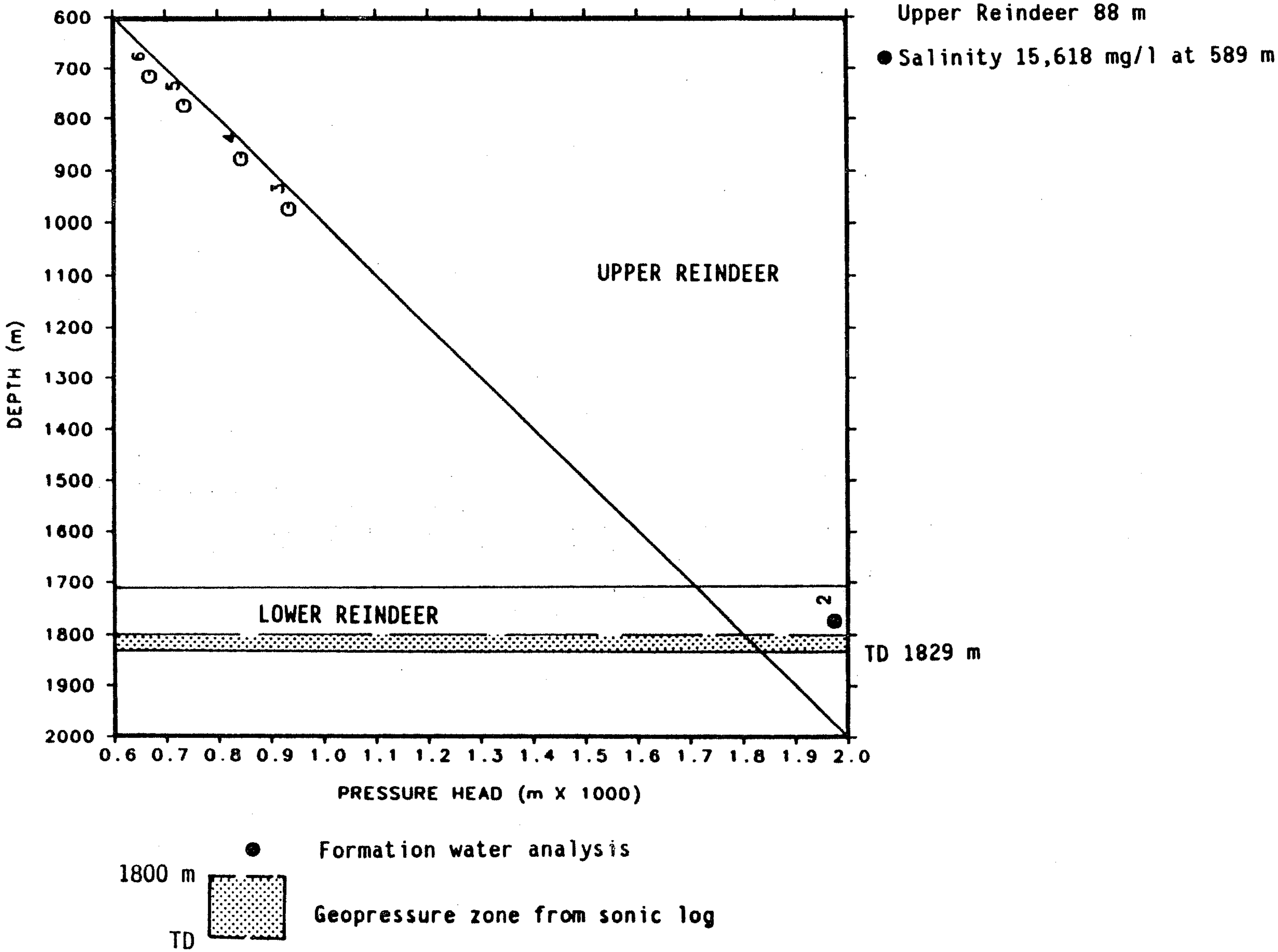
3064 m – (bottom of log) 3262 m: Geopressure zone from sonic log


WELL IDENTIFIER: 300A257000136150
NAME: DOME GULF TARSIUT A-25
Kugmallit 1325 m
Richards 2270 m
TD 4434 m
KUGMALLIT
DEPTH (m)
PRESSURE HEAD (m X 1000)
1370 m
1920 m
Geopressure zone from sonic log

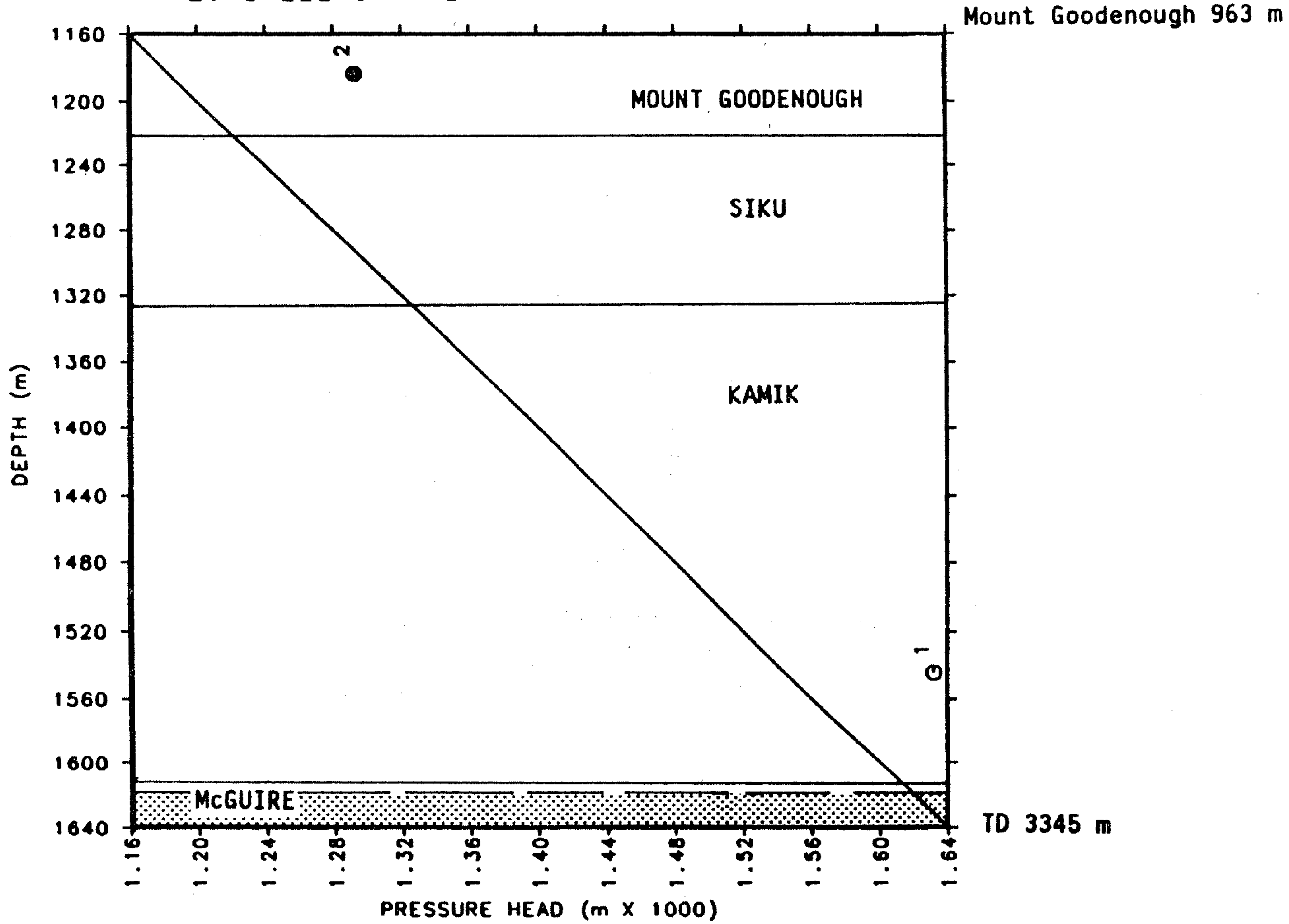
WELL IDENTIFIER: 300A286920134300
NAME: GULF MOBIL YAYA A-28



WELL IDENTIFIER: 300A416910134300
NAME: GULF IMP SHELL REINDEER A-41



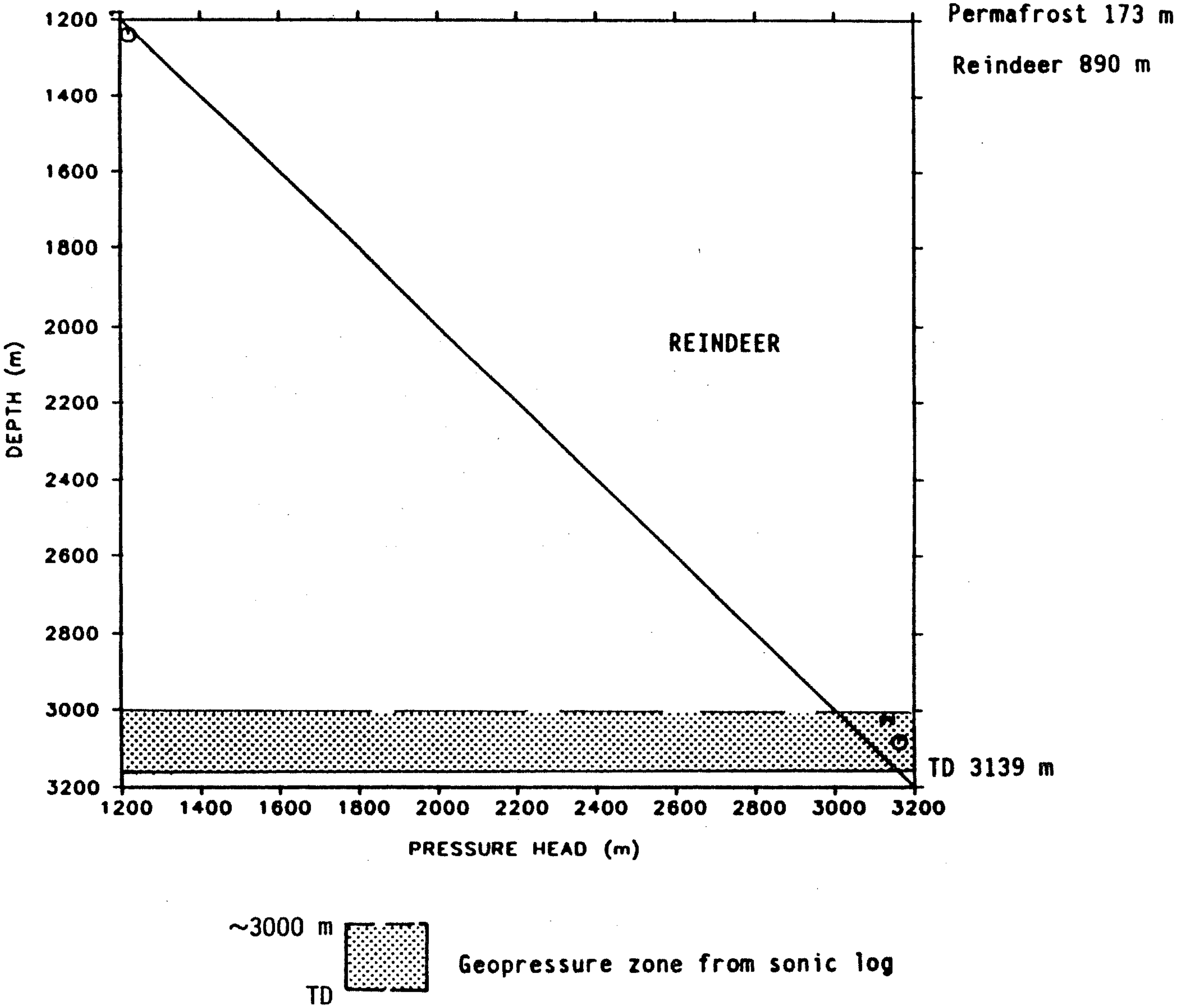
WELL IDENTIFIER: 300B116850135150
NAME: SHELL UNAK B-11

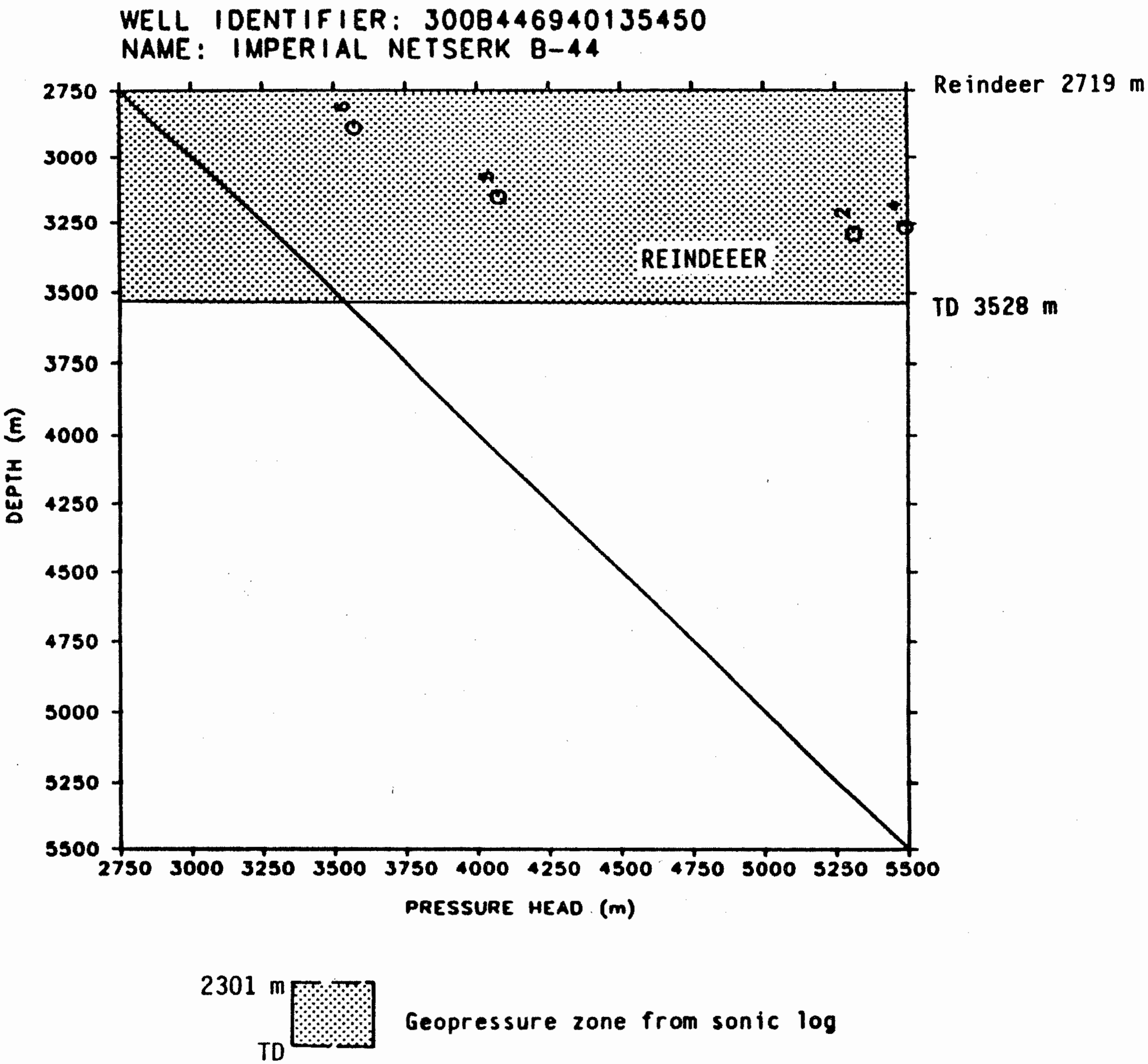


● Formation water analysis

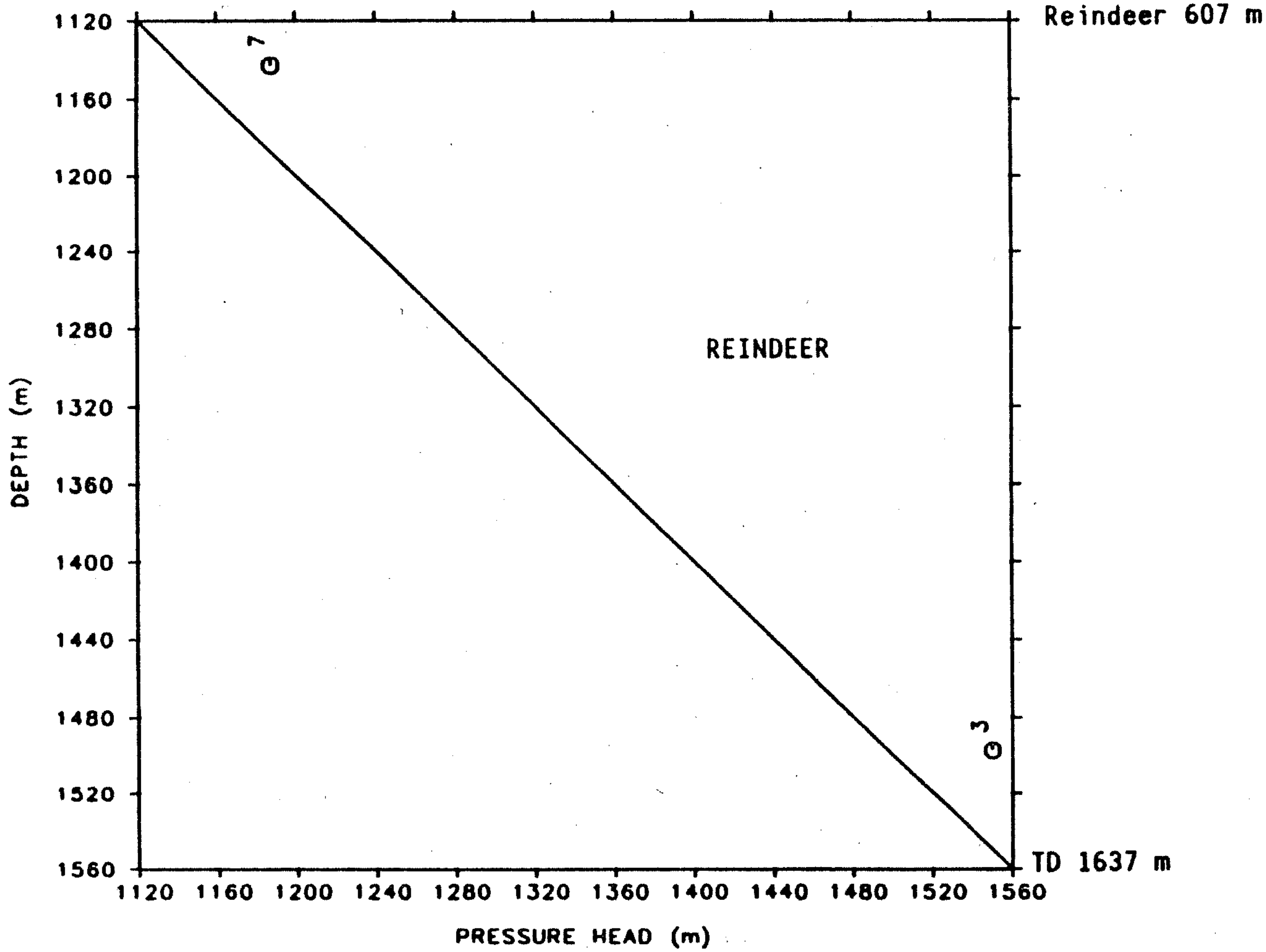
1616 m (slightly overpressured above 1616 m)
Geopressure zone from sonic log
2122 m

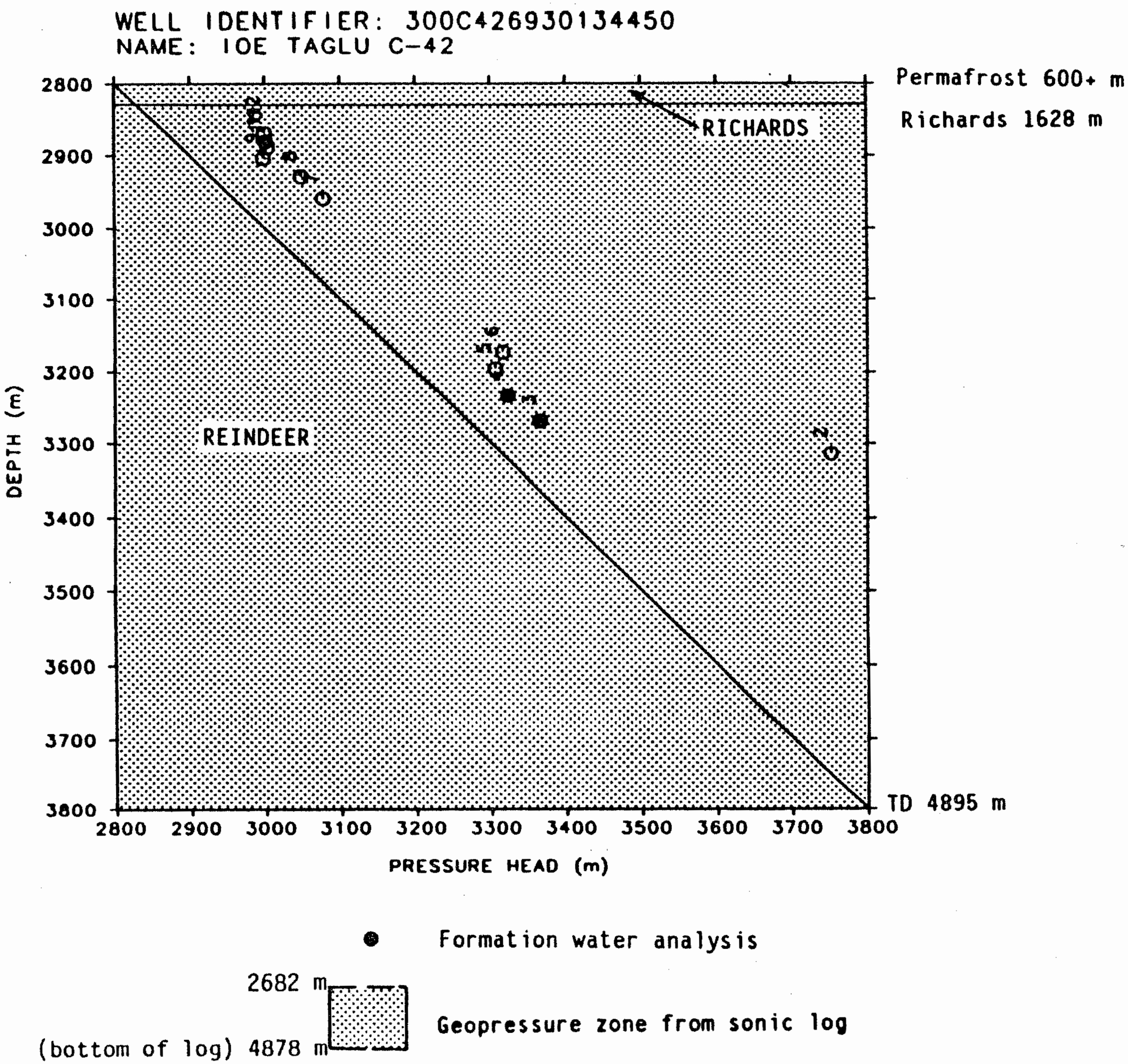
WELL IDENTIFIER: 300B196920135150
NAME: SHELL NIGLINTGAK B-19

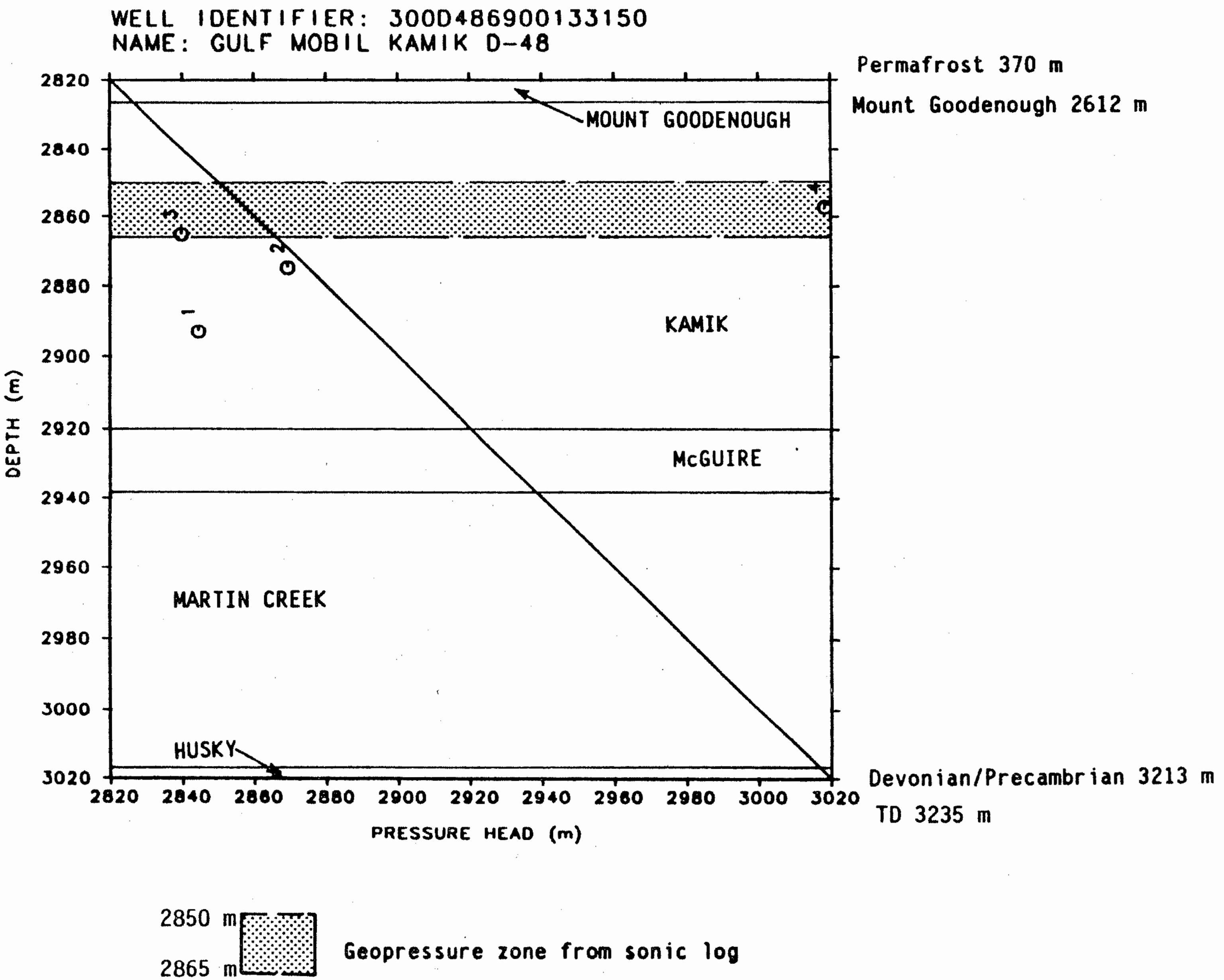



WELL IDENTIFIER: 300B446940135450
NAME: IMPERIAL NETSERK B-44
Reindeer 2719 m
REINDEEER
TD 3528 m
DEPTH (m)
PRESSURE HEAD (m)
2750
3000
3250
3500
3750
4000
4250
4500
4750
5000
5250
5500
2301 m
TD
Geopressure zone from sonic log

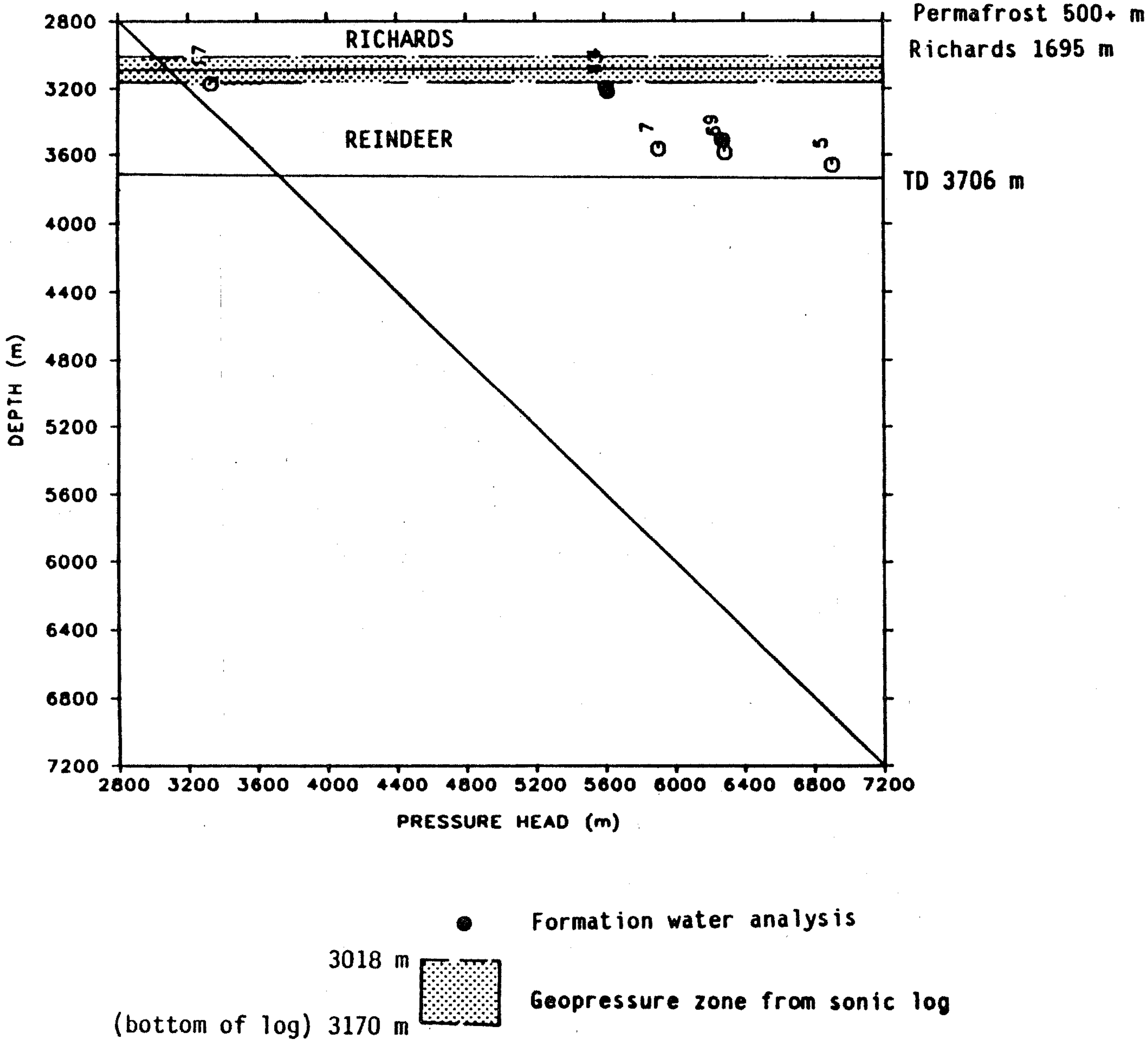
WELL IDENTIFIER: 300C216930135150
NAME: CHEVRON SOBC UPLUK C-21



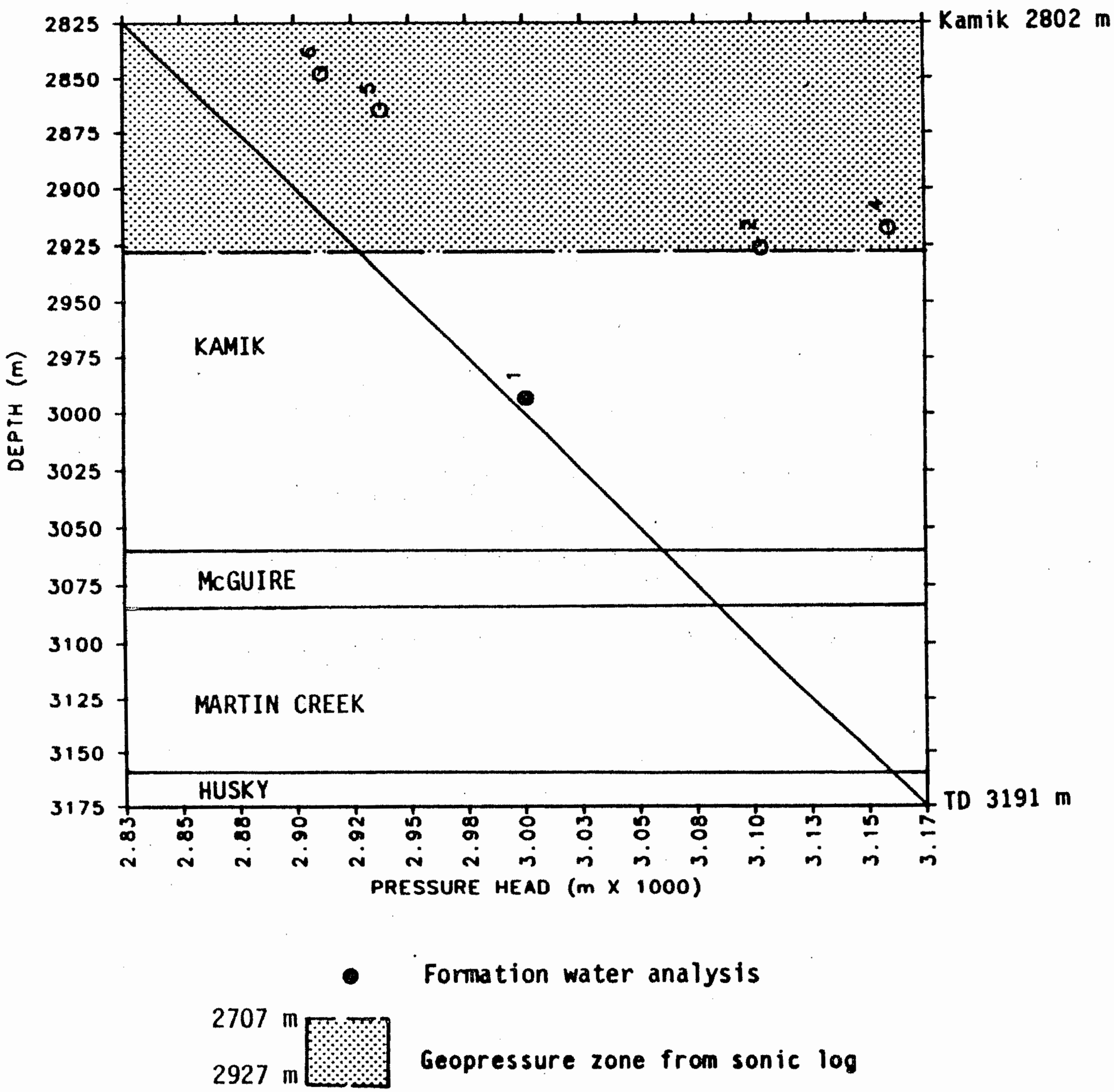

WELL IDENTIFIER: 300C426930134450
NAME: IOE TAGLU C-42
Permafrost 600+ m
Richards 1628 m
RICHARDS
REINDEER
DEPTH (m)
PRESSURE HEAD (m)
TD 4895 m
Formation water analysis
2682 m
(bottom of log) 4878 m
Geopressure zone from sonic log


WELL IDENTIFIER: 300D486900133150
NAME: GULF MOBIL KAMIK D-48
Permafrost 370 m
Mount Goodenough 2612 m
MOUNT GOODENOUGH
KAMIK
McGUIRE
MARTIN CREEK
HUSKY
Devonian/Precambrian 3213 m
TD 3235 m
DEPTH (m)
PRESSURE HEAD (m)
2820
2840
2860
2880
2900
2920
2940
2960
2980
3000
3020
2850 m
2865 m
Geopressure zone from sonic log

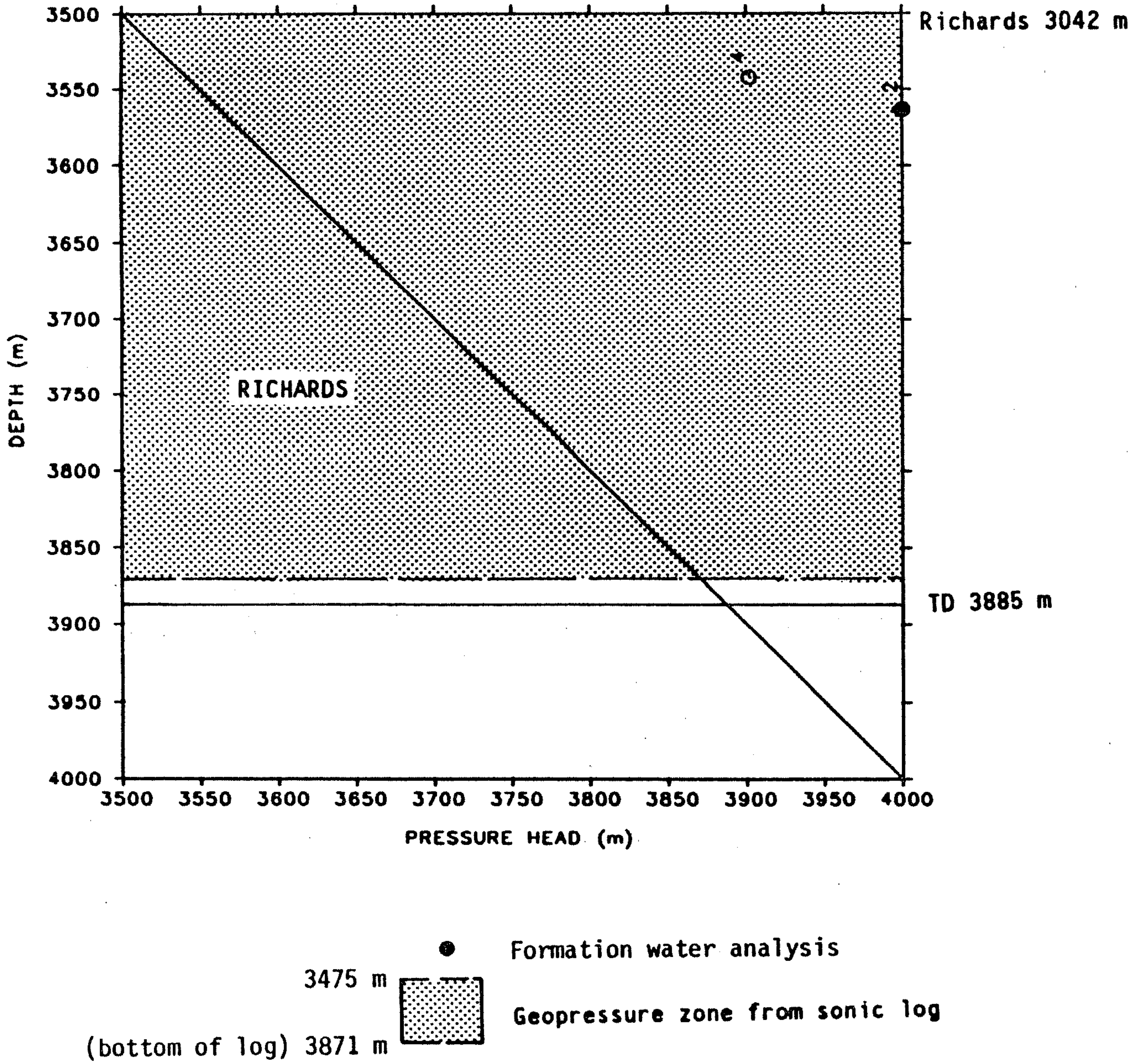
WELL IDENTIFIER: 300D556930134450
NAME: IOE TAGLU D-55



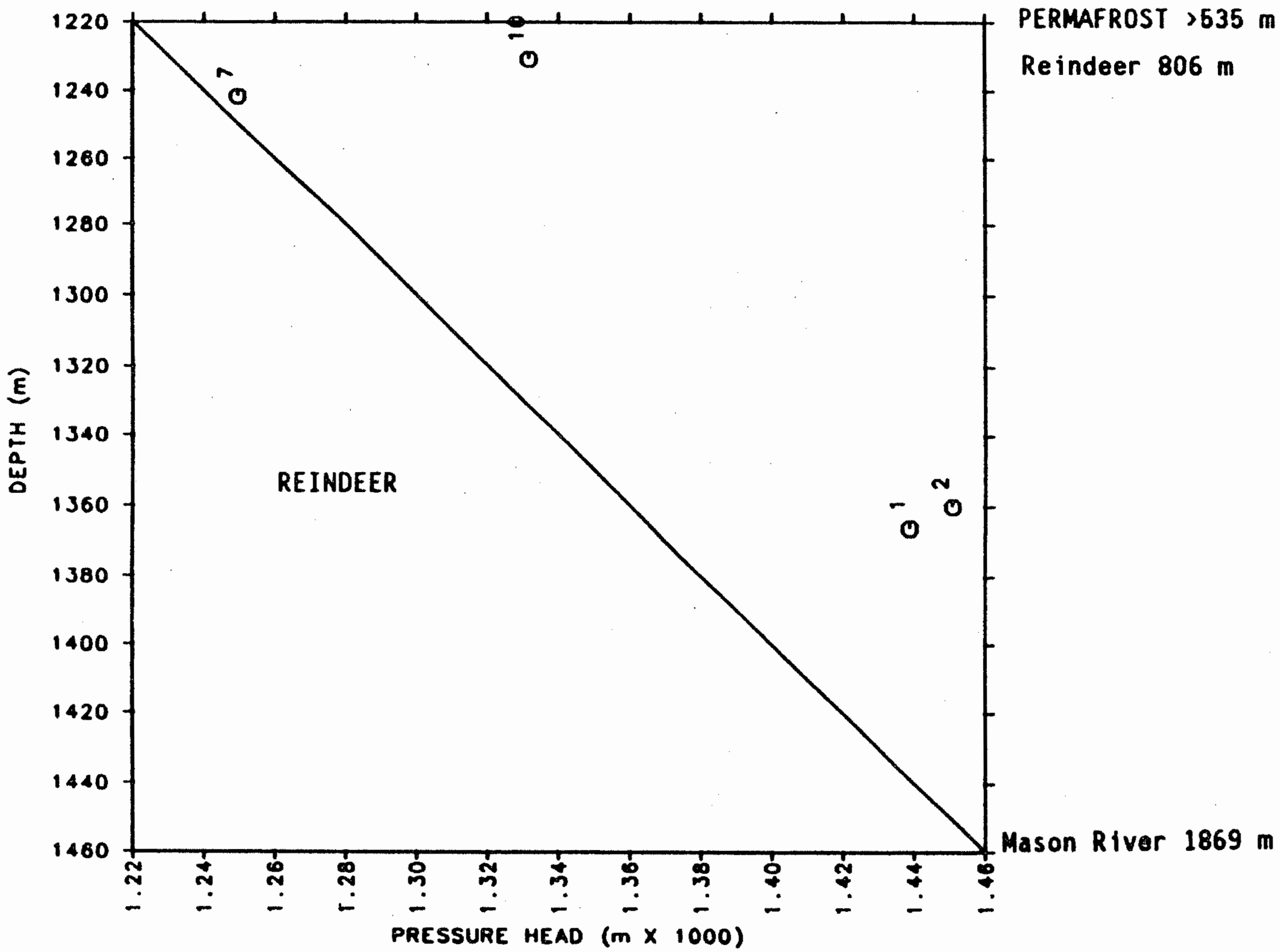
WELL IDENTIFIER: 300D586900133150
NAME: GULF MOBIL KAMIK D-58



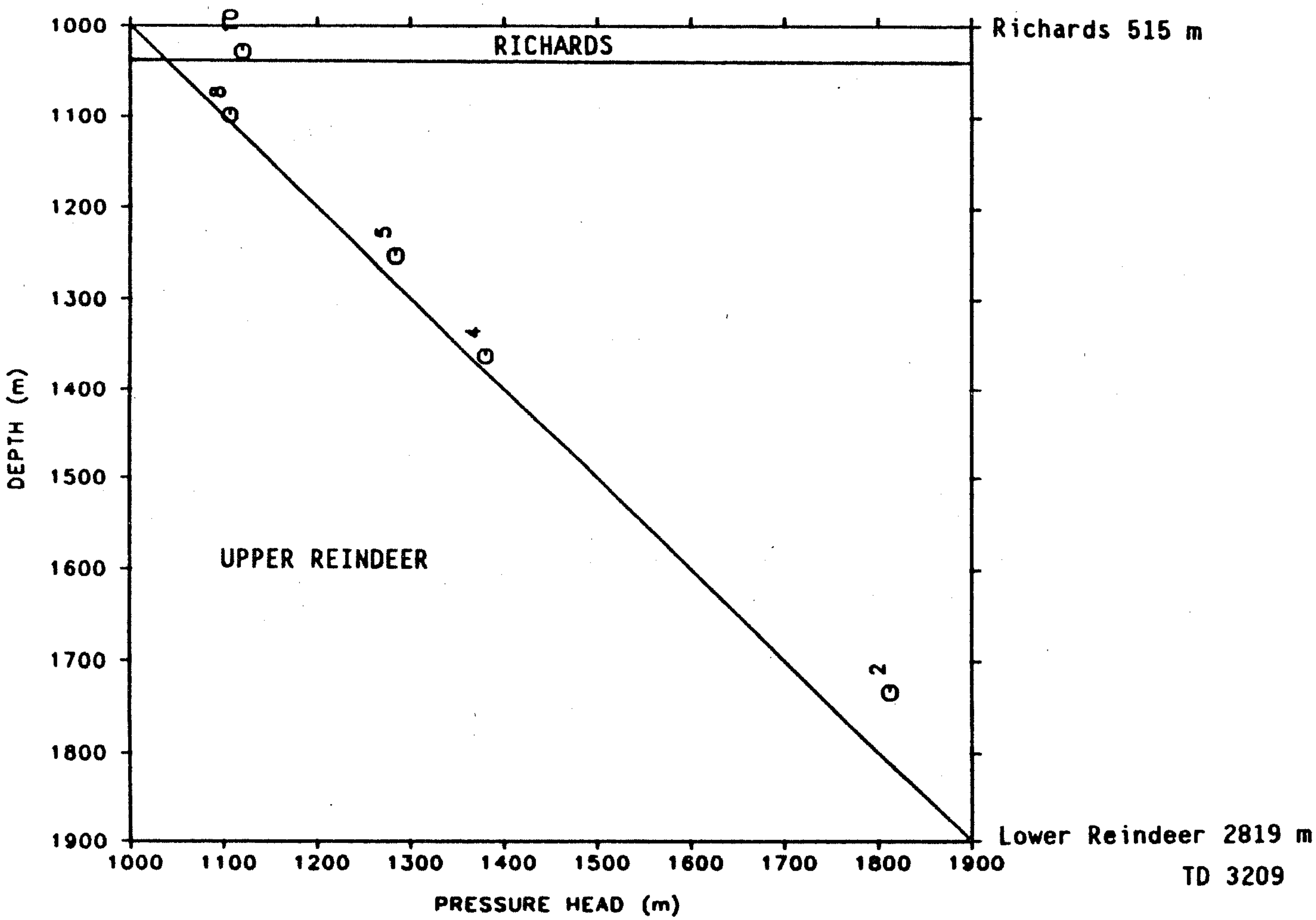
WELL IDENTIFIER: 300E176950134150
NAME: IMPERIAL PULLEN E-17



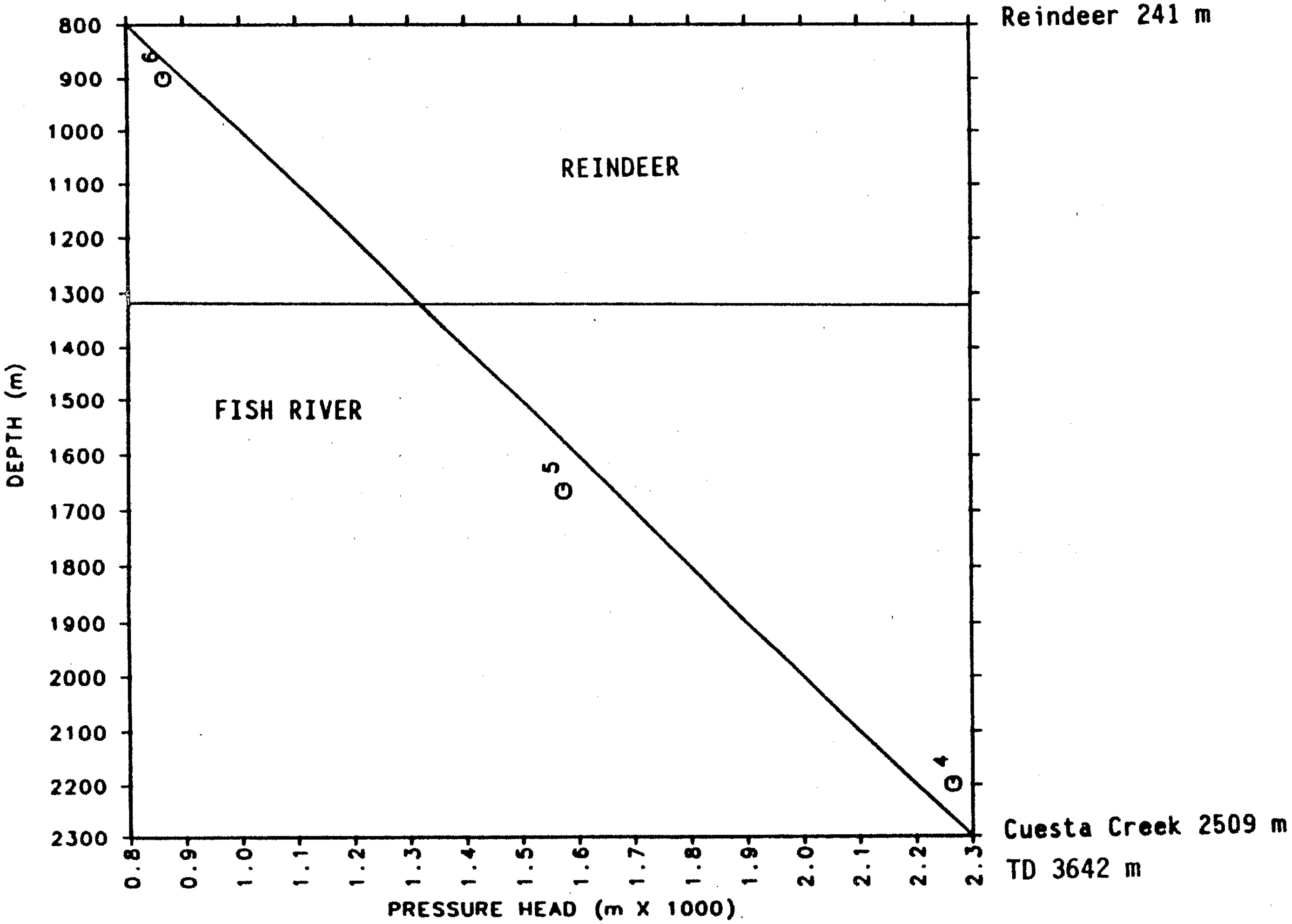
WELL IDENTIFIER: 300E416940132300
NAME: ATERTAK E-41



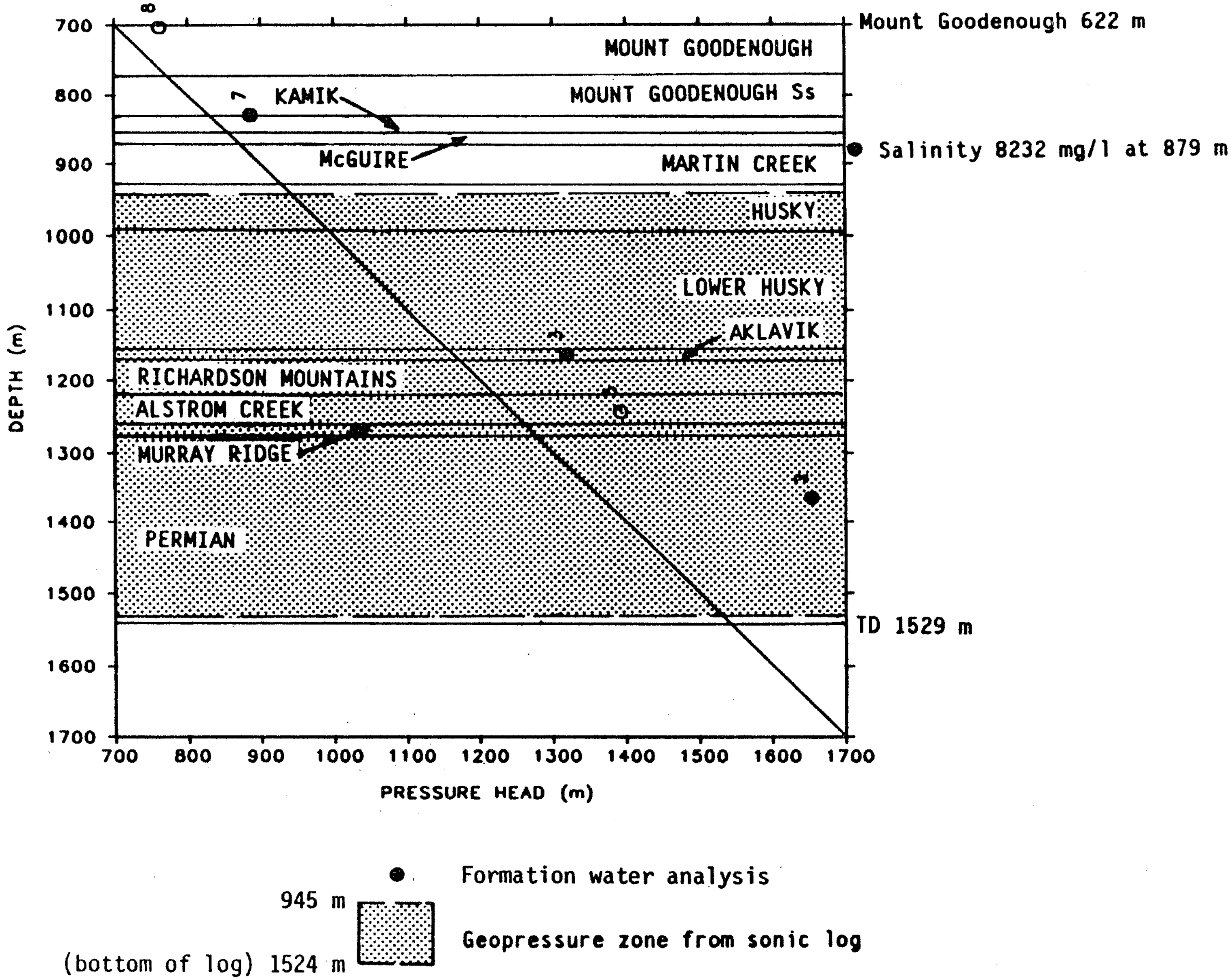
WELL IDENTIFIER: 300F286930135450
NAME: IMPERIAL ADGO F-28

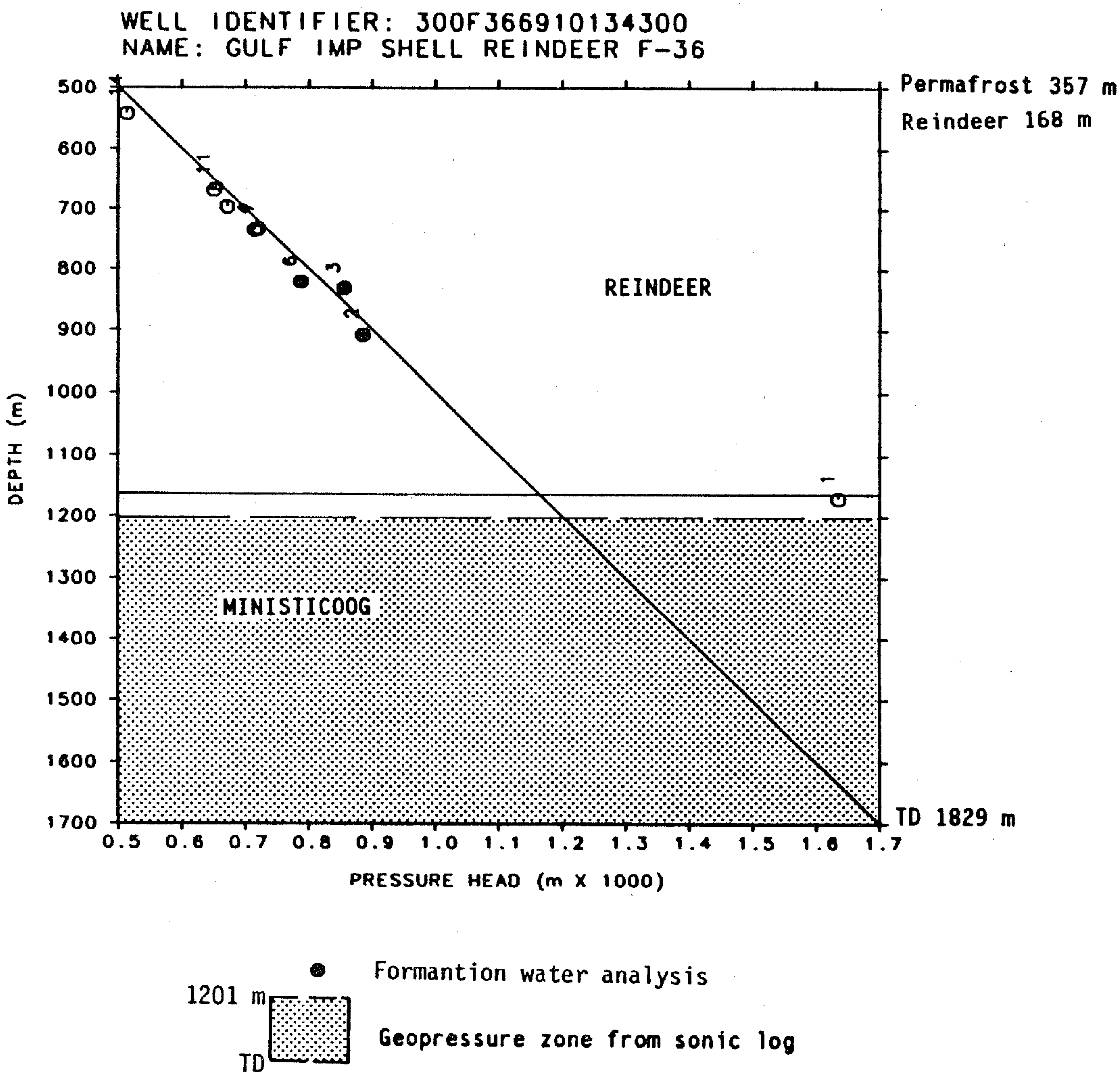


WELL IDENTIFIER: 300F306900134300
NAME: GULF IMP SHELL TUNUNUK F-30

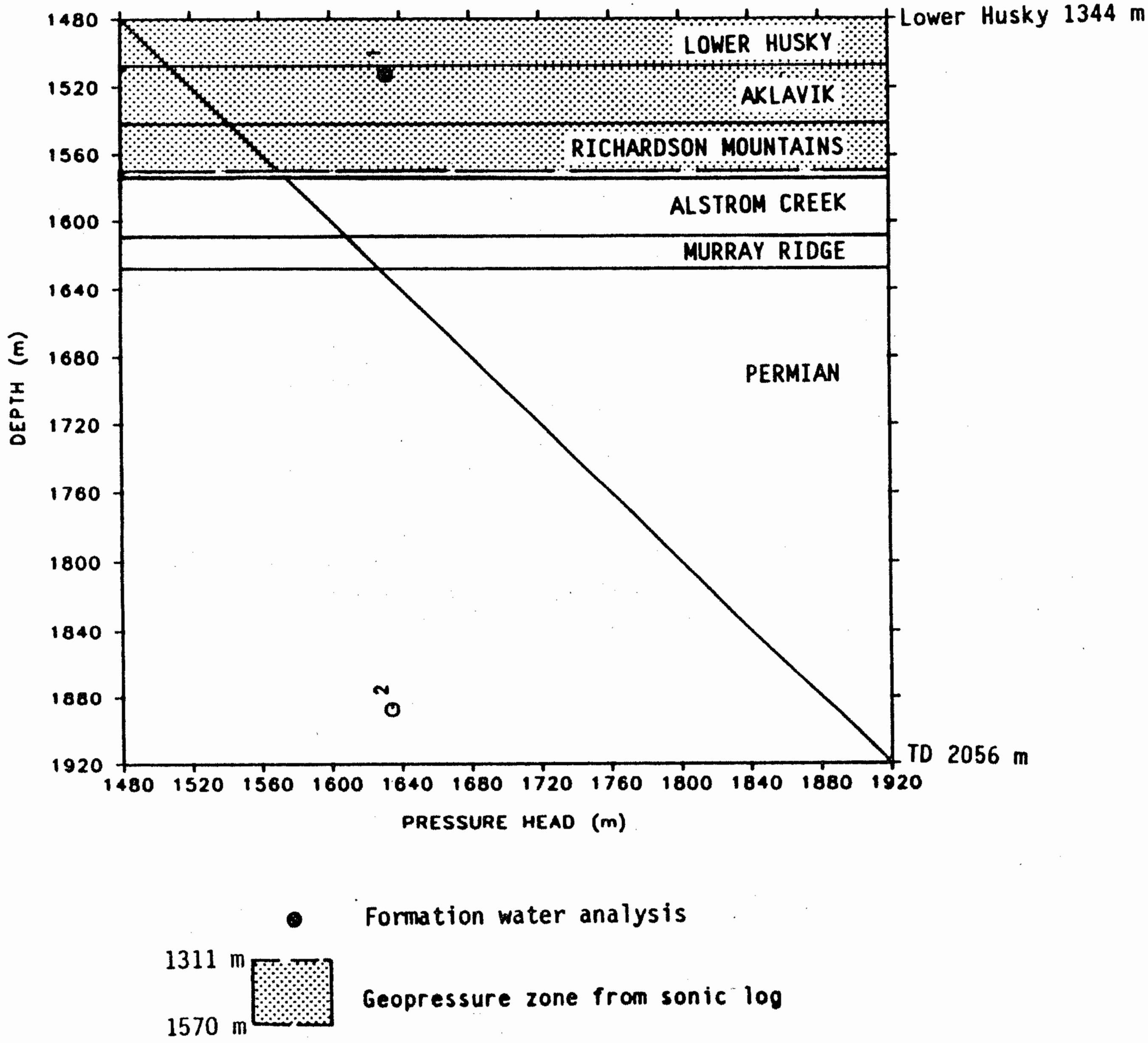


WELL IDENTIFIER: 300F316830134450
NAME: SHELL NAPOIAK F-31

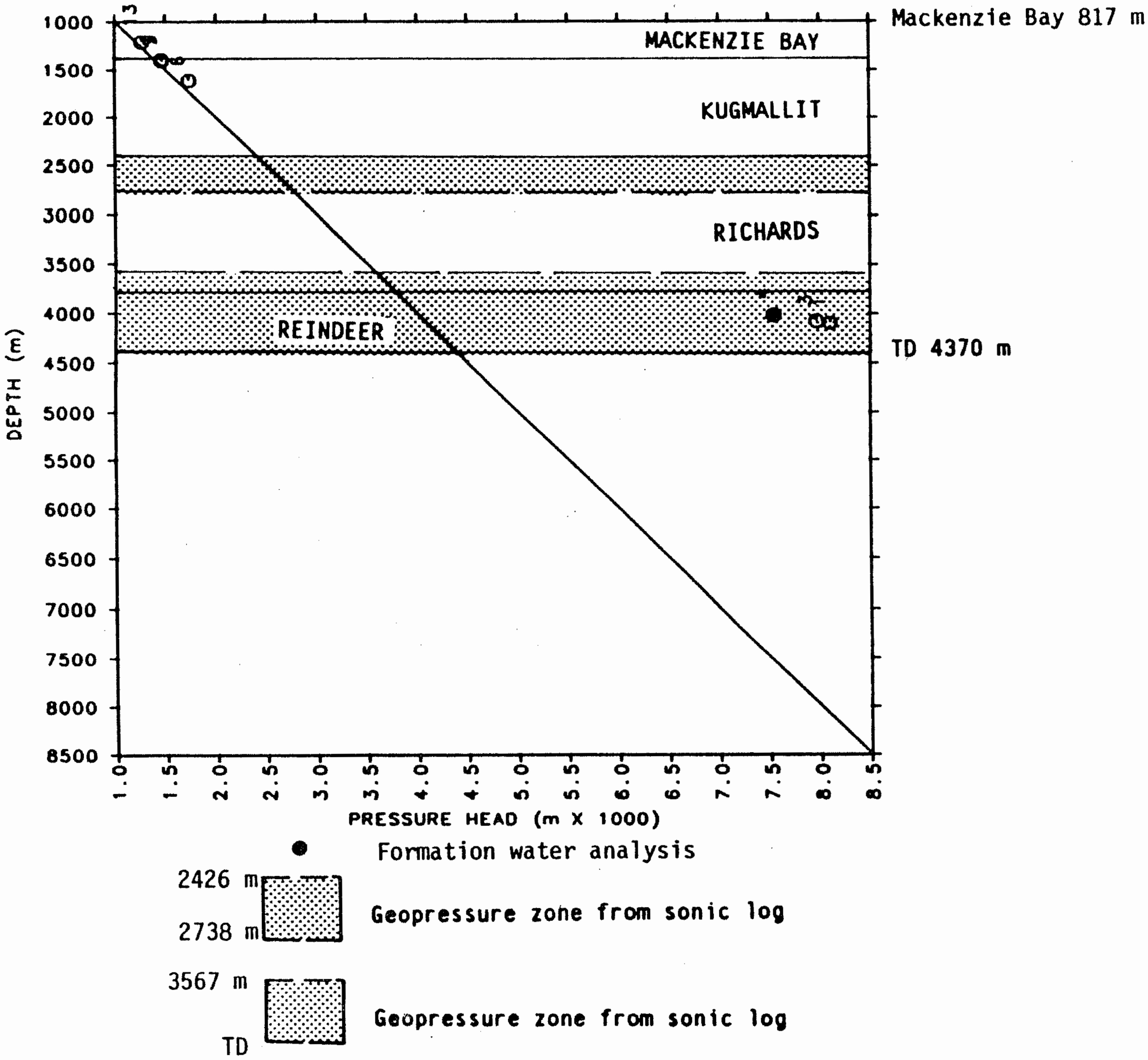



WELL IDENTIFIER: 300F366910134300
NAME: GULF IMP SHELL REINDEER F-36
Permafrost 357 m
Reindeer 168 m
REINDEER
MINISTICOOG
TD 1829 m
DEPTH (m)
PRESSURE HEAD (m X 1000)
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
Formantion water analysis
1201 m
TD
Geopressure zone from sonic log

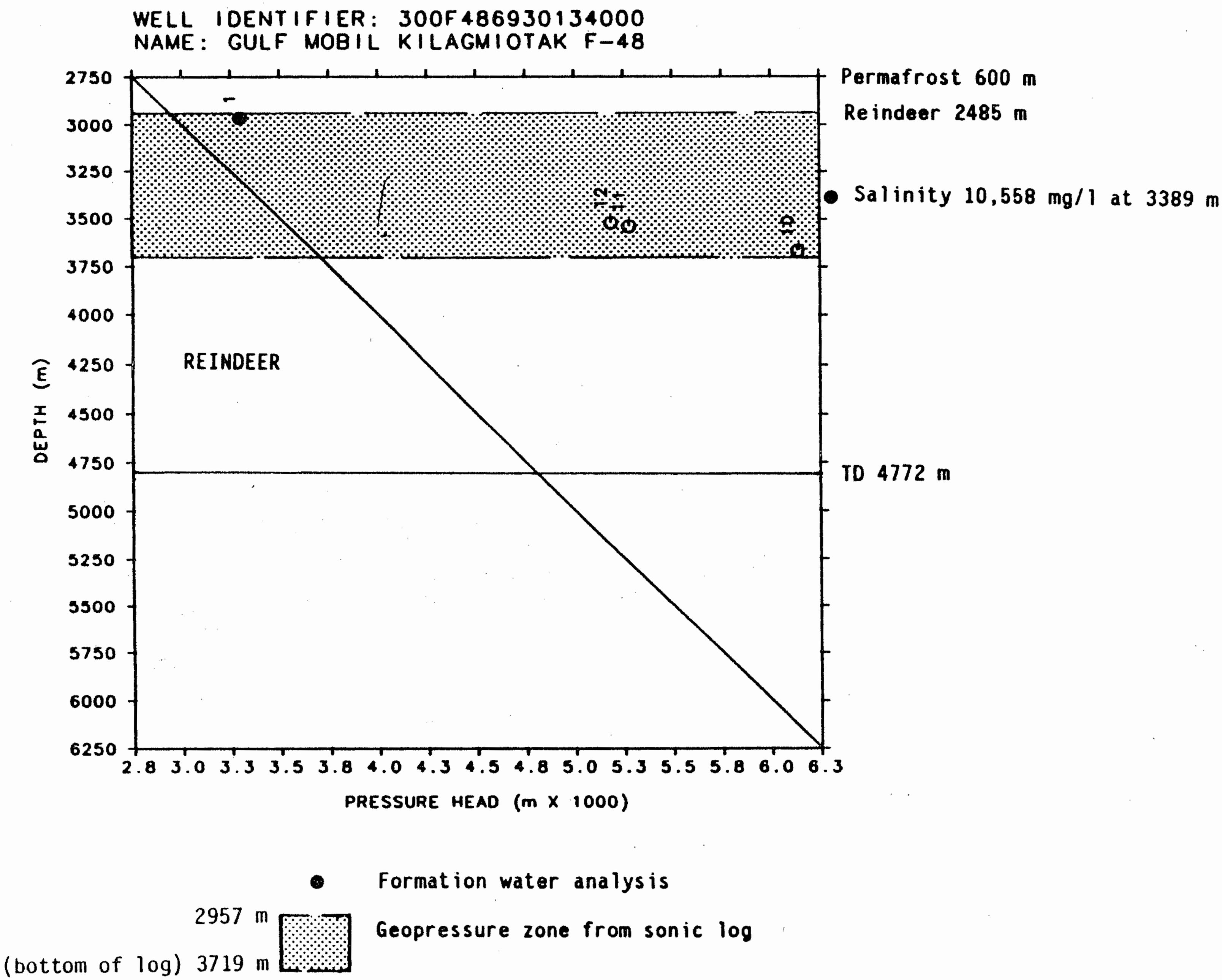
WELL IDENTIFIER: 300F386810135000
NAME: UNION AKLAVIK F-38



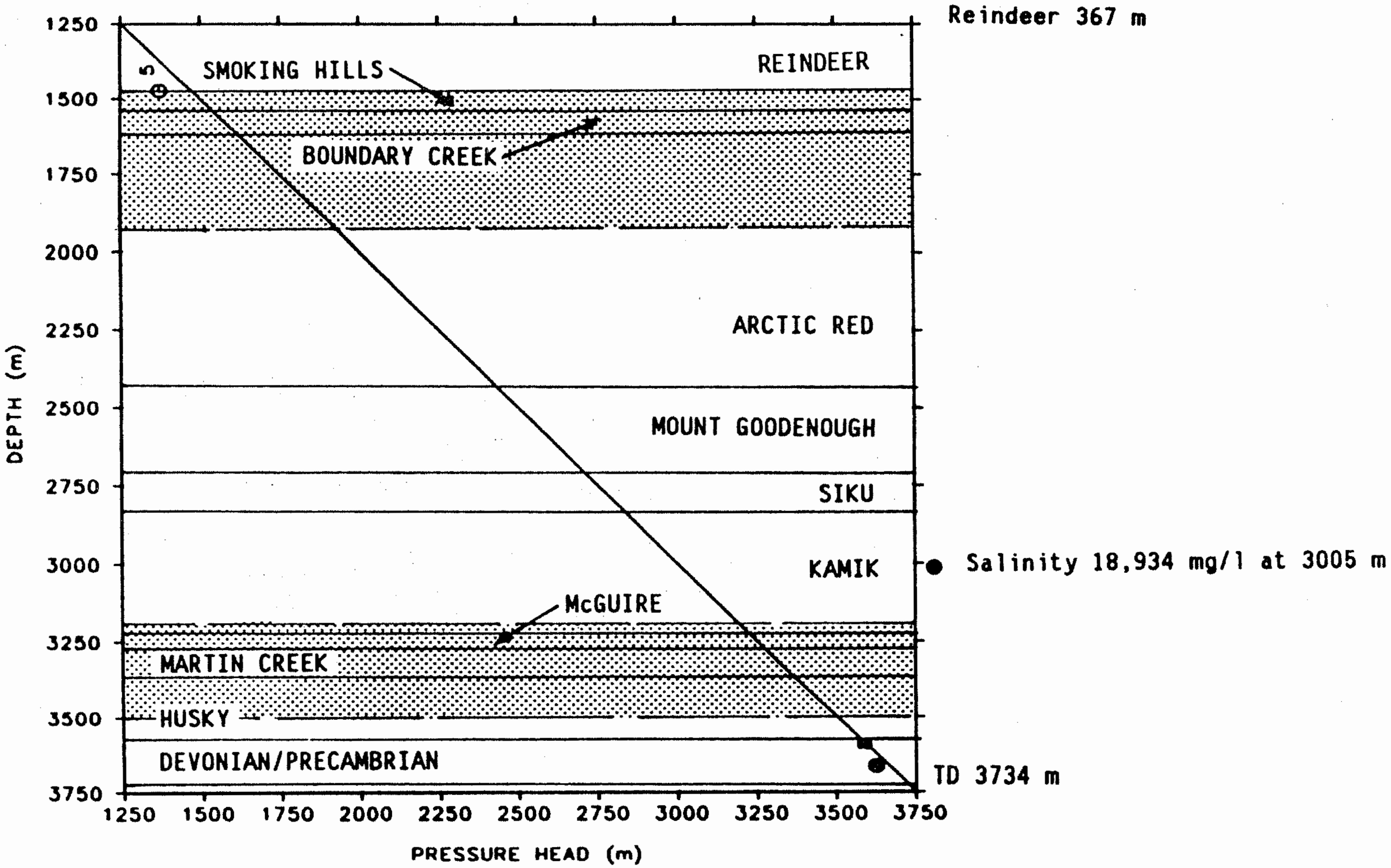
WELL IDENTIFIER: 300F406940135450
NAME: IMPERIAL NETSERK F-40



127.


WELL IDENTIFIER: 300F486930134000
NAME: GULF MOBIL KILAGMIOTAK F-48
Permafrost 600 m
Reindeer 2485 m
Salinity 10,558 mg/l at 3389 m
TD 4772 m
REINDEER
DEPTH (m)
2750
3000
3250
3500
3750
4000
4250
4500
4750
5000
5250
5500
5750
6000
6250
2.8 3.0 3.3 3.5 3.8 4.0 4.3 4.5 4.8 5.0 5.3 5.5 5.8 6.0 6.3
PRESSURE HEAD (m X 1000)
Formation water analysis
2957 m
(bottom of log) 3719 m
Geopressure zone from sonic log

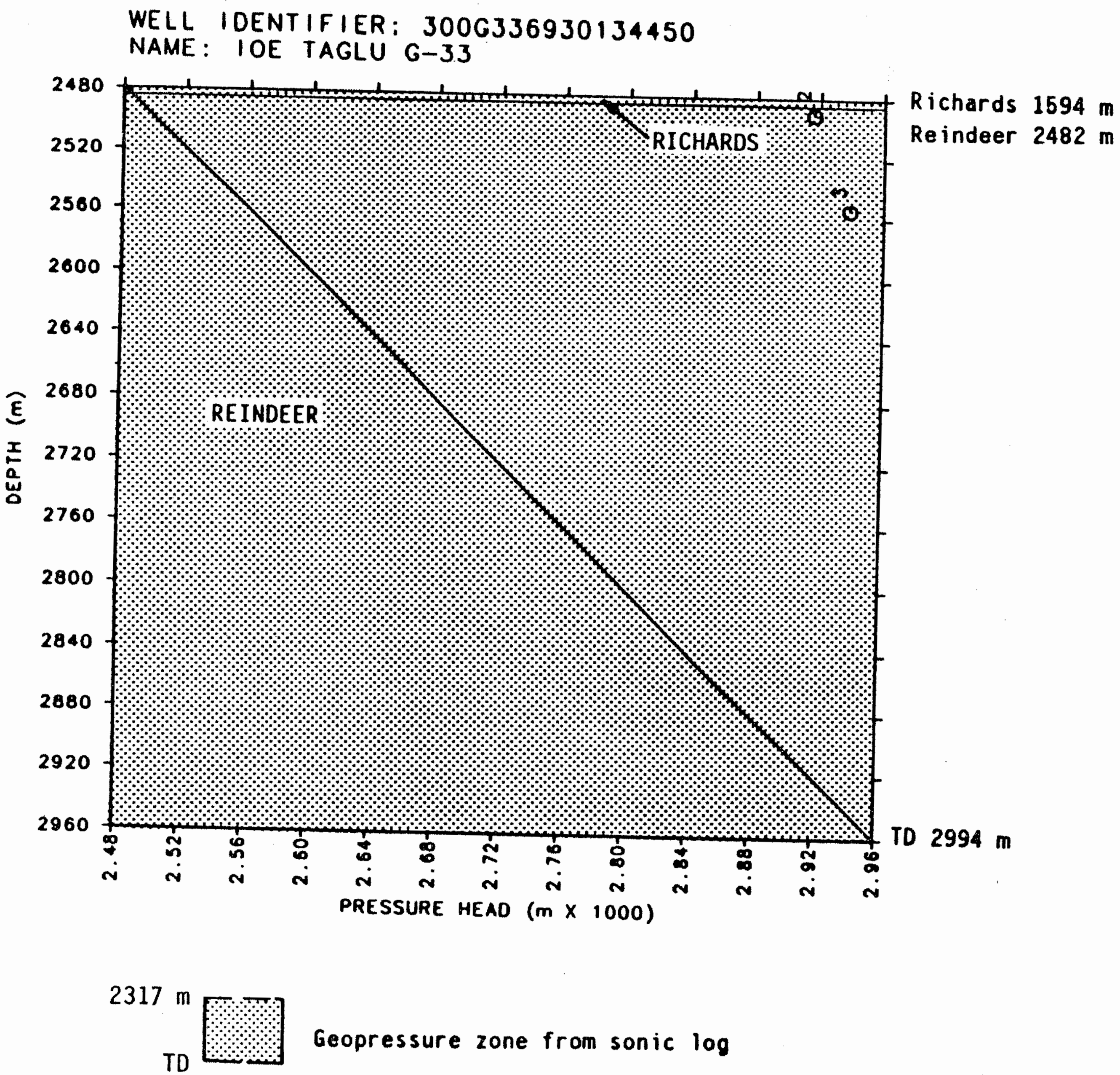
WELL IDENTIFIER: 300G046900133450
NAME: GULF MOBIL EAST REINDEER G-04



● Formation water analysis

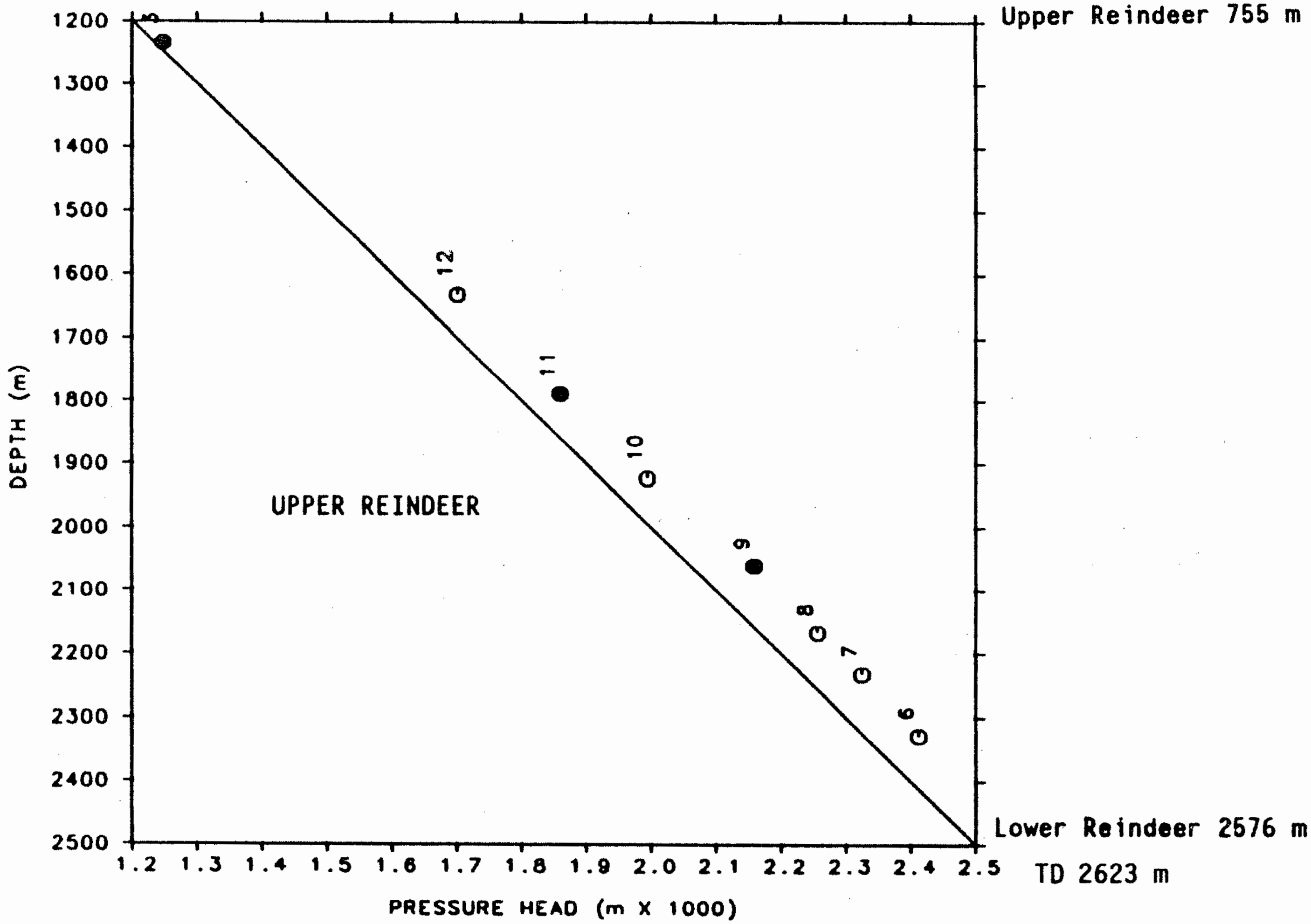
1478 m – 1927 m: Geopressure zone from sonic log

3231 m – 3500 m: Geopressure zone from sonic log

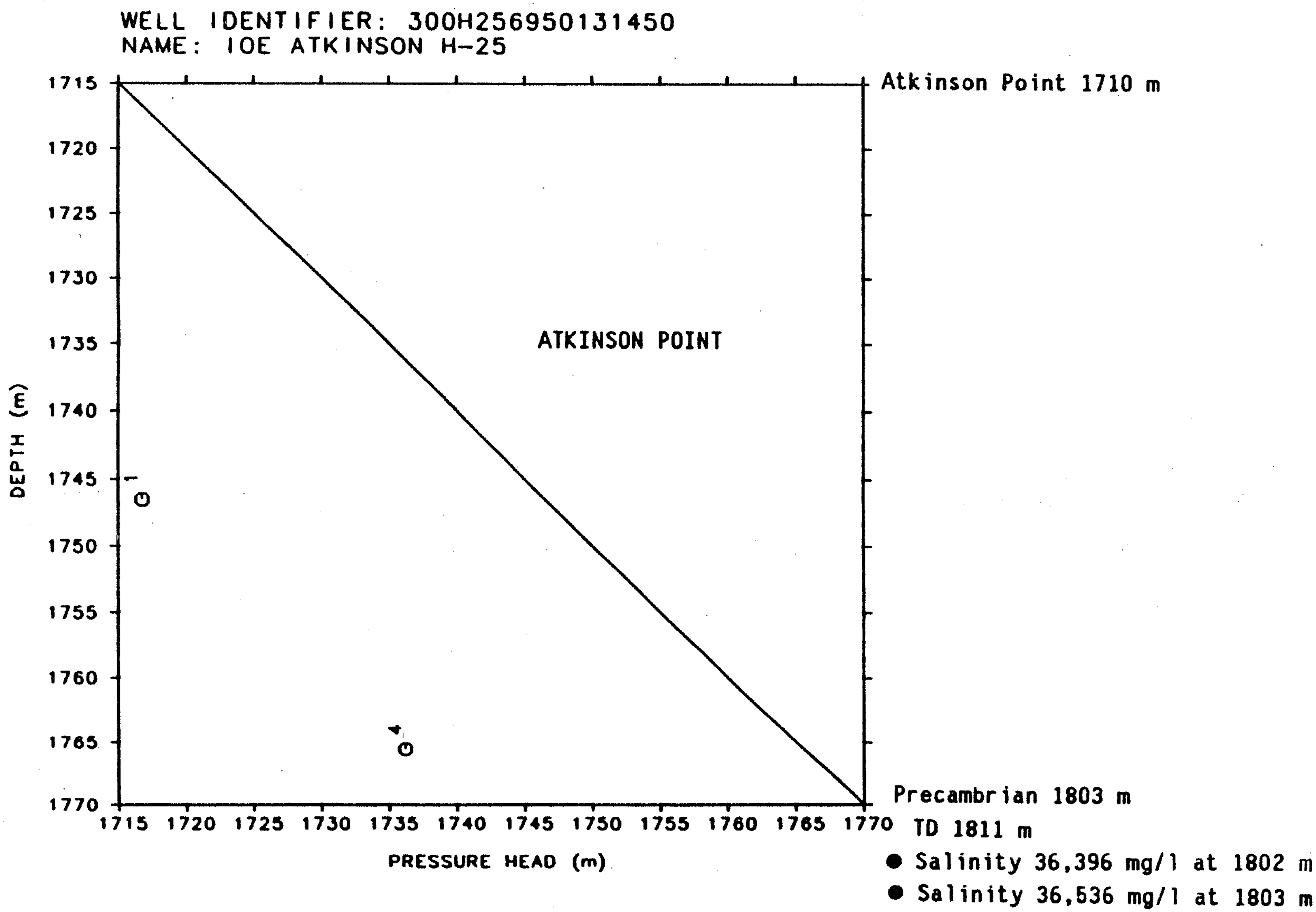


WELL IDENTIFIER: 300G336930134450
NAME: IOE TAGLU G-33
2480
2520
2560
2600
2640
2680
2720
2760
2800
2840
2880
2920
2960
DEPTH (m)
RICHARDS
REINDEER
Richards 1594 m
Reindeer 2482 m
TD 2994 m
2.48
2.52
2.56
2.60
2.64
2.68
2.72
2.76
2.80
2.84
2.88
2.92
2.96
PRESSURE HEAD (m X 1000)
2317 m
TD
Geopressure zone from sonic log

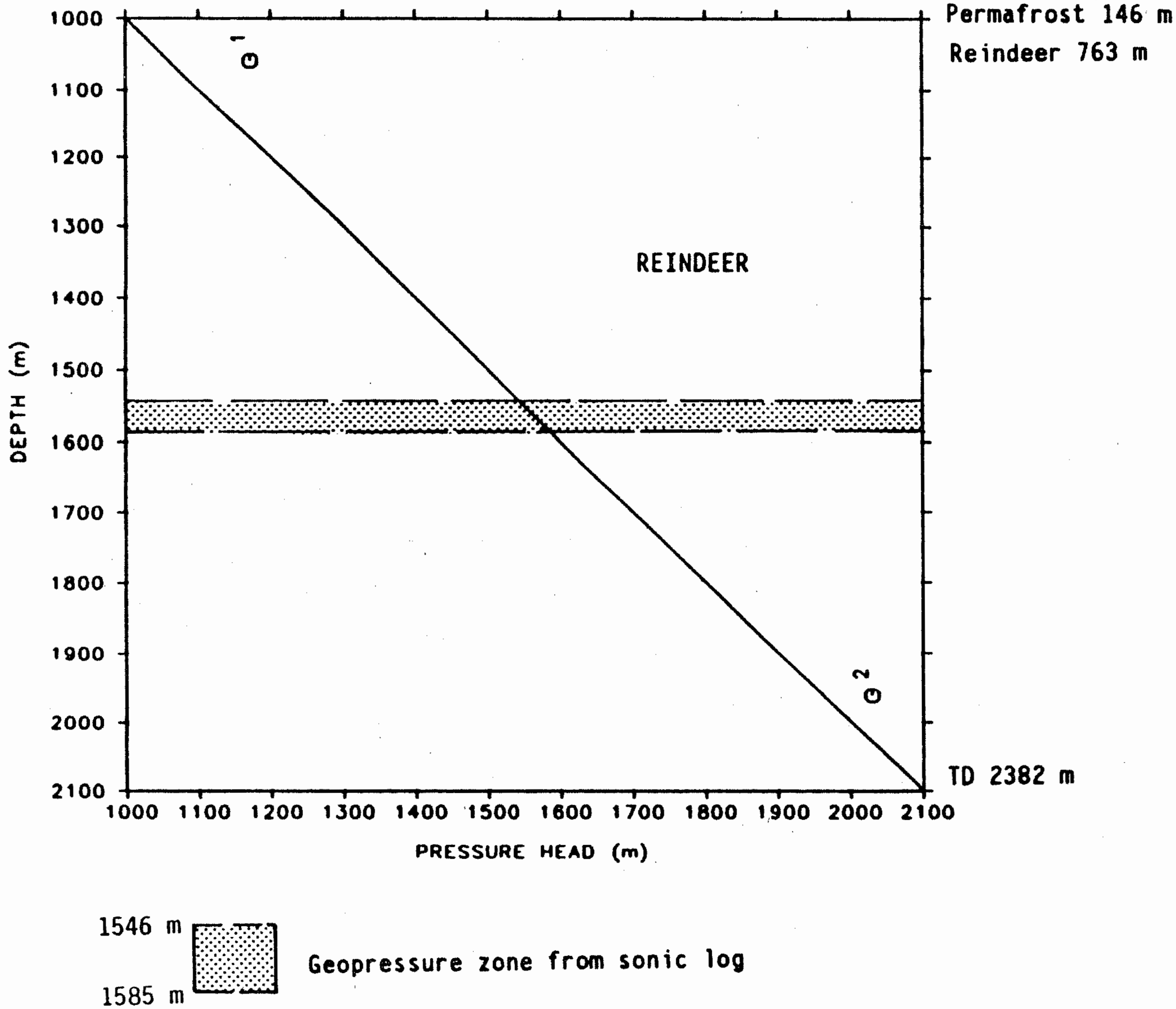
WELL IDENTIFIER: 300H246920134450
NAME: GULF MOBILE TOAPOLOK H-24



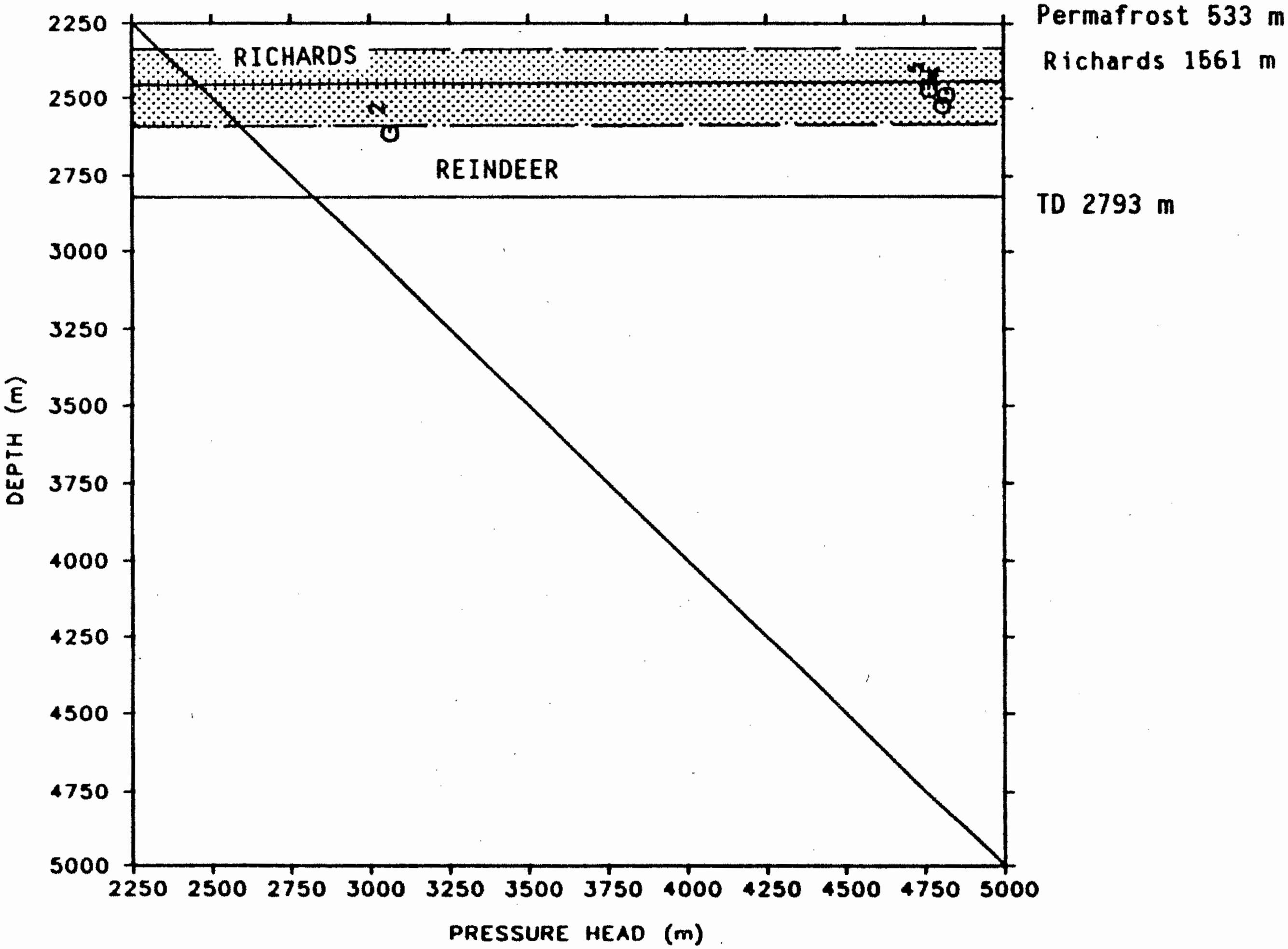
● Formation water analysis


WELL IDENTIFIER: 300H256950131450
NAME: IOE ATKINSON H-25
ATKINSON POINT
Atkinson Point 1710 m
Precambrian 1803 m
TD 1811 m
● Salinity 36,396 mg/l at 1802 m
● Salinity 36,536 mg/l at 1803 m
DEPTH (m)
PRESSURE HEAD (m)
1715
1720
1725
1730
1735
1740
1745
1750
1755
1760
1765
1770
1
4

WELL IDENTIFIER: 300H306920135150
NAME: SHELL NIGLINTGAK H-30

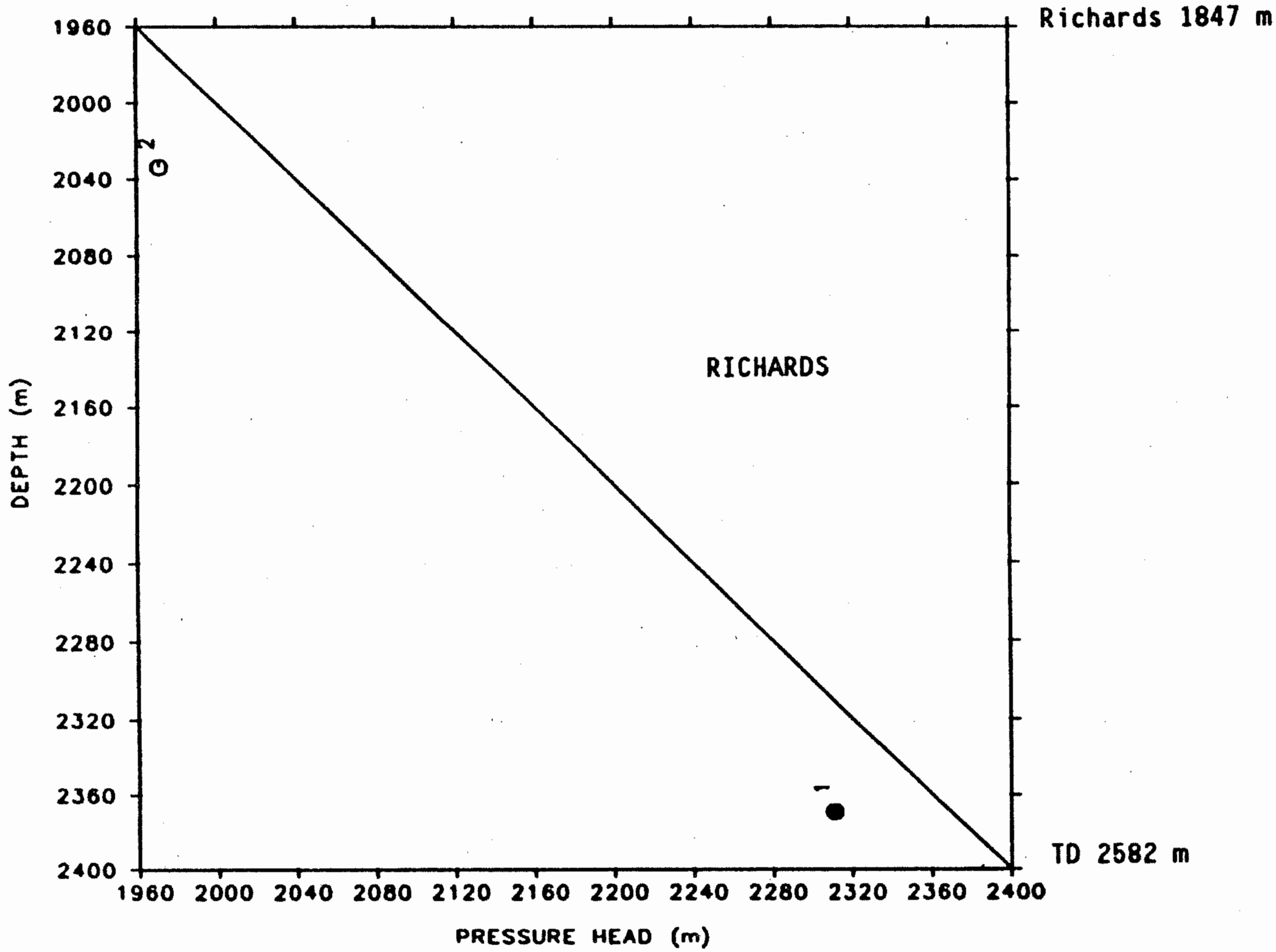


WELL IDENTIFIER: 300H546930134450
NAME: IOE TAGLU H-54



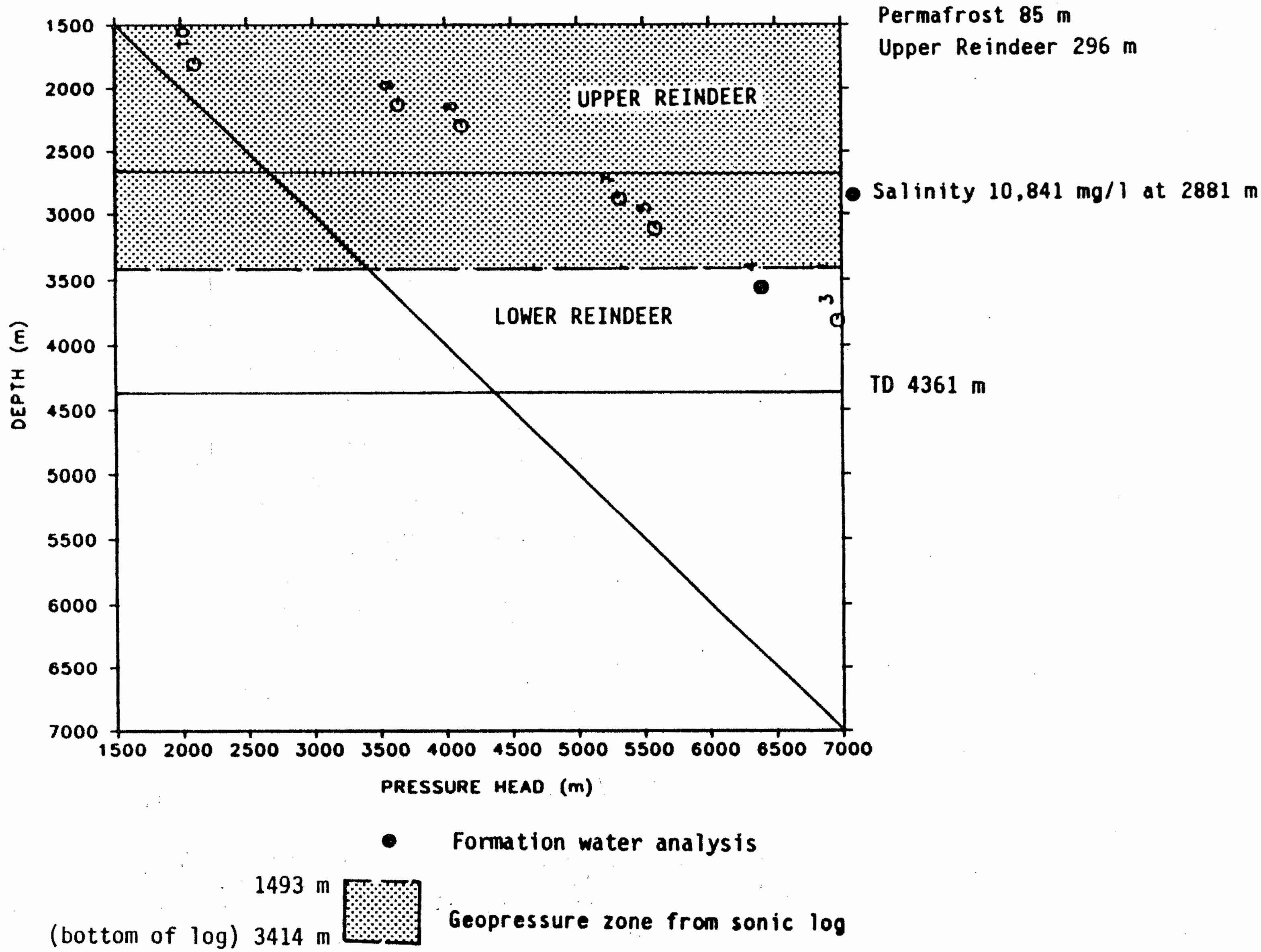
2317 m
2591 m
Geopressure zone from sonic log

WELL IDENTIFIER: 3001176920134300
NAME: GULF MOBIL YA YA 1-17



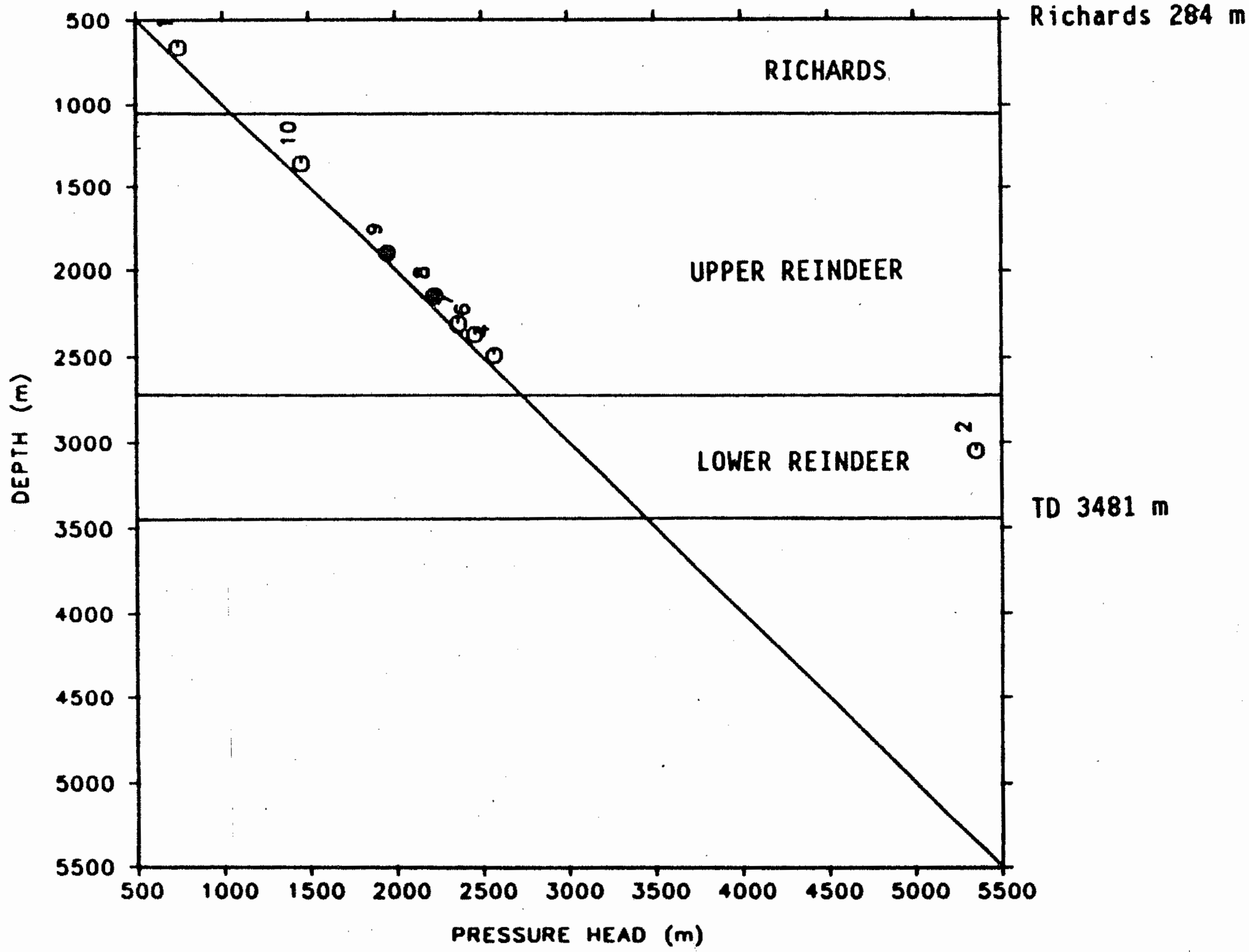
● Formation water analysis

WELL IDENTIFIER: 300122692013515O
NAME: SHELL UNIPKAT 1-22

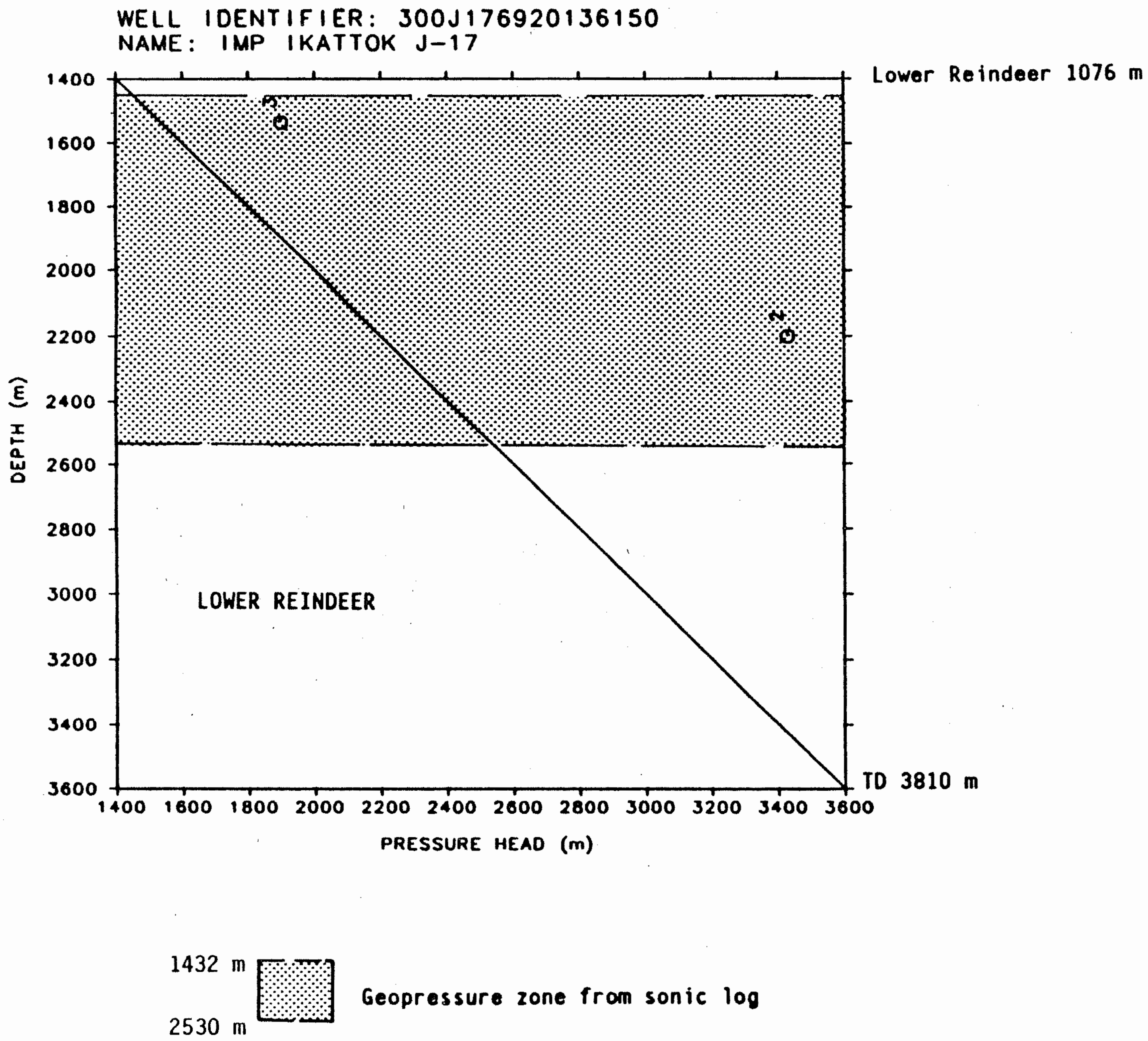


136.

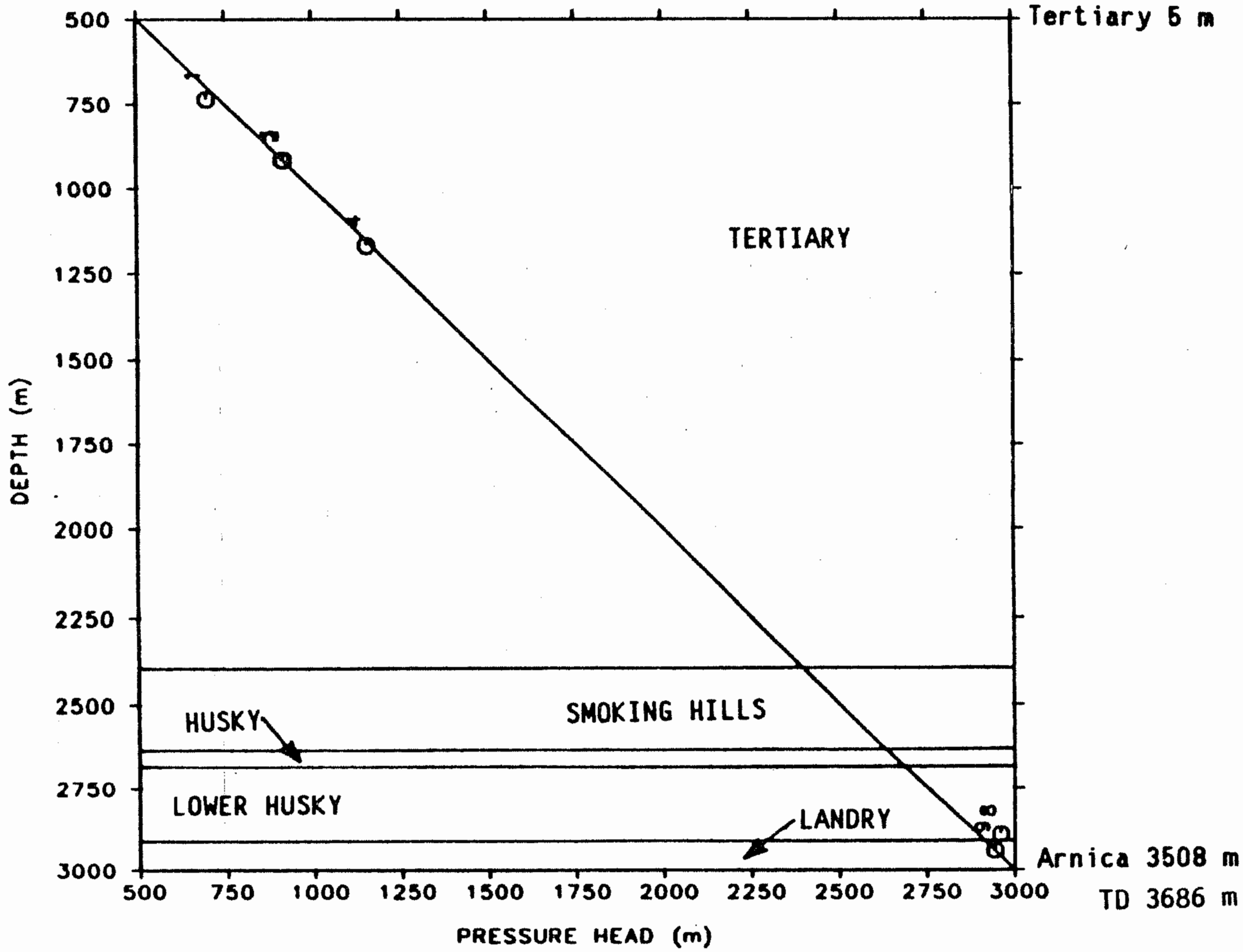
WELL IDENTIFIER: 300J066920135000
NAME: SHELL KUMAK J-06

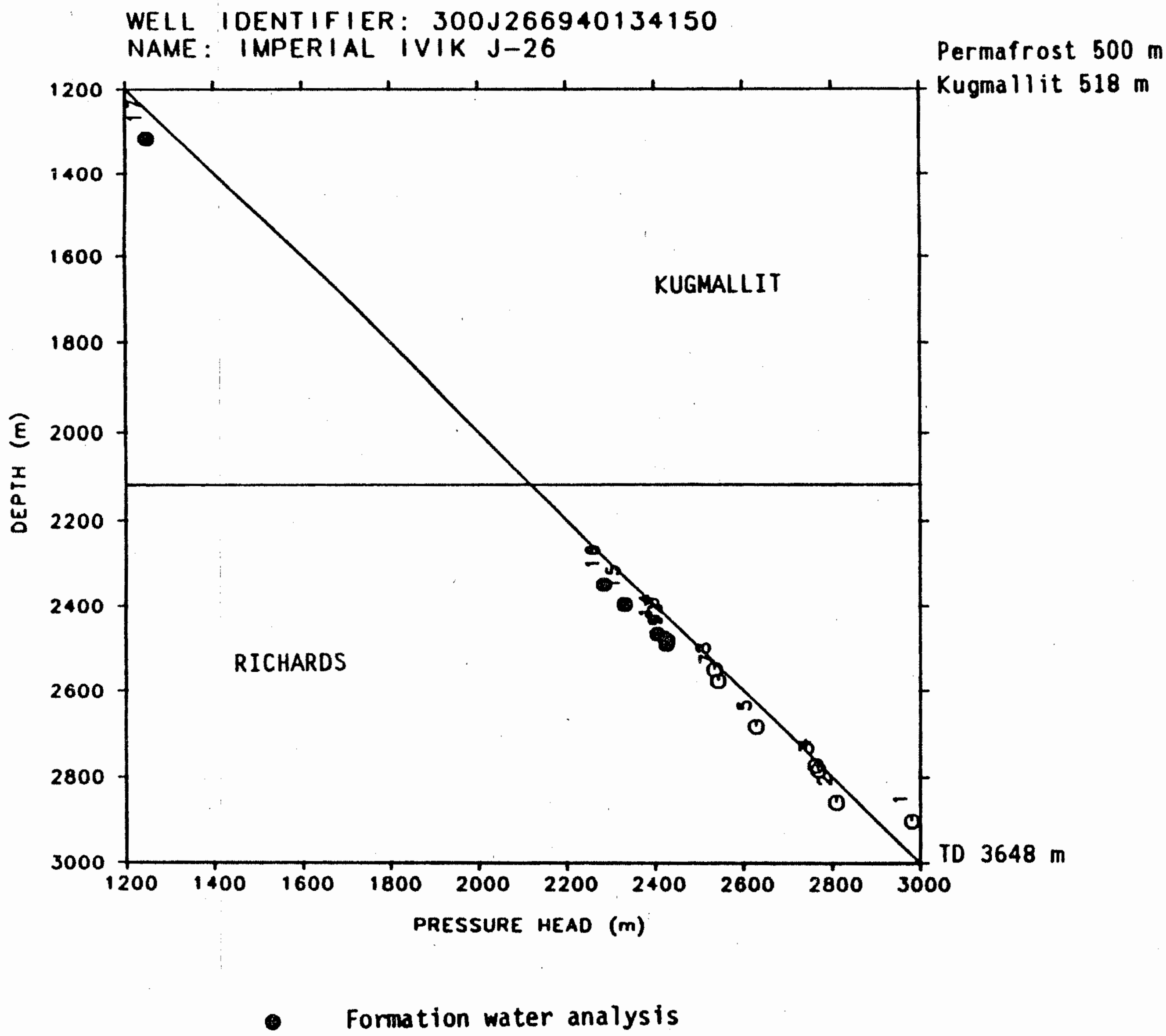


● Formation water analysis

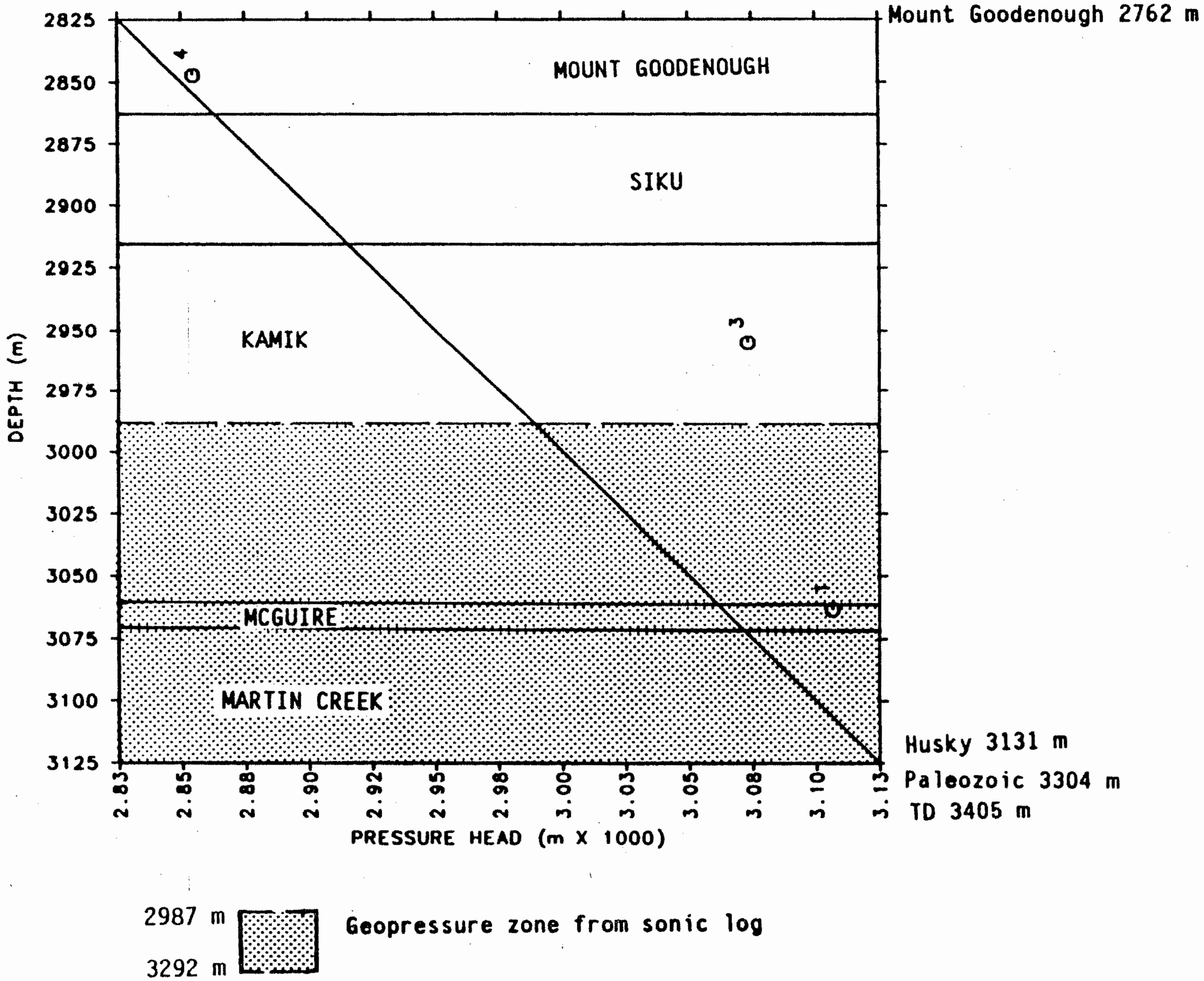

WELL IDENTIFIER: 300J176920136150
NAME: IMP IKATTOK J-17
Lower Reindeer 1076 m
DEPTH (m)
PRESSURE HEAD (m)
LOWER REINDEER
TD 3810 m
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
1432 m
2530 m
Geopressure zone from sonic log

WELL IDENTIFIER: 300J176930132450
NAME: IOE MAYOGIAK J-17

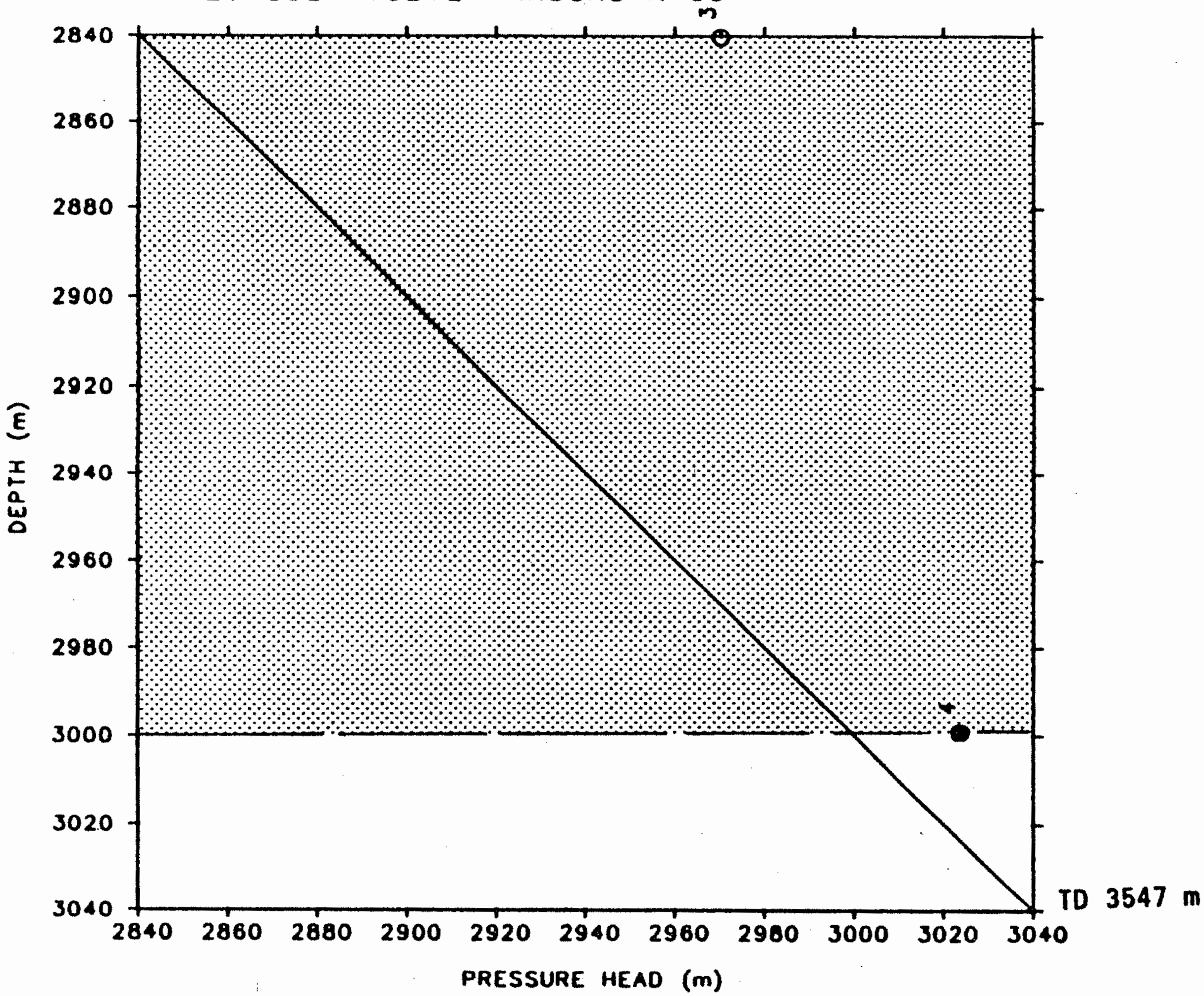



WELL IDENTIFIER: 300J266940134150
NAME: IMPERIAL IVIK J-26
Permafrost 500 m
Kugmallit 518 m
KUGMALLIT
RICHARDS
TD 3648 m
DEPTH (m)
PRESSURE HEAD (m)
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
Formation water analysis

WELL IDENTIFIER: 300J296910133000
NAME: DOME IMP IMNAK J-29



WELL IDENTIFIER: 300K096900133300
NAME: GULF MOBIL PARSONS K-09

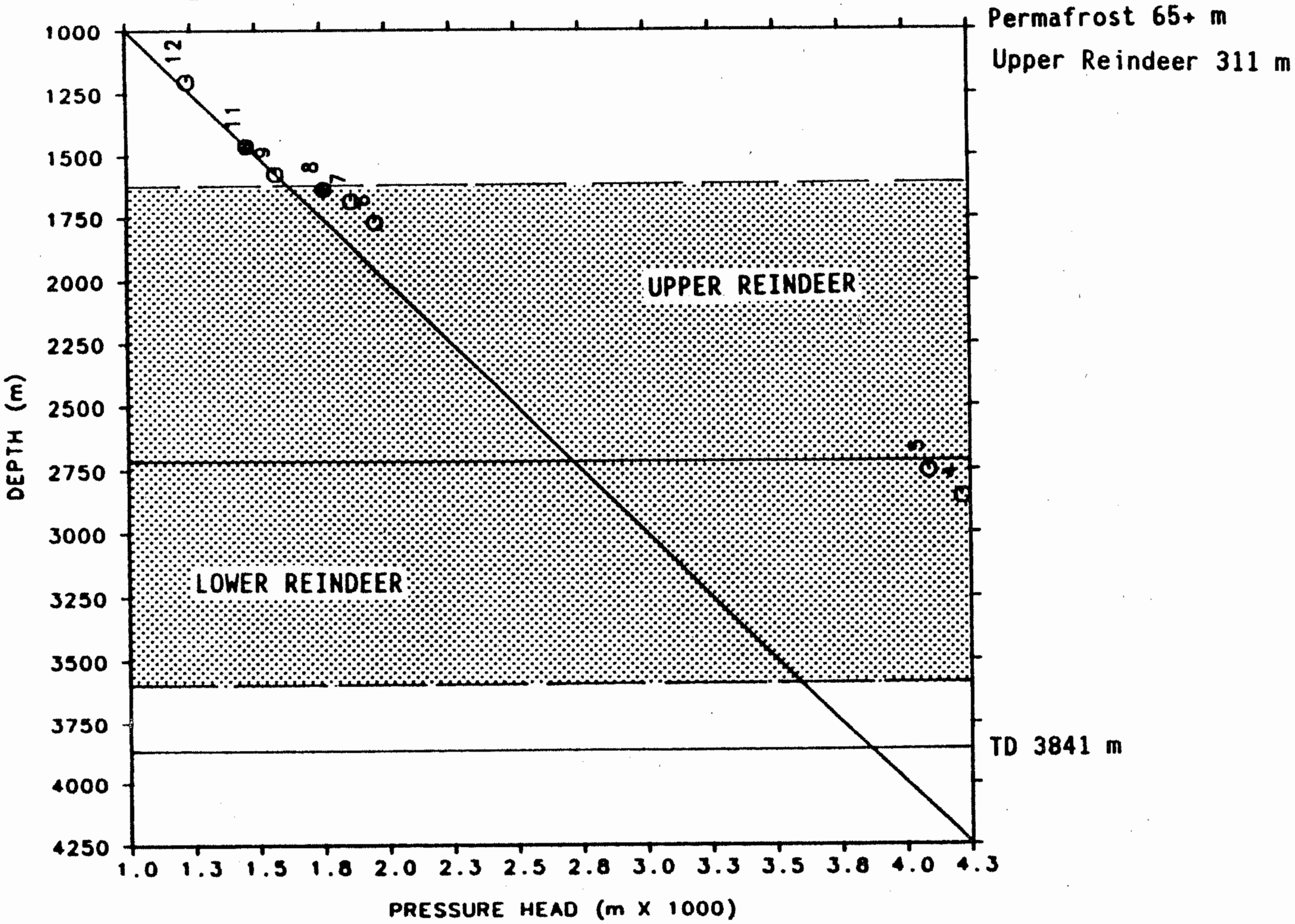


● Formation water analysis

2800 m
3000 m
Geopressure zone from sonic log

Note: Stratigraphy not available

WELL IDENTIFIER: 300K266910135000
NAME: GULF IMP SHELL TITALIK K-26

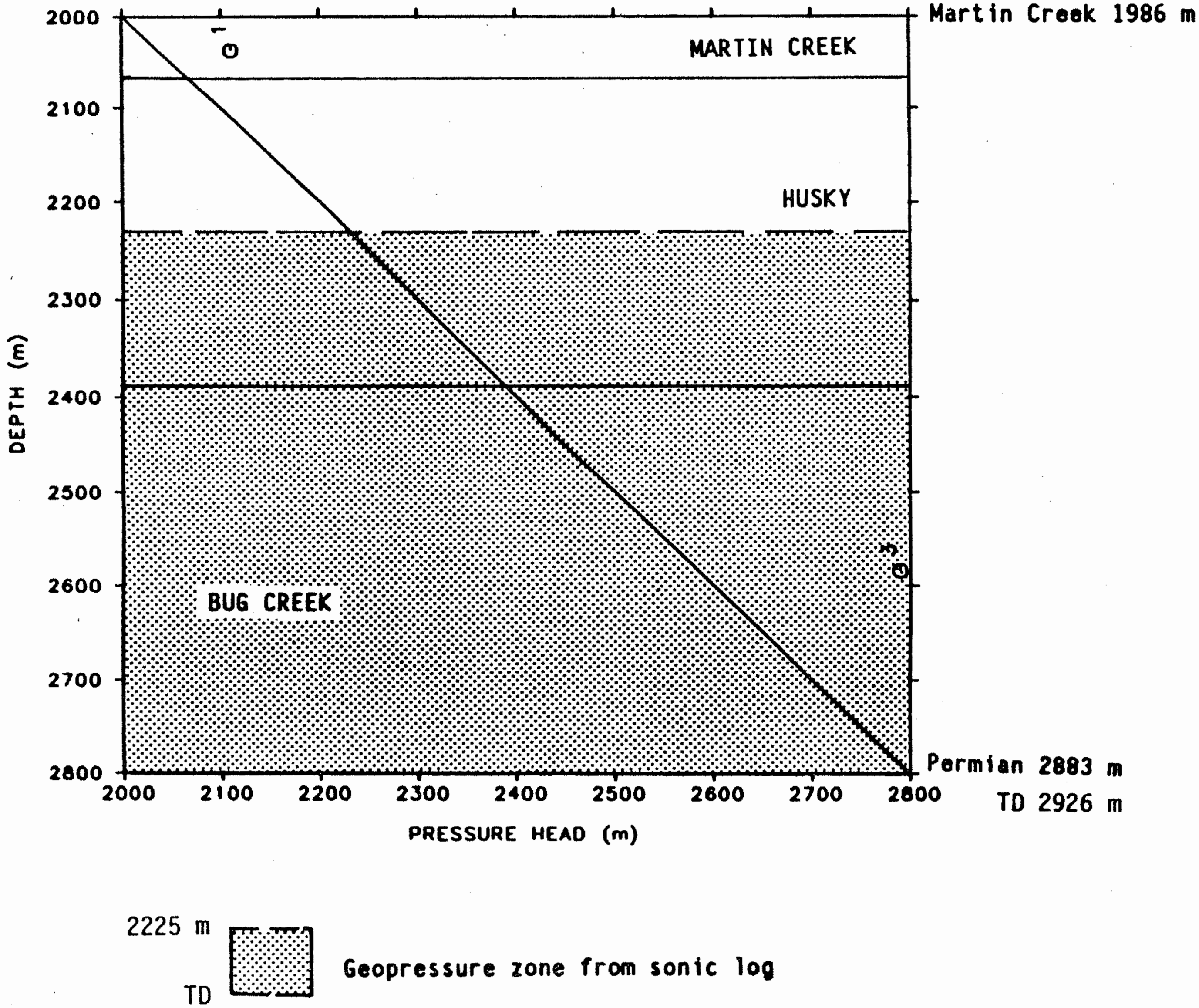


● Formation water analysis

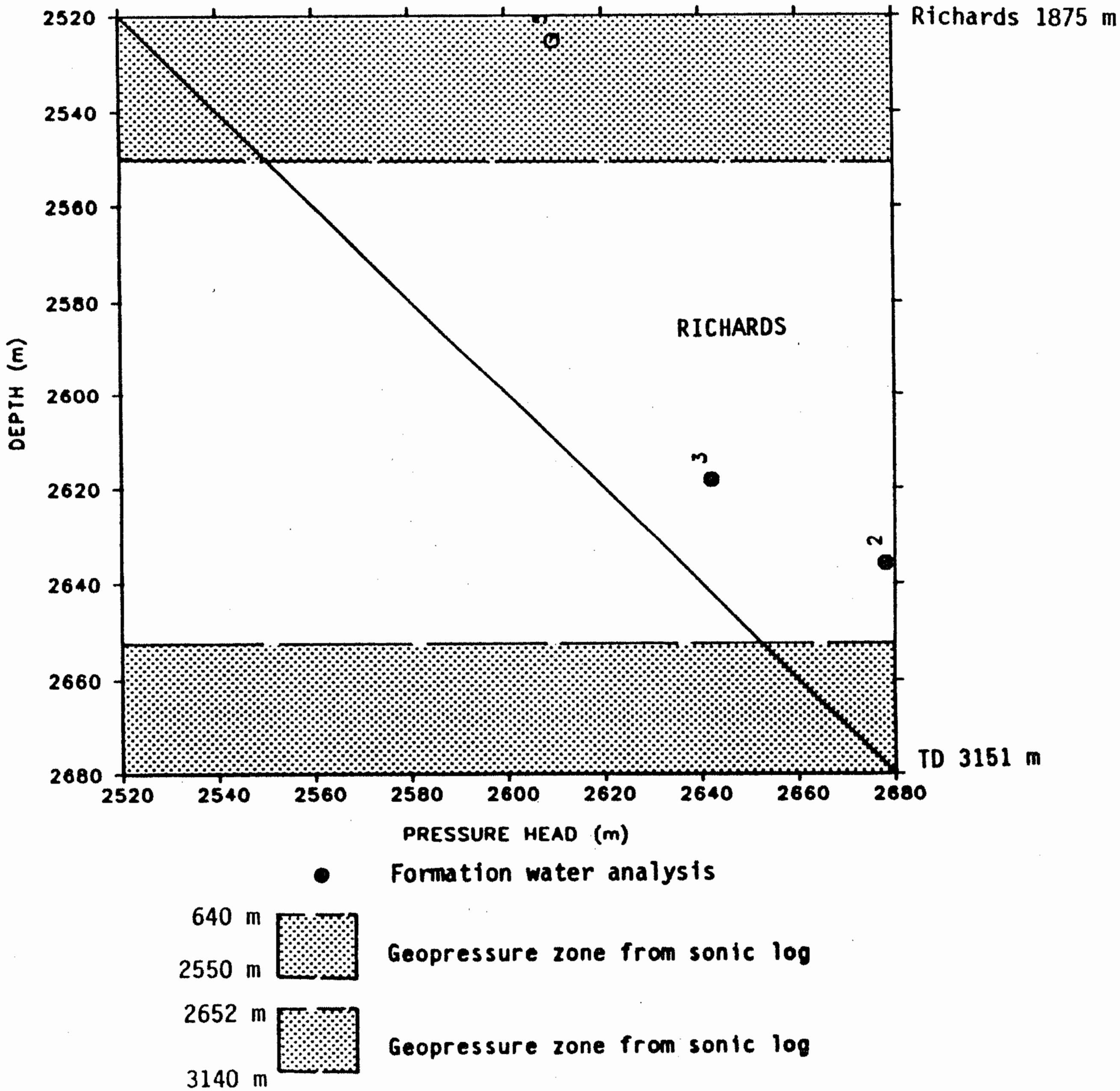
1609 m

(bottom of log) 3598 m — Geopressure zone from sonic log

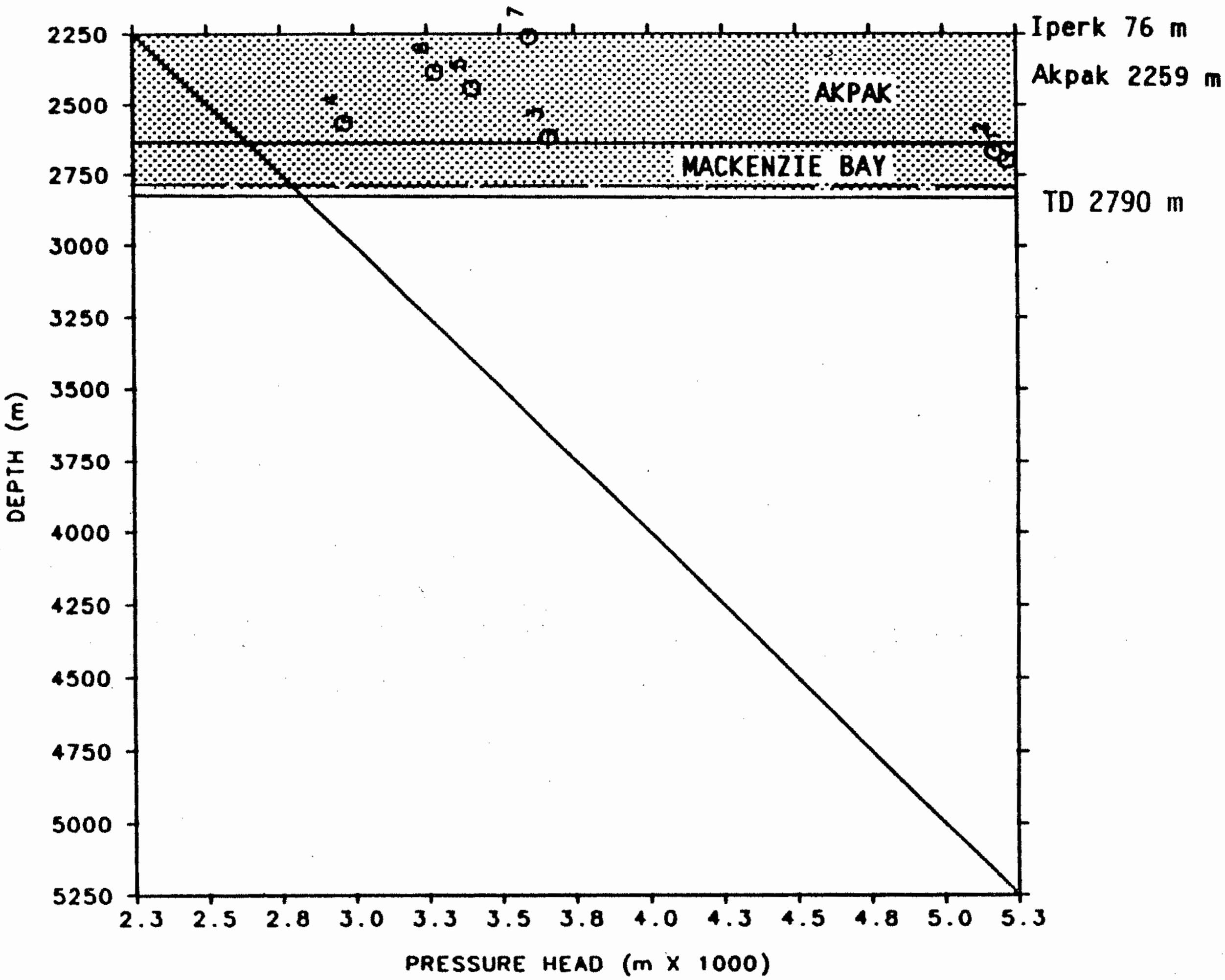
WELL IDENTIFIER: 300K316900135000
NAME: SHELL TULLUGAK K-31



WELL IDENTIFIER: 300K546940134150
NAME: D IMP IVIK K-54

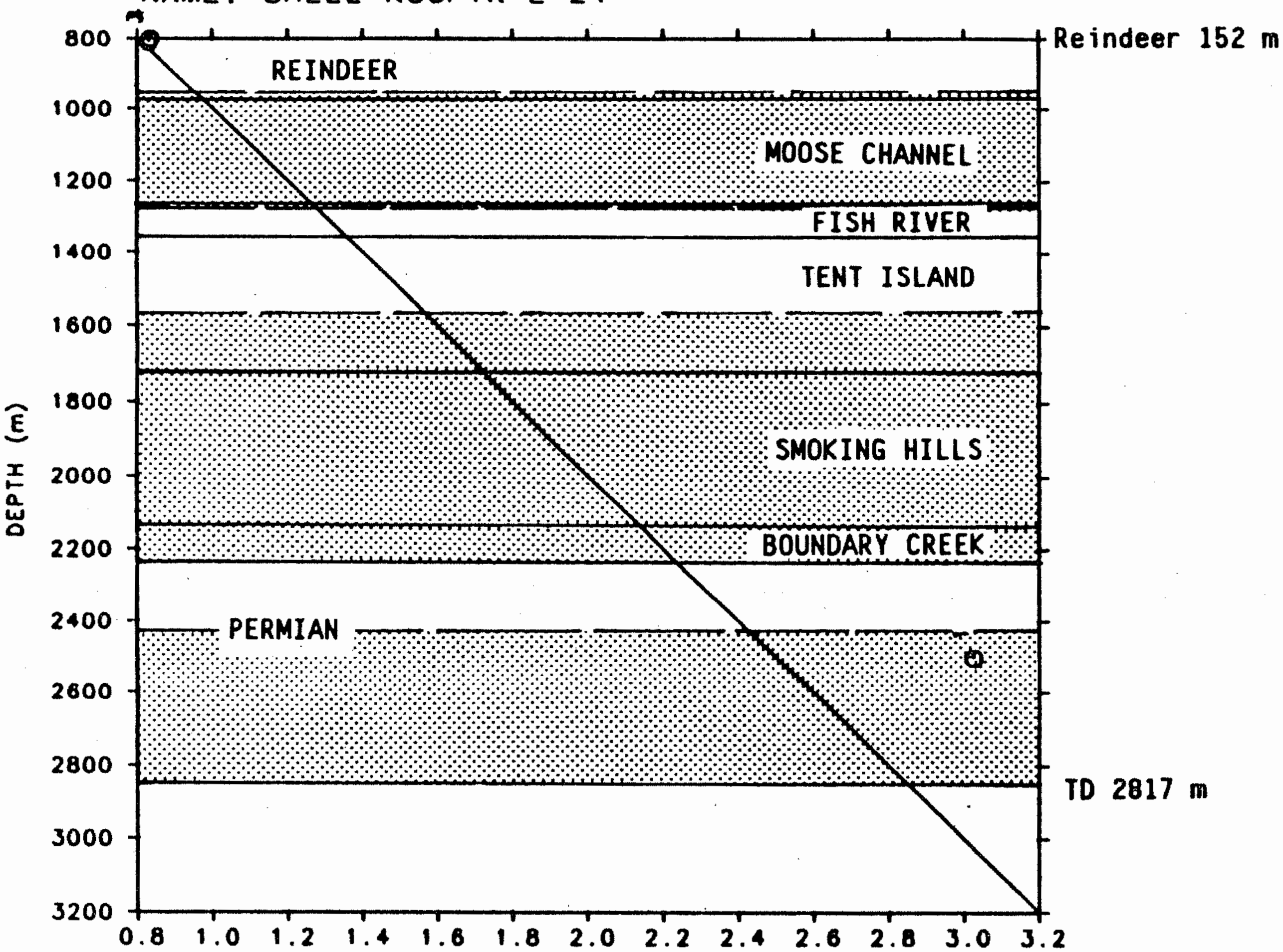


WELL IDENTIFIER: 300K597030136000
NAME: DOME ET AL NEKTORALIK K-59



2103 m
(bottom of log) 2774 m
Geopressure zone from sonic log

WELL IDENTIFIER: 300L246900135150
NAME: SHELL KUGPIK L-24

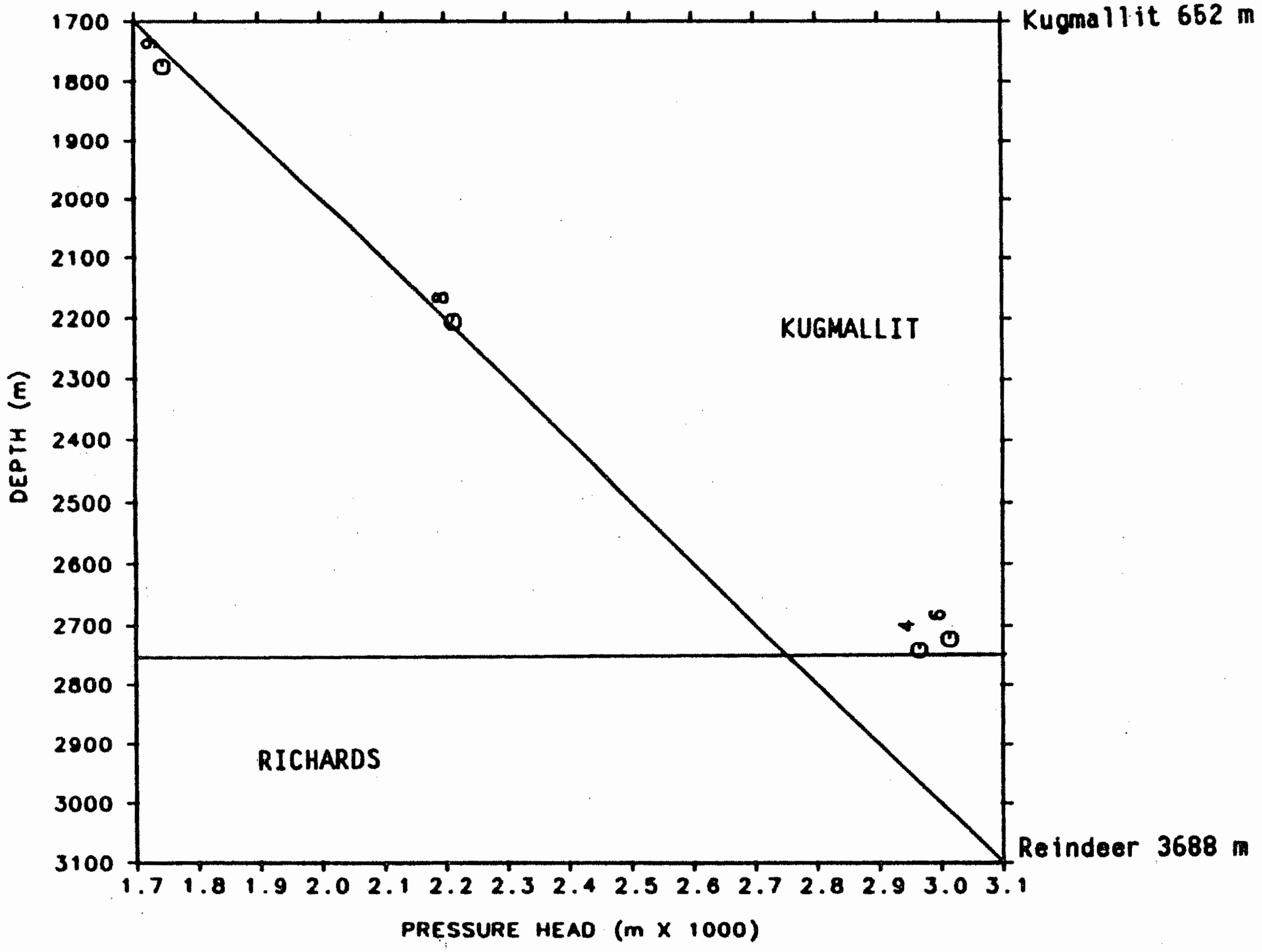


? 990 m – ? 1244 m: Geopressure zone from sonic log

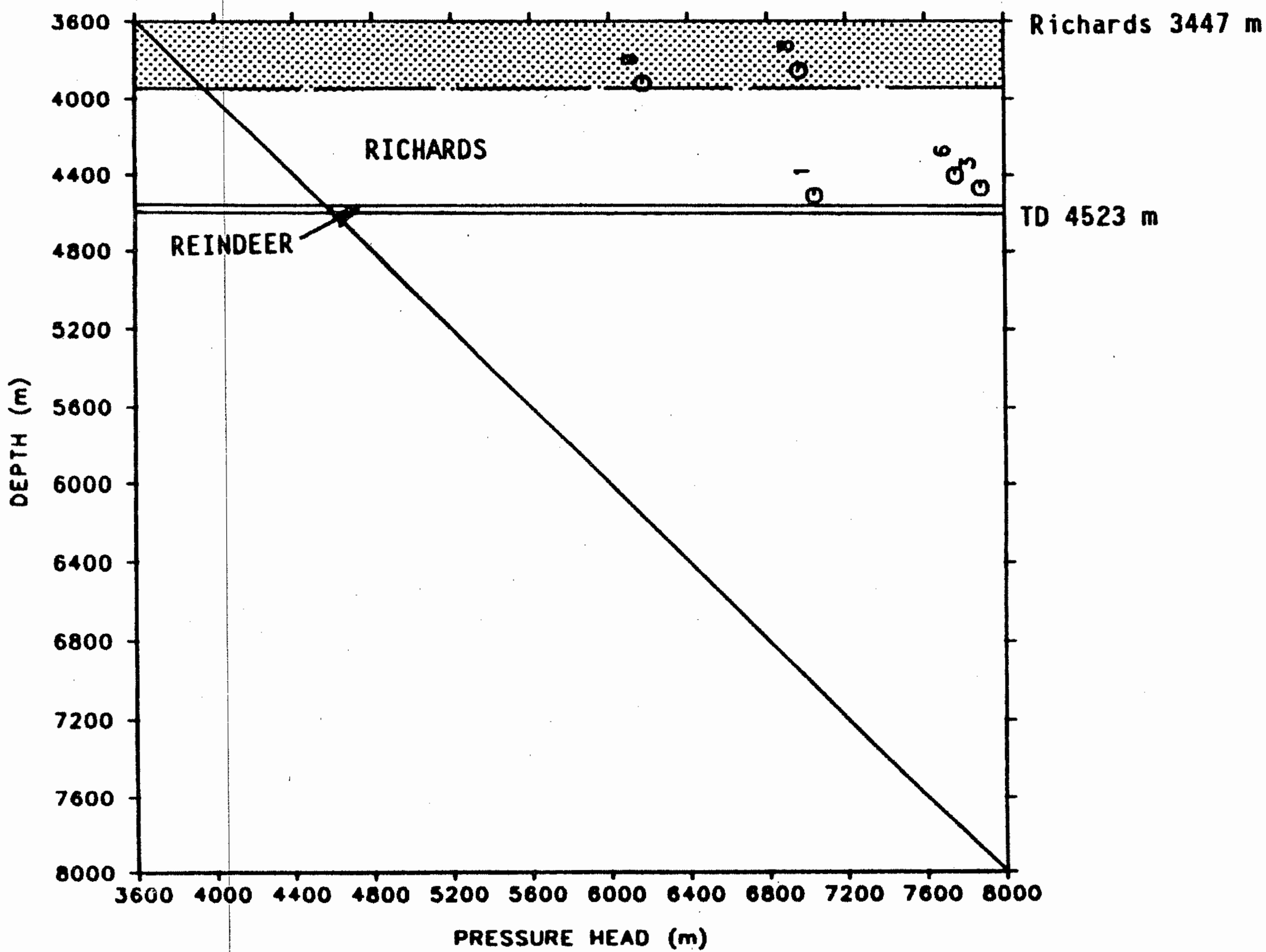
1573 m – 2225 m: Geopressure zone from sonic log

2408 m – TD: Geopressure zone from sonic log

WELL IDENTIFIER: 300L246940134300
NAME: SUN BVX ET AL UNARK L-24



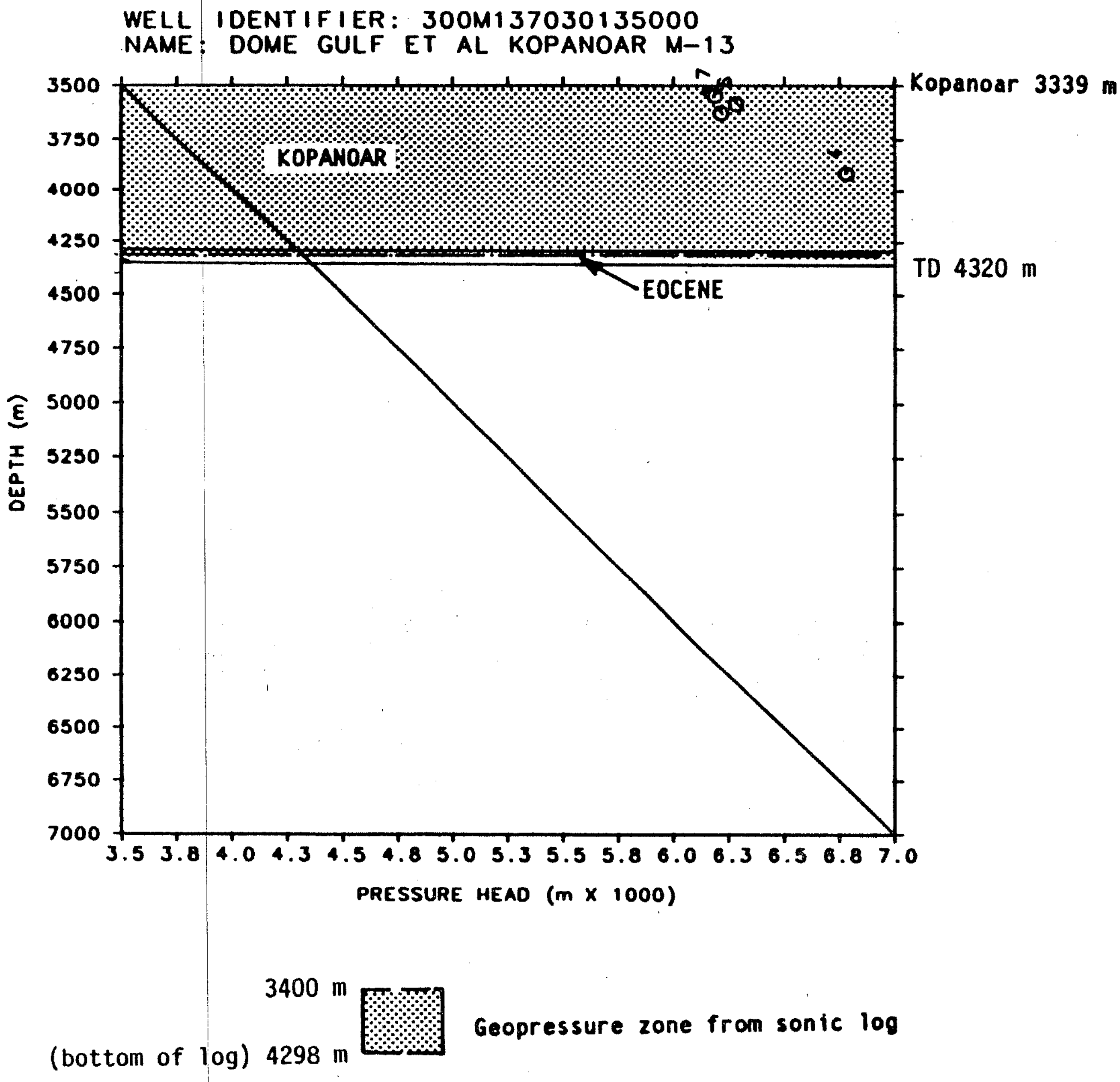
WELL IDENTIFIER: 300L306950133450
NAME: IMPERIAL ARNAK L-30



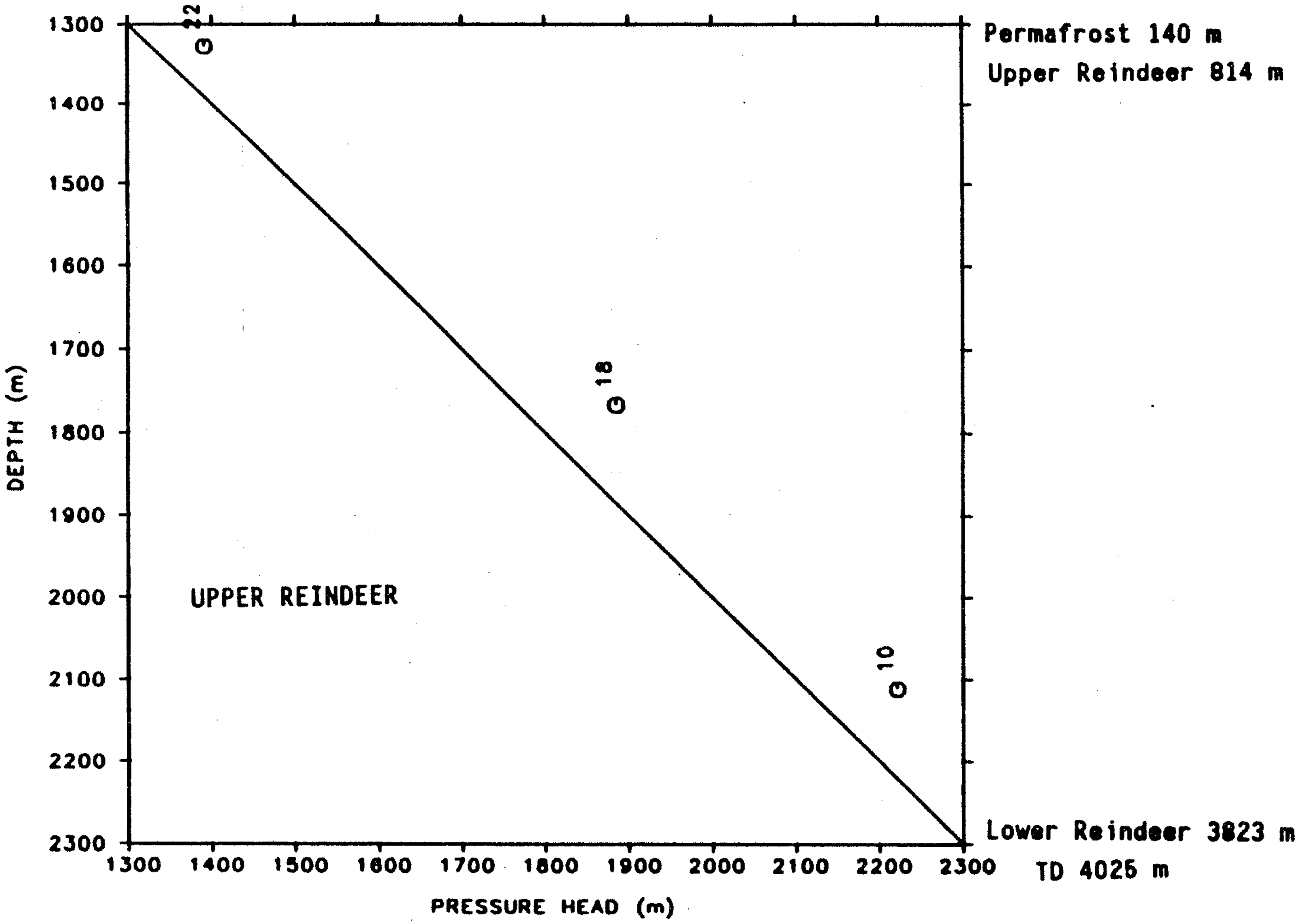
2975 m

(bottom of log) 3932 m

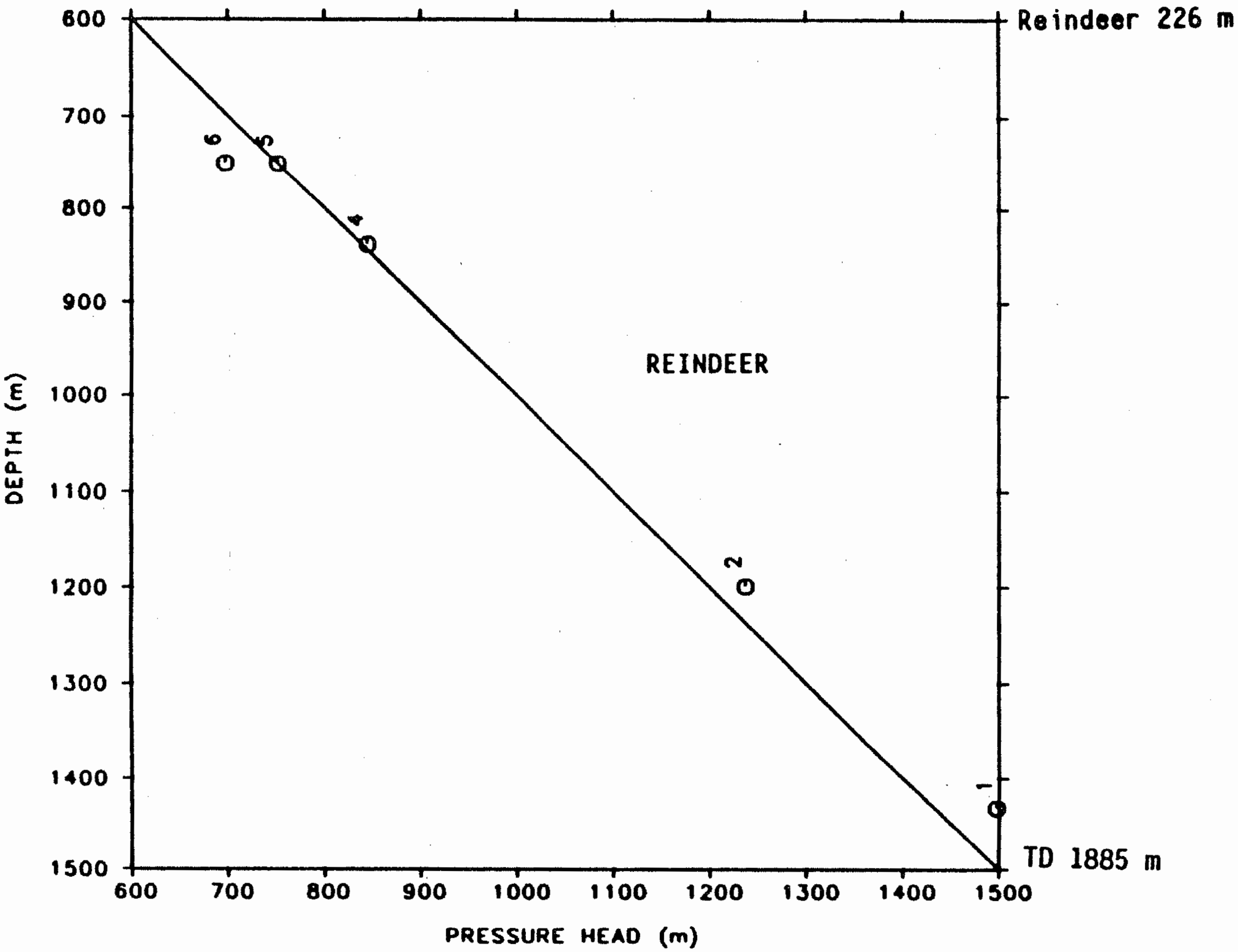
Geopressure zone from sonic log


WELL IDENTIFIER: 300M137030135000
NAME: DOME GULF ET AL KOPANOAR M-13
Kopanoar 3339 m
KOPANOAR
TD 4320 m
EOCENE
DEPTH (m)
3500
3750
4000
4250
4500
4750
5000
5250
5500
5750
6000
6250
6500
6750
7000
3.5 3.8 4.0 4.3 4.5 4.8 5.0 5.3 5.5 5.8 6.0 6.3 6.5 6.8 7.0
PRESSURE HEAD (m X 1000)
3400 m
(bottom of log) 4298 m
Geopressure zone from sonic log

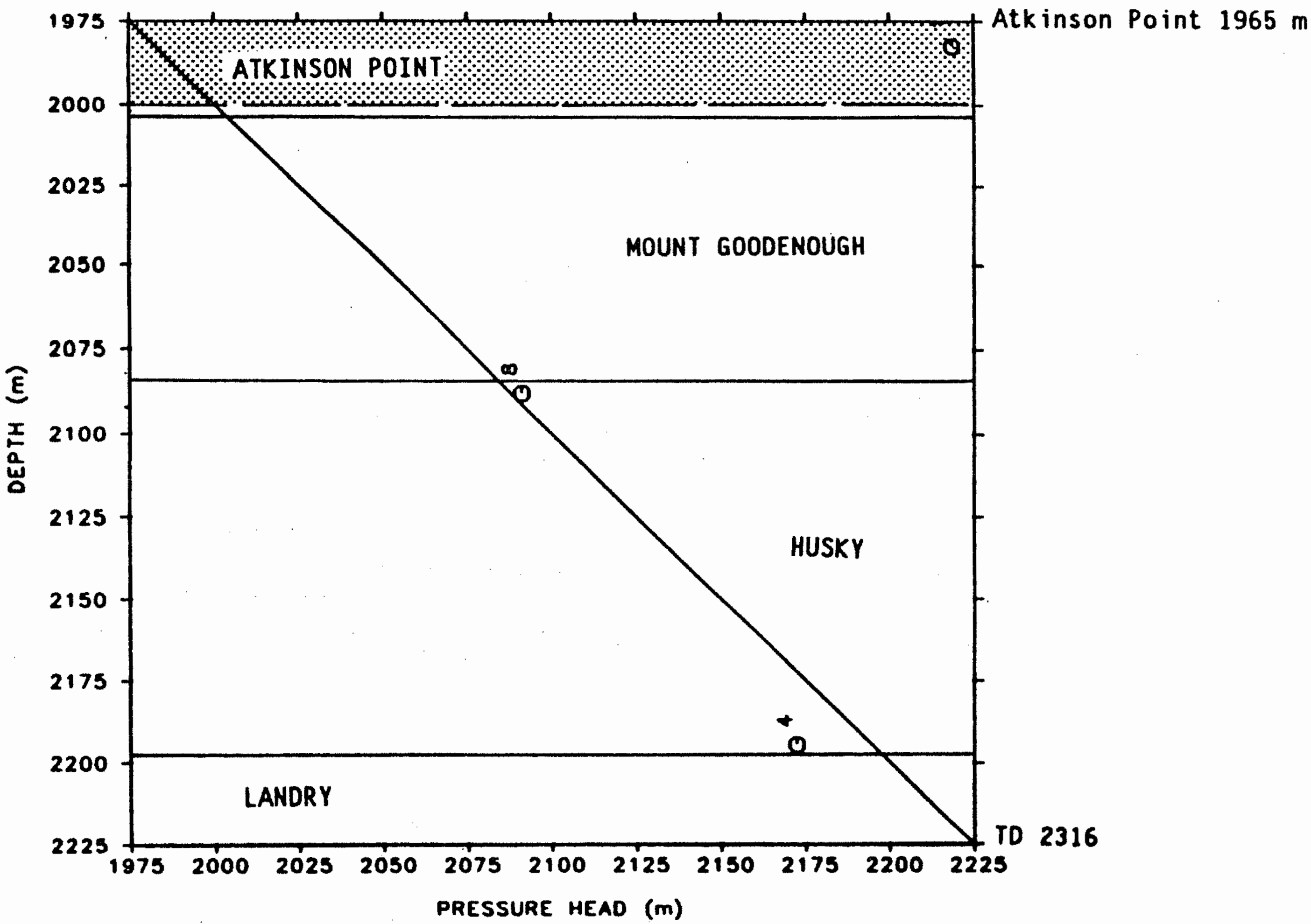
WELL IDENTIFIER: 300M196920135150
NAME: SHELL NIGLINTGAK M-19



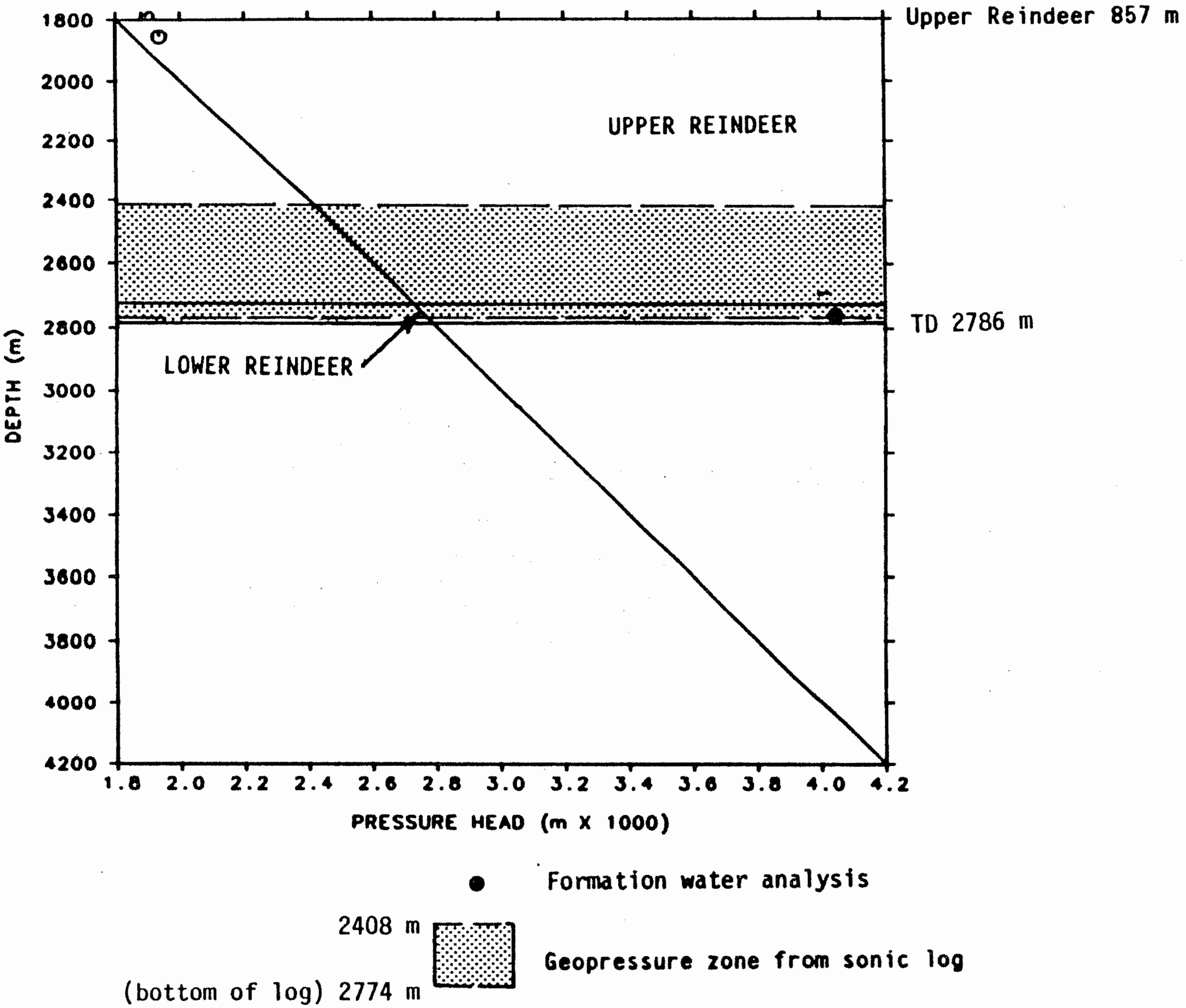
WELL IDENTIFIER: 300N466910134450
NAME: GULF MOBIL KIKORALOK N-46



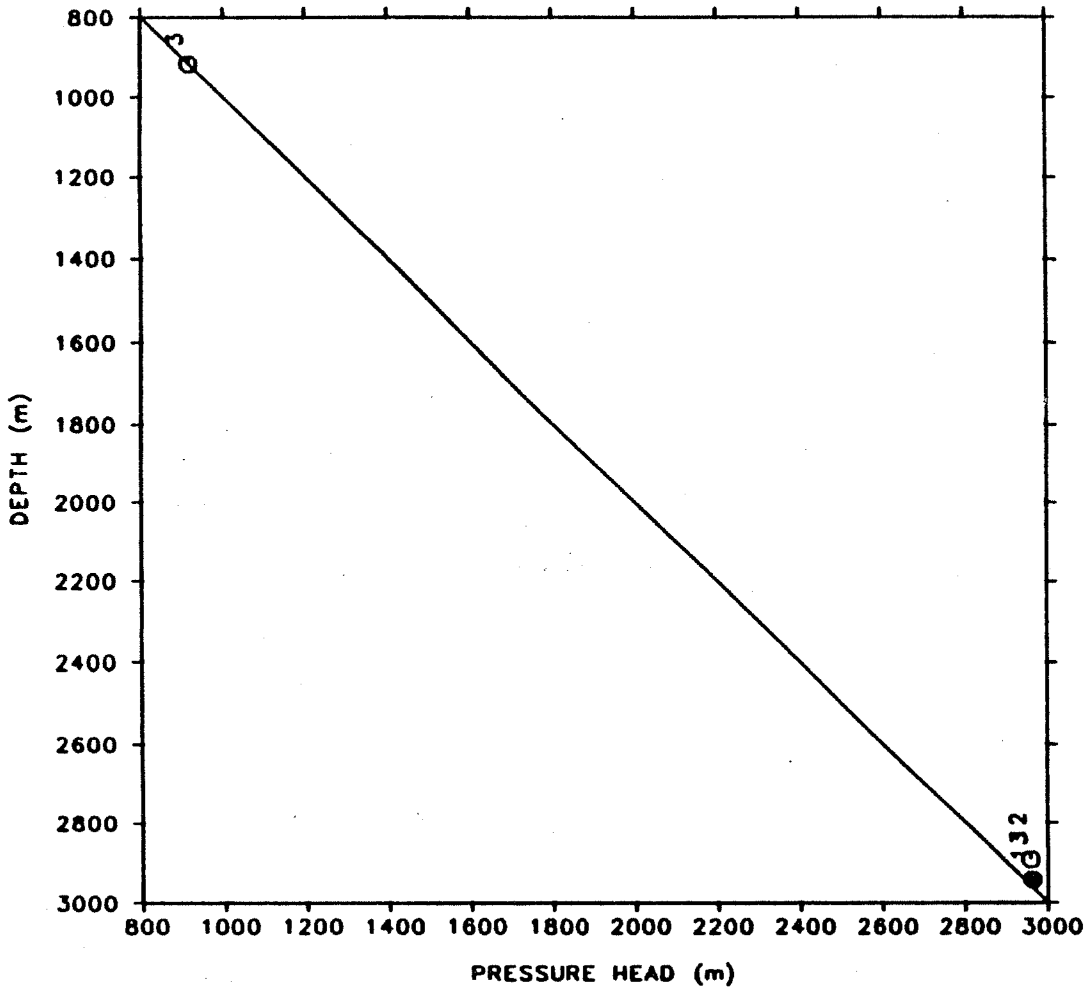
WELL IDENTIFIER: 300019692013245O
NAME: IOE TUKTU O-19



WELL IDENTIFIER: 300054692013445O
NAME: D GULF MOBIL TOAPOLOK O-54



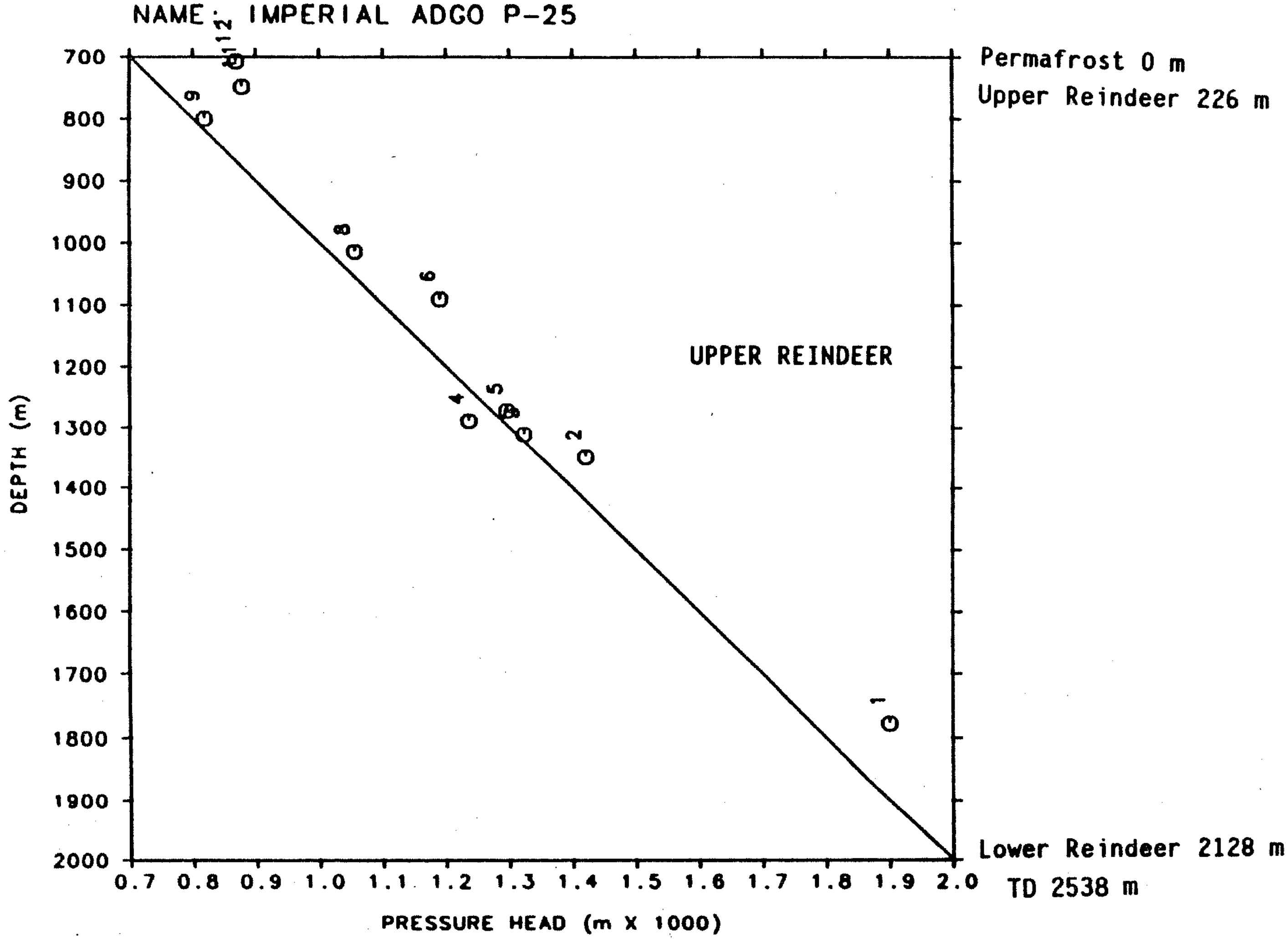
WELL IDENTIFIER: 300P176930132450
NAME: D IOE MAYOGIAK P-17



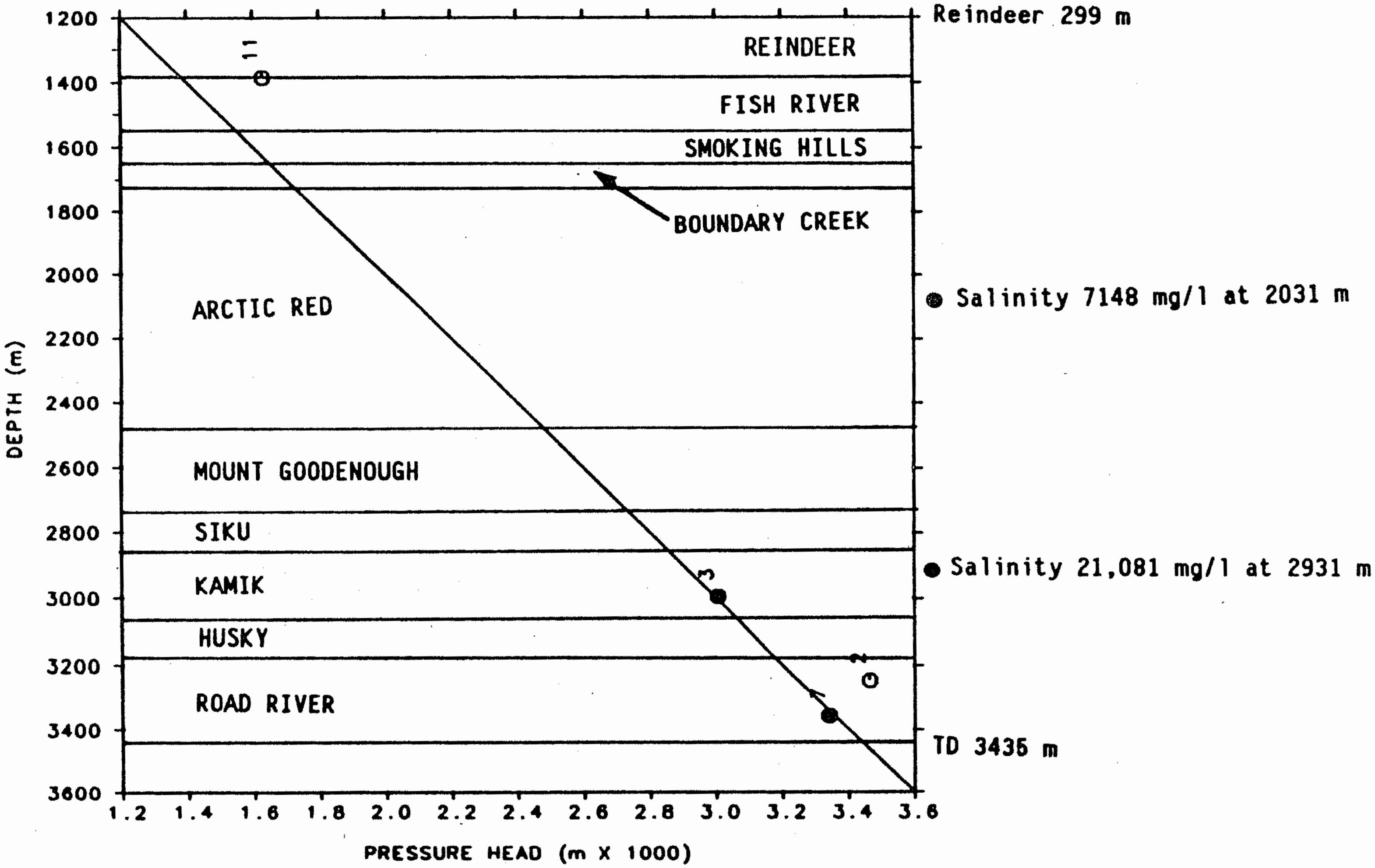
Note: Stratigraphy not available

● Formation water analysis

WELL IDENTIFIER: 300P256930135450
NAME: IMPERIAL ADGO P-25

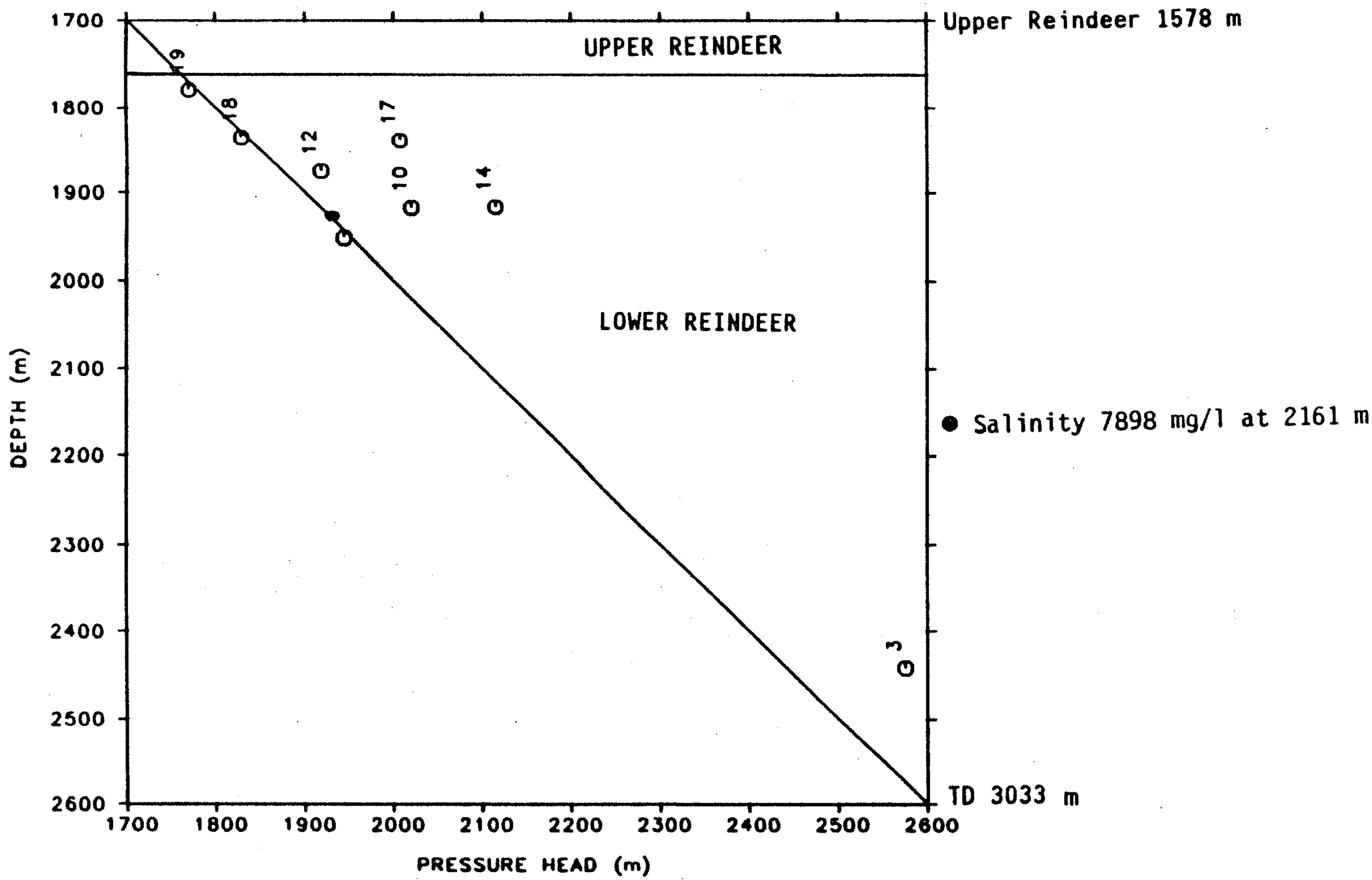


WELL IDENTIFIER: 300P536900133300
NAME: GULF MOBIL PARSONS P-53



● Formation water analysis

WELL IDENTIFIER: 300P536920134300
NAME: GULF MOBIL YA-YA P-53



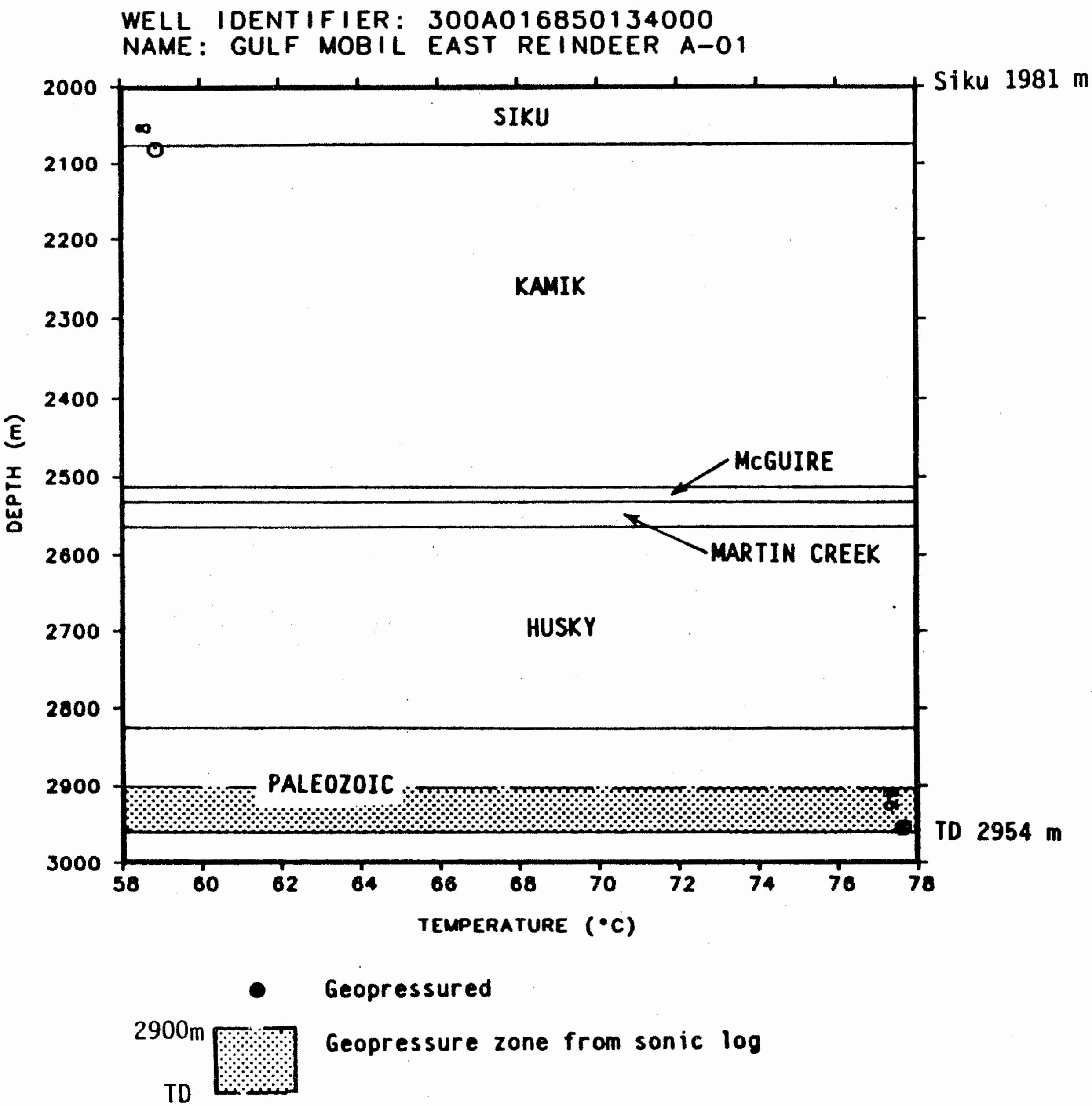
● Formation water analysis

Geopressure zones present, based on sonic log, but very difficult to determine exact depths.

Temperature-depth plots, Beaufort-Mackenzie basin

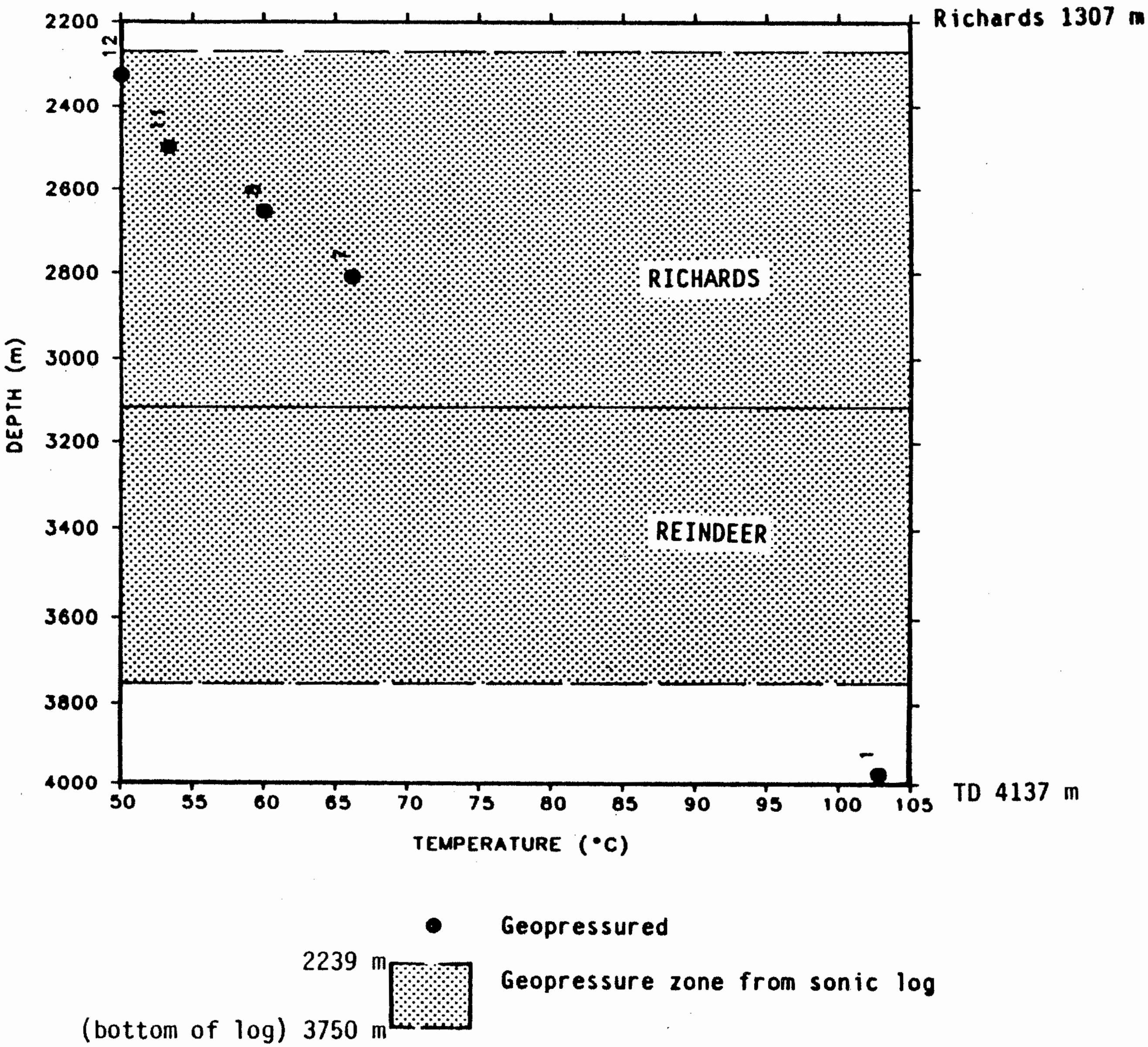
NOTES:

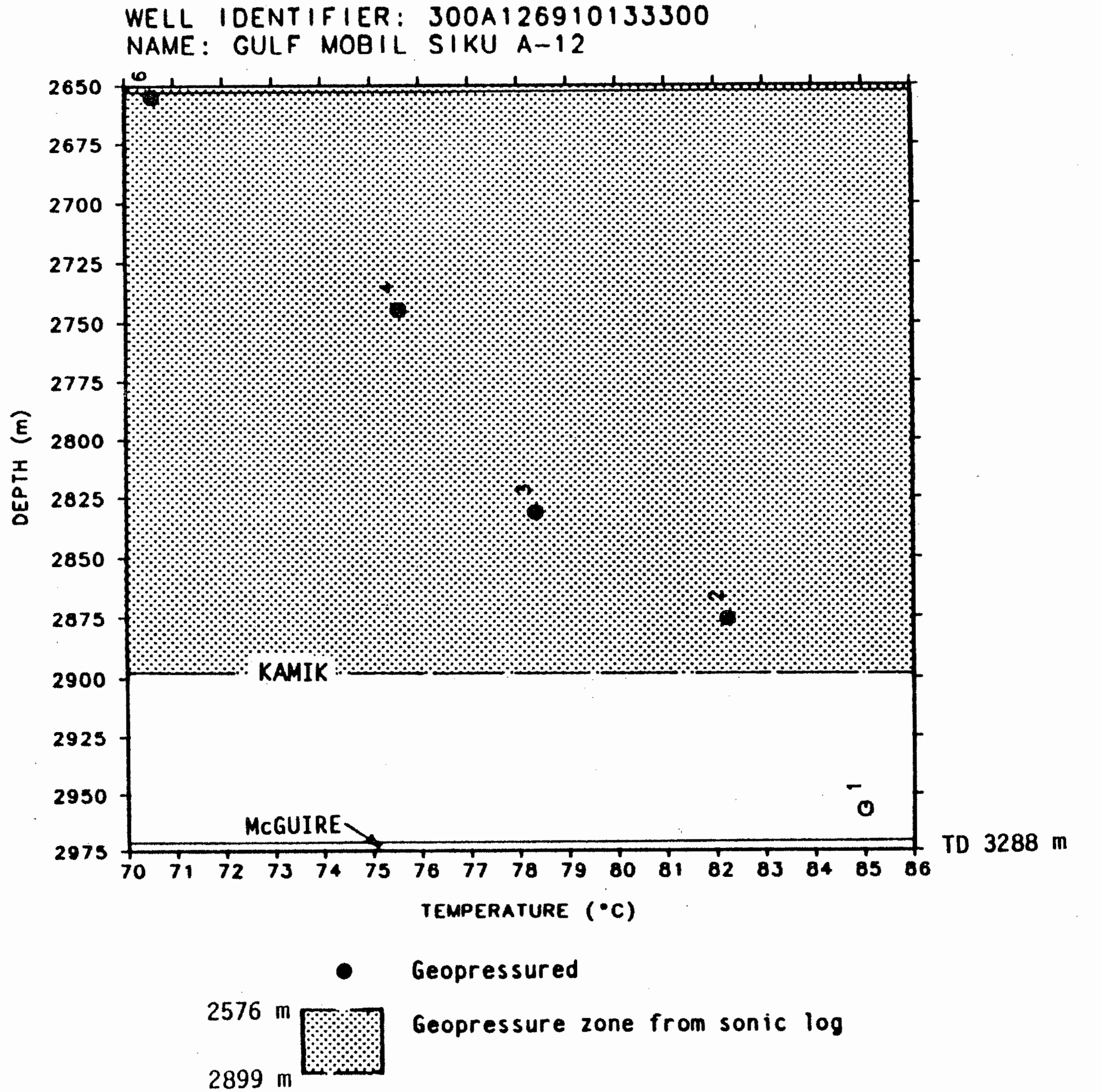
This section of the Appendix contains plots of temperature against depth for all wells for which appropriate data were available based on information entered into the Basin Analysis Group data base at 1988-03-31. Each plot is identified by the full well name and unique identifier based on well number and location. Drillstem test numbers correspond to those in Table A4. Bottomhole temperature measurements have been assigned the number 99. The raw data is compiled in Table A4. Drillstem tests from geopressure zones are solid dots; this assignment is based on either pressure-head/depth plots and information in Table A2 (pressure head generally greater than 100 m) or on the interpretation of sonic and density logs (Table A5). All stratigraphic information came from the files of the ISPG and represents interpretations to the end of 1987. For many wells there is a corresponding pressure-head/depth plot in the preceding section of this Appendix.



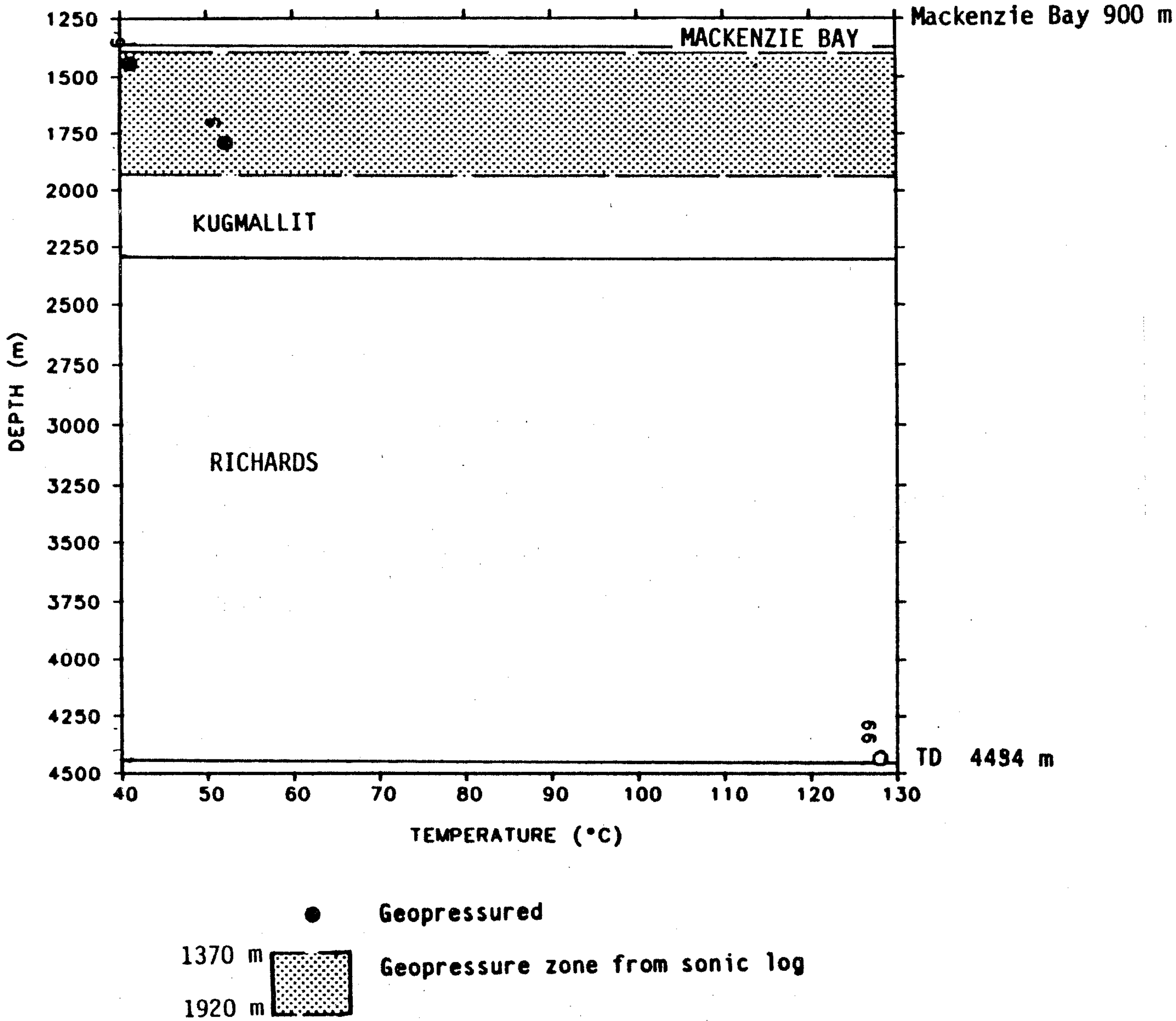
WELL IDENTIFIER: 300A016850134000
NAME: GULF MOBIL EAST REINDEER A-01
Siku 1981 m
SIKU
KAMIK
McGUIRE
MARTIN CREEK
HUSKY
PALEOZOIC
TD 2954 m
DEPTH (m)
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
58
60
62
64
66
68
70
72
74
76
78
TEMPERATURE (°C)
Geopressured
2900m
TD
Geopressure zone from sonic log

WELL IDENTIFIER: 300A066930134300
NAME: IMPERIAL MALLIK A-06

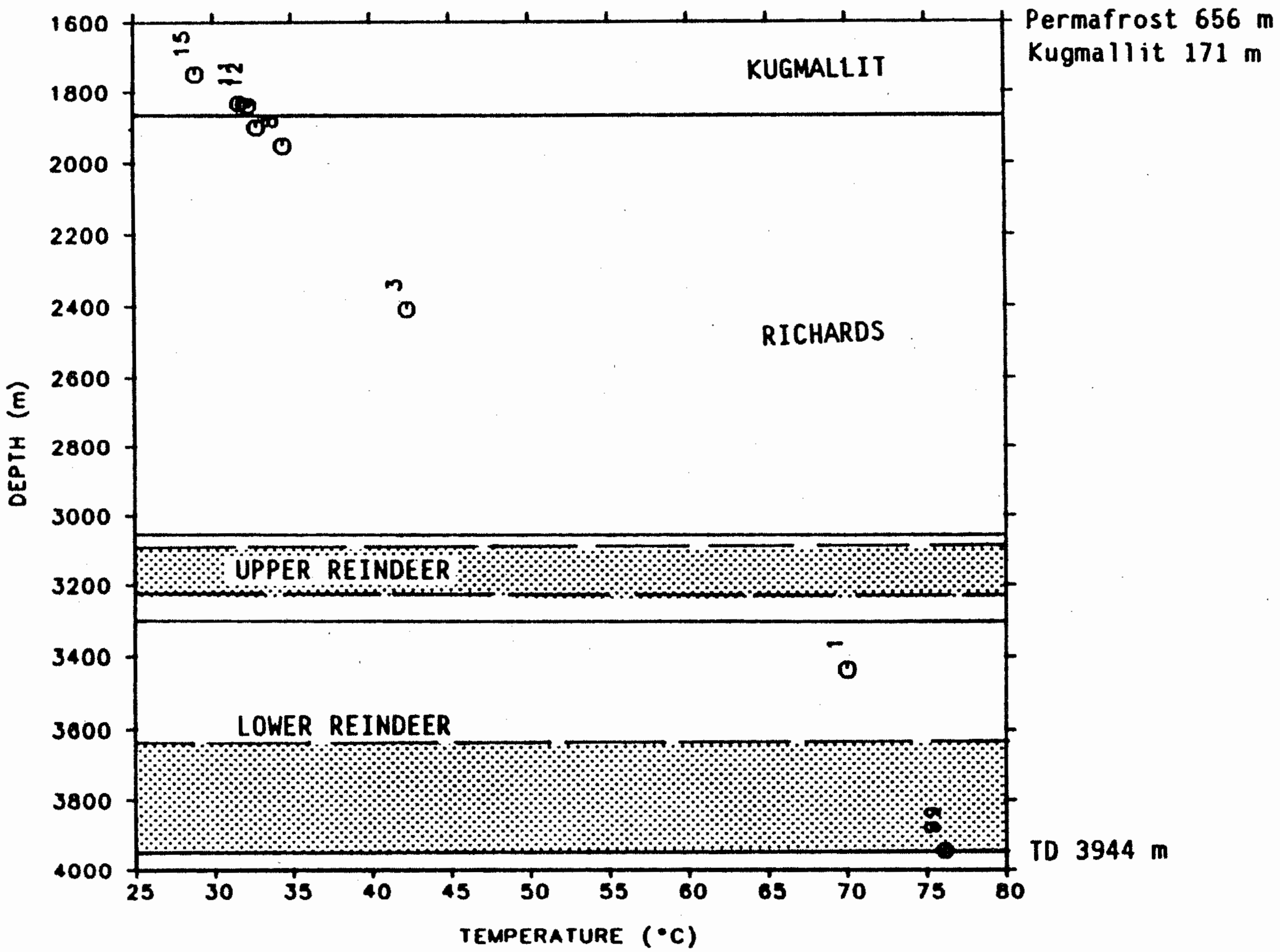



WELL IDENTIFIER: 300A126910133300
NAME: GULF MOBIL SIKU A-12
DEPTH (m)
2650
2675
2700
2725
2750
2775
2800
2825
2850
2875
2900
2925
2950
2975
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
TEMPERATURE (°C)
KAMIK
McGUIRE
TD 3288 m
Geopressured
2576 m
2899 m
Geopressure zone from sonic log

WELL IDENTIFIER: 300A257000136150
NAME: DOME GULF TARSIUT A-25



WELL IDENTIFIER: 300A286920134300
NAME: GULF MOBIL YAYA A-28

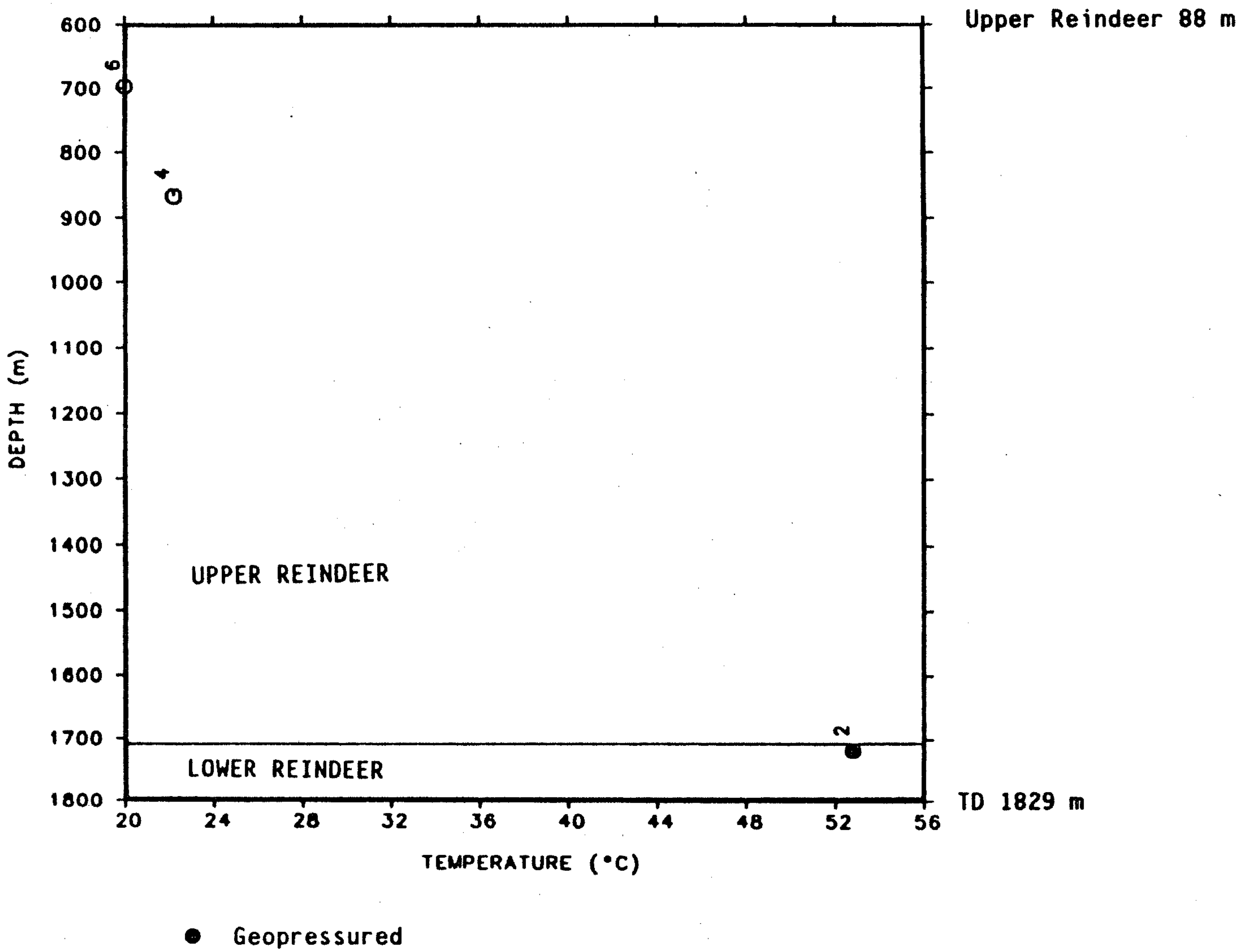


● Geopressured

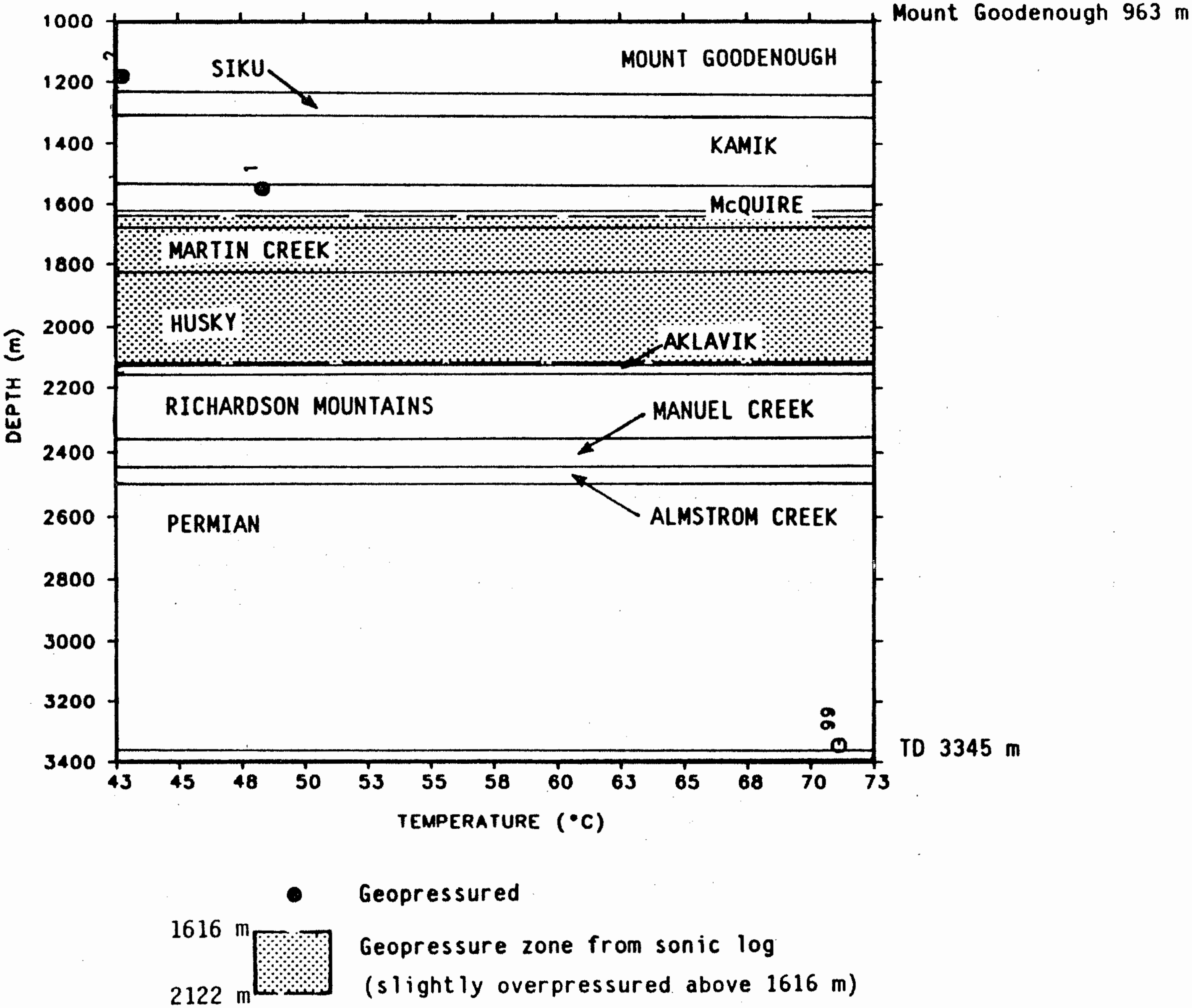
3094 m – 3216 m: Geopressure zone from sonic log

3628 m – TD: Geopressure zone from sonic log

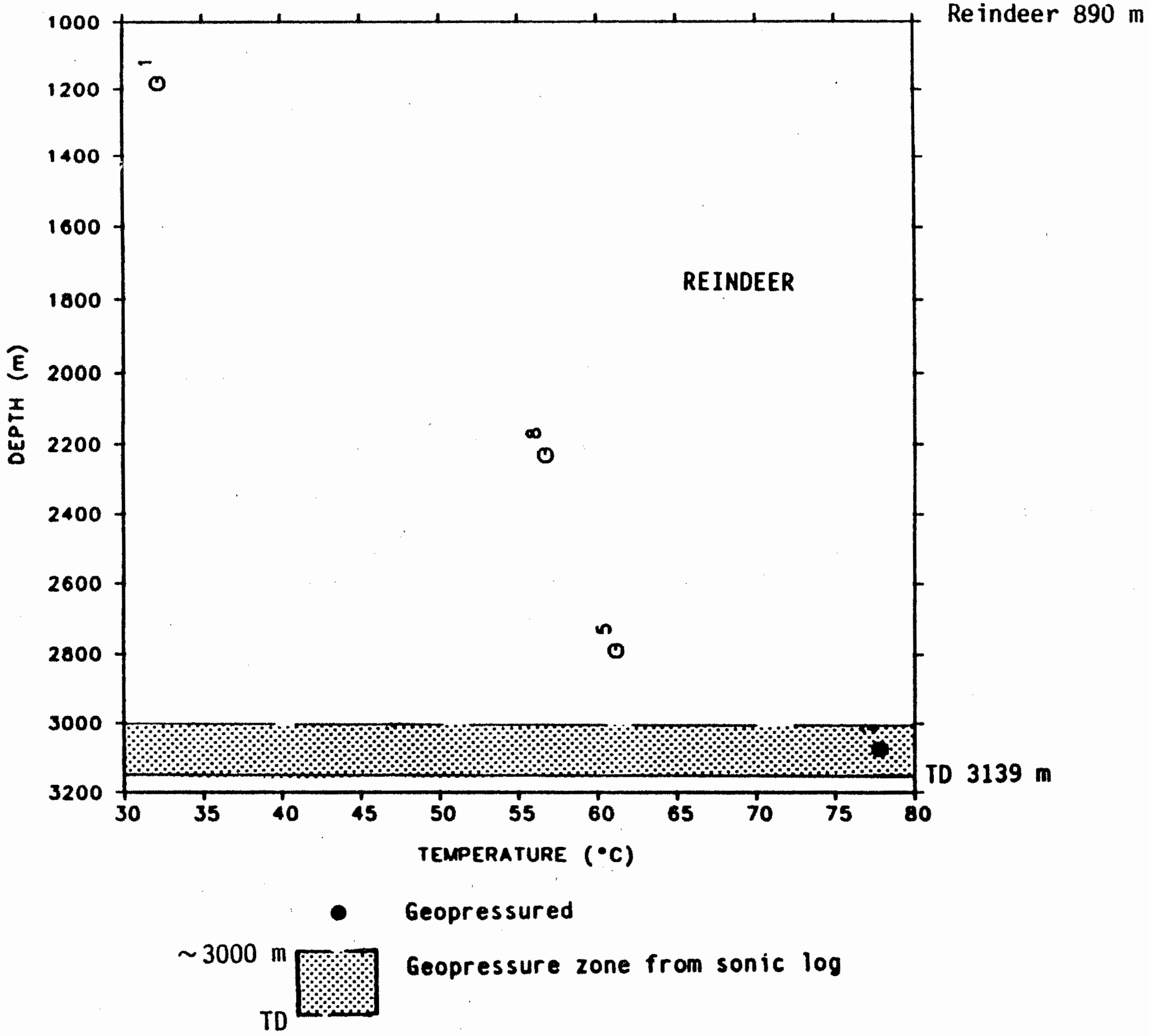
WELL IDENTIFIER: 300A416910134300
NAME: GULF IMP SHELL REINDEER A-41

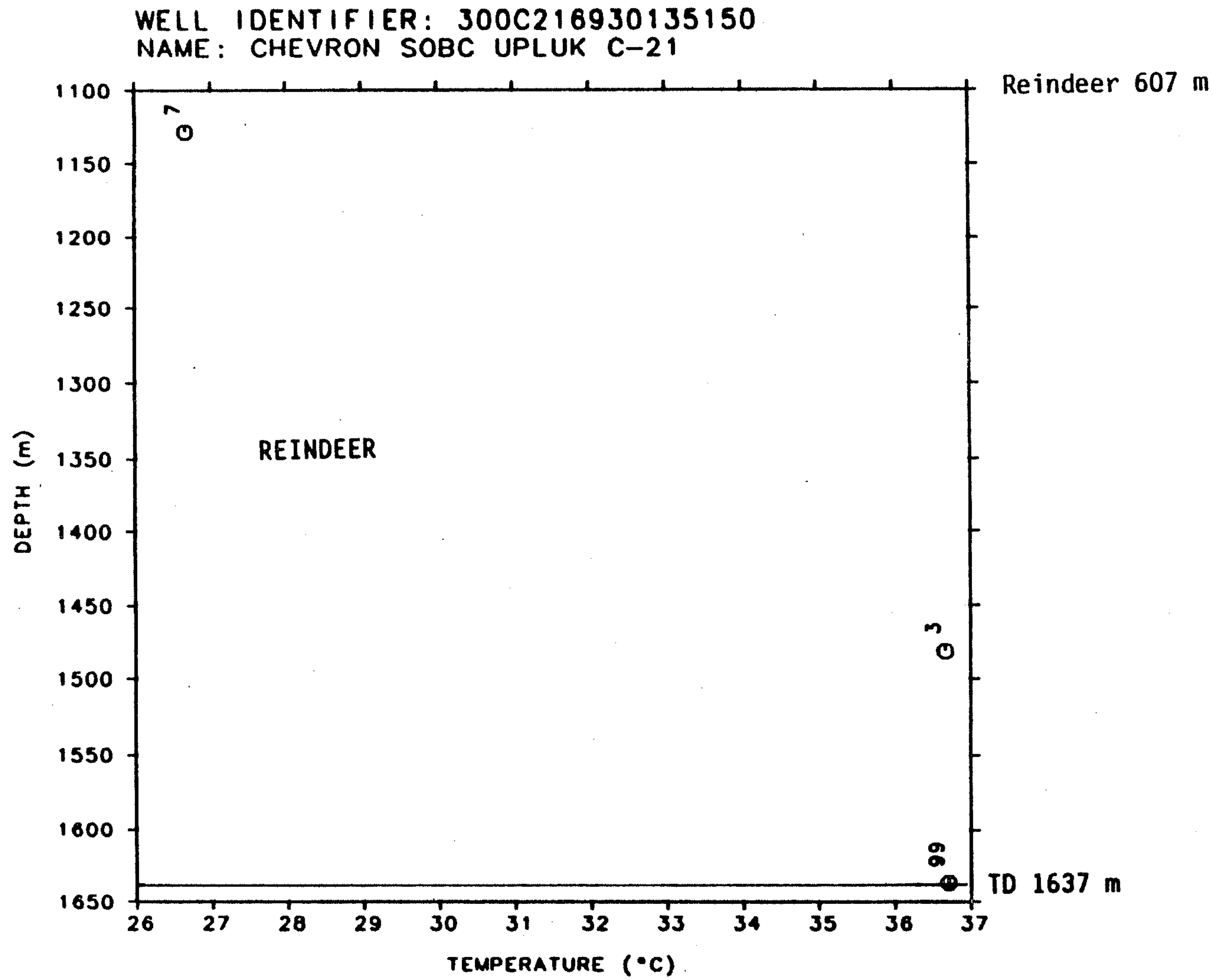


WELL IDENTIFIER: 300B116850135150
NAME: SHELL UNAK B-11

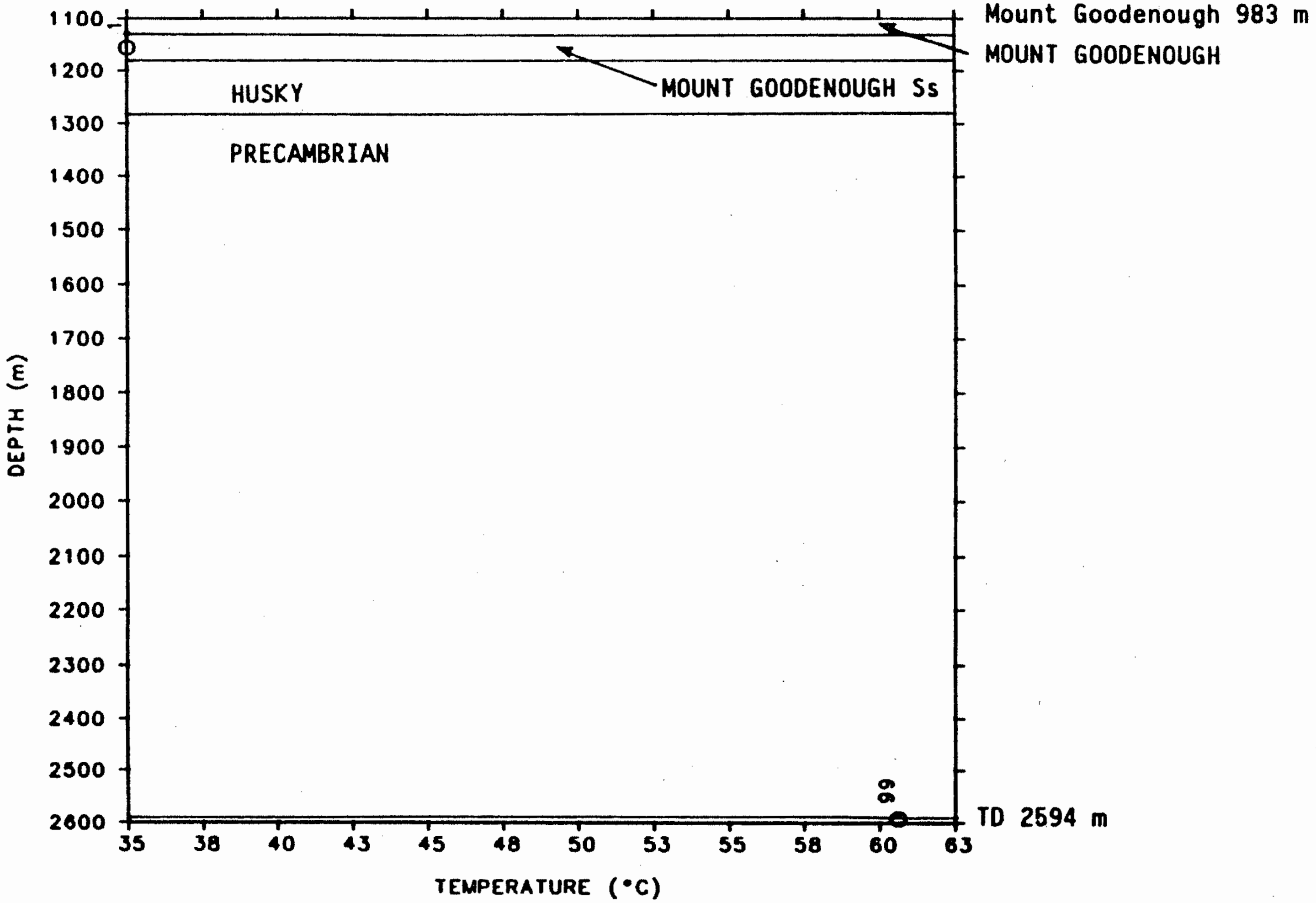


WELL IDENTIFIER: 300B196920135150
NAME: SHELL NIGLINTGAK B-19

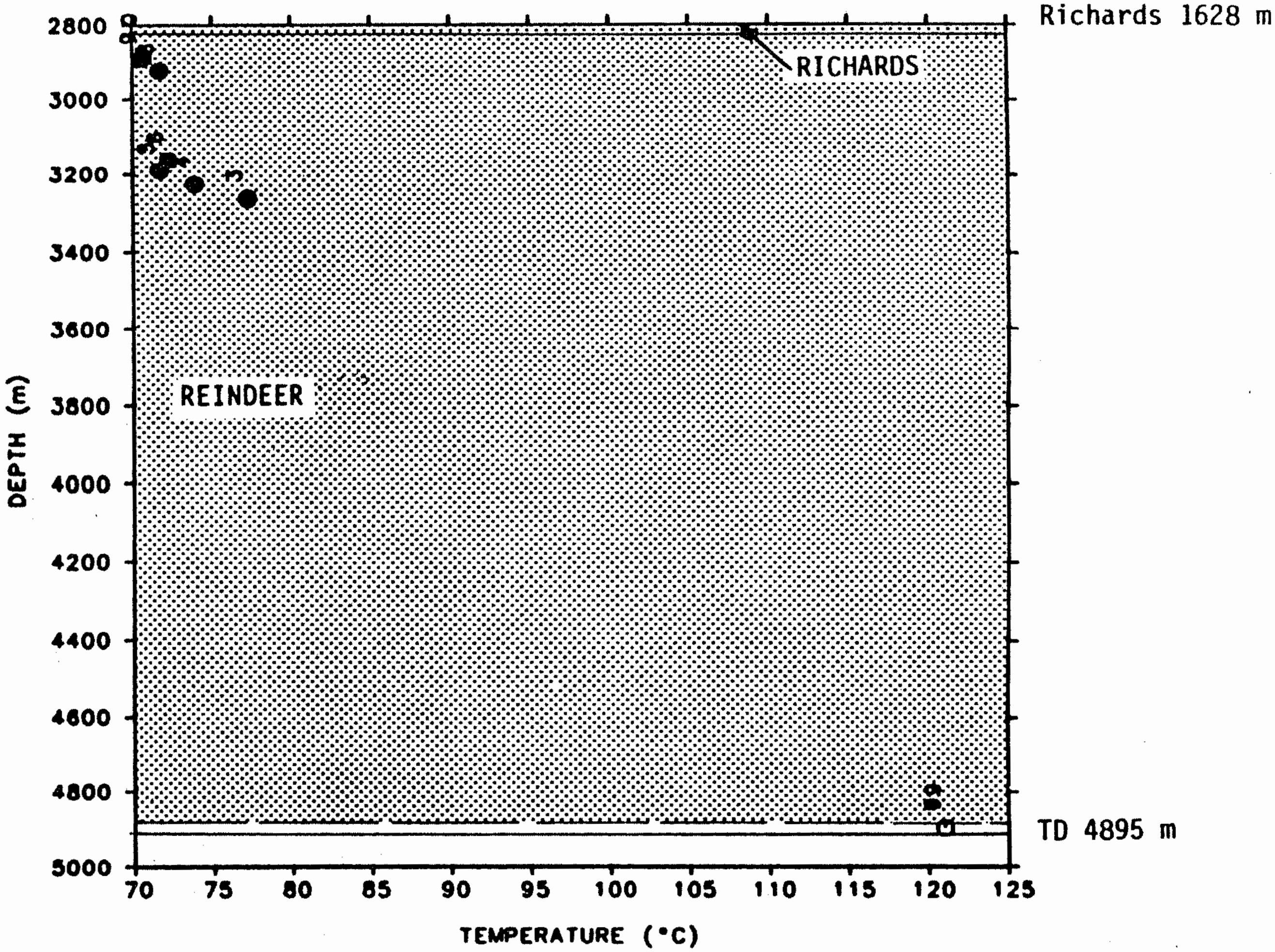



WELL IDENTIFIER: 300C216930135150
NAME: CHEVRON SOBC UPLUK C-21
Reindeer 607 m
REINDEER
TD 1637 m
DEPTH (m)
TEMPERATURE (°C)
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
1650
26
27
28
29
30
31
32
33
34
35
36
37
7
3
99

WELL IDENTIFIER: 300C386850133300
NAME: GULF EAST REINDEER C-38



WELL IDENTIFIER: 300C426930134450
NAME: IOE TAGLU C-42

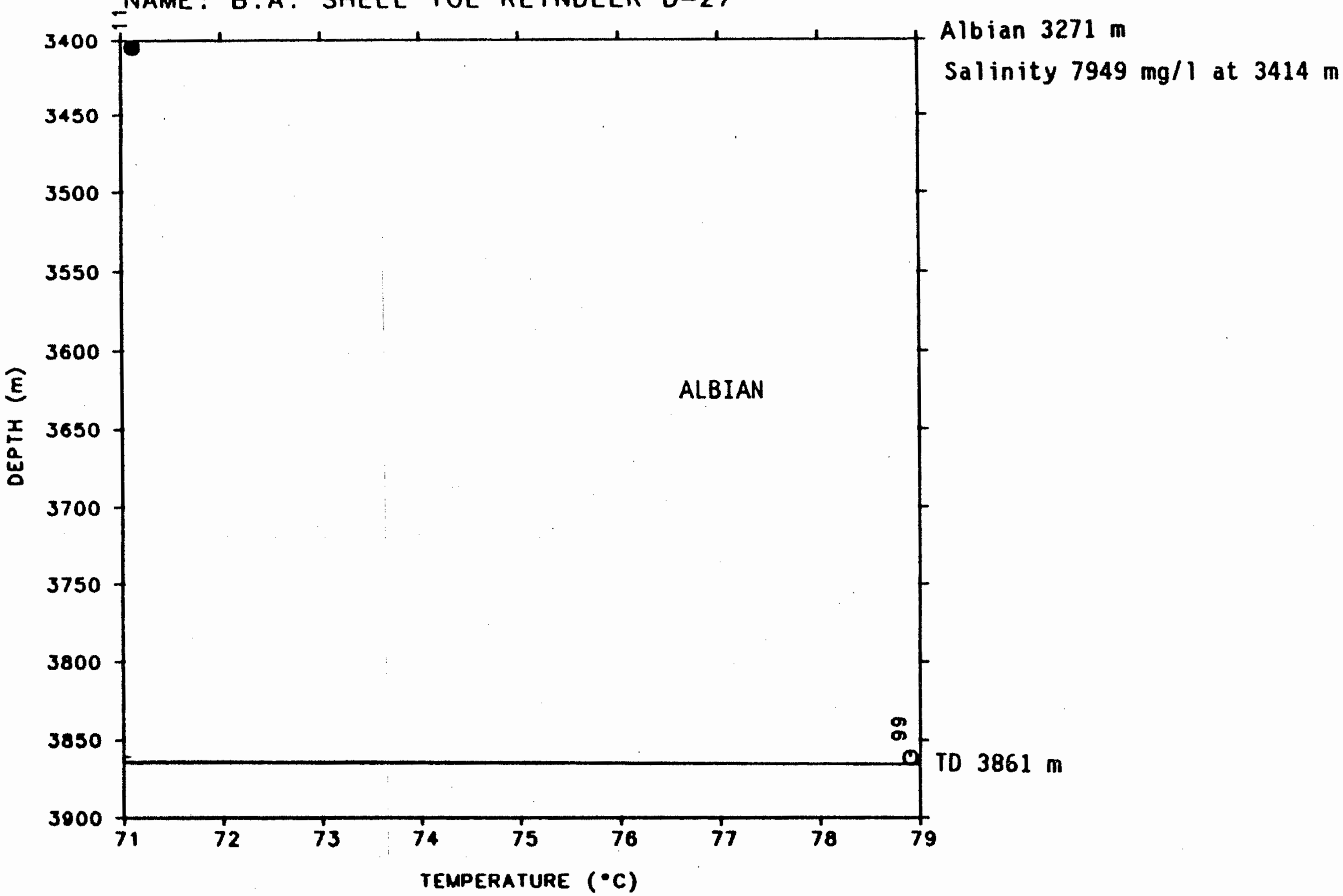


● Geopressured

2682 m Geopressure zone from sonic log

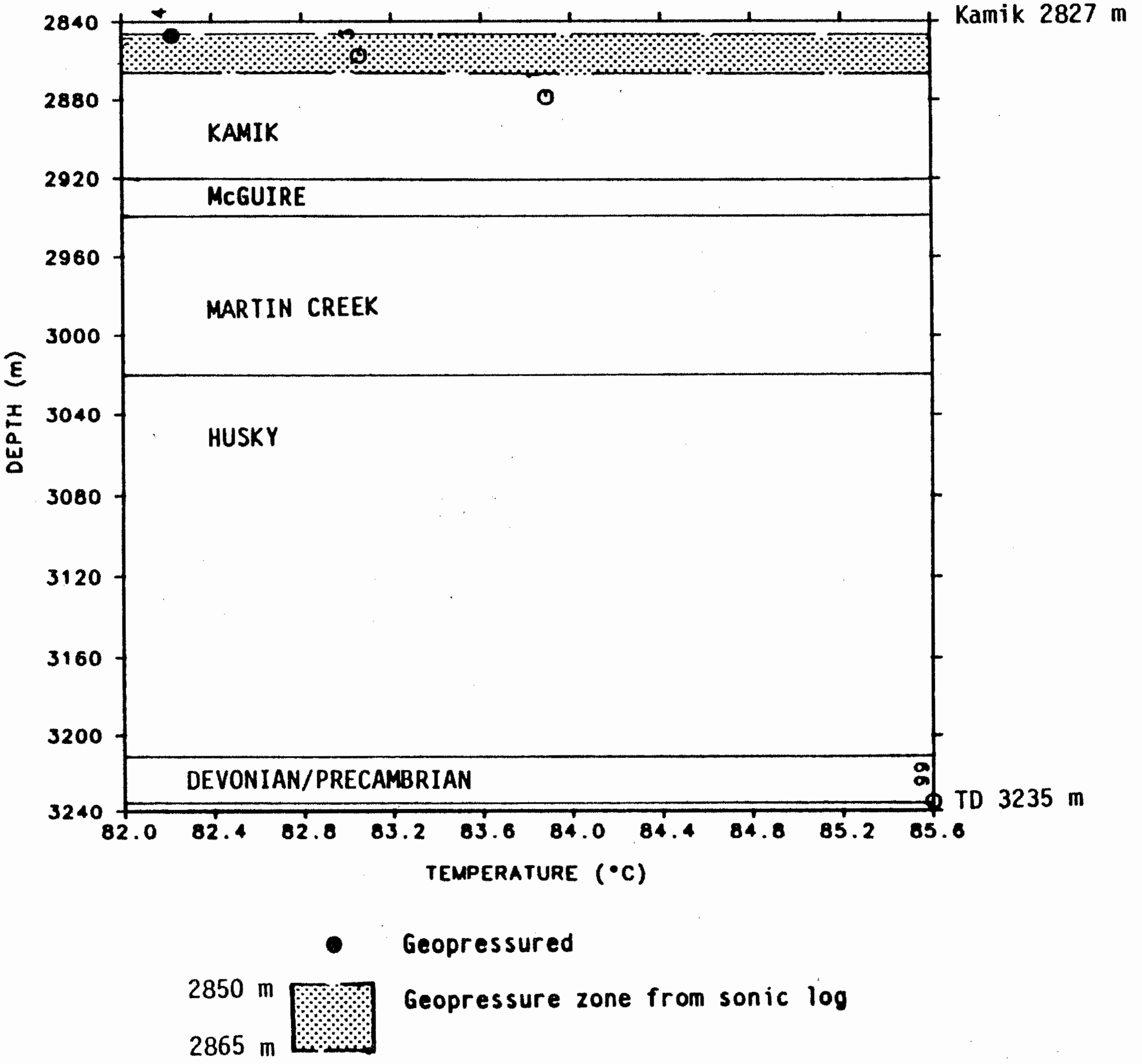
(bottom of log)4878 m

WELL IDENTIFIER: 300D276910134300
NAME: B.A. SHELL IOE REINDEER D-27

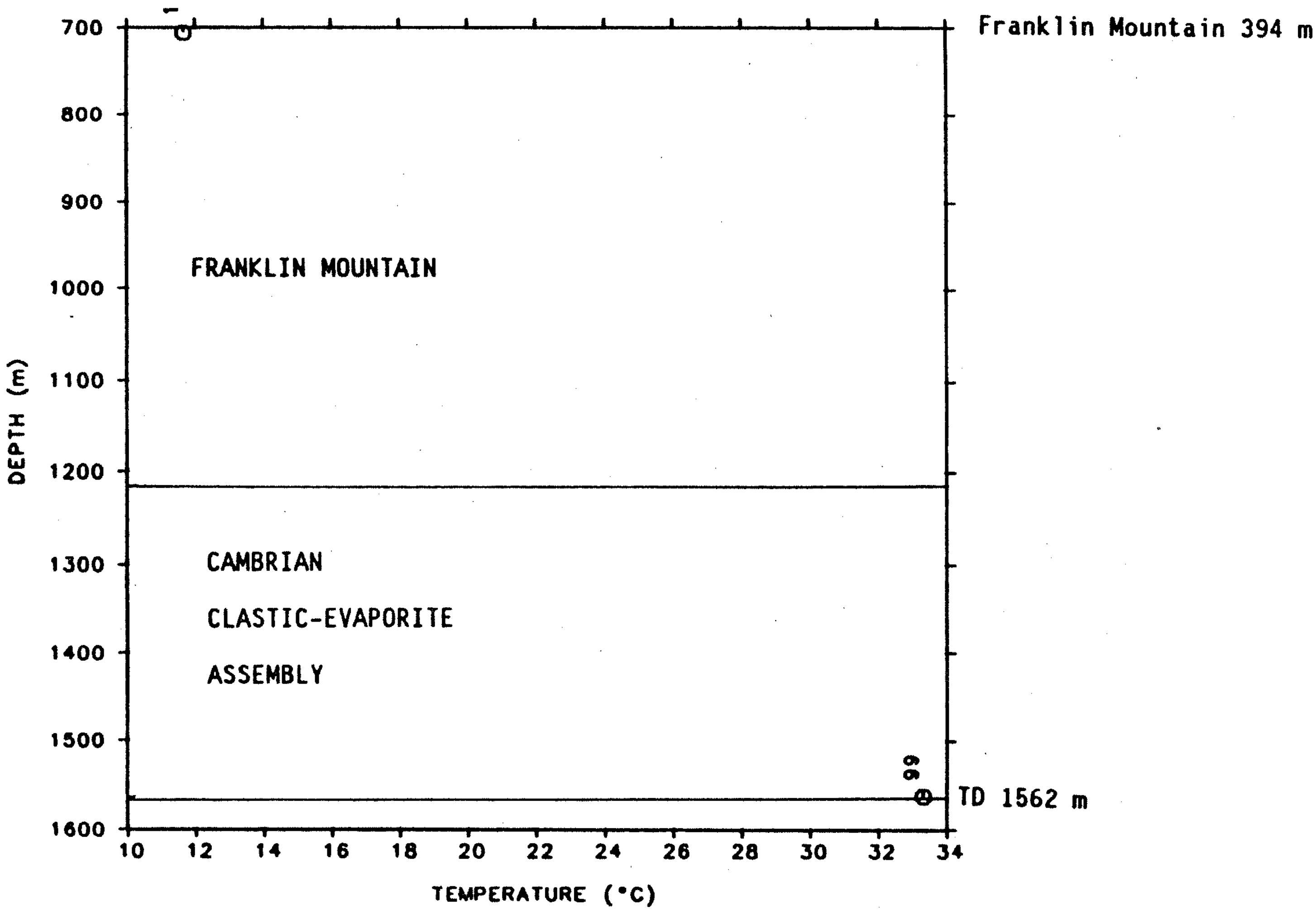


● Geopressured

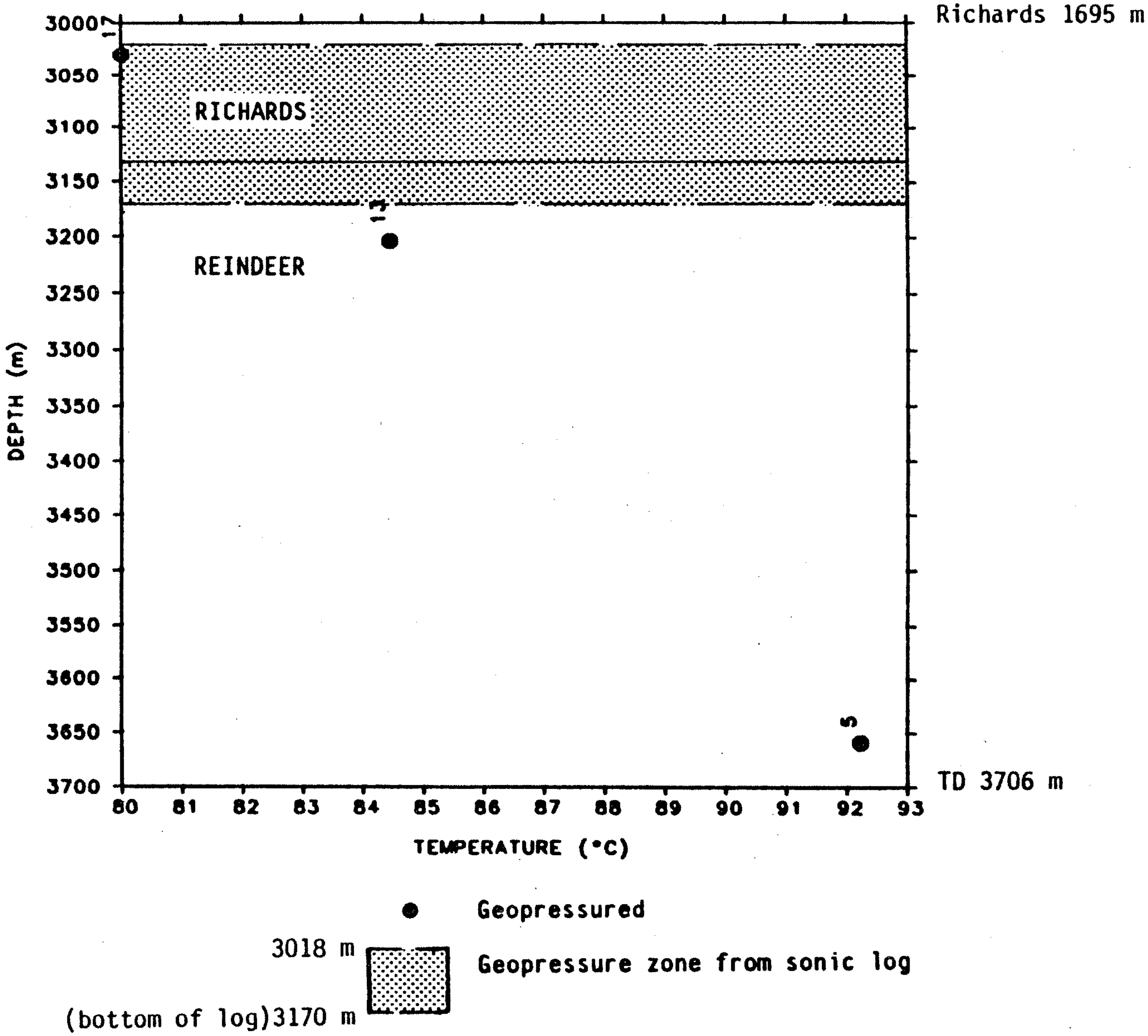
WELL IDENTIFIER: 300D486900133150
NAME: GULF MOBIL KAMIK D-48



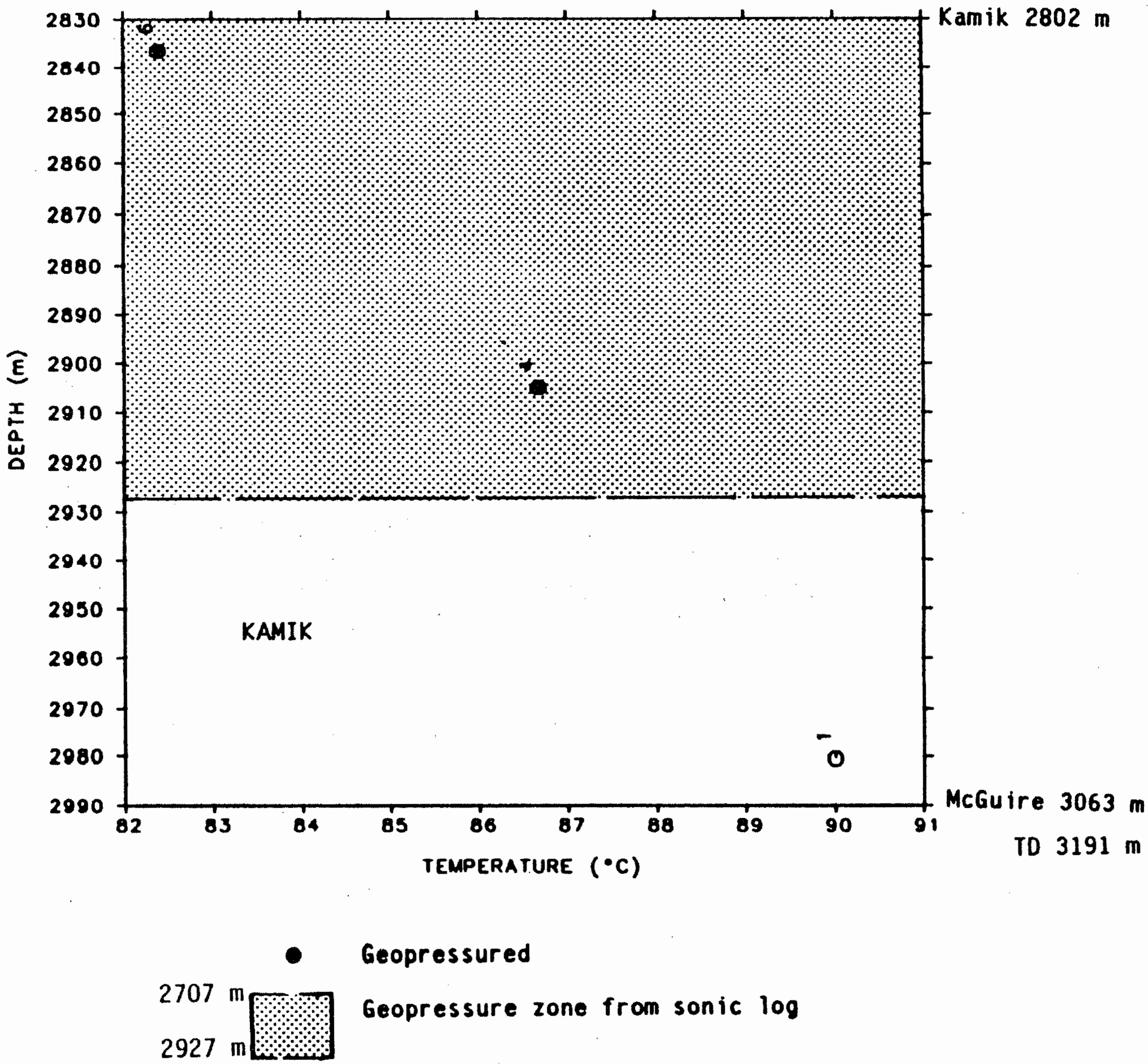
WELL IDENTIFIER: 300D546830133300
NAME: AMOCO ULSTER SCURRY INUVIK D-54



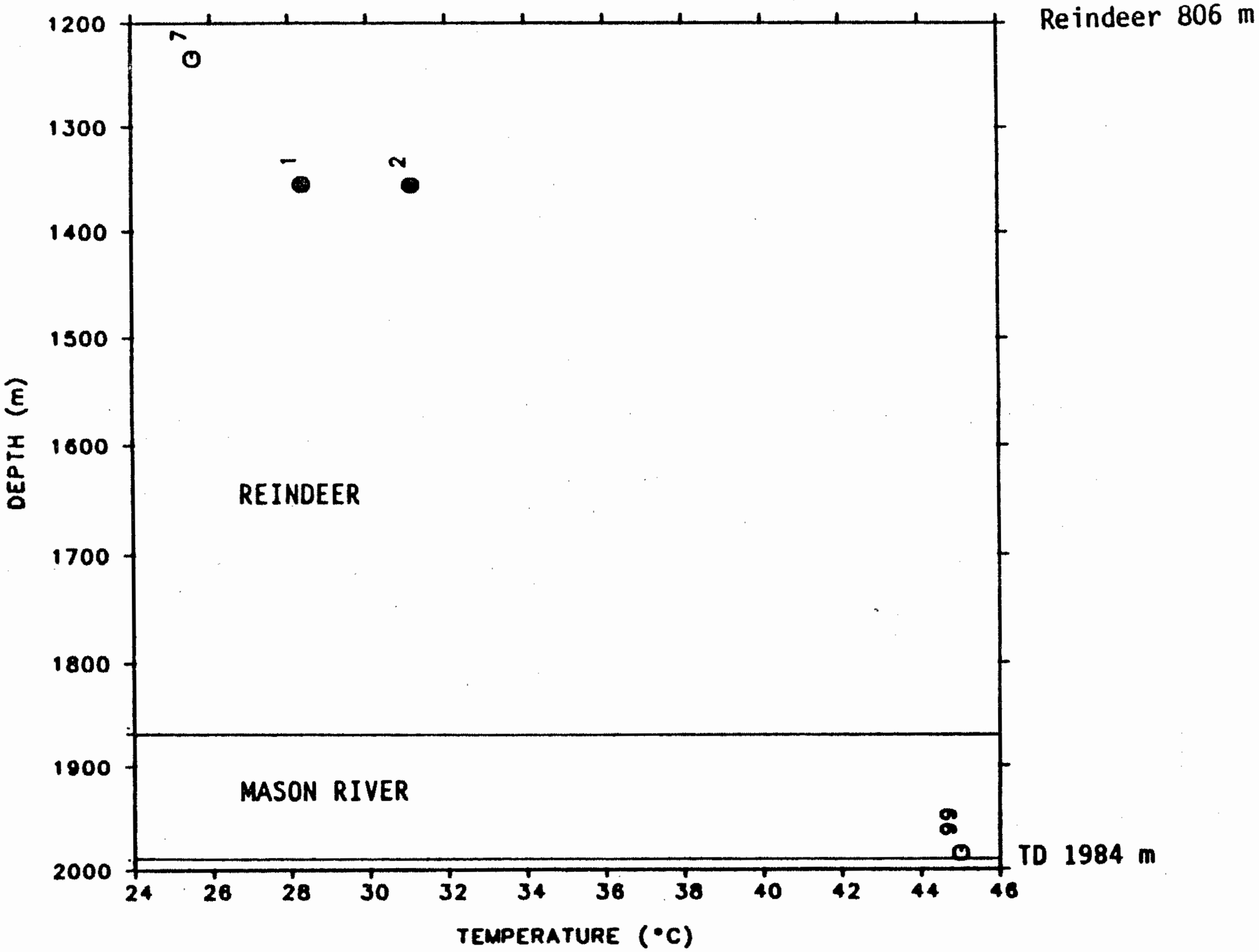
WELL IDENTIFIER: 300D556930134450
NAME: IOE TAGLU D-55



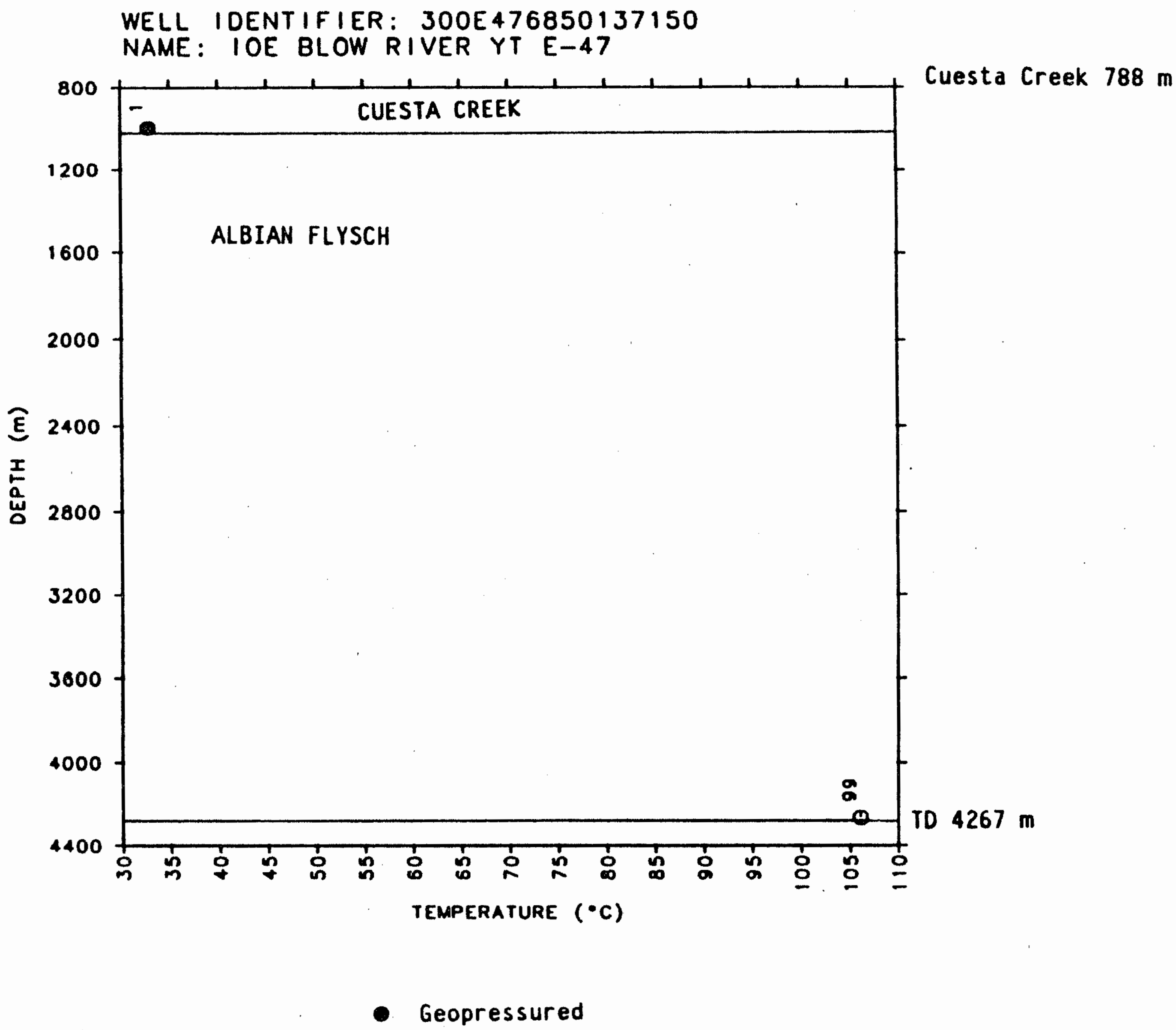
WELL IDENTIFIER: 300D586900133150
NAME: GULF MOBIL KAMIK D-58



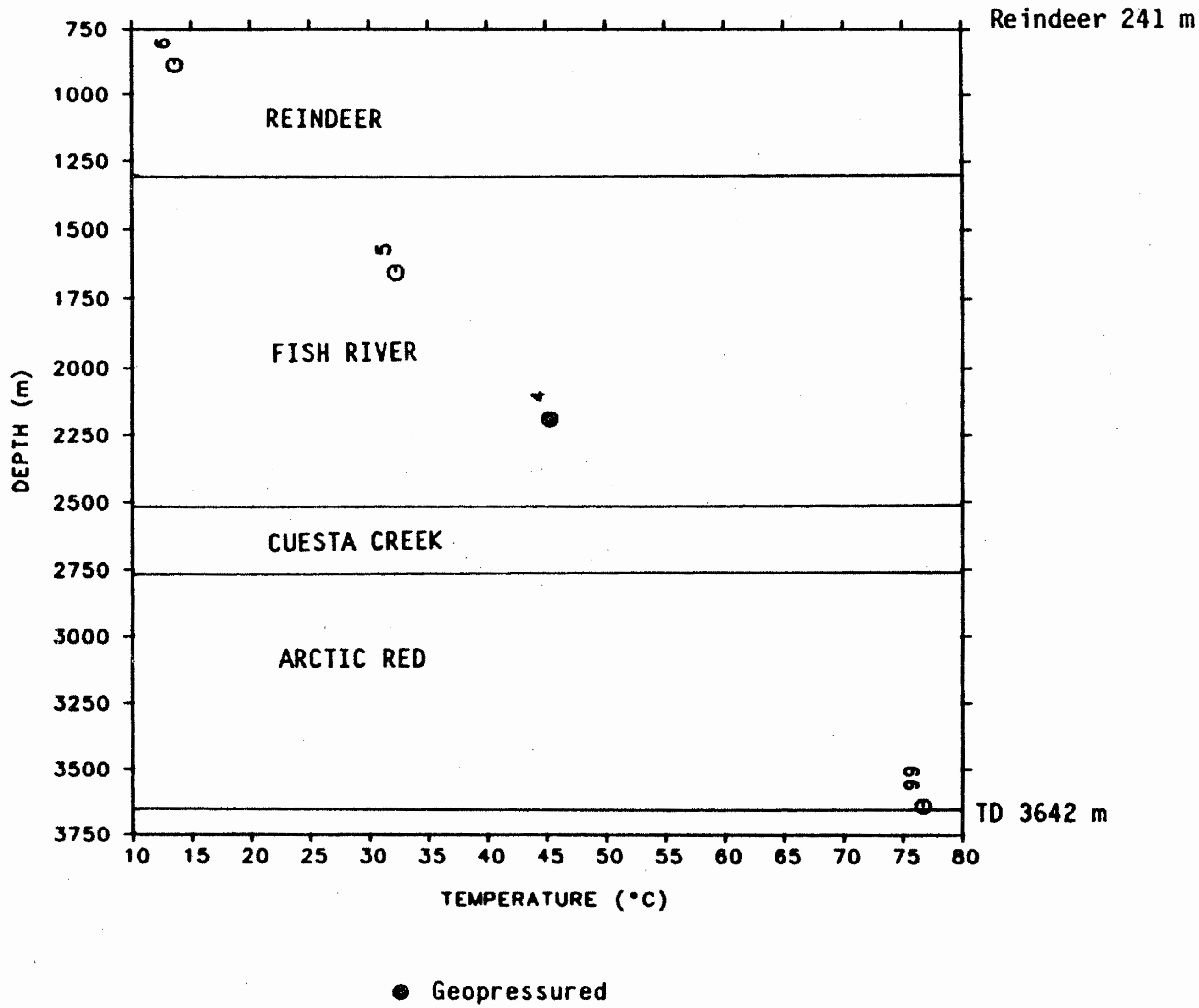
WELL IDENTIFIER: 300E416940132300
NAME: ATERTAK E-41



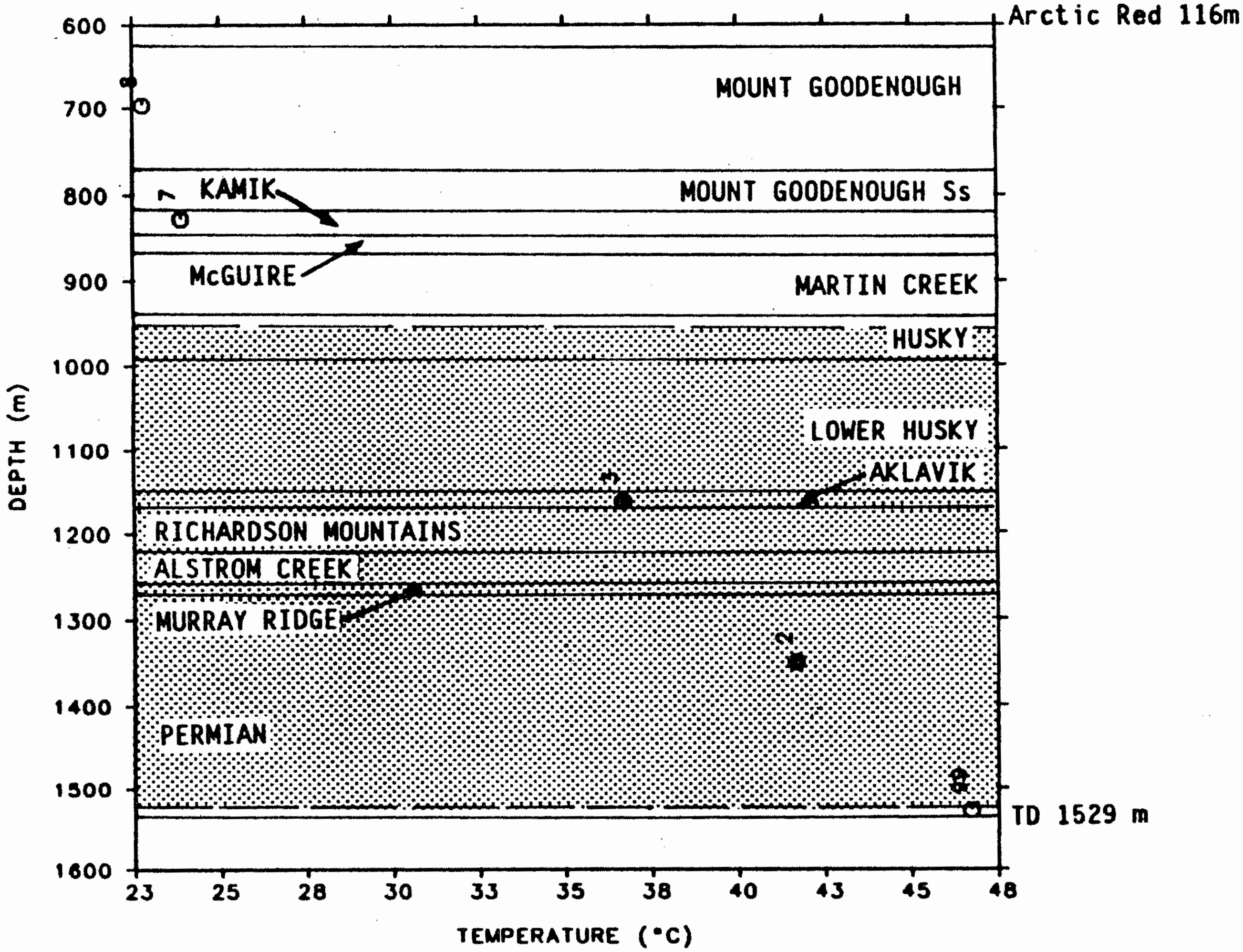
● Geopressured


WELL IDENTIFIER: 300E476850137150
NAME: IOE BLOW RIVER YT E-47
Cuesta Creek 788 m
CUESTA CREEK
ALBIAN FLYSCH
DEPTH (m)
800
1200
1600
2000
2400
2800
3200
3600
4000
4400
99
TD 4267 m
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110
TEMPERATURE (°C)
Geopressured

WELL IDENTIFIER: 300F306900134300
NAME: GULF IMP SHELL TUNUNUK F-30



WELL IDENTIFIER: 300F316830134450
NAME: SHELL NAPOIAK F-31

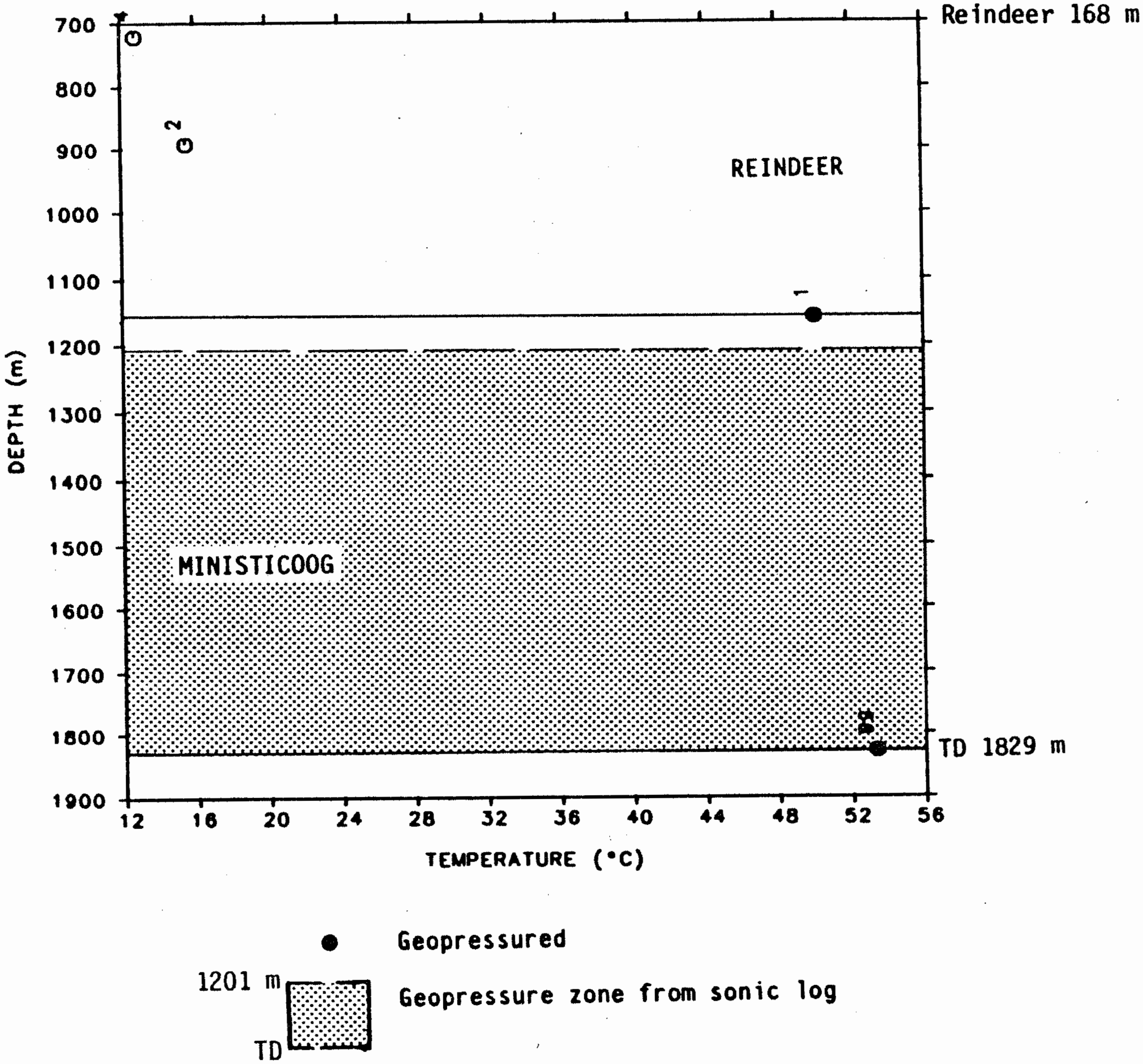


● Geopressured

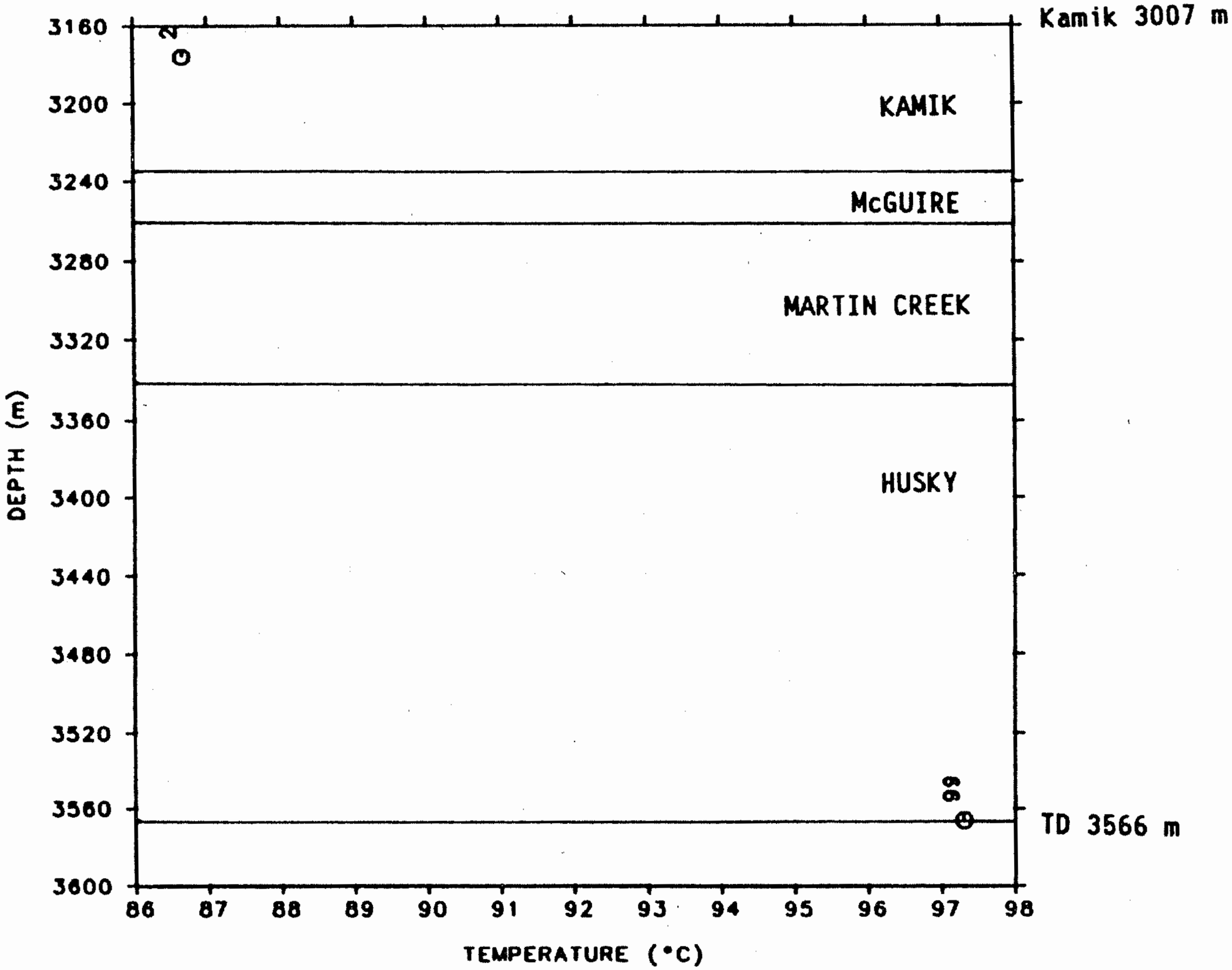
945 m — Geopressure zone from sonic log

(bottom of log) 1524 m

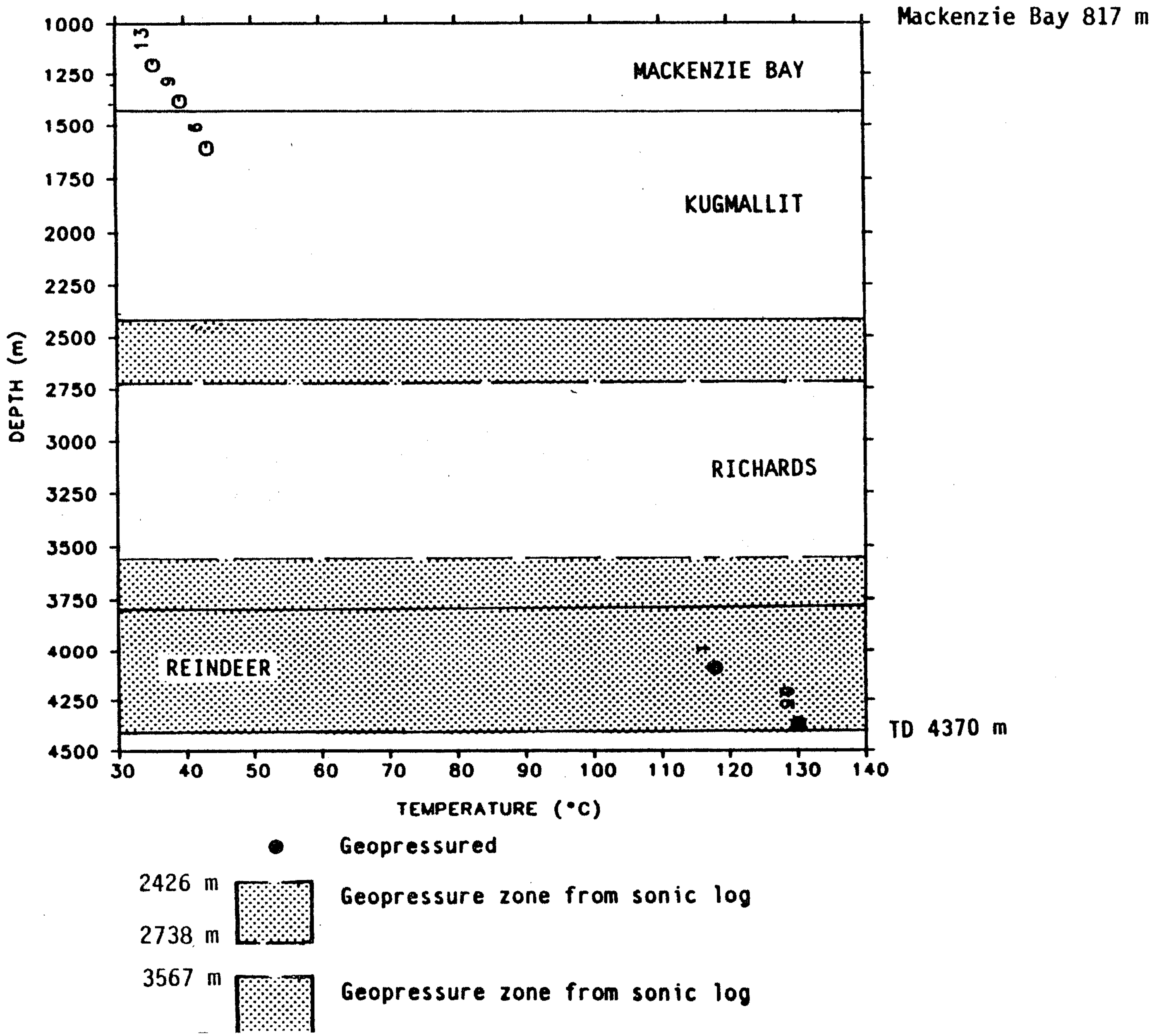
WELL IDENTIFIER: 300F366910134300
NAME: GULF IMP SHELL REINDEER F-36



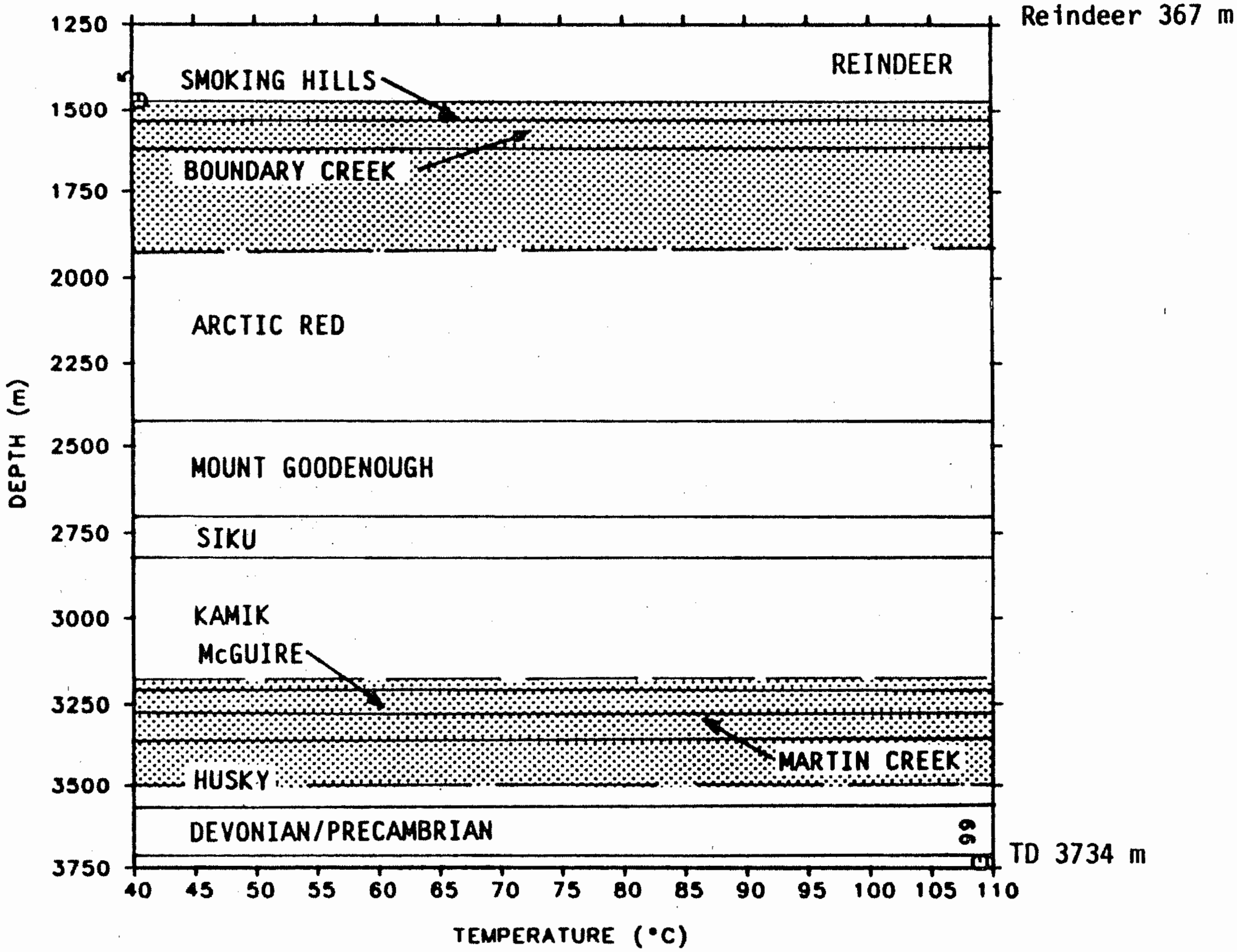
WELL IDENTIFIER: 300F386900133150
NAME: GULF MOBIL KAMIK F-38



WELL IDENTIFIER: 300F406940135450
NAME: IMPERIAL NETSERK F-40



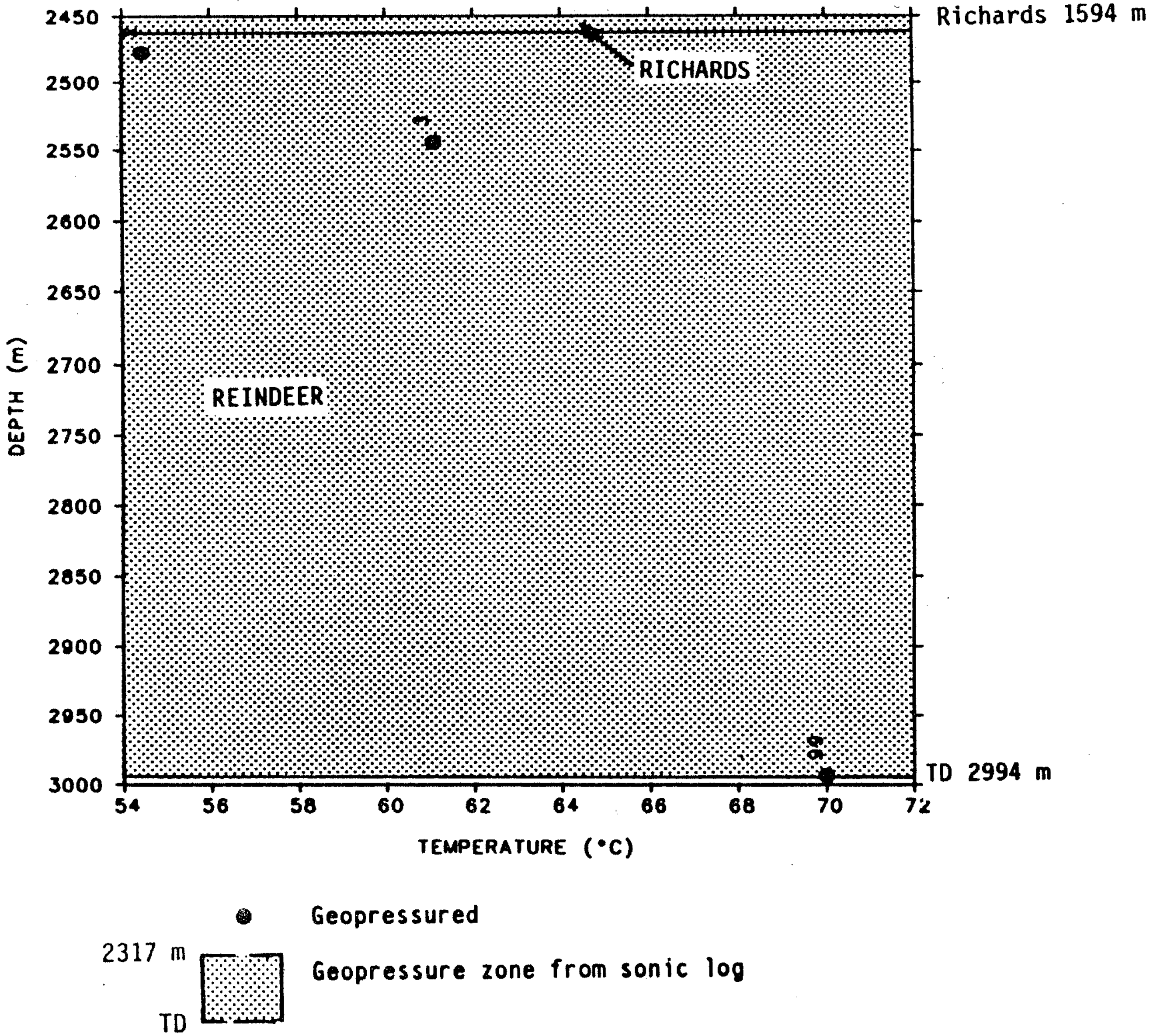
WELL IDENTIFIER: 300G046900133450
NAME: GULF MOBIL EAST REINDEER G-04



1478 m – 1927 m: Geopressure zone from sonic log

3231 m – 3500 m: Geopressure zone from sonic log

WELL IDENTIFIER: 300G336930134450
NAME: IOE TAGLU G-33



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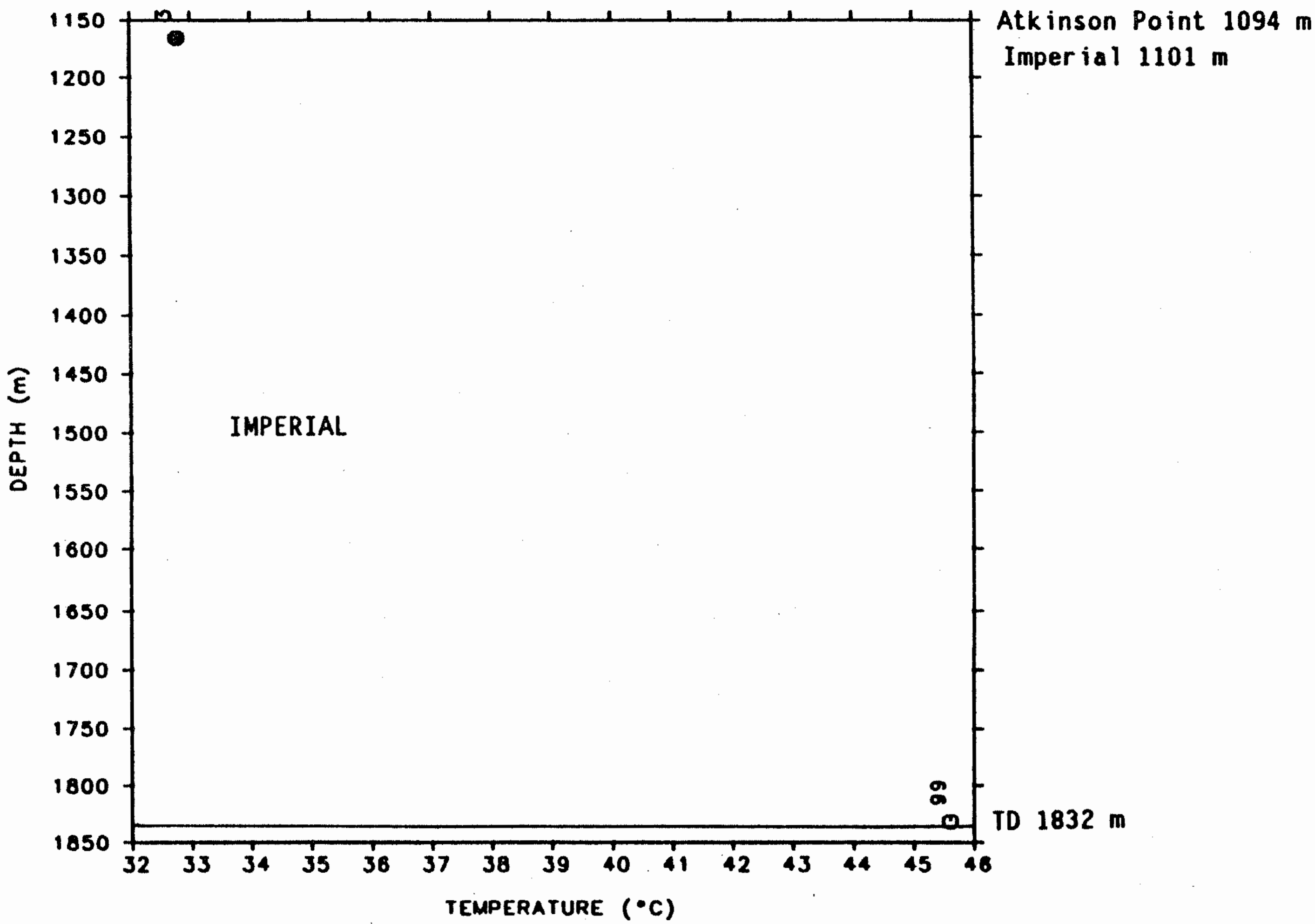
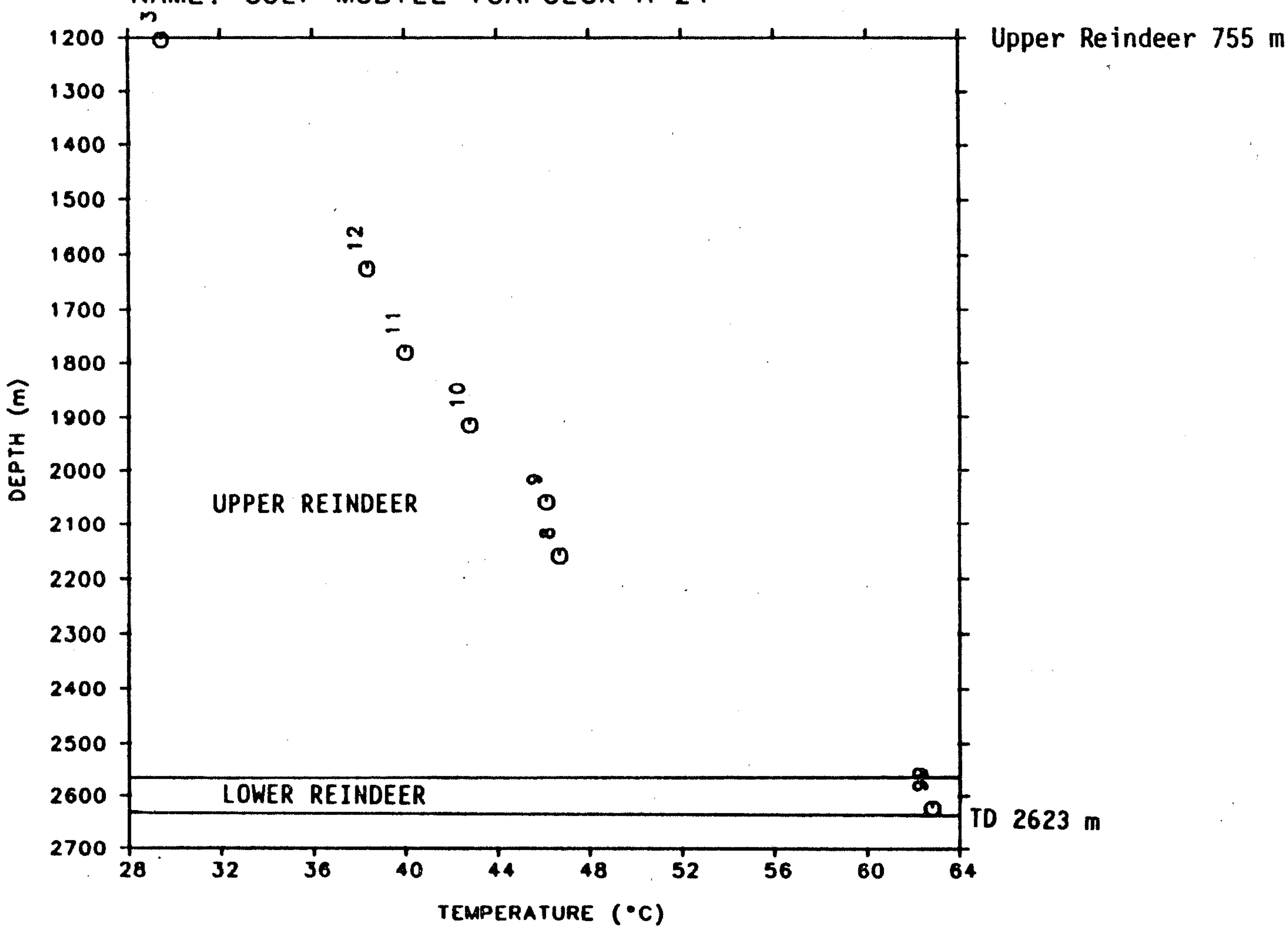
NAME: IMP CIGOL RUSSELL H-23

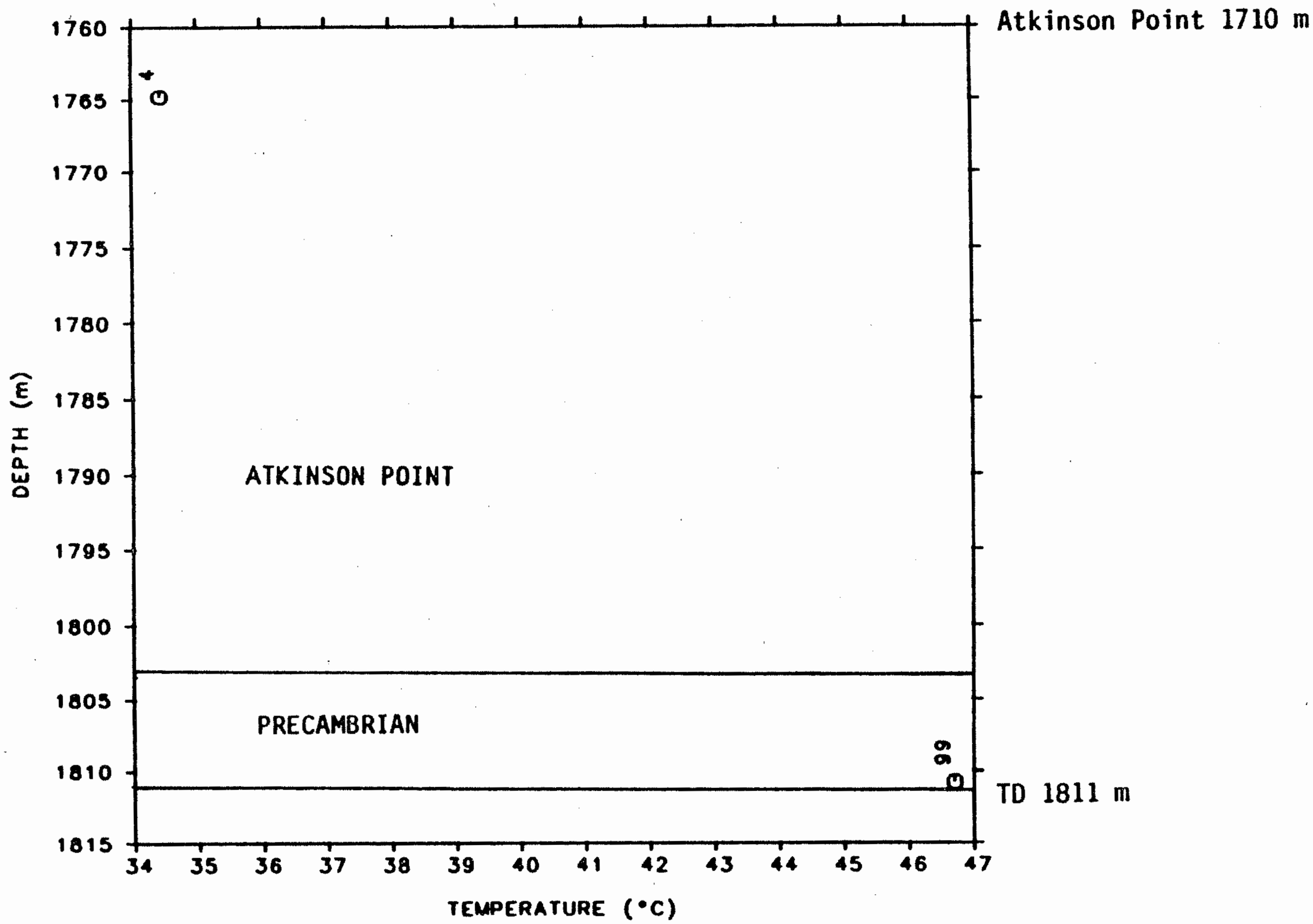


● Geopressured

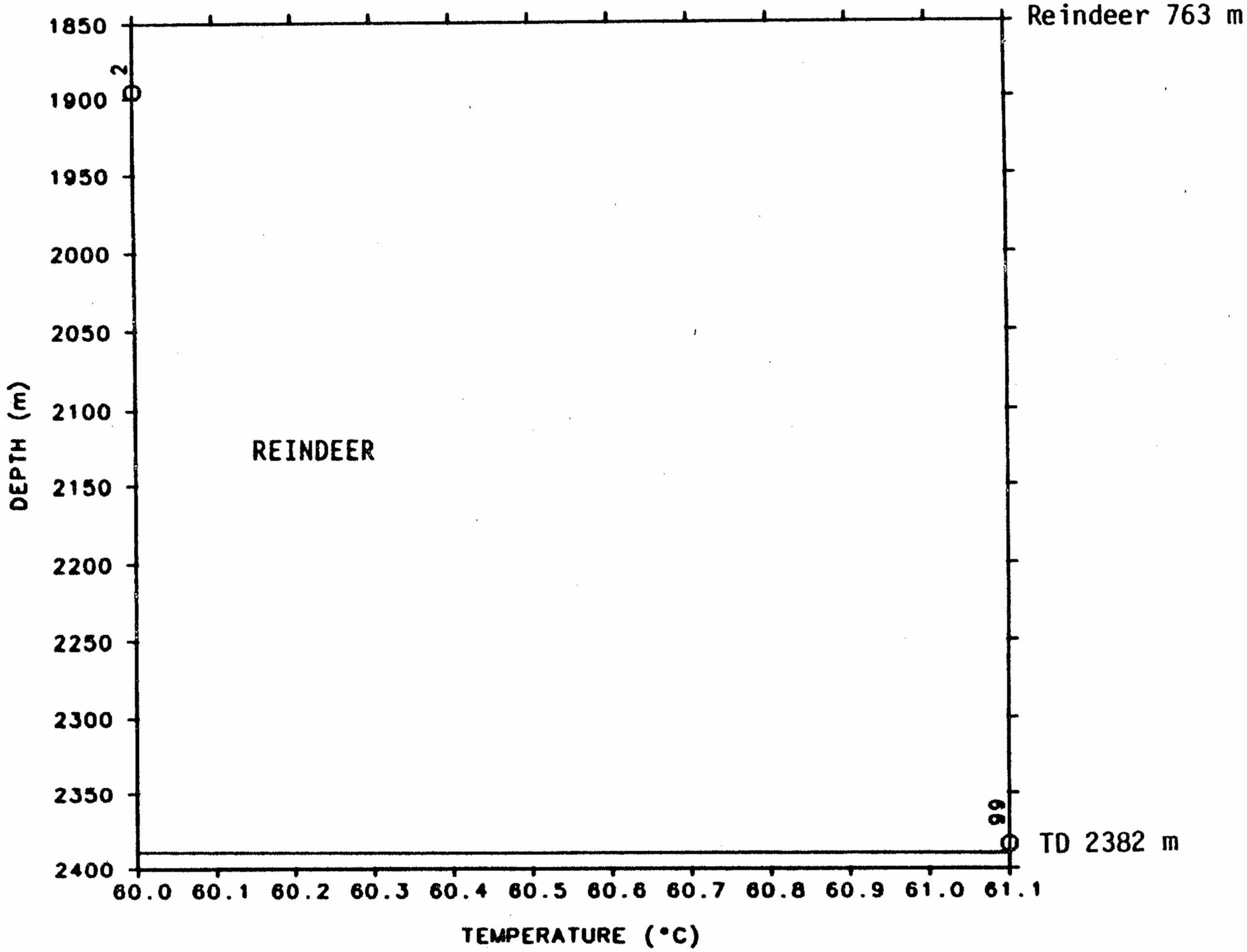
WELL IDENTIFIER: 300H246920134450
NAME: GULF MOBILE TOAPOLOK H-24

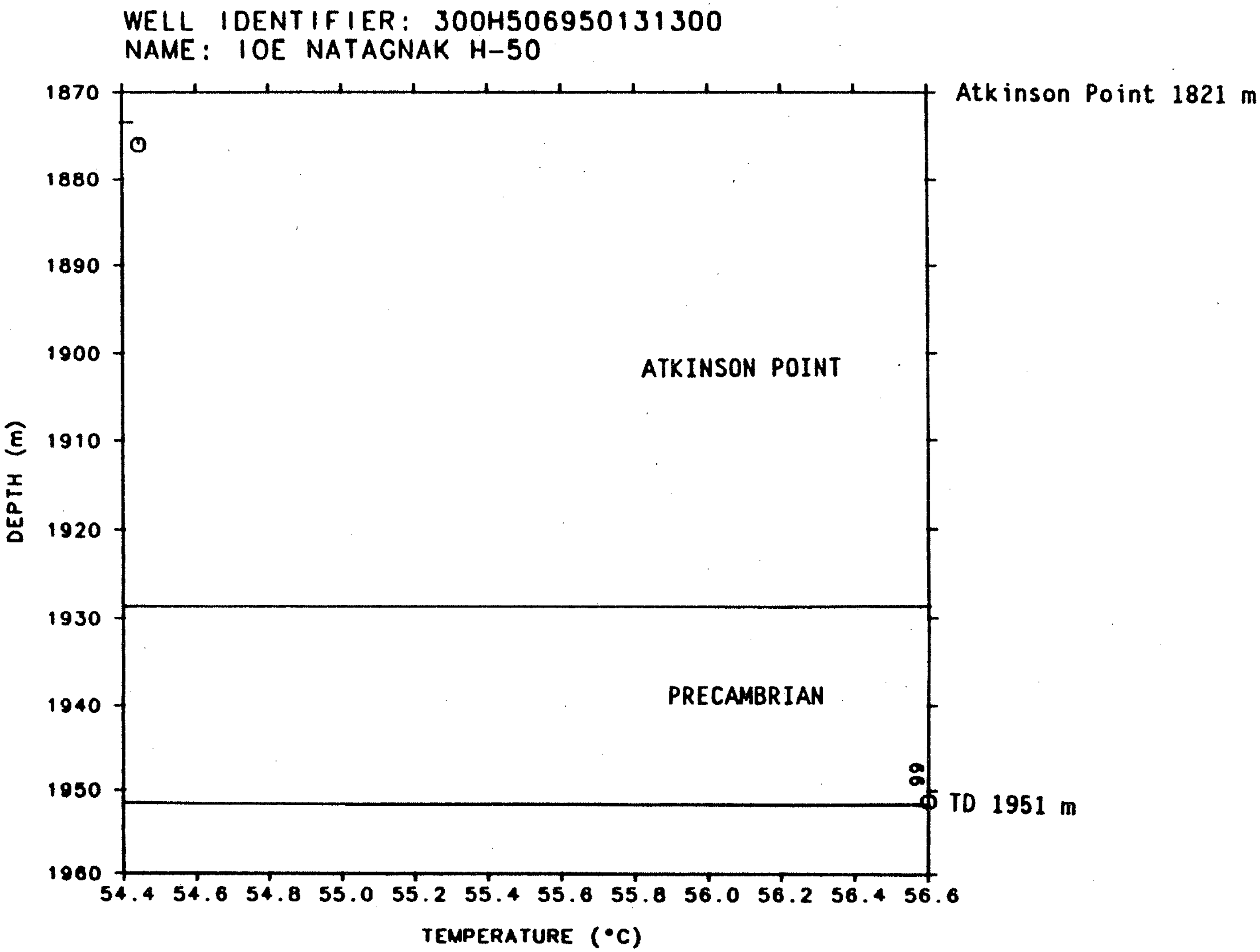


WELL IDENTIFIER: 300H256950131450
NAME: IOE ATKINSON H-25

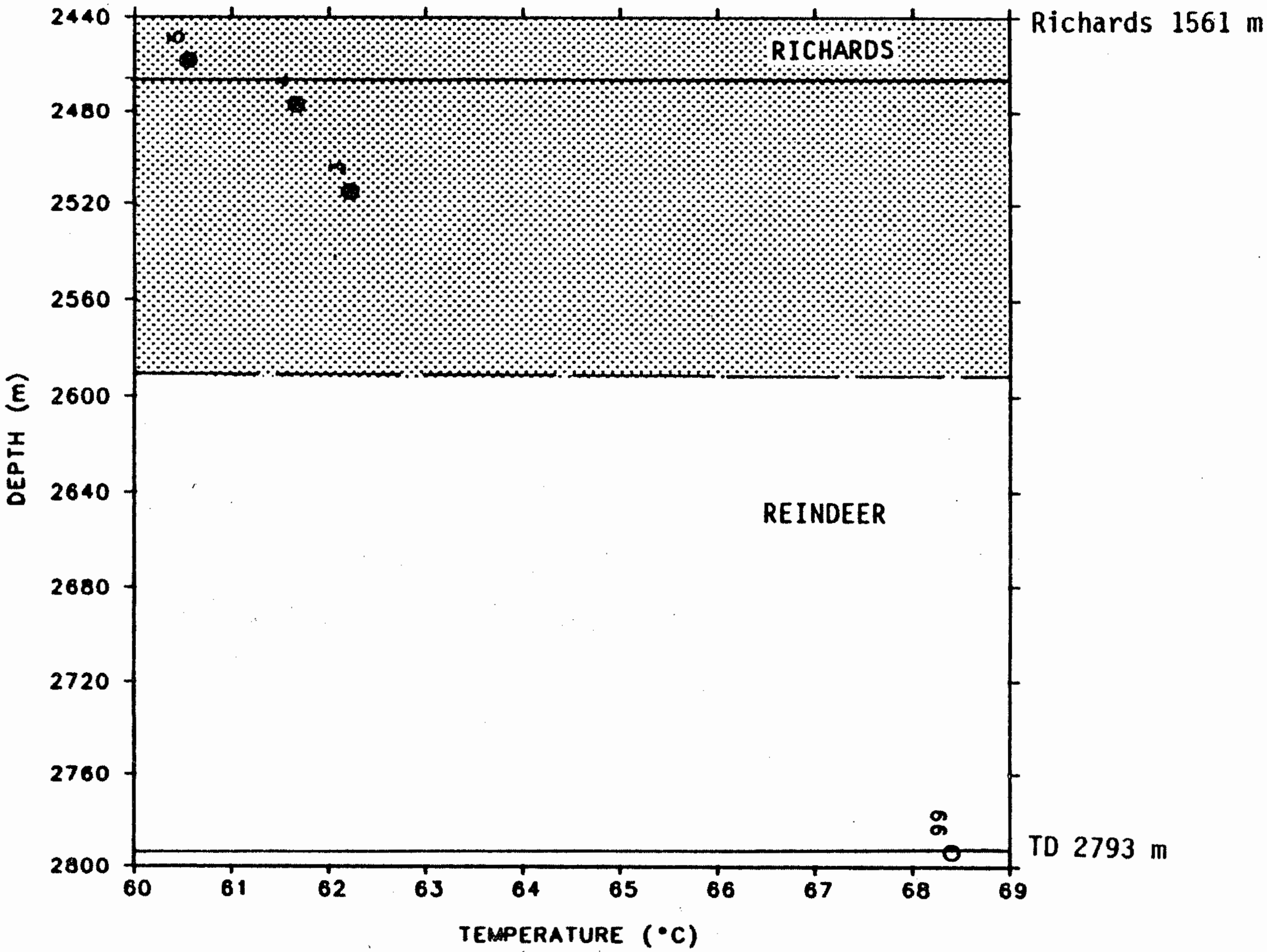


WELL IDENTIFIER: 300H306920135150
NAME: SHELL NIGLINTGAK H-30




WELL IDENTIFIER: 300H506950131300
NAME: IOE NATAGNAK H-50
Atkinson Point 1821 m
ATKINSON POINT
PRECAMBRIAN
TD 1951 m
69
DEPTH (m)
TEMPERATURE (°C)
1870
1880
1890
1900
1910
1920
1930
1940
1950
1960
54.4 54.6 54.8 55.0 55.2 55.4 55.6 55.8 56.0 56.2 56.4 56.6

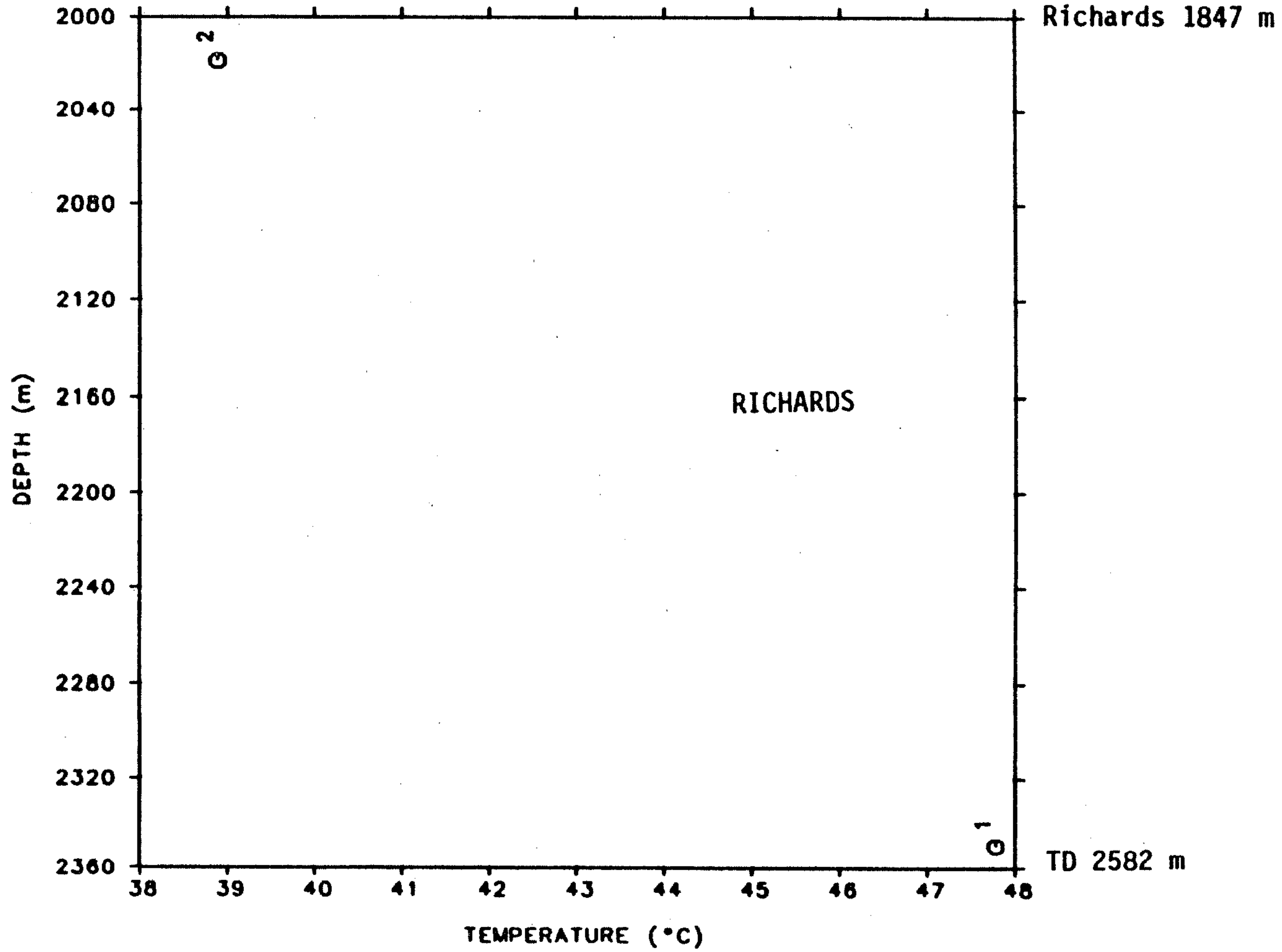
WELL IDENTIFIER: 300H546930134450
NAME: IOE TAGLU H-54



● Geopressured

2317 m – 2591 m: Geopressure zone from sonic log

WELL IDENTIFIER: 3001176920134300
NAME: GULF MOBIL YA YA I-17



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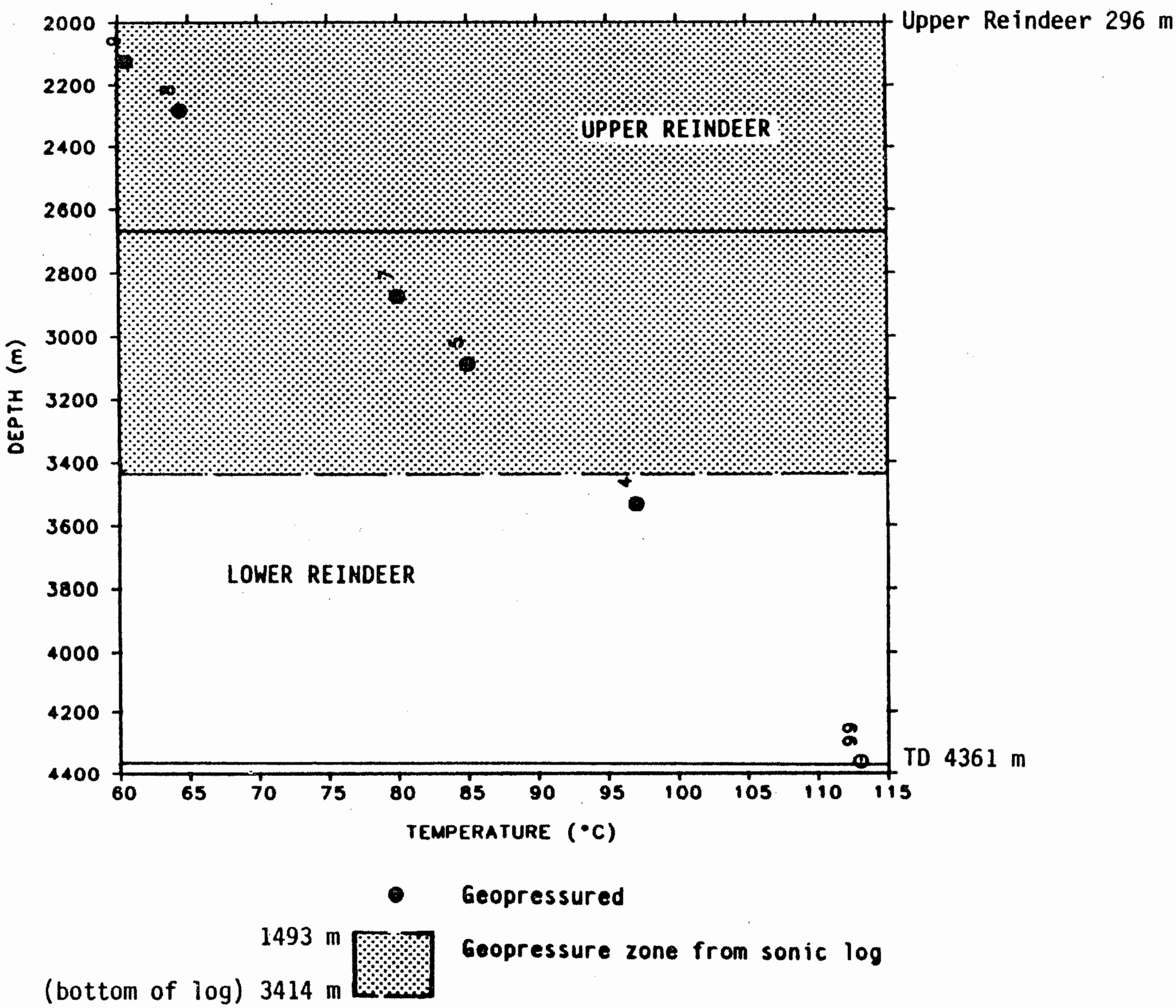
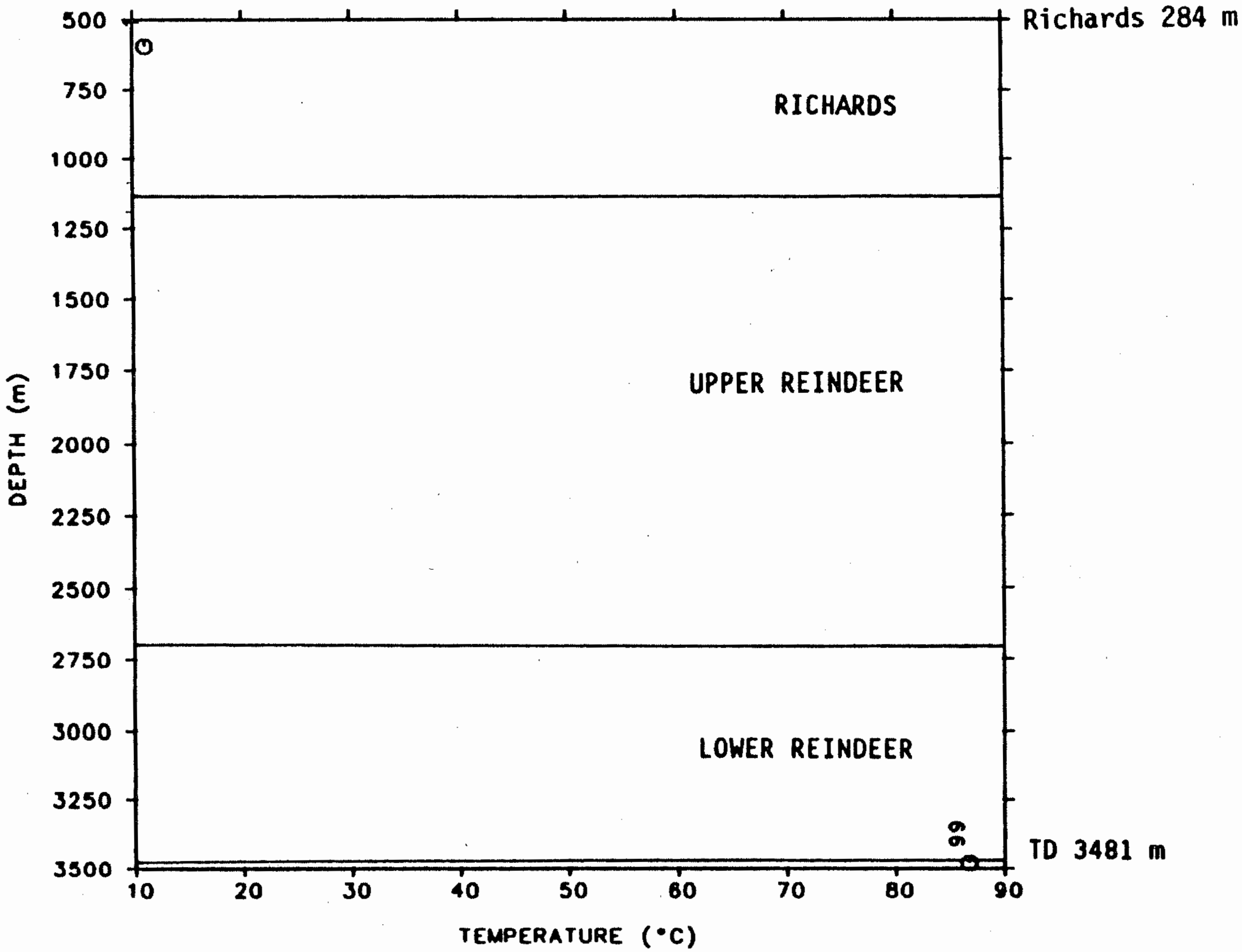
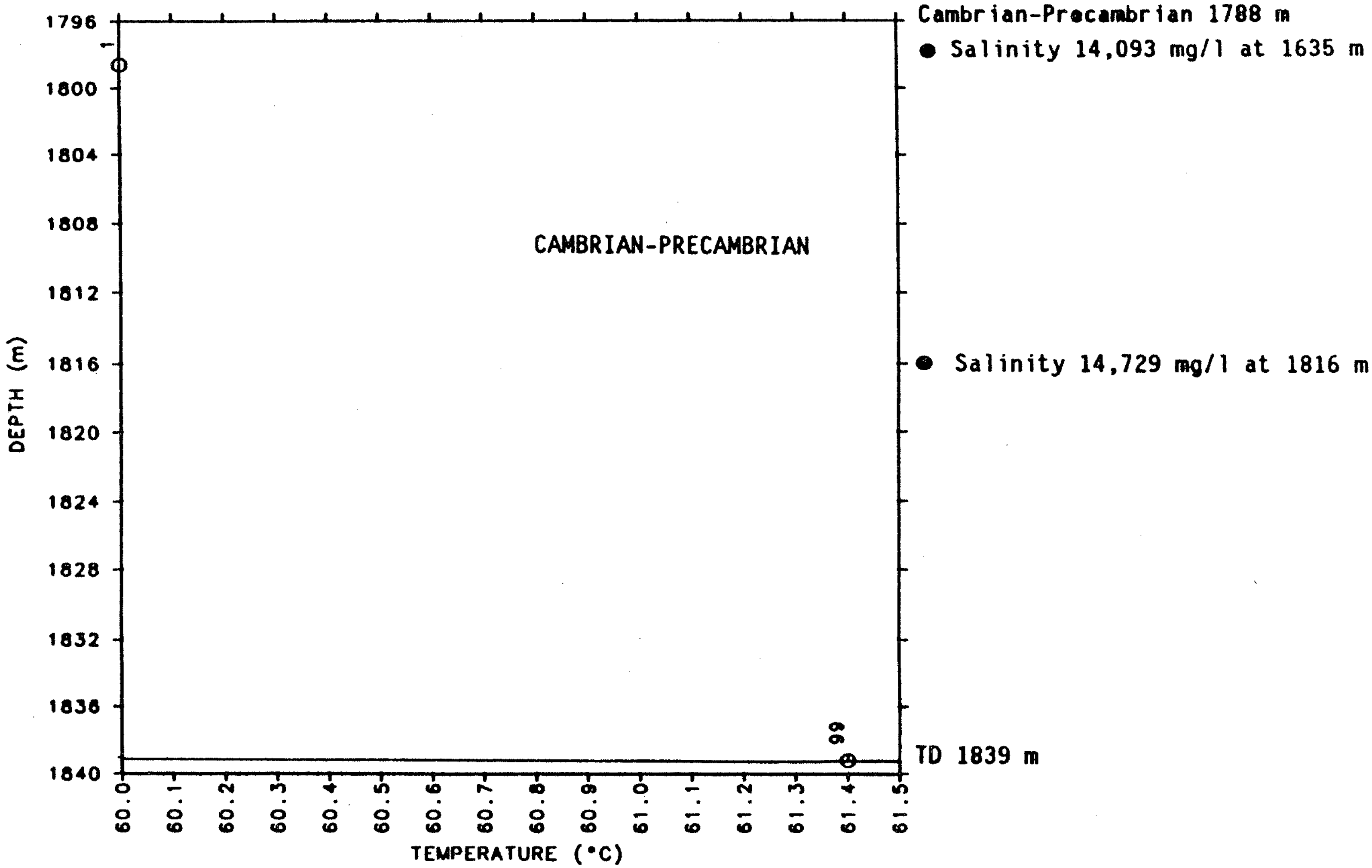
NAME: SHELL UNIPKAT 1-22



WELL IDENTIFIER: 300J066920135000
NAME: SHELL KUMAK J-06



WELL IDENTIFIER: 300J066850133450
NAME: GULF MOBIL OGEOQEOQ J-06



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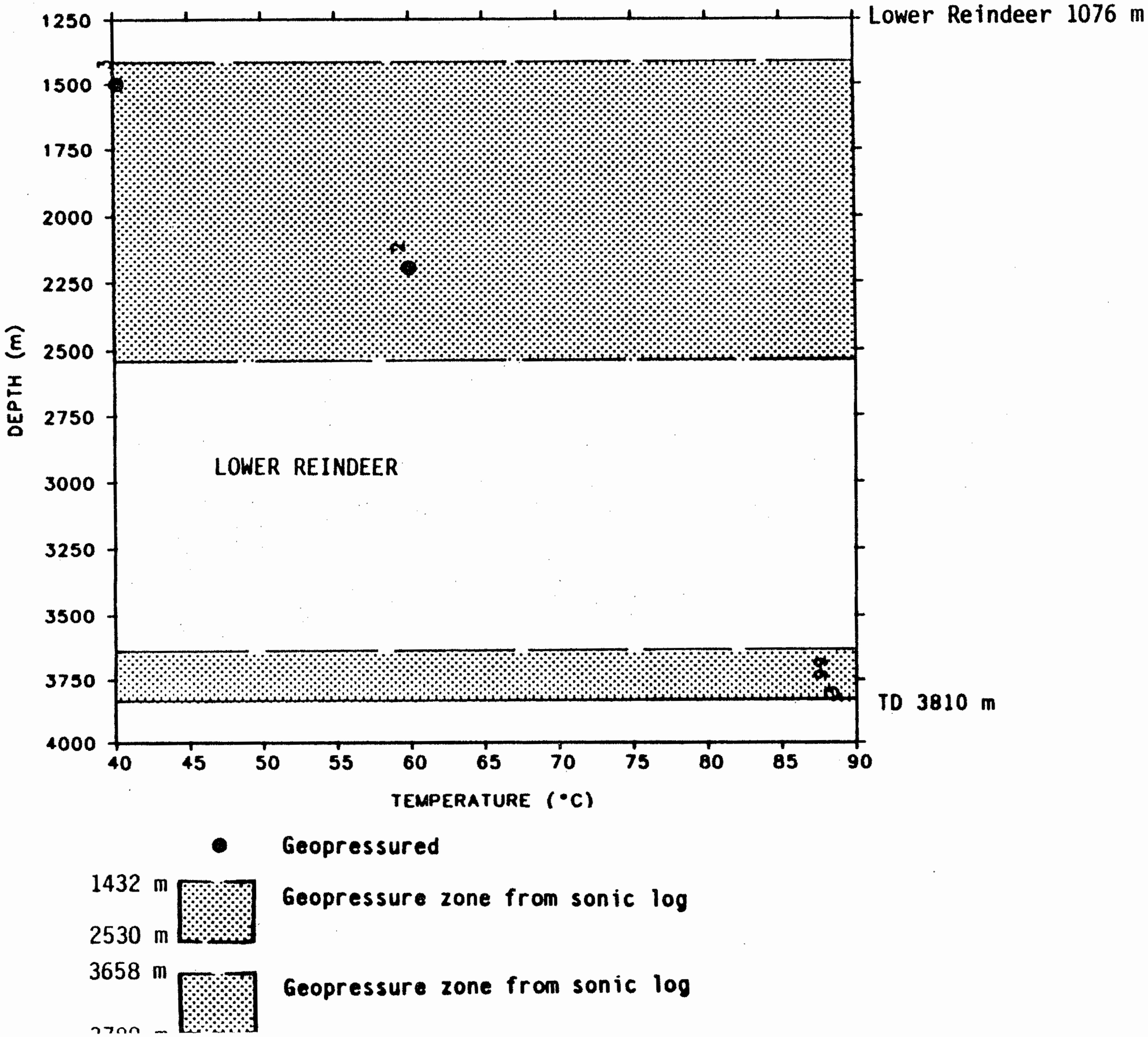
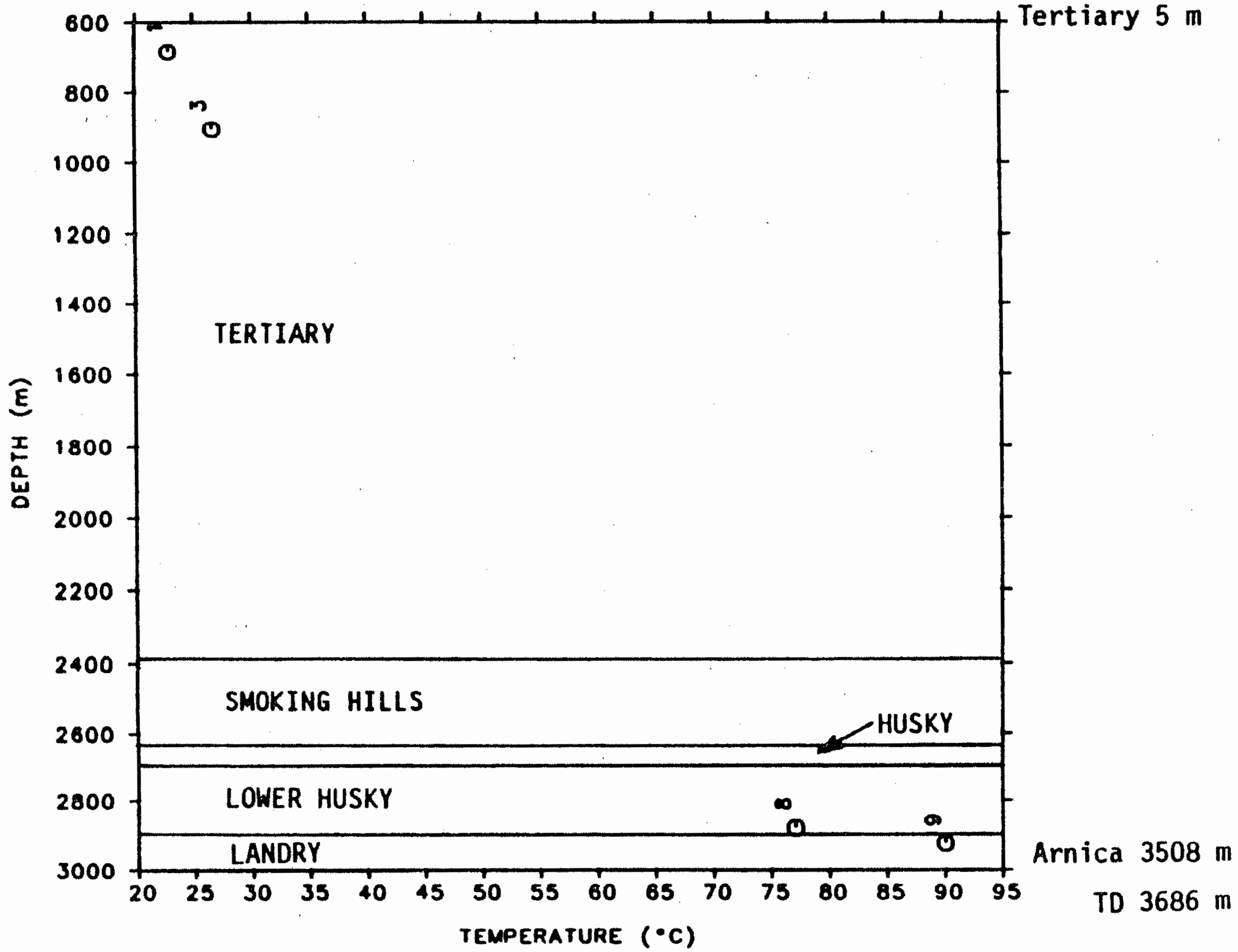
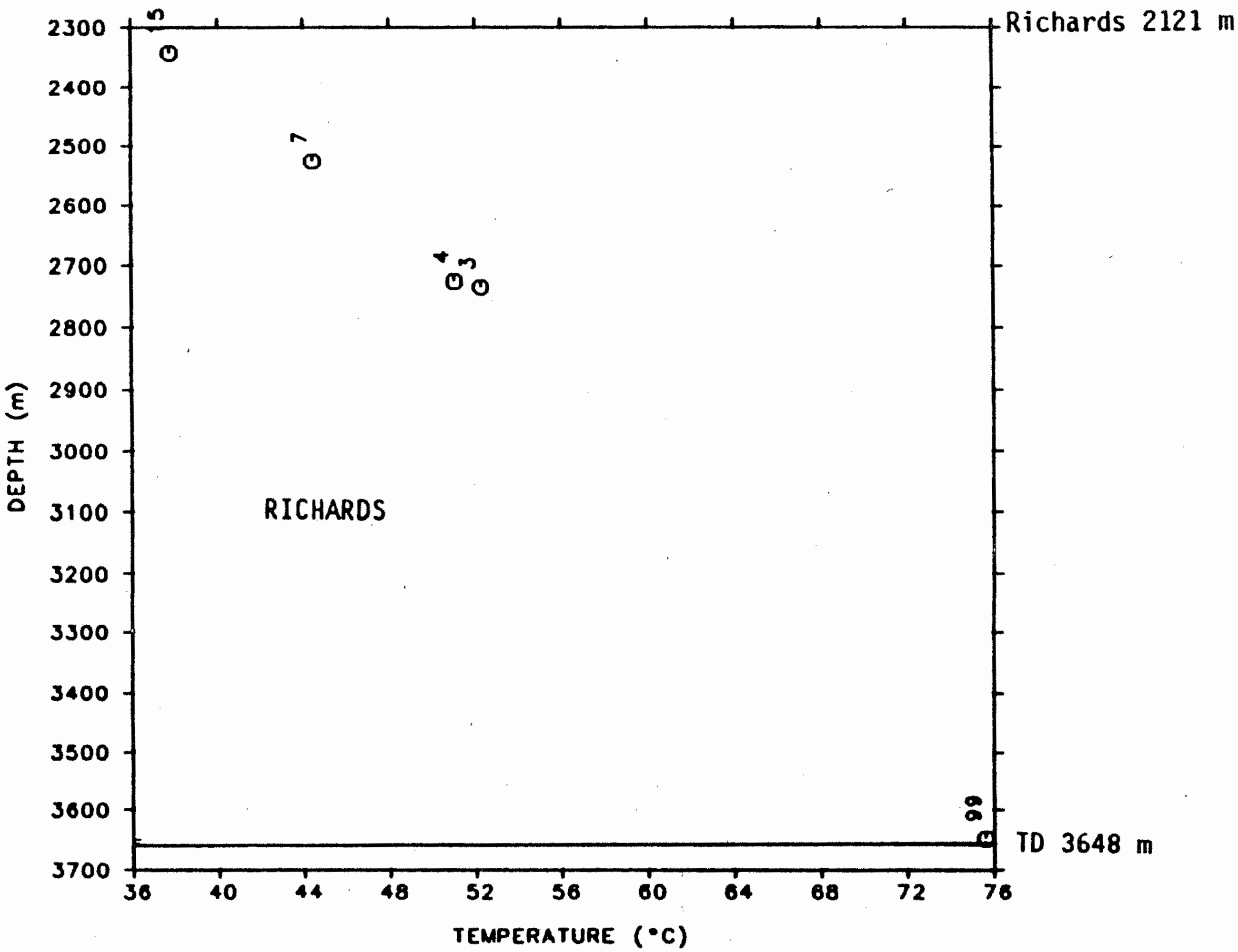
NAME: IMP IKATTOK J-17



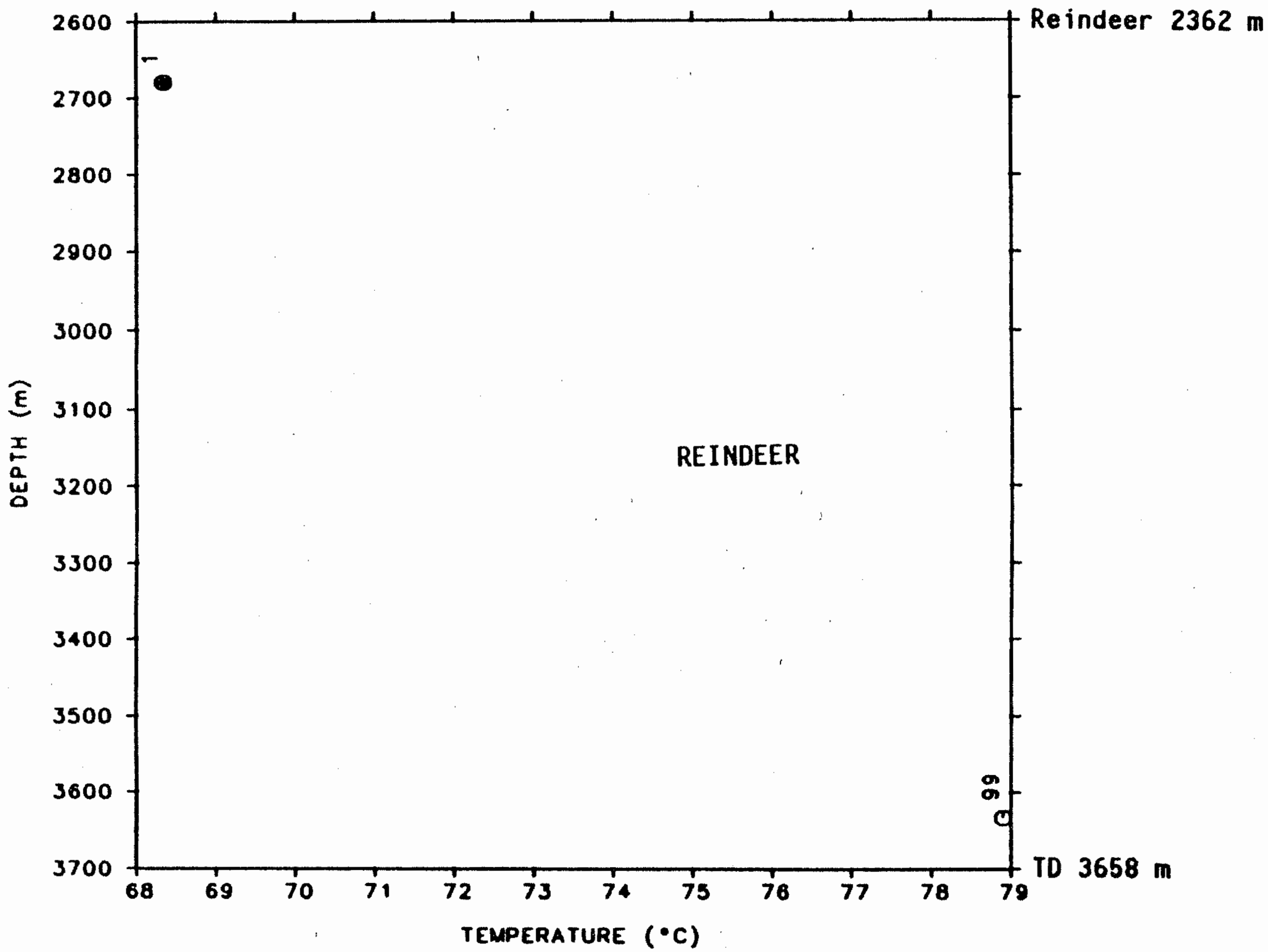
WELL IDENTIFIER: 300J176930132450
NAME: IOE MAYOGIAK J-17



WELL IDENTIFIER: 300J266940134150
NAME: IMPERIAL IVIK J-26

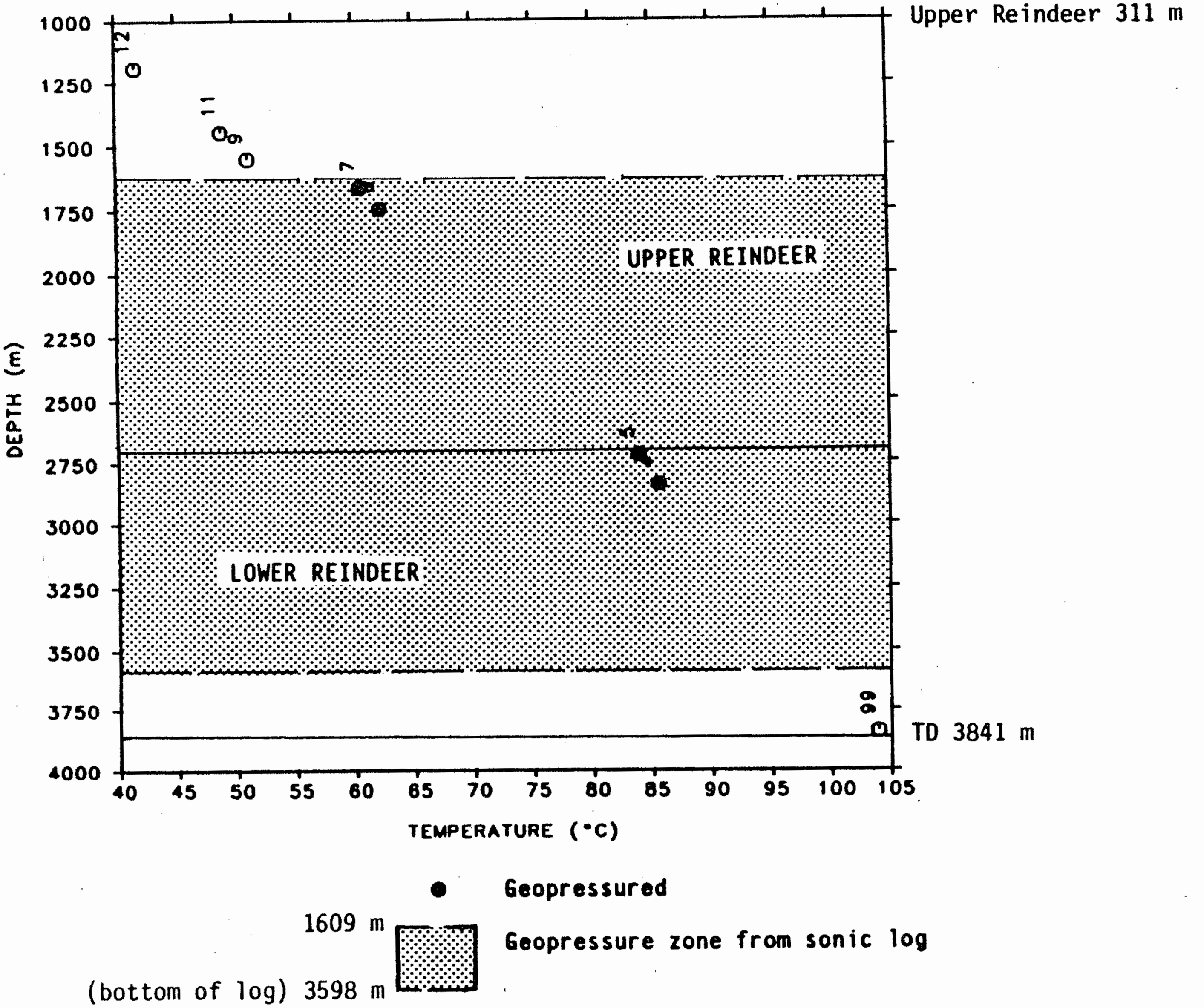


WELL IDENTIFIER: 300J376930134300
NAME: IMP MALLIK J-37



● Geopressured

WELL IDENTIFIER: 300K266910135000
NAME: GULF IMP SHELL TITALIK K-26



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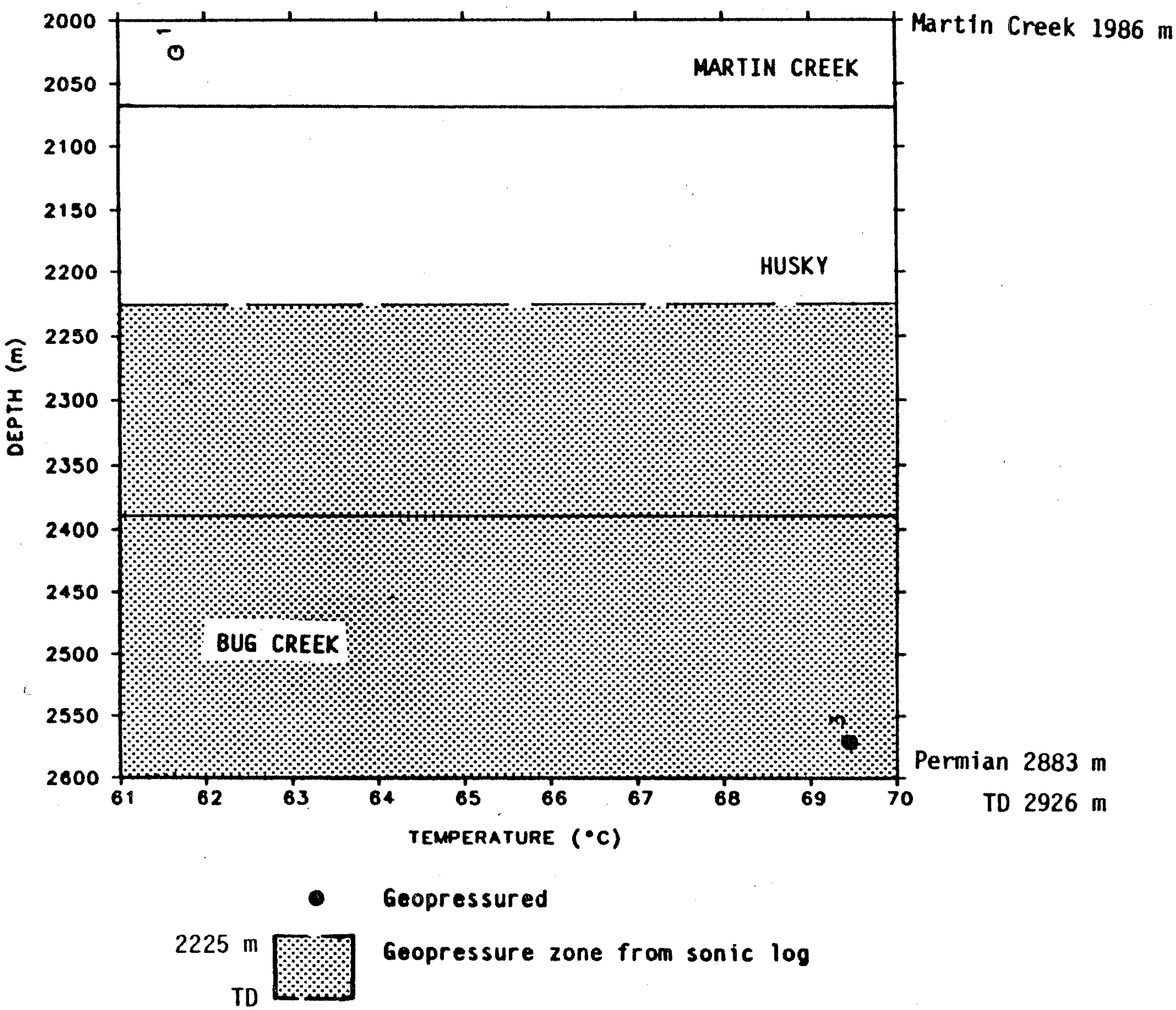
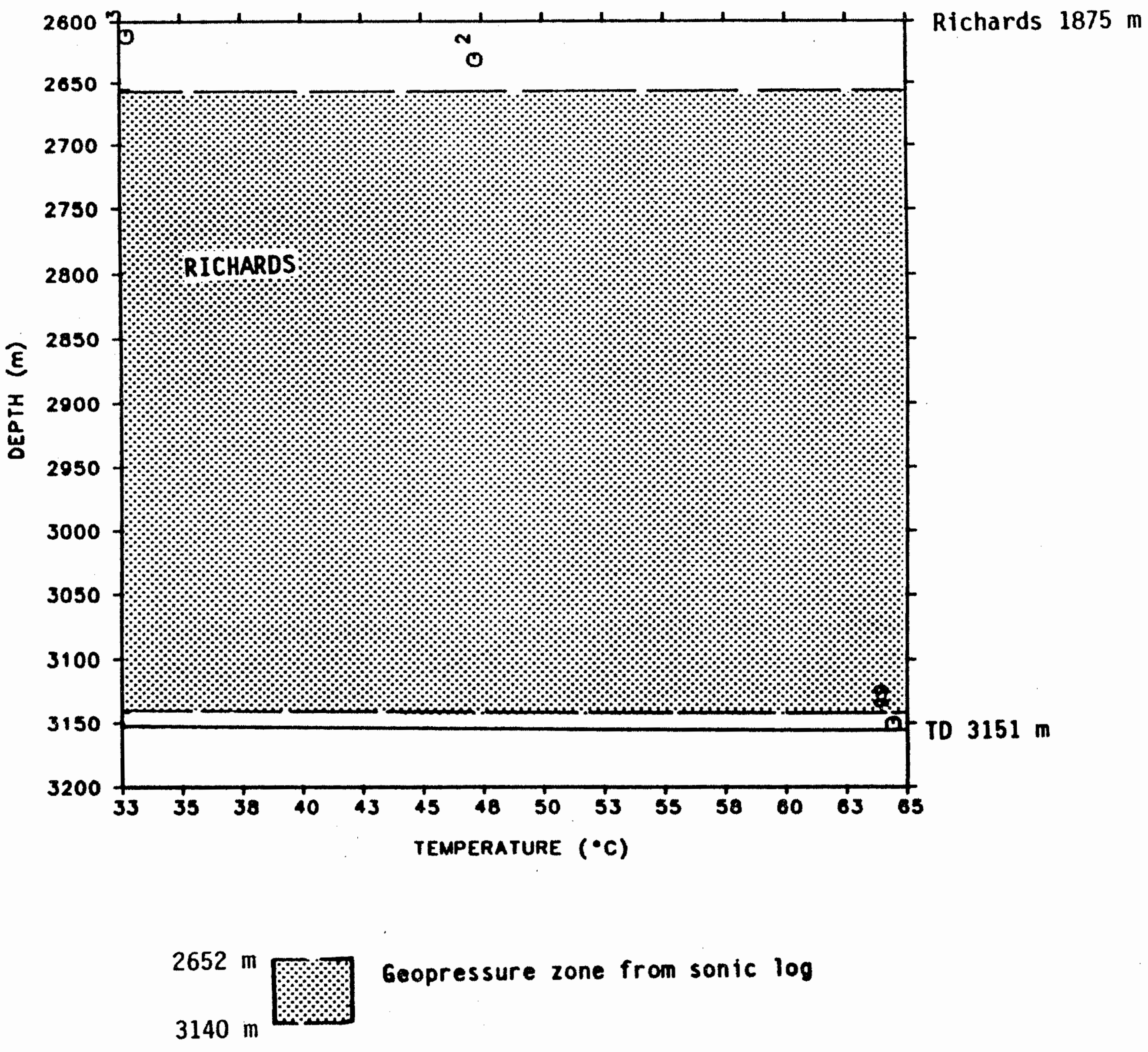
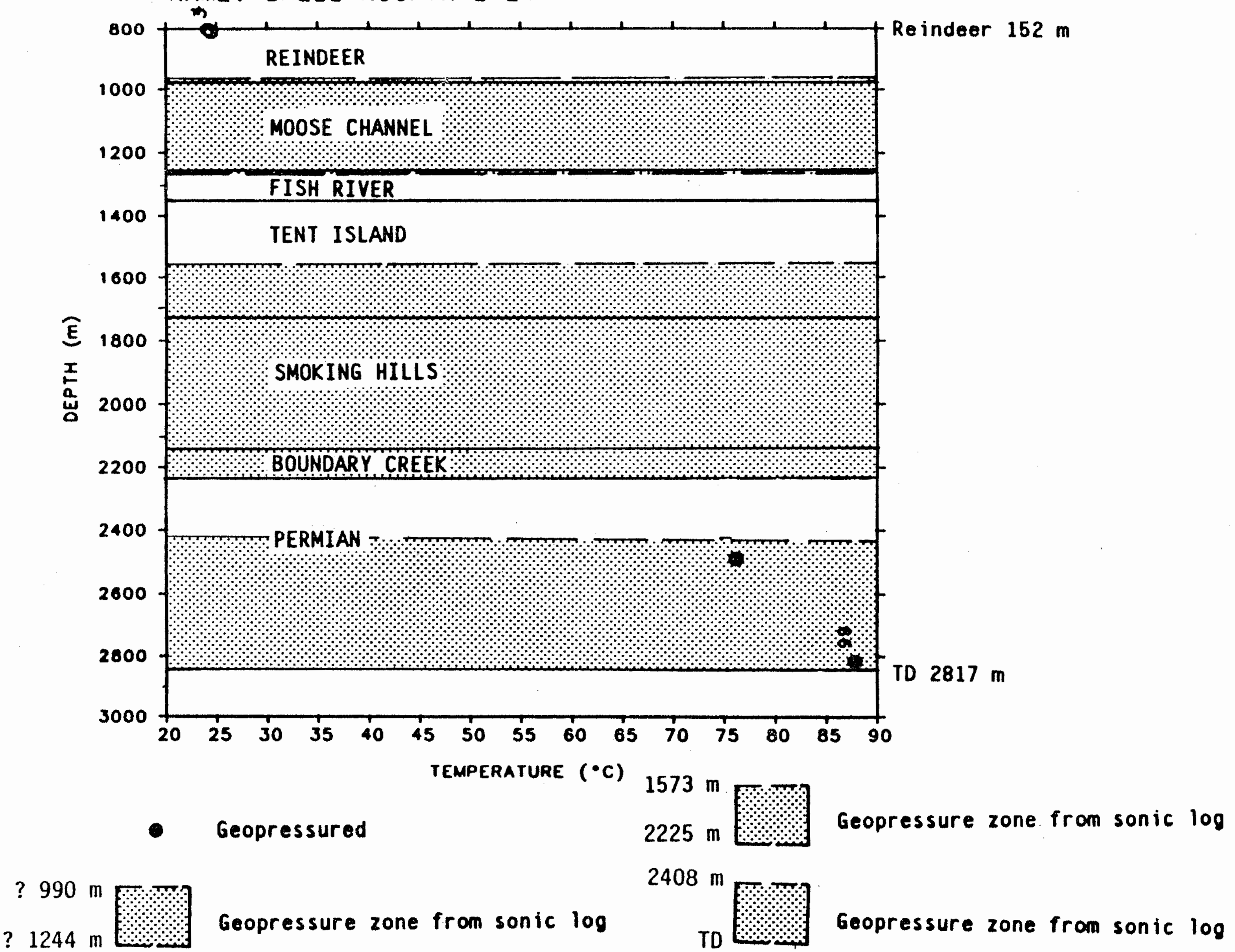
NAME: SHELL TULLUGAK K-31



WELL IDENTIFIER: 300K546940134150
NAME: D IMP IVIK K-54



WELL IDENTIFIER: 300L246900135150
NAME: SHELL KUGPIK L-24



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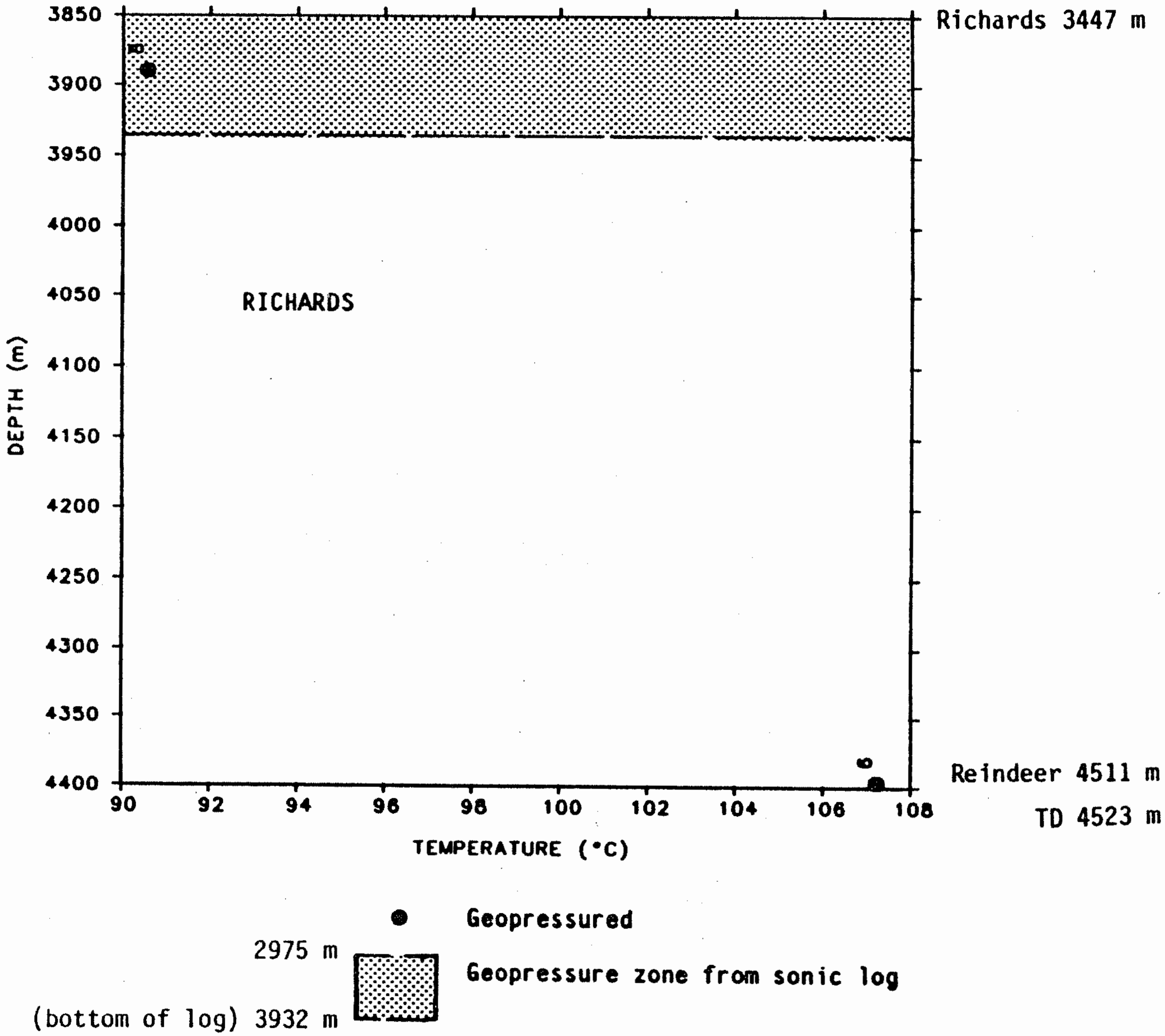
NAME: IMPERIAL ARNAK L-30



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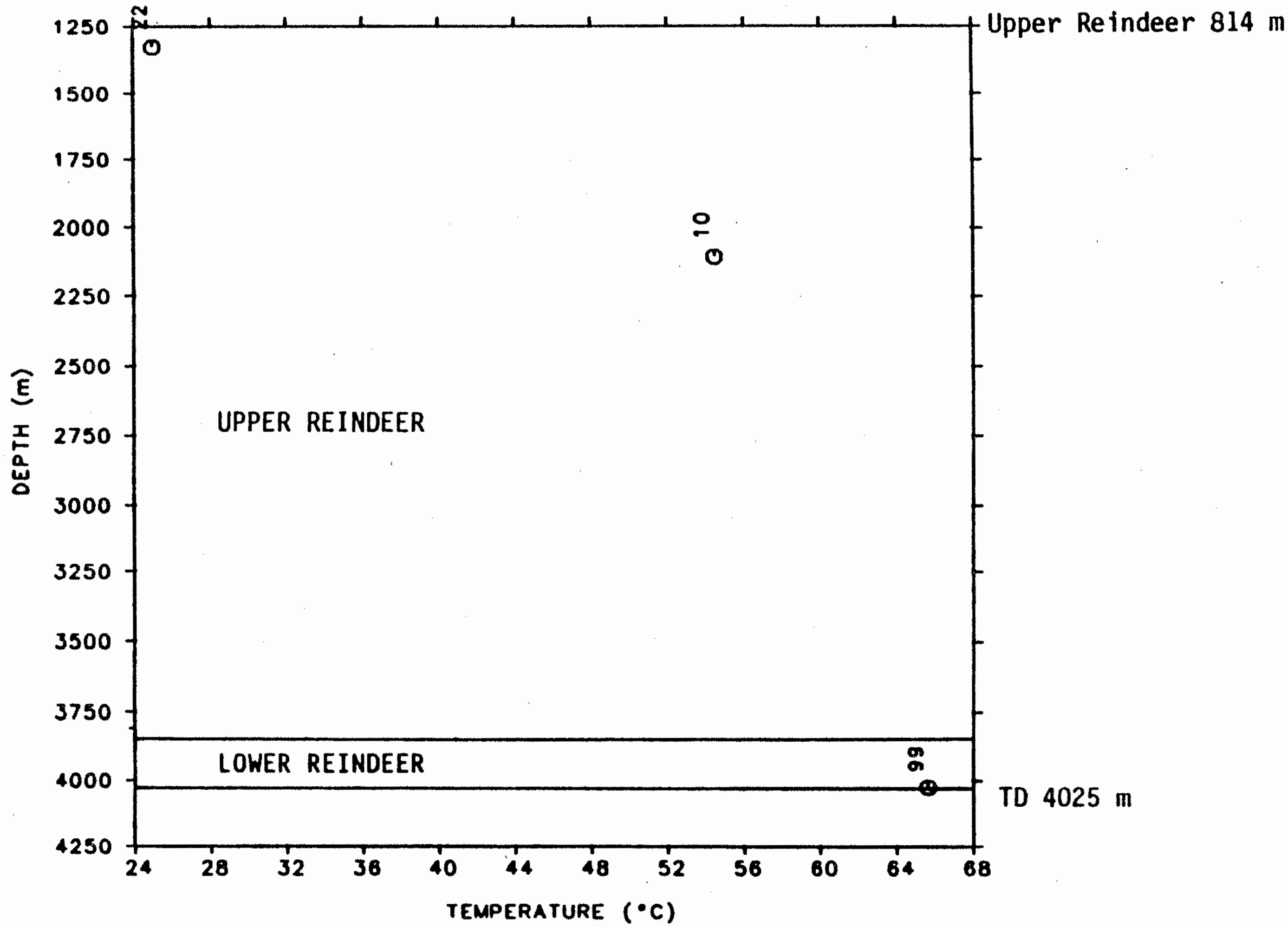
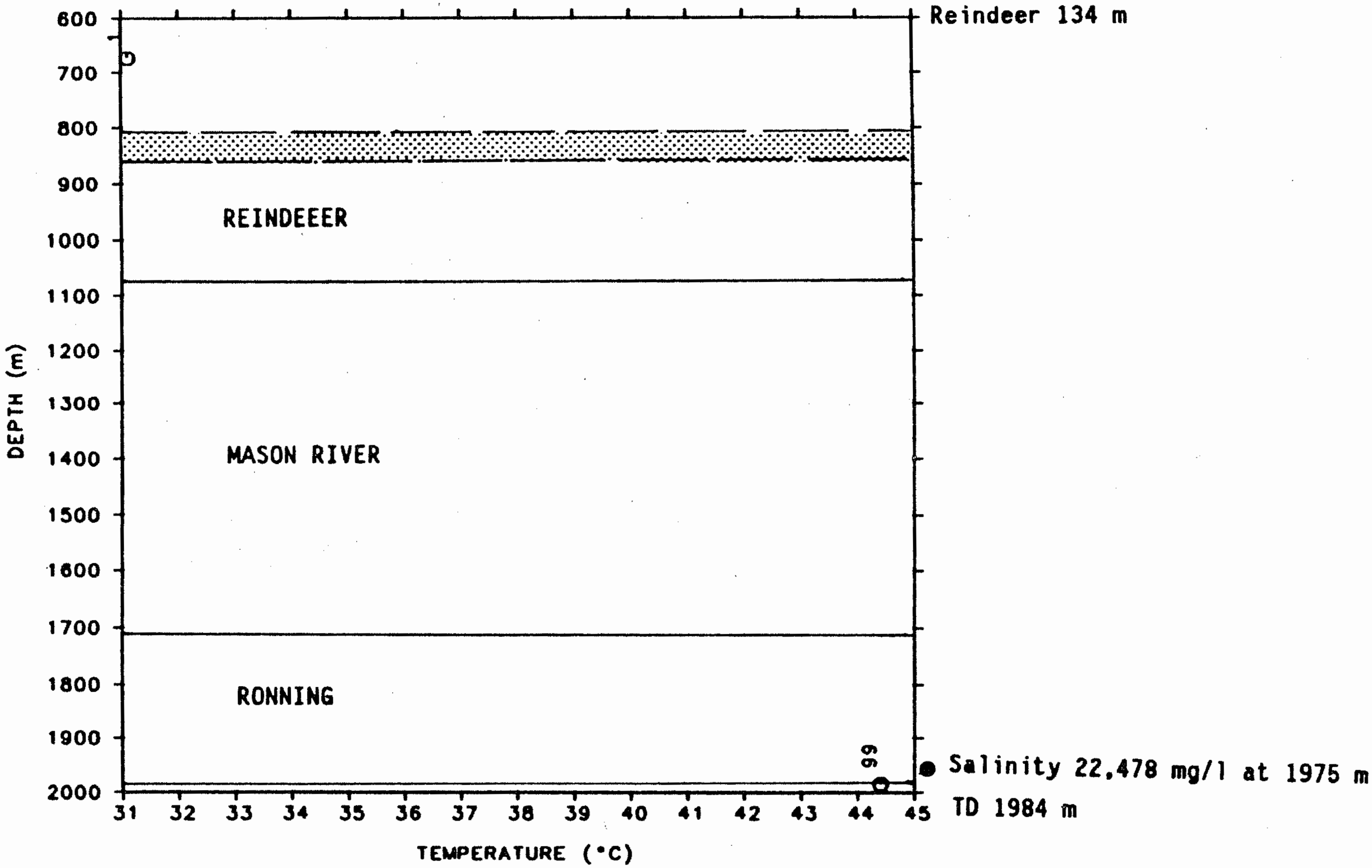
NAME: SHELL NIGLINTGAK M-19

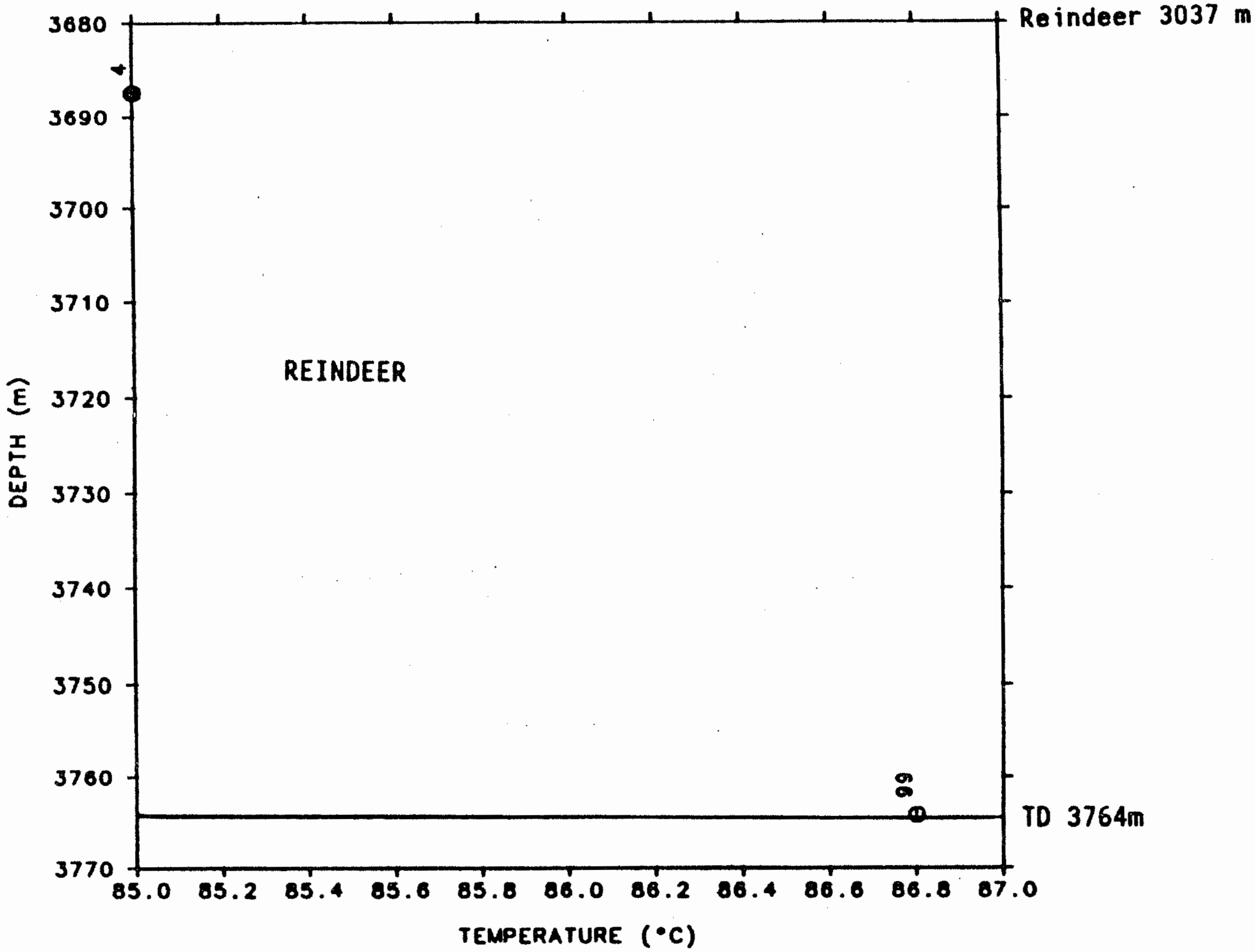


WELL IDENTIFIER: 300M266930132300
NAME: IOE PIKIOLIK M-26



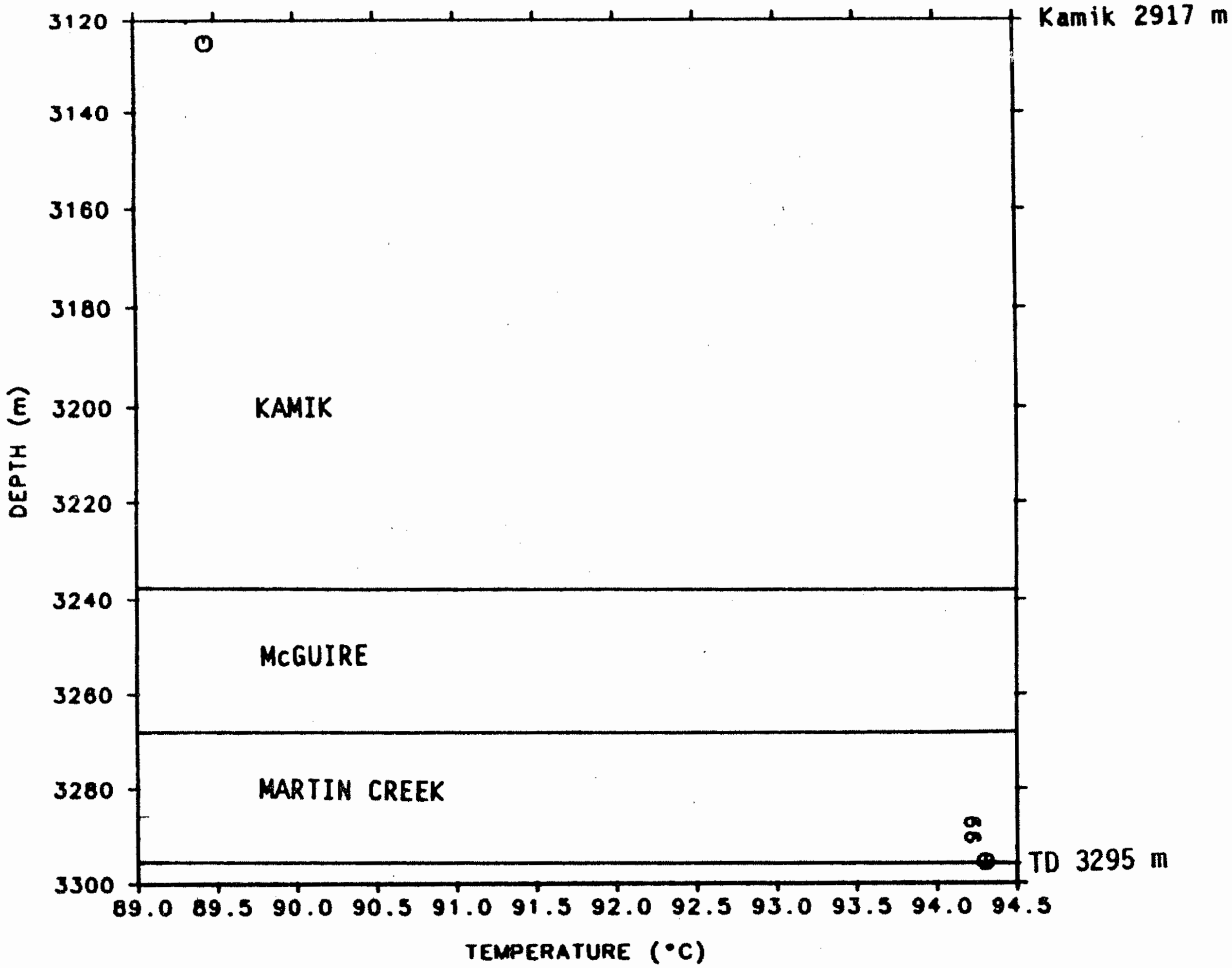
801 m
853 m
Geopressure zone from sonic log

WELL IDENTIFIER: 300M386930135150
NAME: CHEVRON SOBC UPLUK M-38

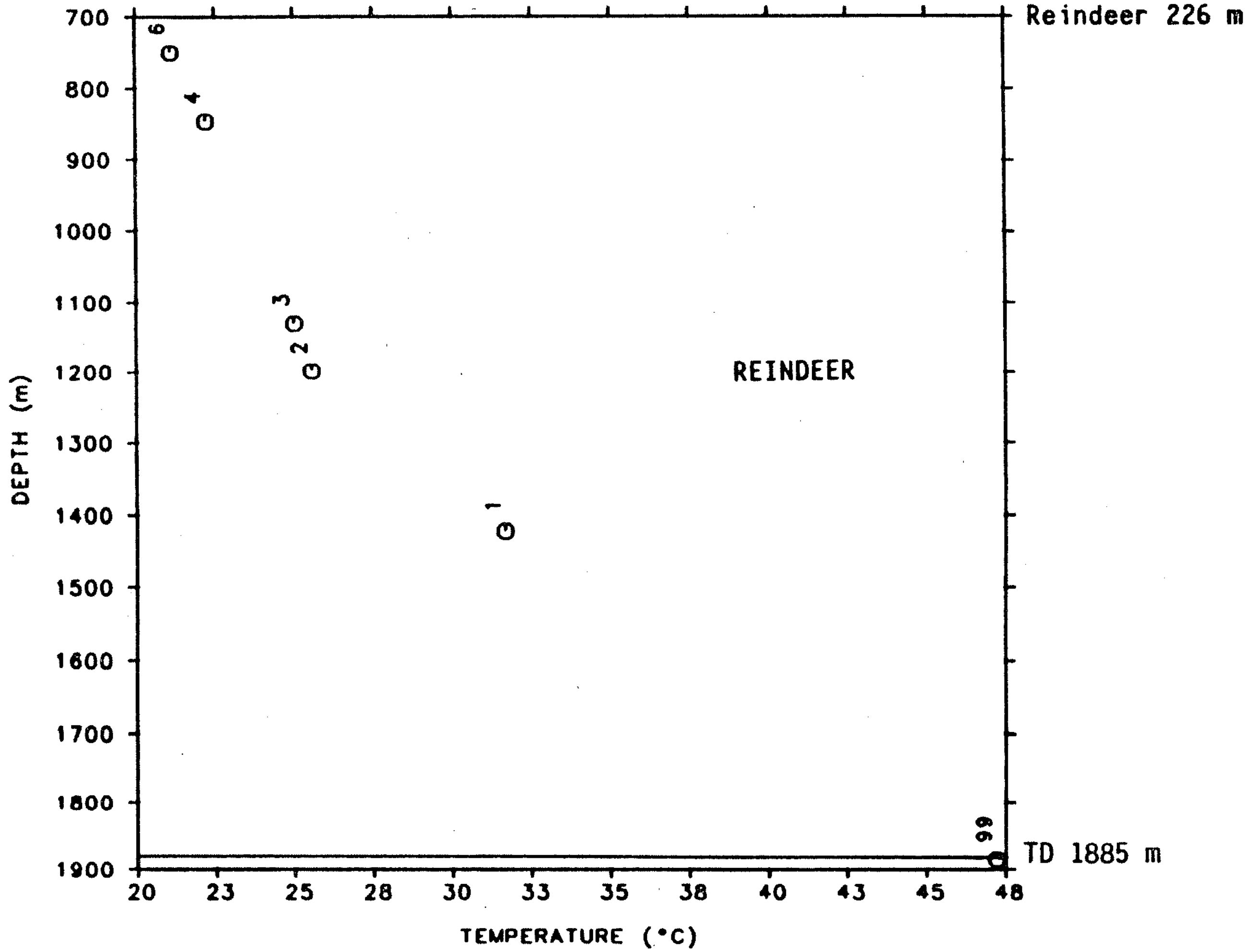


● Geopressured

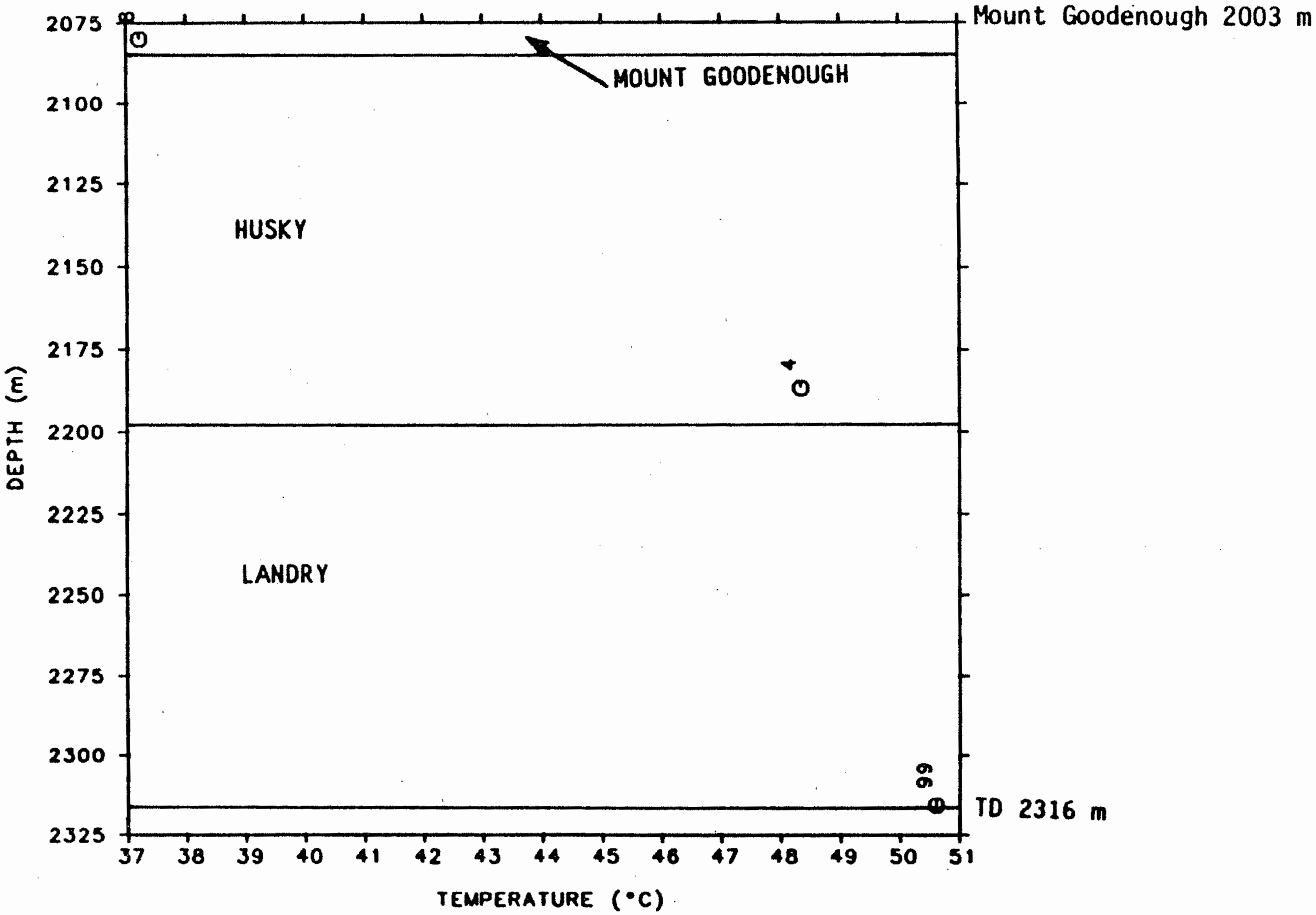
WELL IDENTIFIER: 300N176900133300
NAME: GULF MOBIL PARSONS N-17



WELL IDENTIFIER: 300N466910134450
NAME: GULF MOBIL KIKORALOK N-46



WELL IDENTIFIER: 300019692013245O
NAME: IOE TUKTU O-19



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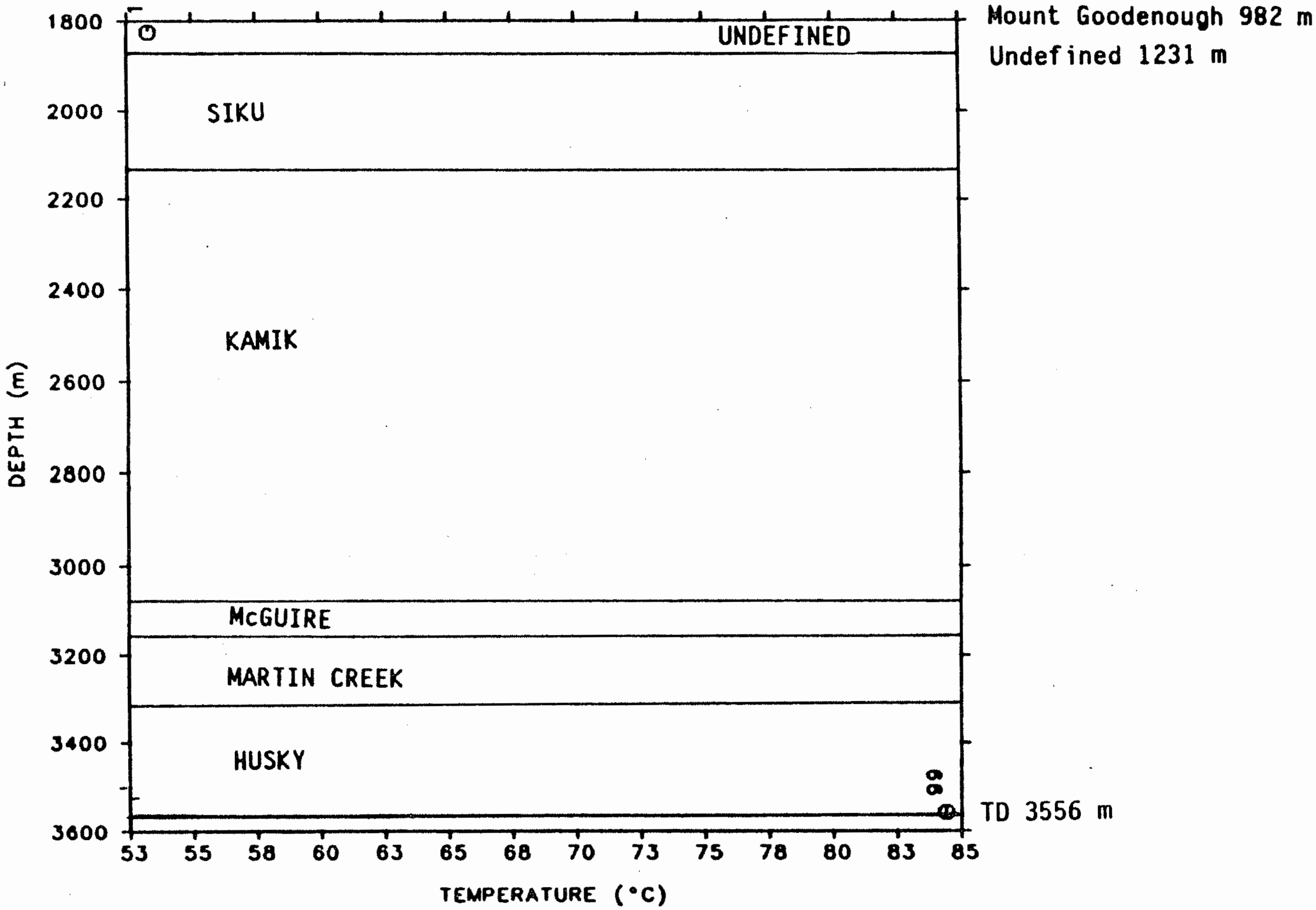
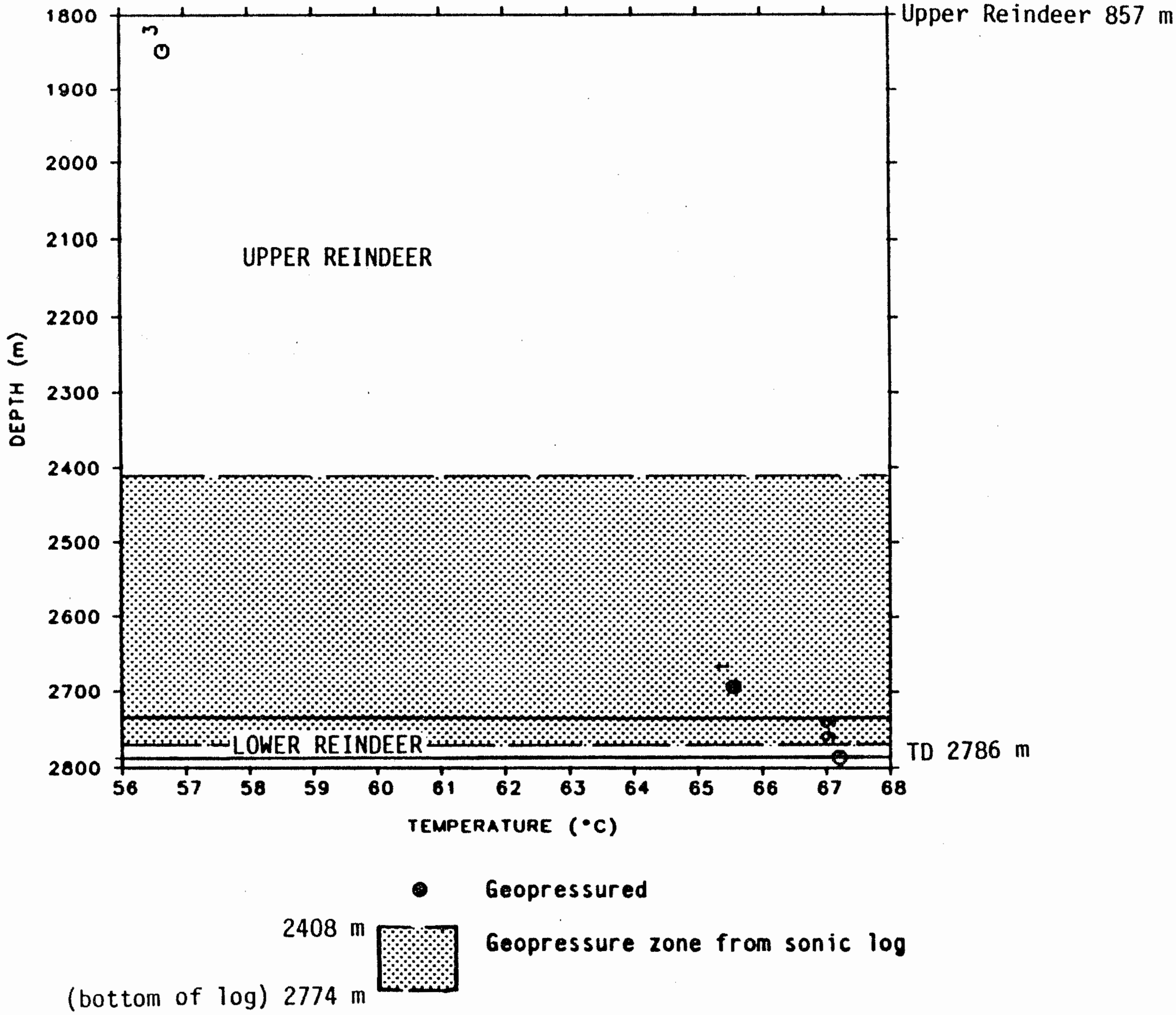
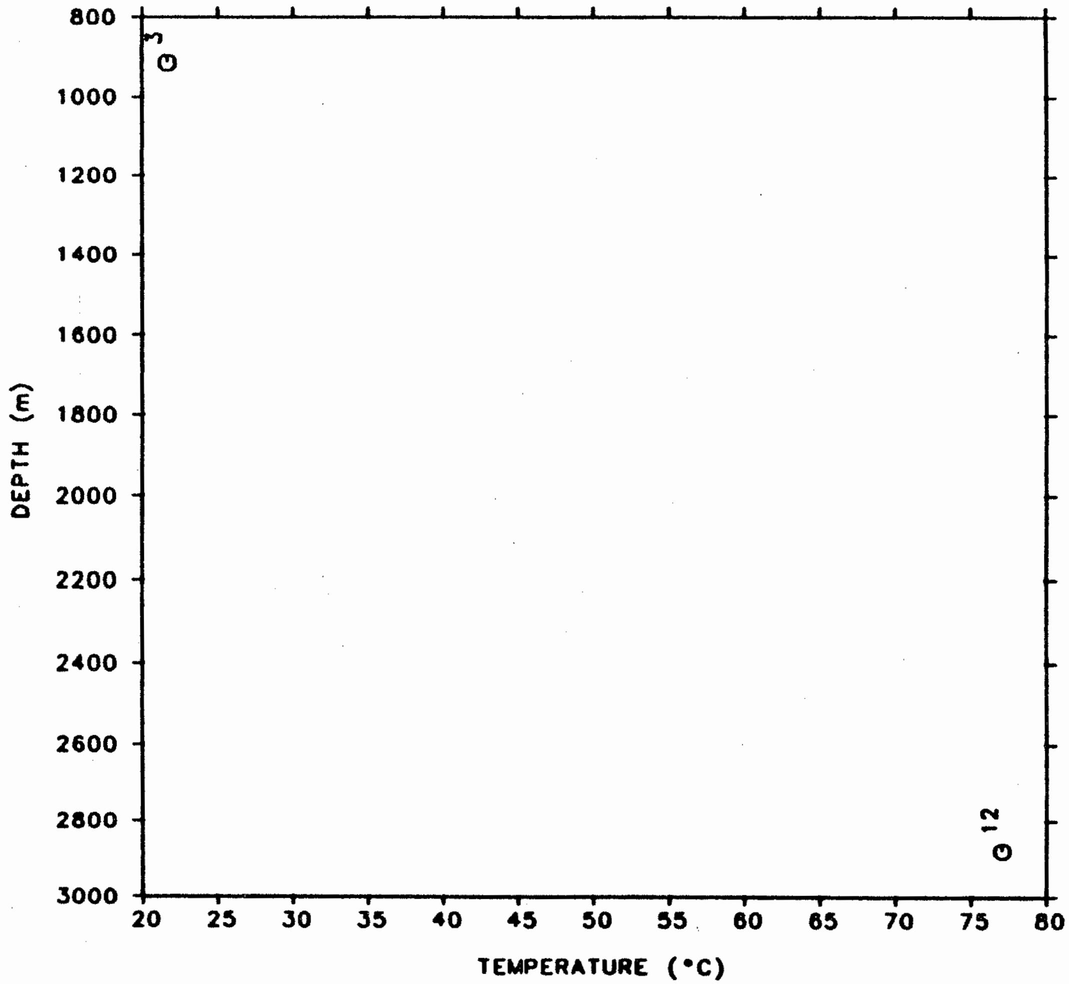
NAME: SHELL KIPNIK O-20



WELL IDENTIFIER: 300054692013445O
NAME: D GULF MOBIL TOAPOLOK O-54

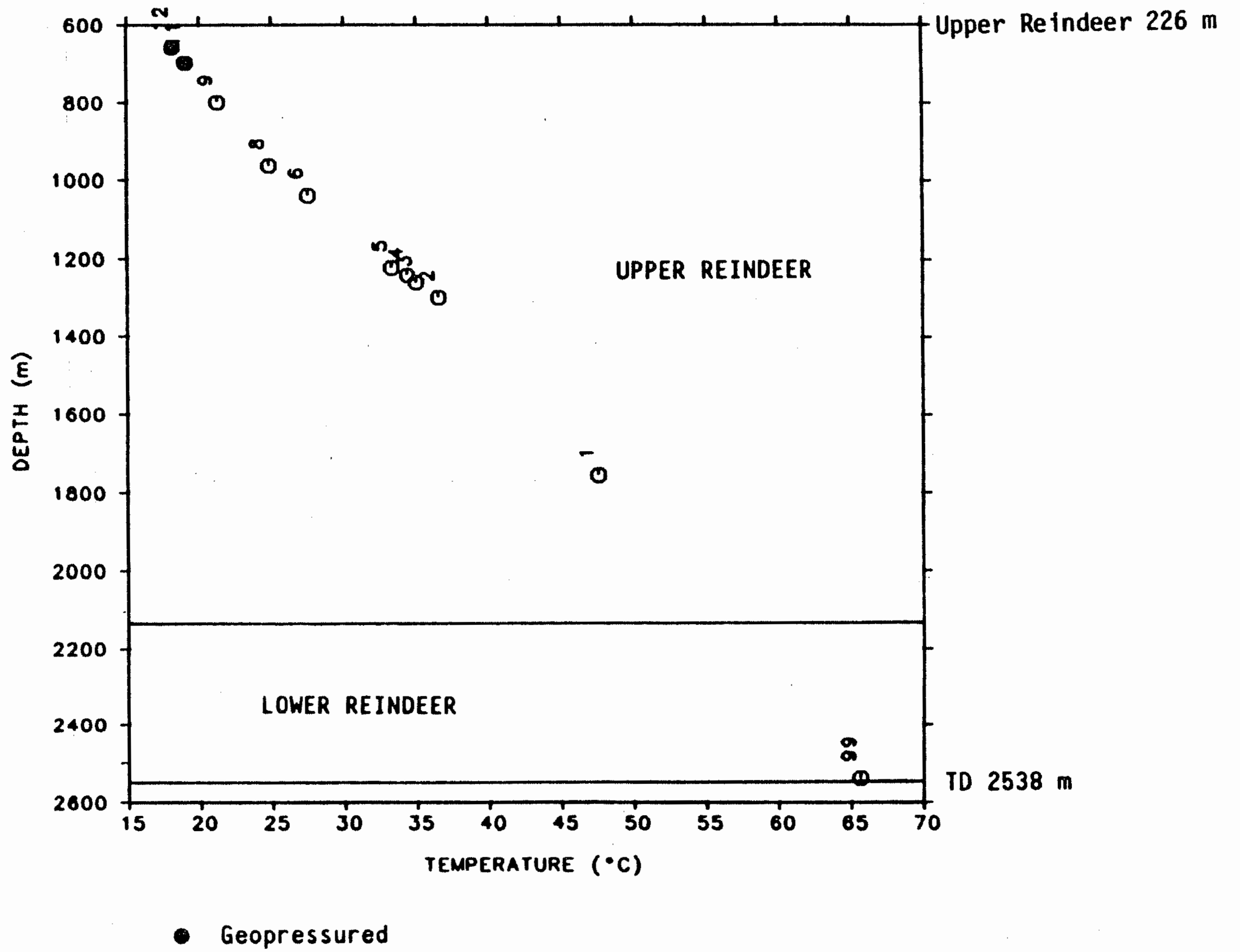


WELL IDENTIFIER: 300P176930132450
NAME: D IOE MAYOGIAK P-17

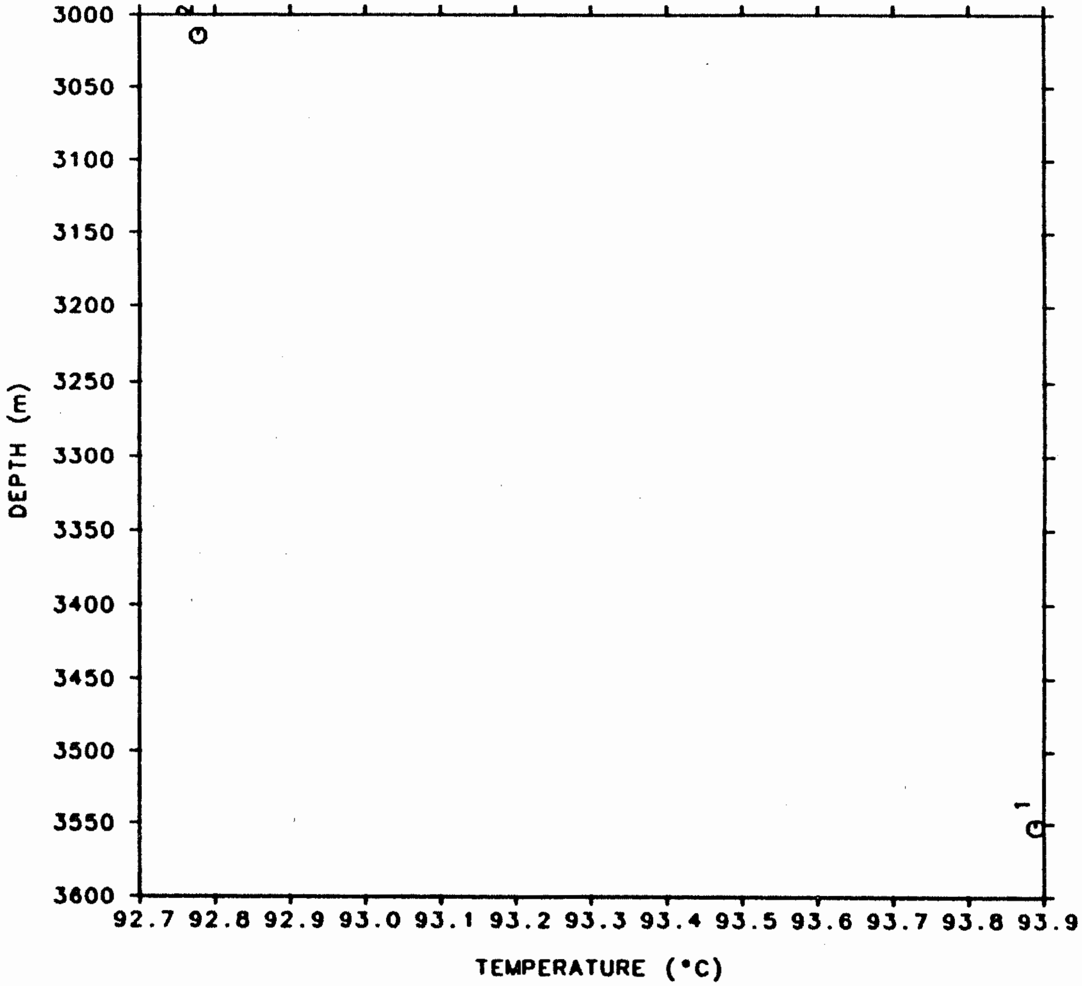


Note: Stratigraphy not available

WELL IDENTIFIER: 300P256930135450
NAME: IMPERIAL ADGO P-25

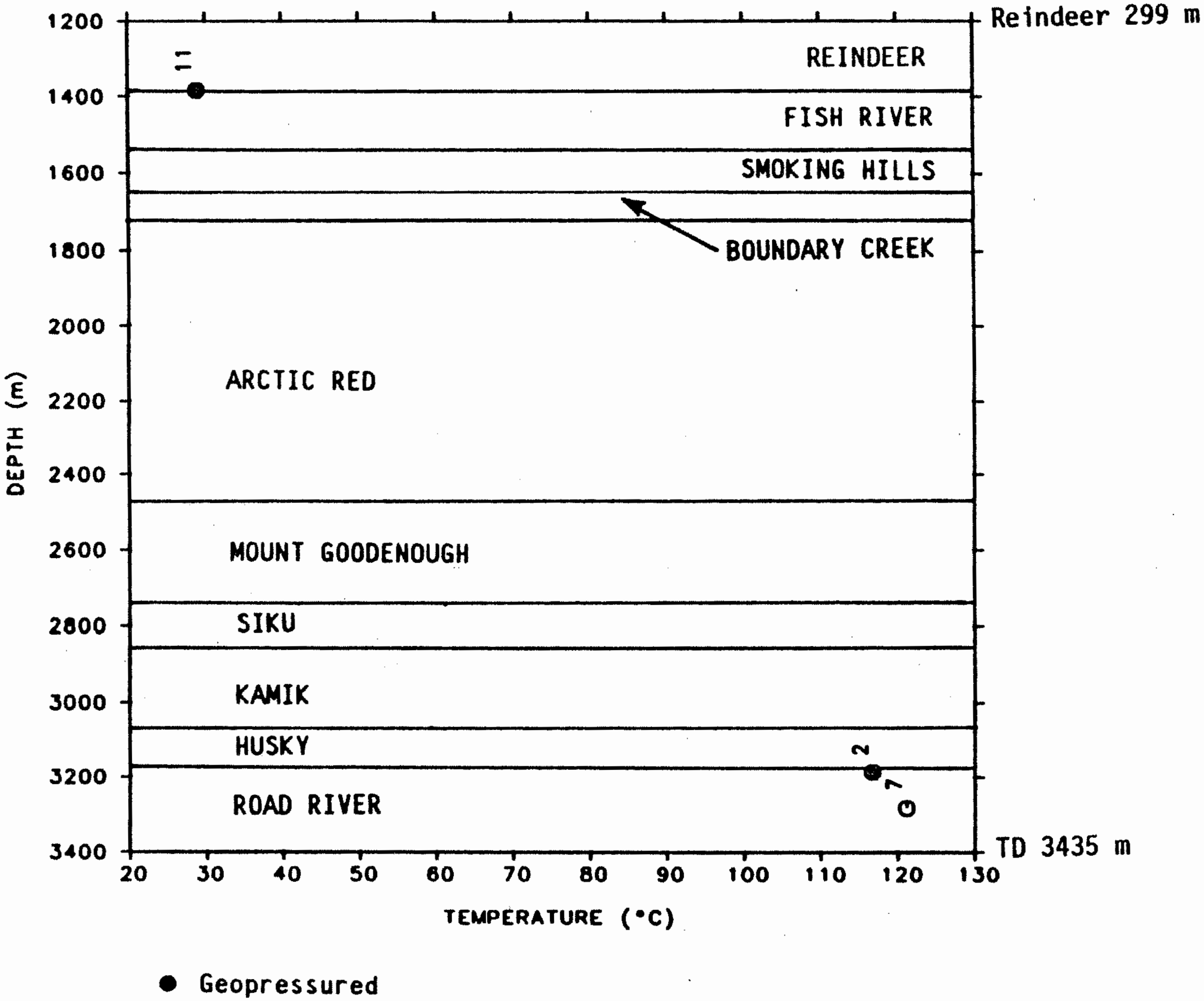


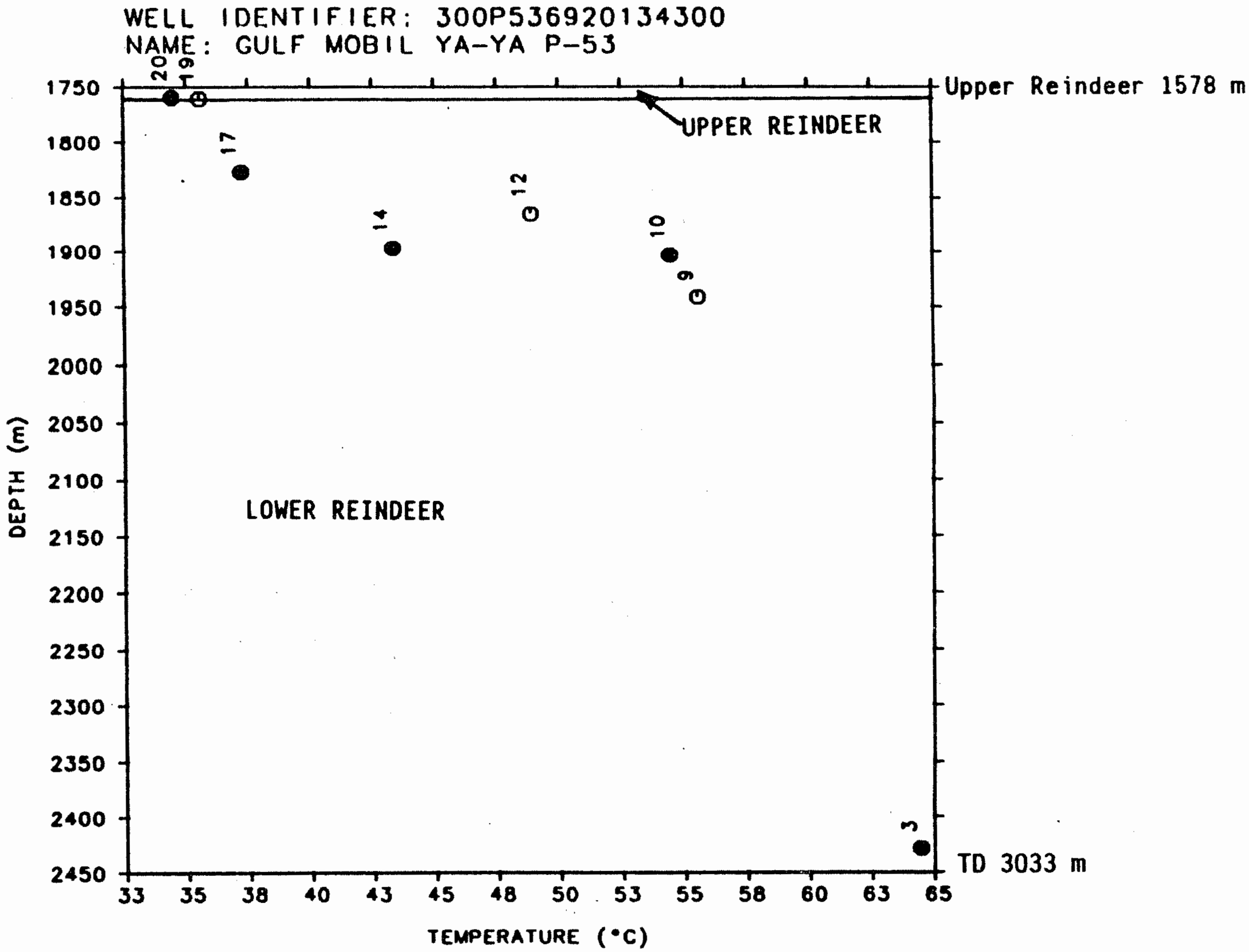
WELL IDENTIFIER: 300P416900133300
NAME: GULF MOBIL PARSONS P-41



Note: Stratigraphy not available

WELL IDENTIFIER: 300P536900133300
NAME: GULF MOBIL PARSONS P-53





● Geopressured

Geopressure zones present, based on sonic log, but very difficult to determine exact depths.

Analysis of Fluid and Heat Regimes in Sedimentary Basins: Techniques for Use with Large Data Bases

S. BACHU, C. M. SAUVEPLANE, A. T. LYTVIAK,
and BRIAN HITCHON

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V. 71, No. 7 (July 1987), P. 822-843, 16 Figs., 4 Tables

Analysis of Fluid and Heat Regimes in Sedimentary Basins: Techniques for Use with Large Data Bases[1]

S. BACHU, C. M. SAUVEPLANE, A. T. LYTVIAK, and BRIAN HITCHON[2]

ABSTRACT

Fluid and heat regimes, as well as mass transport, are an integral part of "dynamic basin analysis." All must be included to understand both the rocks and the processes affecting their contained fluids. This paper is concerned with the interpretation and integration of fluid and heat data from point form into synthesized form within the geologic framework of sedimentary basins. Raw data for the geologic framework are obtained from well logs, whereas that for evaluation of the fluid-flow and geothermal regimes originates from formation-water analyses, drill-stem tests, cores, and bottom-hole temperature measurements. A data-base management system has been developed that allows integrating these various parameters into a form suitable for study by using maps, cross sections, graphs, and statistical techniques. The final product is a synthesis of the fluid-flow and geothermal regimes in terms of hydrostratigraphic units, and an evaluation of the flow of both fluids and heat. Vertical and lateral fluxes of fluid flow can be determined using an integral mass-balance approach. Fluid-flow information is used to produce a virtual potentiometric surface for oil when looking for hydrodynamic entrapment of hydrocarbons. Examples of the application of the various techniques are taken from the Swan Hills and Cold Lake areas of Alberta, Canada.

INTRODUCTION

Sedimentary basins comprise two entities: (1) the rock framework, the history of which is the subject of conventional basin analysis, and (2) the contained fluids, which are dominantly formation waters with effectively minor, but economically important, amounts of hydrocarbons (natural gas, condensate, conventional crude oil, heavy oil, and bitumen). During the past 2-3 decades, major advances have been made in conventional basin analysis, as well as in our understanding of formation fluids, fluid flow, heat transfer, and mass transport in sedimentary basins. The writers believe that considerable advantage may be gained by integrating knowledge from conventional basin analysis and from our understanding of fluid flow, heat transfer, and mass transport. We have termed this approach "dynamic basin analysis" (Hitchon et al, in press), the objective of which is to synthesize and evaluate the present geological, hydrogeological, geothermal, and geochemical situation in sedimentary basins, as well as their past history.

Dynamic basin analysis develops from a comprehensive, qualitative, and quantitative understanding of dynamic processes in sedimentary basins, specifically, sedimentary processes, fluid flow, heat transfer, and mass transport. This analysis is best achieved with a multidisciplinary, computer-oriented team comprising geologists, geochemists, geophysicists, hydrogeologists, reservoir engineers, numerical modelers, and computer experts. The need to conduct this analysis is justified by the following practical applications: (1) predicting future impact on the present (natural) conditions by such underground activities as in-situ recovery methods for energy resources, natural gas storage, deep waste disposal of hazardous material, and the exploitation of geothermal energy; and (2) deducing past basin dynamics in an attempt to understand important mechanisms, such as the expulsion-migration-accumulation of hydrocarbons, the generation of strata-bound ore deposits, the persistence of anomalous pore pressures, and the origin of geothermal reservoirs.

In the first application (predicting), the goal is to optimize the engineering aspects and minimize the environmental consequences on a human time scale. In the second (deducing), the objective is to incorporate, for exploratory purposes, the flow processes that take place in sedimentary basins on a geologic time scale. Common to both problems is the necessity, first, to analyze and model the present natural flow regimes as a baseline condition, and second, to evaluate the final situation, after, for example, a disturbing of the baseline condition by deep waste disposal or by regional change of boundary conditions following geologic events.

Alberta is rich in energy resources, and the Energy Resources Conservation Board (ERCB) has developed an electronic data base that contains information for more than 130,000 wells drilled in the province. This information includes stratigraphic picks from well logs, core analyses, drill-stem test records, and a variety of administrative infor-

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mation. In addition, digitized pressure increments from drill-stem tests, bottom-hole temperature measurements, and chemical analyses of fluid samples are available in hard-copy form. Much of this information requires extensive processing before it can be used in dynamic basin-analysis studies.

This paper presents a computer-based methodology developed by the Basin Analysis Group of the Alberta Geological Survey to study a sedimentary block (basin or subbasin) emphasizing the present fluid-flow and geothermal regimes. We first describe the structure of the data base that allows the organization and processing of such large and varied data sets. This is followed by a description of the techniques used for processing individual point data and their integration into a form suitable for regional study using maps, cross sections, graphs, and statistical techniques. The final product synthesizes the fluid-flow and geothermal regimes in terms of hydrostratigraphic units, and evaluates the flow of both fluids and heat. Examples are cited from work conducted in the Swan Hills and Cold Lake areas of Alberta, Canada.

DATA-BASE ORGANIZATION

Fundamental to dynamic basin analysis is the acquisition, interpretation, and evaluation of a very diverse suite of point data into synthesized form. This requires the development of a data-base management system and specialized data-processing techniques. Given the sheer size of the data sets, one has to forego considering each data element on an individual basis or refining each relationship between elements in pursuit of exact solutions, in favor of identifying generally similar, but broader, classes of data elements and relationships. The information in the ERCB data base is actually a mass of point information derived from drilled wells, that is, each parameter is associated with the corresponding coordinates that define the position of the measuring point in space and time. To develop a conceptual or descriptive model of a sedimentary basin, or part of it, one must synthesize the point information at higher levels (usually as maps, cross sections, graphs, statistical characteristics, and/or mathematical relationships). To achieve this goal, a custom data base for point information was designed and implemented by the Basin Analysis Group, together with a comprehensive software package for data processing. The software is written in FORTRAN 77 and implemented on VAX/VMS.

The point data in the data base are organized at two levels depending on the amount of processing involved. The first level (A) contains only raw data, as obtained from various sources (e.g., ERCB well-data files, field or laboratory measurements). The second level (B) contains data that require a certain amount of processing, either automatic, manual, or both (e.g., hydraulic heads and permeabilities from drill-stem test reports). This dual-level system allows the option to go back to the primary data if the interpretation is questioned or changed. At both levels, the data are stored on indexed files that allow easy, direct access.

The interrelationships between the data records and the included elements can be complex. Several different types of data records may be at one location, (e.g., temperature and pressure) or many occurrences of one data type may be at a location (e.g., stratigraphic picks or formation-water analyses). Additionally, single records may refer to a number of locations (e.g., a formation-water sample from a battery of wells or a composite sample from several drill-stem tests). In order to accommodate this complexity, the data base is structured as a threaded tree. Within this tree, variable-length records are used extensively; within these records are nested variable occurrences of subrecords and/or data elements.

The links between records and elements within the data base are made by using indexed and multiple-indexed files. The most important characteristic of the data is their spatial location and, therefore, the primary index is based on a key that incorporates the Dominion Land Survey (DLS) coordinate of the data-point location. For the ERCB well-data system, well versions are also indicated; for example, where a major change occurred in the well completion, a new record at the old location is created by incrementing the event sequence value. Another key, automatically generated by the system, links records addressed by location to record types, which may occur an arbitrary number of times in one well or at one site. This key also links different record types at one site.

Currently, the data base defines 14 different record types (Figure 1), with provisions to accommodate up to 50. The data base master record provides a list of the names and locations of the files that comprise the data base, and a count of the records in each file. The data base master record allows subsetting of a larger data base or constructing a modified version without changing the original records.

The site master record locates the data point on the earth's surface and maintains an inventory of up to 50 other record types referring to this point. The location record improves the accuracy of the data point location. The well data system header record, from the ERCB, contains primarily those elements of the administrative description of a well that are considered to be of interest.

The stratigraphic pick record contains the stratigraphic picks (coded) and their depths as identified at each well. This record contains pointers to a dictionary of stratigraphic names (pick code dictionary).

Every well may have multiple occurrences of data from drill-stem tests, cores, and formation-water chemistry, depending on the number of measurements or samples taken. Moreover, this information requires a varying degree of interpretation, culling, and processing. For these two reasons, the drill-stem tests, cores, and chemical analyses have three types of records: a header record, an initial data record, and an interpreted data record. The header record lists pointers to the respective records (drill-stem tests, cores, or chemical analyses) pertinent to a well. The initial data record contains the data relevant to a simple drill-stem test, cored interval, or chemical analysis. The results of interpreting and processing data contained in the initial data record are found in the interpreted data record. The initial data records represent the first level (A) of the data base,

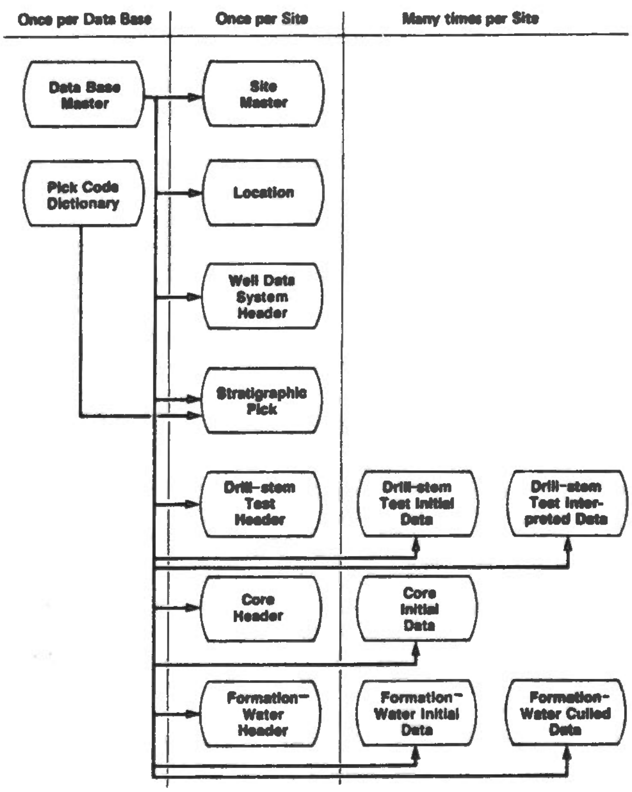

Figure 1—Data-base record types.

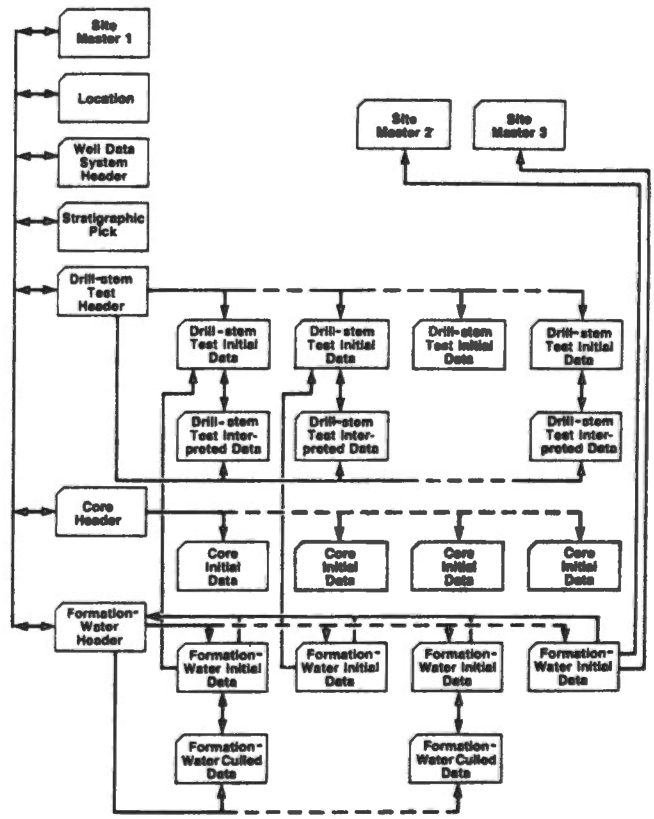

Figure 2—Data-base inter-record links.

whereas the interpreted data records represent the second level (B). All records pertaining to individual data locations are ultimately related back to the site master record. Also, where the formation-water sample may have been produced during a drill-stem test, pointers connect the formation water initial data record to the pertinent drill-stem test initial data record. Figure 2 presents the links between the different record types in the data base.

The ERCB well-data system automatically produces most of the records by using specially designed software. Because the formation-water chemistry data are available only in hard copy, the header and initial data records were created by manual entry. For drill-stem tests, only a subset of the required data was available in machine-readable form. Therefore, the drill-stem test initial data record is created in two steps. In the first step, the data available in electronic form are read in. The second step consists of editing and supplementing the data entered previously, with manual entry of data available only in hard copy. The procedure used also includes many validity-checking tests to reduce possible errors during manual data entry. The interpreted data records are created using interactive interpretation of initial data records. The routines used take advantage of the indexed structure of the data base and direct screen control, using a custom graphics package to perform the interpretation in an interactive graphics mode.

To analyze flow processes in sedimentary basins, one must define and describe both the geometry and physical properties of the solid matrix (hydrostratigraphic units) and the physical and chemical properties of the fluids, as they relate to flow phenomena. Some relevant data are in raw form and need additional processing to obtain good quality point information required later in the analysis. Appendix 1 presents the processing techniques developed to achieve this objective up to the point where synthesis can be started.

POINT DATA SYNTHESIS

Once the individual point data are provisionally acceptable, they are stored in the data base. These data then have to be processed at higher levels of knowledge, in a synthesized form, in order to be able to describe and analyze the flow phenomena in a sedimentary basin. Given the large amount of data, computer procedures are the only way to process the information. Automatic data processing is "blind" and, therefore, one must have a clear understanding and definition of the algorithms used and the criteria for selection and/or error detection. Examining individual data is done only to check possible errors. As a result, processing data from point values to synthesized information is an iterative hybrid loop. This loop is a hybrid human and computer process because, after computer processing large amounts of data, humans need to examine the data to check possible errors and to correct them. The loop is an iterative loop because this process has to be repeated until the respective data set is free of errors.

To analyze flow phenomena in a sedimentary basin, the physical frame first has to be described (i.e., the geometry and stratigraphy of the subsurface environment). Therefore, the processing of the stratigraphic data has to precede the processing of the flow data (fluid flow, mass and heat transport). A series of programs allows for interactively examinating stratigraphic picks on a record-by-record basis, adding or deleting picks, and correcting formation codes or depths or both. For any rectangular area defined by its DLS coordinates, another set of programs report, on a series of sequential derivative files, the stratigraphic picks of any particular group of formations, hydraulic data in the area (permeabilities, hydraulic heads, porosities, storativities), measured temperatures, and chemical components of formation waters (total dissolved solids, Na, Ca, Mg, Cl, Br, I, HCO_3, CO_3, SO_4, pH, density). At the same time, the programs also convert stratigraphic tops to elevations relative to sea level, in order to have a constant reference through time and to avoid the influence of present topography. The data reported in the derivative files have to pass different culling criteria and logical filters for completeness and consistency.

A special package of cartographic software (GEOPLTR) performs a coordinate transform of data location from DLS to Cartesian, allowing for the posting of data points. The same package also performs inclusion and exclusion of data using closed contour, vector, and polygon plotting. The irregular point distribution that defines each formation top or thickness is transformed into a regular grid of values and contoured using the SURFACE II software package (Kansas Geological Survey, 1978). Human examination of the maps allows the detection of possible errors and anomalies in the original data. These data are checked by examining the well logs and then correcting the data base if necessary. Usually, the data need to pass through this processing loop a few times before the grids and maps reach the required degree of confidence.

The computer automatically produces the regular grids of values for stratigraphic surfaces and isopachs by using interpolation and extrapolation techniques. The grids are based solely on the data distribution. A software package for grid manipulation was designed in order to be able to process the grids according to known information about the subsurface environment. The grids can be interactively accessed and modified, described by boundaries, or combined through different arithmetic and logical operations. The final result of this data-processing procedure is a set of stratigraphic surfaces and isopachs stored on magnetic devices and represented graphically as structure contour maps, isopachs, and cross sections.

The flow data are processed in a similar way to the stratigraphic data, except that flow data are assigned first to stratigraphic units. This assigning is done using an automatic procedure for interpolating the point data through the three-dimensional stratigraphic grid structure. After allocating and sorting the flow data by stratigraphic units, the point data characterizing flow phenomena are manually analyzed and synthesized in order to describe the processes in the sedimentary basin. Parameters such as permeability and porosity depend on the solid matrix and are represented by statistical distributions. The variables related to fluid and heat flow, such as hydraulic heads, solute content, or temperature, have a continuous variation. For each hydrostratigraphic unit, the point data distribution of variables with continuous variation are converted into a regular grid distribution, using a kriging spatial interpolation scheme (Yeh et al, 1983), and are analyzed for trends.

The synthesis of the geochemical, geothermal, and hydrogeological information is not a sequential process, but rather an iterative, interlinked one. For example, one needs to know the strength of the fluid flow in order to assess the importance of convective processes in heat transfer. However, to evaluate properly the characteristics of fluid flow, one needs sometimes to know the geothermal gradient first. In any case, the geology and stratigraphy have to be defined before the geochemical, geothermal, and hydrogeological information can be synthesized.

In principle, using computers in data processing does not bring fundamentally new methods or algorithms, but allows for the examination and processing of huge amounts of information in very short periods of time, for the search for new links and relationships between different phenomena, and for the integration of various aspects in a comprehensive model of sedimentary basins. For example, the information for 3,276 wells, 635 drill-stem tests, 3,477 core analyses, and 645 formation-water analyses in 15,760 km^2 in the Swan Hills area, Alberta, was processed in about 6 months and produced 48 stratigraphic surfaces, 7 potentiometric surfaces governing the flow in contiguous aquifers, and distribution maps and statistics for permeability, porosity, and chemical components of formation waters of 22 aquifers in the area.

Stratigraphic Geometry

As discussed previously, the physical frame for the flow regimes has to be described first. For a sedimentary basin, this framework means the geology, stratigraphy, and geometry of the sedimentary rocks. When dealing with large amounts of data for several stratigraphic units, computers are the only way to process this information. However, the blind application of automatic data processing often produces maps or cross sections with geological inconsistencies. One must consider the concepts of stratigraphic relationships before directing the computer to model the geology. The relationships between stratigraphic units—notably onlap, offlap, or truncation phenomena—must be well defined before starting automatic data processing. Therefore, the entire process has basically three steps: (1) interpreting and defining major geologic events and stratigraphic considerations, (2) data processing, and (3) checking the resulting grids and maps for internal consistency. Once the data are processed into regular grids of values, it is possible to obtain various displays, such as cross sections and structure contour, isopach, and paleostructure maps. In the following section, the procedures used to describe and define the stratigraphy and geometry of the sediments are presented, along the lines discussed previously by Jones and Johnson (1983), for the Swan Hills area of Alberta, which consists of a sedimentary block of 38,300 km^3 with an average thickness of 2.43 km.

The Swan Hills area (Figure 3) is part of the Western Canada sedimentary basin. We will describe the techniques used to determine subcrop boundaries at an unconformity and

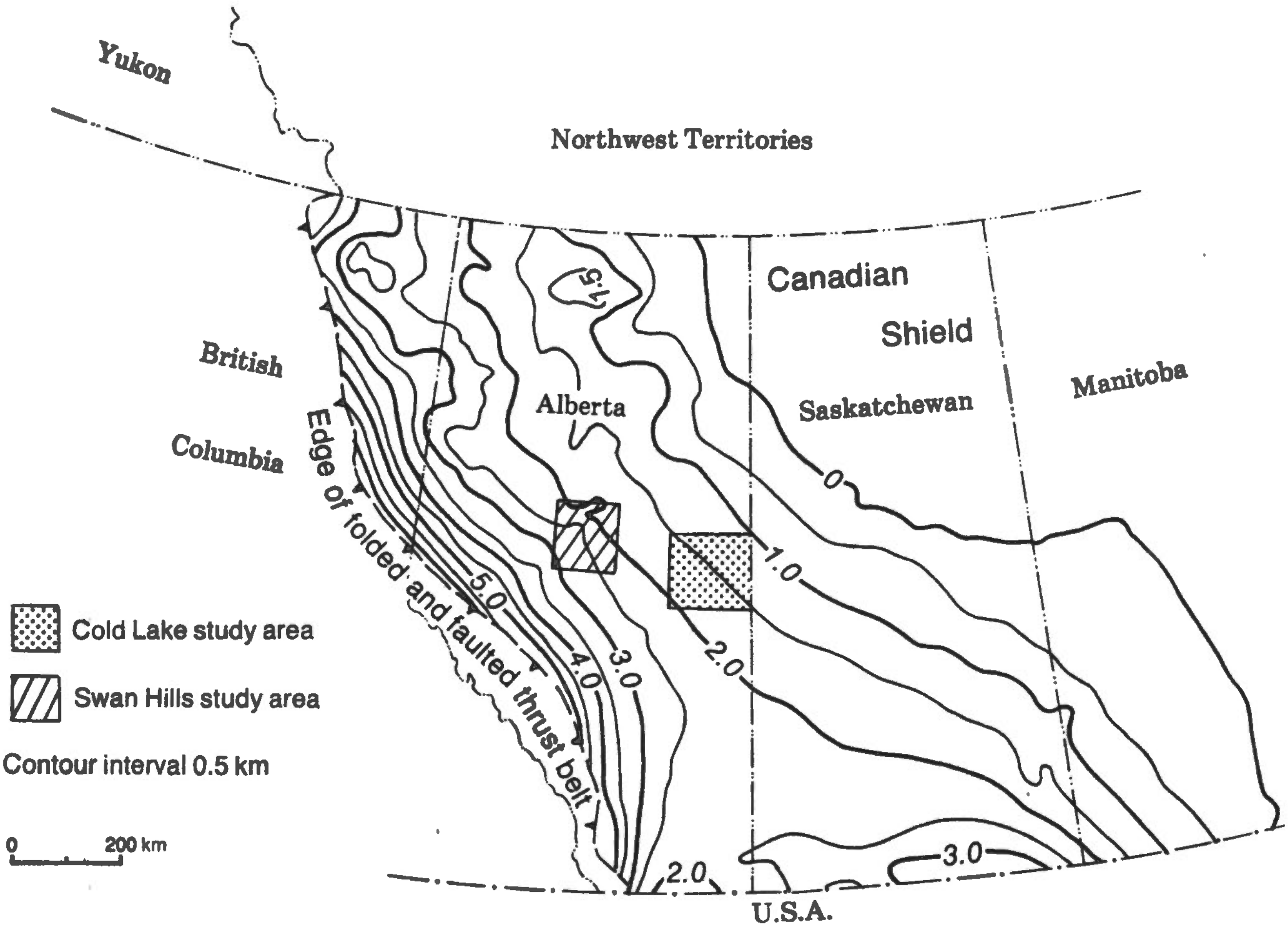

Figure 3—Location of Swan Hills and Cold Lake study areas, Alberta, Canada. Isopachs (C.I. = 0.5 km) represent total preserved thickness of Phanerozoic strata east of the Cordillera (based on Porter et al, 1982, their Figure 2).

onlap features during deposition (Figure 4 shows the simplified stratigraphy).

As a result of petroleum exploration activity, 3,276 wells have been drilled, with an irregular distribution. For the purpose of data processing, a control horizon needs to be selected within each sequence of conformable strata, usually the top of the stratigraphic unit with the greatest number of data points. By gridding the top of this unit, we can obtain a reliable control surface. Noncontrol horizons commonly have fewer data points than the control horizon, hence gridding of these horizons sometimes causes errors. For example, "negative" isopachs may result when the differences in elevation between two horizons are contoured, even though it is known that the stratigraphic unit extends throughout the study area. Grids of positive thicknesses (true isopachs) are created directly out of thickness data at each location, and added to or subtracted from the control surface. In this way, the consistency of conformity within a conformable sequence is assured.

Where there is truncation at an unconformity, processing is more complex. Here, different situations could arise depending on whether or not subcrop boundaries are known. Figure 5 illustrates the procedure used to construct the eroded surface and the stratigraphic top of a truncated formation where subcrop boundaries are known. In the Swan Hills area, the subcrop boundaries (beneath the Cretaceous) are known for the Rundle Group (Debolt, Shunda, and Pekisko Formations), Banff Formation, and Wabamun Group (ERCB, 1977, 1978). For each stratigraphic unit, the wells recording the respective top in the subcrop region (Figure 5A) were selected using an automatic procedure for inclusion and/or exclusion. All the subcrop tops pooled together (2,957 points) were used to obtain the contours at the top of the eroded Paleozoic sequence (Figure 5B), which becomes a control surface. Formations subcropping at the erosional unconformity were gridded individually based on the respective data distribution. The preliminary top of the Banff Formation (2,722 points) is presented in Figure 5C. The "blind" computer gridding cannot take into account formation boundaries and truncation features. Actually, the formation is absent east of the subcrop boundary, and is conformably overlain by the Pekisko Formation west of the subcrop boundary. In the subcrop area, the top of the formation should, theoretically, be identical with the unconformity surface. In practice, this is not the case due to the differences in the data distributions used to create the two surfaces (i.e., differences in size and the influence of different data subsets outside the subcrop area). An automatic procedure was used for blanking and for "cutting and pasting" two grids, inside

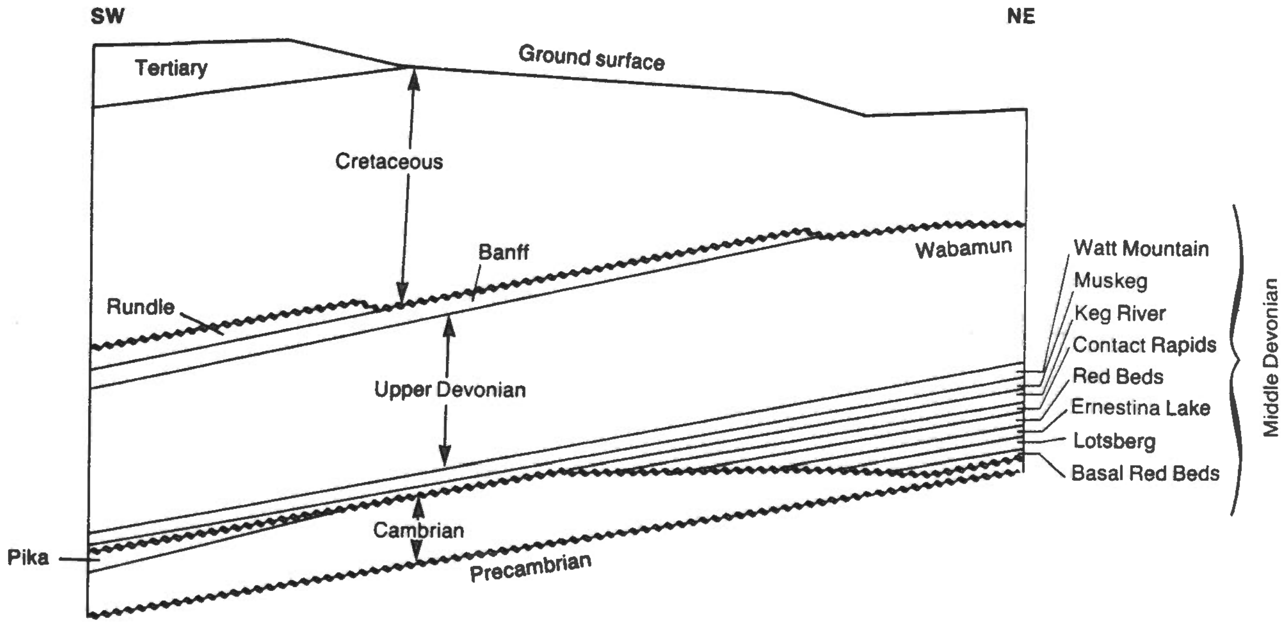

Figure 4—Simplified dip (southwest-northeast) cross section through Swan Hills area showing relations of stratigraphic units used to exemplify computer-processing techniques.

or outside given boundaries, to obtain the final grid and contours at the top of the Banff Formation (Figure 5D).

Figure 6 shows the situation where the subcrop boundaries at the unconformity are unknown for the erosional truncation at the top of the Cambrian (pre-Middle Devonian). Based on the number and distribution of the wells recording the top of the Cambrian, the unconformity was chosen as the control surface, and gridded and contoured first (Figure 6A). In the example illustrated, the top of the Pika Formation (Middle Cambrian) is also gridded, although the automatic procedure extends the surface well beyond the known distribution of the data, in an area where the formation is absent due to erosion (Figure 6B). This extension is due to computer extrapolation of the top of the eroded formation, based on its trend. The isopach between the gridded and the control surfaces yields positive values in the area where the Pika Formation is present, and negative values in the area where, in reality, it is absent (Figure 6C). The zero contour line represents the subcrop boundary of the top of the Pika Formation. Blanking out the structure contour grid outside the zero edge boundary gives the final contours at the top of the Pika Formation (Figure 6D). The subcrop boundaries and the structures of the formations truncated by erosion at the top of the Cambrian in the Swan Hills area were constructed this way (see Figure 7 for boundaries and for a dip cross section).

Onlap situations are less complex to handle than truncation, because only the horizons in the onlapping sequence need to be compared with the onlapped grid. Although onlap and offlap are distinct concepts geologically, the computer handles them by the same process. Structure contour maps showing boundaries of onlaps are made in a similar manner to those involving truncation, namely, by using the isopach grid between the onlapping unit and the onlapped one. The zero contour of the isopach grid indicates the edge of deposition. In the Swan Hills area, the following Middle Devonian formations were deposited, in chronological order, onlapping on the top of the eroded Cambrian: Basal Red Beds, Lotsberg, Ernestina Lake, Red Beds, Contact Rapids, and Keg River. They were processed in the same order, beginning with the oldest, for depositional boundaries and structure contours. As an example, Figure 8A shows the isopach between the top of the Ernestina Lake Formation and the top of the Cambrian. However, note the true data distribution and the fact that the positive grid values in the west and southeast indicate the presence of the Ernestina Lake Formation in areas where it is actually absent. This results only from computer extrapolation outside the area where the data points indicate the presence of the formation. This example stresses the need to be critical when applying automatic data processing to geological problems. Figure 8B shows the final onlap boundaries of the Middle Devonian strata; a cross section is shown in Figure 7.

The automatic procedures described previously can be applied to any sedimentary basin where the size and distribution of data make manual interpretation difficult and lengthy. However, one has to have knowledge and understanding of the broad geologic processes in the basin to be able to direct the computer and to interpret and critically accept the results. Otherwise, geologic inconsistencies introduced by the computer will not be detected and corrected.

Hydrochemistry

Once the most obviously erroneous analyses have been removed, the remaining analyses are allocated to the stratigraphic units and may be examined by a variety of techniques. Because many geochemical data approximate a log-normal distribution, one may use cumulative frequency

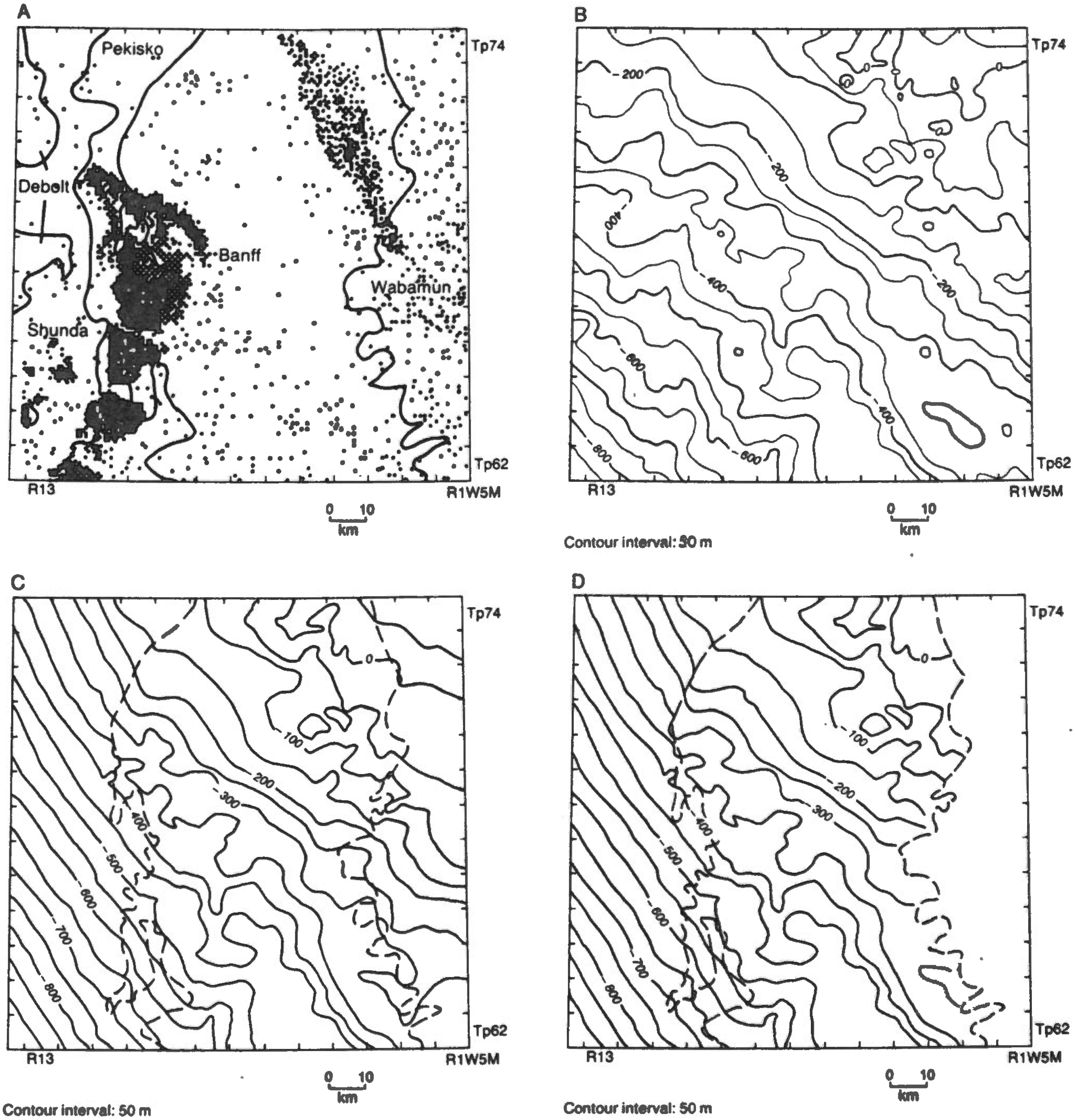

Figure 5—Example of computer processing of stratigraphic data to determine structure contours on a stratigraphic unit beneath an unconformity when subcrop boundaries are known. (A) Data distribution and subcrop boundaries of Mississippian (Rundle Group and Banff Formation) and Upper Devonian (Wabamun Group) beneath pre-Cretaceous unconformity, Swan Hills area. (B) Structure contours of top of Paleozoic erosional surface. (C) Preliminary structure contours of top of Banff Formation. (D) Final structure contours of top of Banff Formation.

plots of the logarithm of selected ions as an additional culling criterion. The most geochemically conservative ion reported in standard formation-water analyses is chloride (Cl) and, accordingly, this is the best ion for constructing cumulative log frequency plots. A typical example is shown in the upper diagram in Figure 9. Computer printouts are then obtained of the individual analyses at the less than 10% and greater than 90% frequency intervals. Manually examinating these analyses allows removal of all or part of the "tails" and, after possibly several iterations, the final satisfactory cumulative frequency profile is obtained (see lower diagram, Figure 9). Experience shows that the majority of formation-water analyses removed by this technique was subject to either evaporation in holding tanks or contami-

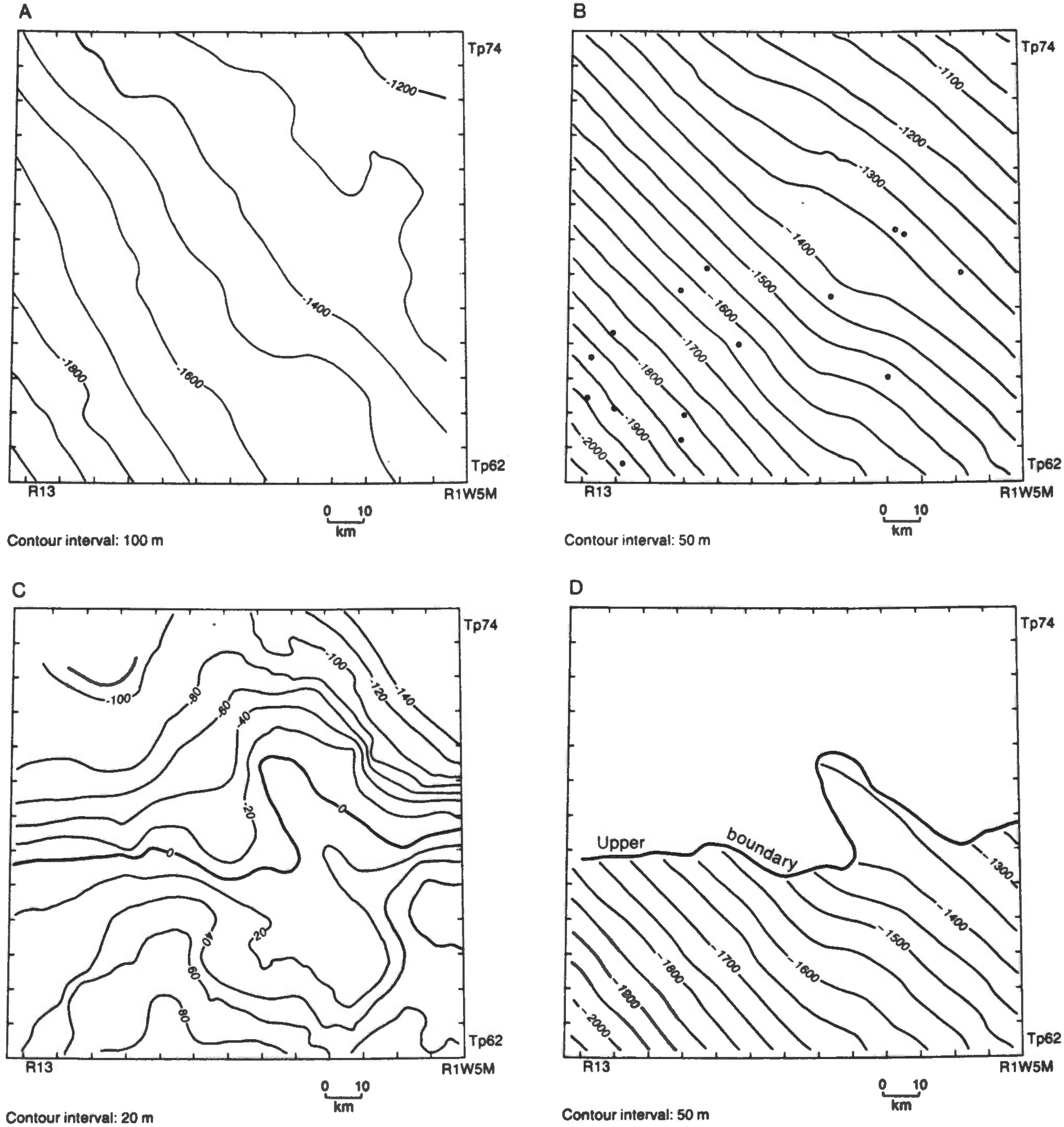

Figure 6—Example of computer processing of stratigraphic data to determine structure contours of a stratigraphic unit beneath an unconformity when subcrop boundaries are unknown. (A) Structure contours of top of Cambrian (pre-Middle Devonian) erosional surface. (B) Preliminary structure contours of top of Pika Formation. (C) Preliminary isopach of Pika Formation. Note that "negative isopach" is an artifact due to computer extrapolation beyond true zero edge of formation. (D) Final structure contours of top of Pika Formation.

nation by drilling mud. Although other ions could be plotted using cumulative log frequency plots, only the use of Cl has proved to be satisfactory.

Contour maps can then be plotted for the regional distribution of selected chemical and physical properties of formation waters from the cleaned-up data base to identify the remaining anomalous samples. The most useful parameters for this purpose are total dissolved solids (calculated), Cl, SO_4, and density. More rigorous culling of the remaining anomalous samples could then be achieved using trend-surface maps. Many other culling methods can be devised, but it is doubtful if the reliability of the information present in standard formation-water analyses in the ERCB data file justifies them at this stage. As an example of the degree to

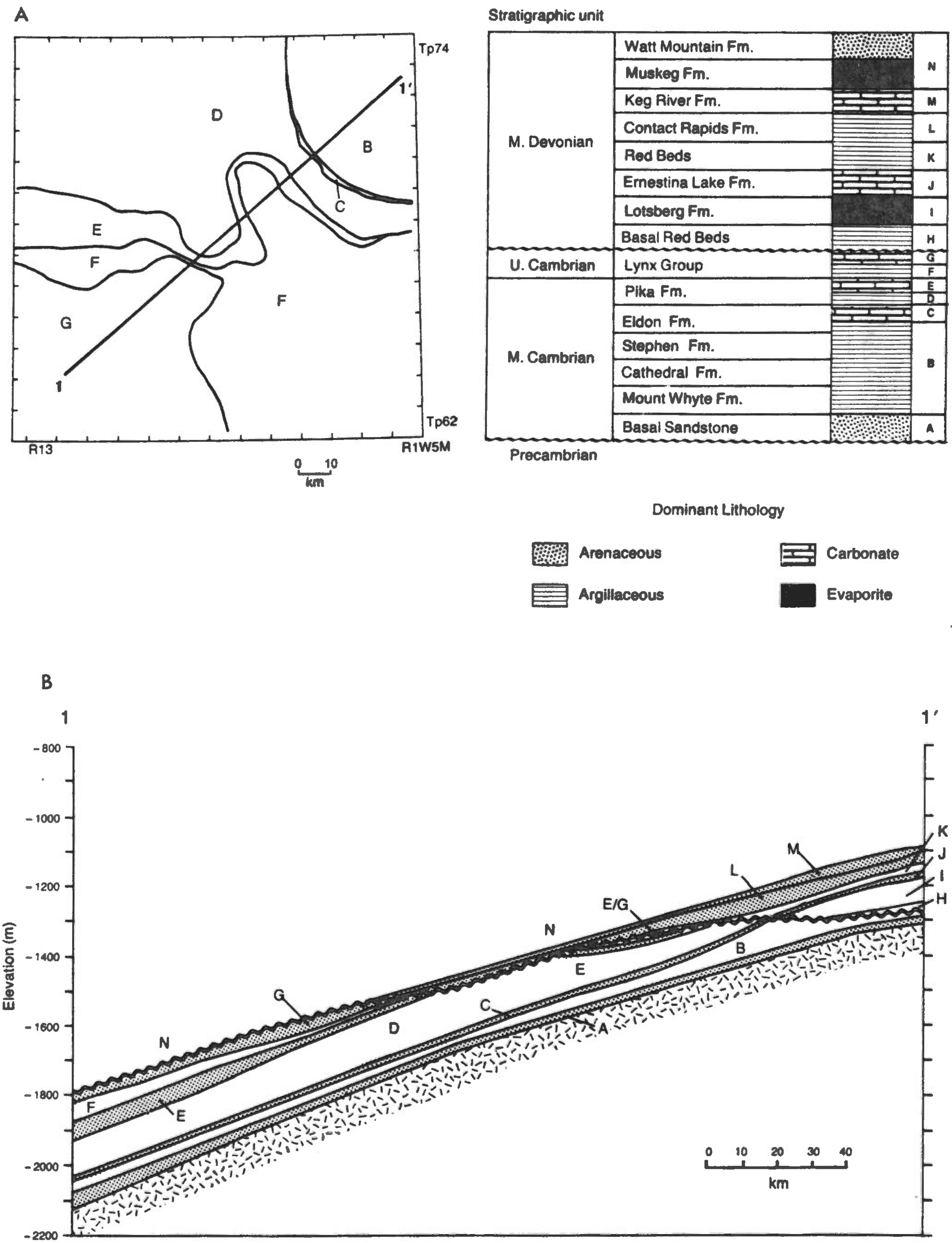

Figure 7—(A) Subcrop boundaries of Cambrian strata beneath pre-Middle Devonian unconformity. (B) Dip cross section through Swan Hills area for Cambrian and Middle Devonian strata.

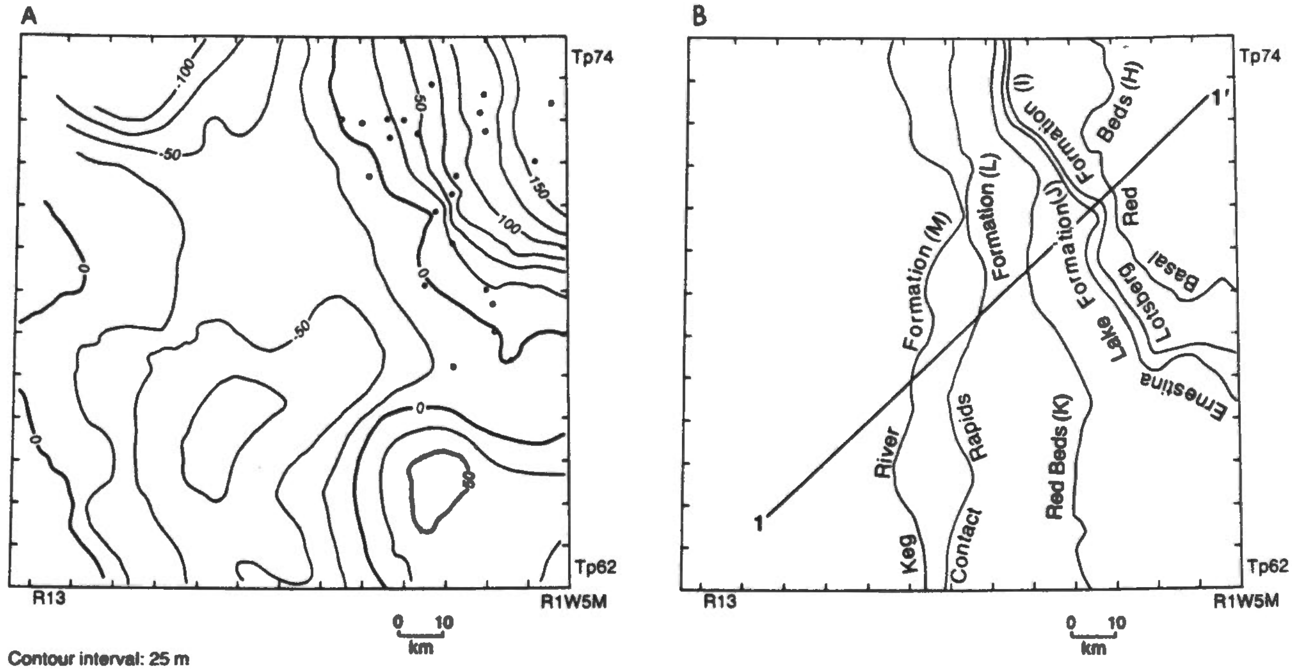

Figure 8—(A) Isopach of Middle Devonian Ernestina Lake Formation showing extensive computer extrapolation beyond distribution of real data. (B) Onlap edges of Middle Devonian strata on Cambrian strata. Cross section 1-1′ refers to Figure 7.

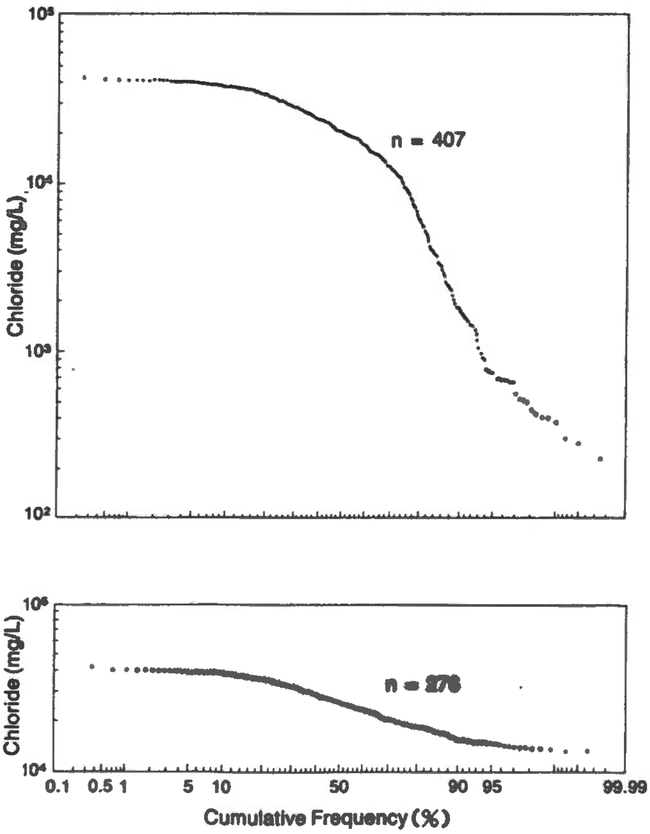

Figure 9—Typical cumulative frequency plots of log Cl, showing original data base after preliminary culling (upper diagram) and final data base (lower diagram). Example taken from Viking Formation, Cold Lake area.

which these procedures are effective in culling a formation-water data base, we can cite the results of our work in the Cold Lake area, Alberta: out of more than 3,100 wells in that area, formation-water analyses were available from only 1,894 wells (about 60%). From these wells, 3,650 formation-water analyses were entered into the data base, of which 2,366 (65%) remained in the formation water culled data record. After examining the cumulative log frequency plots, and removing anomalous data from the various contour maps, the final data base comprised 852 analyses, which represented only 23% of the original data base. Although this final data base could possibly be purged of additional analyses using more rigorous culling techniques, we have considerable confidence in the general regional trends of the resulting formation-water composition maps. In addition to printed maps and diagrams, the grid of regional variations in density of formation water in any specific stratigraphic unit is used as input to the drill-stem test records for correcting the hydraulic information.

Geothermal Regime

The main mechanisms of heat transfer in sedimentary basins are convection by fluids and conduction. Dimensional analysis (Bachu, 1985) shows that the relative importance of the different terms in the heat-transfer equation for a sedimentary column (block) is given by the following dimensionless groups:

$$Pe = \gamma v_o D/\kappa_m;$$
$$S^* = SD^2/\lambda_m \Delta T_o;$$
$$d^* = d_\omega/D.$$

The Peclet number for heat transfer (Pe) is a measure of the intensity of convective heat transfer versus conductive heat transfer, S* is a measure of internal heat generation versus conduction, and d* is a measure of the propagation in depth of the temperature variations at the surface. Here, $\gamma = n\rho_f c_f/(\rho c)_m$ is the ratio of the heat capacity of the fluid fraction to the bulk heat capacity of the saturated porous medium, n is the effective porosity, c is the specific heat, v_o is a characteristic velocity of fluid flow, D is a characteristic length, $\kappa = \lambda/\rho c$ is the thermal diffusivity, λ is the thermal conductivity, S represents heat sources, ΔT_o is a reference temperature difference, $d_\omega = (2\kappa_m/\omega)^{1/2}$ is the skin depth (Turcotte and Schubert, 1982), and ω is the frequency of the cyclic fluctuations of surface temperature. The subscripts m and f refer to the saturated porous medium (rock + fluid) and to fluid, respectively.

For the Alberta part of the Western Canada sedimentary basin, the average thermal conductivity is $\lambda_m = 2.4\ \mu W/m°C$ (Majorowicz and Jessop, 1981). The strength of heat sources in sedimentary rocks is less than $2.0\ \mu W/m^3$ (Rybach, 1981). The thickness of the undisturbed sediments ranges between zero at the Precambrian shield in the northeast to more than 5 km at the edge of the disturbed belt in the southeast, and the temperature difference between the top and the bottom of the sedimentary column reaches $\Delta T_o = 130°C$. The skin depth d_ω for the annual variations of temperature is of the order of magnitude of meters. It follows that we can neglect the influence of annual temperature variations on the temperature distribution in sediments thicker than a few tens of meters. The internal heat generation in the sediments has an order of magnitude of less than 10^{-1} with respect to other heat-transfer processes involved, and as such it is also negligible. The analysis of the Peclet number confirms if the heat transfer in the sediments takes place mainly through conduction or through both conduction and convection.

The heat-transfer processes and the temperature distributions have to be analyzed by hydrostratigraphic units (Bachu, 1985). Accordingly, the Peclet number must be computed using the appropriate values for the parameters characterizing each unit. The characteristic length (D) is the average thickness of each hydrostratigraphic unit, and the characteristic velocity (v_o) is the Darcy velocity. The values for rock density (ρ_s) range between 2,300 kg/m^3 for shales and 2,700 kg/m^3 for dolomites (Daly et al, 1966). Values for thermal conductivity (λ_s) range between 1.5 W/m°C for shales and 5.5 W/m°C for salt (Clark, 1966; Majorowicz et al, 1984). (The subscript s refers to rock matrix properties.)

For the Cold Lake area, the order of magnitude of the Peclet number ranges between 6×10^{-7} and 8×10^{-2} as shown in Table 1. There is no fluid flow through the Prairie aquiclude, therefore Pe = 0 (V_o = 0). This analysis concludes that convective heat transfer is negligible throughout the area and, therefore, the heat transport mechanism from the basement to the atmosphere is thermal conduction through the stratigraphic column. Hence, at a given location, the heat flux crossing the sedimentary basin produces a vertical temperature distribution and a geothermal gradient depending ultimately on lithology and saturating fluids.

The influence of the geometry and lithology of the stratigraphic units on the heat transfer in a sedimentary basin can be studied by analyzing the variation of geothermal gradient with depth and the areal temperature distributions. The geothermal gradients presented in Table 1 for each unit are given by the slope of the regression line fitted to the temperature-versus-depth data in the respective unit. Examples of the temperature variation with depth are presented in Figure 10 for a shale and a sandstone from the Cold Lake area.

In applying this method of calculating the geothermal gradient, one must consider the geometry of the strata. Thus, if a particular formation is dipping, the areal extent of the data set should be limited on a case-by-case basis in order to obtain meaningful results. In the Cold Lake area, the Cretaceous sequence is present throughout the study area and dips very gently (0.75 m/km) toward the southwest, whereas the Upper Devonian strata are only partially present due to erosional truncation. Taking into account these considerations and the strong correlation coefficients of temperature versus depth (up to 0.85), the results are considered meaningful.

Geothermal gradients computed by taking the difference between the measured temperature at a given depth and the surface temperature at the same location and reporting this difference with respect to the depth of the measurement point actually represent the weighted average gradient (or integral gradient) of the entire stratigraphic sequence above the recording point (Bachu, 1985). Therefore, the value of the geothermal gradient computed from this method depends on the depth of the recording point and the thermal properties of the overlying rocks.

As discussed previously, the areal distribution of temperature has to be studied by stratigraphic units. This distribution is important, for example, in the study of hydrocarbon maturation processes and water-rock interaction phenomena. The distribution is also needed to estimate correctly fluid properties. However, to represent simple isotherms in a unit is, at times, misleading because of the natural increase of temperature with depth. Such a temperature distribution is presented (Figure 11A) for the Beaverhill Lake aquifer system in the Cold Lake area. This example shows that the general trend of temperature increases downdip toward the southwest (Figure 11B). The temperature distribution here helps us to understand better the salinity distribution in the aquifer system (Figure 11C). Although an increase of salinity would be expected in the direction of the flow (Figure 11D), an actual decrease occurs due especially to the decrease in temperature.

To account for the influence of depth on the temperature distribution in a stratigraphic unit, the temperature value computed according to the respective geothermal gradient can be subtracted from the measured temperature at every location, and the distribution of the residuals in each unit represented as isolines. Maps of temperature deviations from the geothermal gradient (i.e., "warmer" and "colder" than average areas) may reflect general stratigraphic and lithologic features or the nonhomogeneity of the solid matrix and of the fluids that locally affect the heat-transfer processes.

Table 1. Main Characteristics of Fluid and Heat Flow in Cold Lake Area, Alberta, Canada

Hydrostratigraphic Unit	Formation-Water Density (kg/m³)	Porosity	Permeability (m^2)	Permeability (md)*	Characteristic Velocity (mm/year)	Average Thickness (m)	Peclet Number (magnitude)	Geothermal Gradient (°C/km)
Post-Viking aquitard system	1025	0.29	—	—	0.006	314	5×10^{-5}	42.2
Viking aquifer	1026	0.23	0.5×10^{-13}	50.7	0.4	9	3×10^{-5}	19.7
Upper Mannville aquifer system	1026	0.33	10.0×10^{-13}	1,013.0	1.0	86	1×10^{-3}	19.0
Clearwater aquitard	—	—	—	—	0.006	4	8×10^{-7}	—
Lower Mannville aquifer system	1025	0.34	20.0×10^{-13}	2,026.5	5.0	44	3×10^{-3}	17.0
Winterburn aquifer	1025	0.11	10.0×10^{-13}	1,013.0	5.0	8	2×10^{-4}	17.0
Grosmont aquifer	1020	0.12	0.5×10^{-13}	50.7	5.0	68	1×10^{-3}	16.5
Ireton aquitard	—	—	—	—	0.0002	113	6×10^{-7}	40.1
Beaverhill Lake aquifer system	1050	0.13	0.1×10^{-13}	10.1	0.3	240	4×10^{-4}	18.5
Prairie aquiclude	—	0.00	0.0	0.0	0.00	124	0.0	—
Keg River aquifer	1180	0.02	0.1×10^{-13}	10.1	0.06	36	2×10^{-6}	—
Basal Cambrian aquifer	1180	0.18	0.5×10^{-13}	50.7	150	64	8×10^{-2}	—

*1 millidarcy = 9.87×10^{-16} m².

Fluid-Flow Regime

All interpreted hydraulic point data are allocated to the individual hydrostratigraphic units of the study area, that is, to the succession of aquifers and aquitards of the three-dimensional structure. Because virtually all of the drill-stem test and most of the core data originate from aquifers, one can anticipate a major difficulty in characterizing the aquitards with respect to their fluid-flow parameters. This is discussed in a later section.

Permeability and Hydraulic Conductivity

Experience shows that the point permeabilities derived from drill-stem test and core data for the aquifers range over about four to five orders of magnitude when one considers the absolute minimum and maximum measured values. This span reflects the regional-scale spatial heterogeneity of aquifers. To refine further the descriptive model of fluid flow in the multilayered system of sedimentary basins and to be able to conduct numerical simulation of the resulting flow regime, this range must be reduced to a smaller interval, in fact, to a single value called "equivalent permeability." Hydrogeologists and reservoir engineers have been concerned with this difficult problem, and major advances have been achieved in the averaging process. Bear (1972) defined three conceptual levels or scales relevant to describing flow in porous media. The microscopic level or the "grain" scale extends between a few individual grains and a "representative elemental" volume; at this level, the

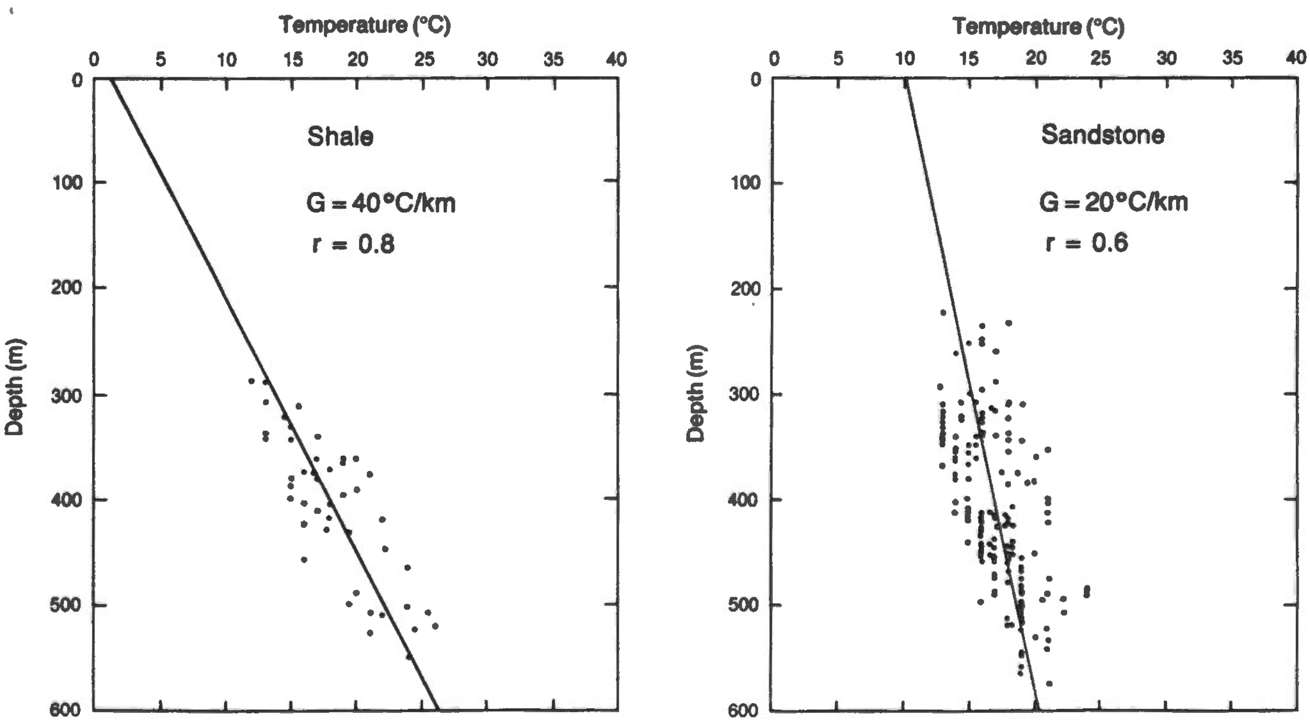

Figure 10—Temperature variation with depth for a shale (Upper Devonian, Ireton Formation) and a sandstone (Lower Cretaceous, Viking Formation), Cold Lake area.

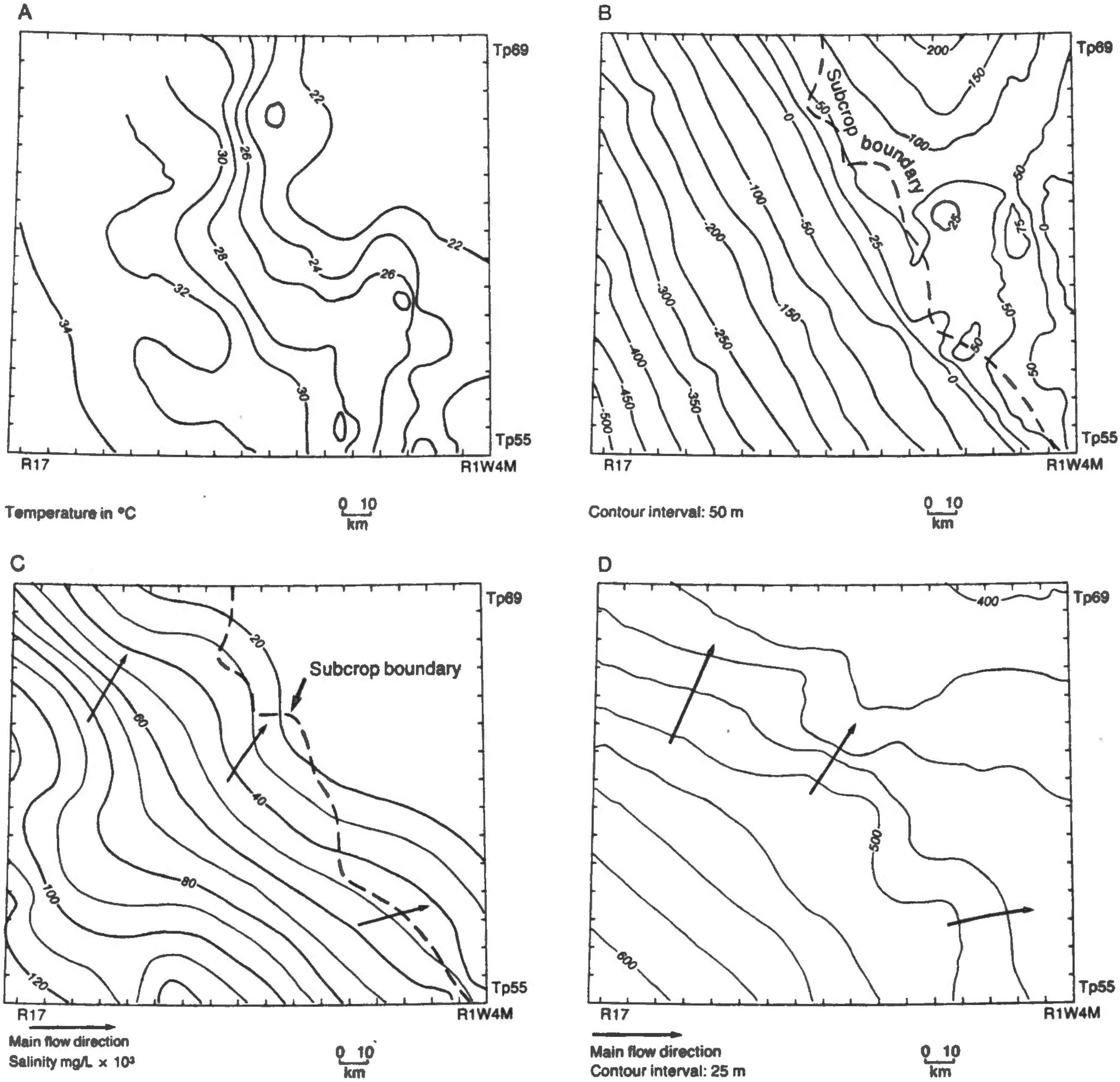

Figure 11—Relations of regional temperature distribution (A), structural dip (B), salinity of formation waters (C), and potentiometric surface (D) for Beaverhill Lake Formation, Cold Lake area.

fluid movement is characterized by extremely complex flow paths obeying the Navier-Stokes equation with varying porosity and permeability. Increasing the volume of rock to a limit called the "maximum elemental" volume, the medium becomes statistically homogeneous with respect to the flow parameters, and Darcy's law is applicable; this constitutes the macroscopic scale and is assumed to be the level at which point permeabilities measured by drill-stem testing and core analysis are meaningful. Beyond the maximum elemental volume, flow parameters may fluctuate in an apparently random fashion; this corresponds to the megascopic scale or the "layer" scale, where Darcy's law is applicable only with spatially averaged flow parameters. A thorough overview of the various deterministic and stochastic methods proposed over the years to perform the averaging process between macroscopic and megascopic scales is given by Neuman (1982).

Our approach uses some practical results demonstrated in the theoretical work of Matheron (1967). Assuming that the point permeabilities of the macroscopic scale as obtained from drill-stem test or core data interpretations are "regionalized" in the strict sense given to this concept by Matheron (1967), then the "equivalent" aquifer permeability depends on the isotropy of the medium and on the dimensions and type of flow problem.

For plane (two-dimensional) quasi-uniform flow in a subisotropic medium where the point permeabilities have a spatial log-normal distribution, the equivalent permeability of the aquifer is the geometric mean of the point values. Such flow conditions can be generally accepted for natural

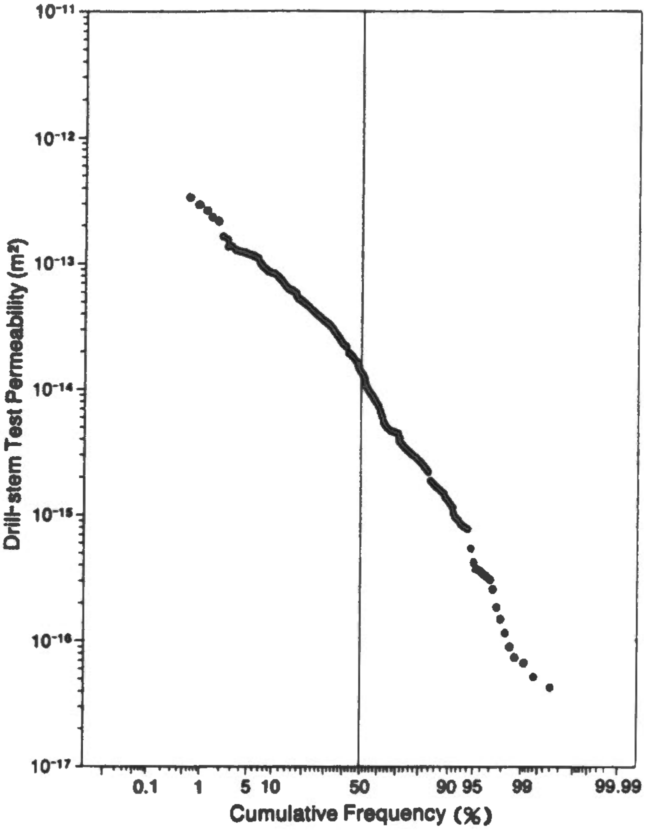

Figure 12—Log-normal cumulative frequency plot of permeability determined from drill-stem tests, upper Mannville aquifer system, Cold Lake area.

lateral flow in rather thin aquifers (up to 50 m), where the velocities change slowly from point to point. For thicker aquifers, where the flow remains quasi-uniform but is three-dimensional, the equivalent permeability is located at two-thirds the distance between the harmonic and arithmetic means of the point permeabilities.

For radial or spherical flow, the probable value of the apparent permeability can be located anywhere inside the interval of the harmonic to arithmetic means of the point permeabilities, depending essentially on the boundary conditions. This situation occurs in drill-stem testing and where the natural flow in an aquifer is perturbed either by pumping or injection. Matheron (1967) also showed that Darcy's law is applicable at the megascopic scale, provided that it relates to the equivalent permeability. These results are really meaningful only when the spatial distribution of point permeabilities is at the same time sufficiently dense and evenly distributed.

The practical implications of these considerations for data processing are (1) to assess whether the permeability point values follow a log-normal distribution (the quality of this fit is judged on log-normal cumulative frequency plots as illustrated in Figure 12) and (2) to compute the harmonic, geometric, and arithmetic means of the point permeabilities for both drill-stem test and core data (where, when the number of point determinations is sufficiently large and the distribution is strictly log-normal, the 50% frequency value of permeability read from the graph is close to, or identical with, the geometric mean).

Typical values of the statistical means and absolute minimum and maximum point permeabilities for sandstone and carbonate aquifers in Alberta are presented in Table 2. This table illustrates that for a relatively homogeneous aquifer, such as the Viking, the interval between the harmonic and arithmetic means is comparatively small, but as expected, the magnitude of this interval varies for the same aquifer from region to region. Also, the means for core horizontal permeability can be greater, by one order of magnitude, than the corresponding means for the bulk (essentially radial) permeability obtained by drill-stem testing. This difference reflects both the qualitative difference between the two types of permeability and the biases introduced by the measurement method; core samples are measured for permeability under disturbed laboratory conditions, and they comprise a smaller "representative elemental volume" than that for "in-situ" drill-stem tests (a few tens of meters around the well bore). In addition, the common presence of a "skin-effect" annulus around the well bore may result in an underestimation of the true permeability by the drill-stem test technique. Because all these factors are difficult to quantify, we recommend that the results of both core and drill-stem test permeabilities be processed. Although, in general, more reliability can be expected from drill-stem test results, a final judgement has to be made on a case-by-case basis depending on the number of samples and on the discrepancy between both categories of statistical results. It is useful to account for anisotropy and compare the "effective" core permeabilities (defined as a geometric mean of horizontal and vertical permeability by Papadopoulos, 1965) to the drill-stem test permeabilities. For example, the ratio between (a) and (b) of the geometric means for area 2 of the Viking Sandstone is reduced from 7.1 (as in Table 2) to 3.4 when "effective" core permeability is considered.

The last two rows of Table 2 illustrate the great difference between the absolute range of permeability and the range of the harmonic and arithmetic means. The ratio of maximum to minimum permeability ranges from 27.5 to 440,000; in contrast, the ratio of the arithmetic and harmonic means ranges from 1.9 to 2,200, being less than 100 for the sandstone aquifers. The ratio of maximum to minimum permeability is considerably greater for a carbonate aquifer than for a sandstone aquifer.

Where the aquifer lithology is spatially characterized for the study area, a zonation of the aquifer into subdomains of more homogeneous permeabilities may be considered. The same statistical means can then be used to determine the equivalent permeability of each subdomain. If a continuous trend of variation can be detected within each subdomain, then the kriging technique can be used to obtain a regular grid of permeabilities. In most places, however, the lithologic information is either sparse or too complex and the regional heterogeneity too great to permit a detailed analysis.

The distribution of measured point permeabilities in places may be very sparse, especially for the deeper aquifers. In this situation, the permeability distribution can be "populated" if a relationship of the type $k = Cn^a$ can be found between the measured permeability (k) from drill-stem tests or core and the porosity (n) obtained from interpretation of geophysical logs. The constants (C, a) are found by the least squares fitting technique on wells that provide, for the same aquifer, both types of information.

Table 2. Range of Regional Permeabilities (in m^2 and millidarcys) for Four Typical Aquifers of Western Canada Sedimentary Basin

Aquifer	Viking				Upper Mannville System				Lower Mannville System*				Beaverhill Lake System**			
Study Area	1		2		1		2		1		2		1		2	
Source	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b
Number of Point Determinations	187	31	26	37	332	405	65	7	117	204	141	33	4	25	22	2834
Absolute minimum	0.24	0.60	0.36	0.04	0.04	0.05	0.20	—	0.45	0.28	0.06	0.03	—	0.02	0.002	0.001
	(0.24)	(6.08)	(0.36)	(0.4)	(0.04)	(0.05)	(0.20)	—	(0.46)	(2.84)	(0.06)	(0.30)	—	(0.20)	(0.002)	(0.01)
Harmonic mean	0.97	3.36	1.55	0.63	1.74	6.57	1.79	—	4.42	12.3	1.6	0.49	—	0.13	0.02	0.18
	(0.98)	(34.0)	(1.57)	(6.4)	(1.76)	(66.6)	(1.81)	—	(4.48)	(124.5)	(1.62)	(4.96)	—	(1.32)	(0.02)	(1.82)
Geometric mean	1.35	7.23	2.51	4.49	11.10	81.0	8.31	—	13.7	113.0	8.4	2.55	—	2.86	0.76	0.79
	(1.36)	(73.3)	(2.54)	(45.5)	(11.25)	(820.7)	(8.42)	—	(13.88)	(1,145.0)	(8.51)	(27.0)	—	(2.90)	(0.77)	(8.0)
50% frequency value	1.30	6.00	3.50	2.50	13.00	170.0	11.0	—	10.0	370.0	7.0	3.00	—	2.50	0.7	0.52
	(1.32)	(60.8)	(3.55)	(25.3)	(13.2)	(1,722.5)	(11.15)	—	(10.13)	(3,749.0)	(7.10)	(30.4)	—	(25.3)	(0.71)	(5.27)
Arithmetic mean	1.87	16.50	4.61	16.70	34.30	170.6	63.6	—	33.8	240.2	101.9	18.9	—	112.6	44.4	4.14
	(1.89)	(167.2)	(4.67)	(169.2)	(34.80)	(1,728.6)	(64.40)	—	(34.25)	(243.4)	(103.3)	(191.5)	—	(1,140.9)	(45.0)	(42.01)
Absolute maximum	6.60	108.00	41.00	100.0	1,122.0	1,200.0	140.0	—	319.2	1,183.0	6,200.0	2,500.0	—	887.2	828.0	443.6
	(6.69)	(1,094.0)	(41.54)	(1,013.0)	(1,137.0)	(12,160.0)	(1,418.6)	—	(323.4)	(11,987.0)	(6,282.2)	(25,330.0)	—	(899.0)	(839.0)	(4,495.0)
Ratio maximum/ minimum	27.5	180.0	113.9	2,500.0	28,000.0	24,000.0	7,000.0	—	709.3	4,225.0	100,000.0	83,000.0	—	44,000.0	410,000.0	440,000.0
Ratio arithmetic/ harmonic mean	1.9	4.9	3.0	26.5	19.7	26.0	35.5	—	7.7	19.5	63.7	38.6	—	866.0	2,200.0	23.0

1—Study area = Cold Lake region (23,780 km^2).
2—Study area = Swan Hills region (15,760 km^2).
a—Point values of bulk permeability from drill-stem test interpretation (in 10^{-15} m^2).
b—Point values of horizontal permeability from core analyses (in 10^{-14} m^2).
*Interbedded sandstone and shale.
**Carbonate sequence.
() values in millidarcys (1 md = 9.86923×10^{-16} m^2).

The relationship can be tested and applied to other locations and intervals where the porosity is available although the permeability has not been measured. Clearly, great caution is needed in using such correlations within the same aquifer.

As for hydraulic conductivity, once the point values are calculated using the measured point permeability and the best possible estimates at the point of measurement of the formation-water properties, then similar statistical considerations as for the permeability can be used to determine the regional hydraulic conductivity. Because this procedure is long (and to some extent repeats what has already been done with respect to the point permeabilities) and yet still contains some approximations related to the formation-water properties, one may be tempted to shorten the process by applying regional evaluations of density and viscosity for the aquifer to the regional characteristics of permeability.

To be able to compare both methods for the evaluation of regional hydraulic conductivity, single average values of regional density and viscosity are used in equation 2 (below) rather than their maximum and minimum for the considered aquifer. The deeper the aquifer, the more significant become the corrections for pressure, temperature, and salinity to be performed on the formation-water properties. As an illustration, Table 3 presents the statistical evaluation of the regional hydraulic conductivity obtained from drill-stem test data for the Middle Devonian Gilwood Sandstone in the Swan Hills area. This aquifer is characterized by the following ranges: depth = 1.45-3.03 km; pressure = 15.88-23.14 MPa; estimated temperature = 50.8-99.1°C; chloride content = 126-243 g/L; density of formation water at 15.5°C and 101.3 kPa = 1,130.1-1,197.6 kg/m^3, with a spatial average of 1,155.1 kg/m^3; and corrected density of formation water at aquifer pressure, salinity, and temperature conditions = 1,075.0-1,117.4 kg/m^3, with a spatial average of 1,090.7 kg/m^3.

In these ranges of temperature, salinity, and pressure, the dynamic viscosity of formation water ranges between 0.4×10^{-3} and 0.95×10^{-3} Pa sec. However, at laboratory conditions, the range is 1.35×10^{-3} to 1.95×10^{-3} Pa sec.

Table 3, column 3, underestimates the values of column 4 by a maximum factor of 1.35 (average factor of 1.20); comparing columns 2 and 4, the maximum factor of underestimation is 3.07 (average of 2.72); intermediate factors are obtained between columns 1 and 4 (maximum = 2.19, average = 1.94). Given all the other possible sources of error at the various stages of measurement and analysis, we can conclude that the regional characteristics of hydraulic conductivity are obtained with an acceptable degree of accuracy with the technique of column 3, that is, by scaling the statistical characteristics of permeability with a factor that uses average density and viscosity of the formation waters under aquifer conditions of salinity, temperature, and pressure rather than statistically treating the point values of hydraulic conductivity obtained by using point estimates of density and viscosity. It is wise, however, to compare both categories of results whenever possible. As a more approximate procedure, standard (freshwater) values of density and viscosity could be used if the average values at aquifer conditions are not available (e.g., deficient chemical data base for a particular unit).

Hydraulic Head and Flow Velocity

For a given aquifer or aquifer system, the hydraulic heads are analyzed on a regional basis because this variable is continuous (i.e., "smoothly" varying from point to point). The resulting potentiometric surface or contour map of hydraulic heads can be statistically characterized by the fit of the first order equation,

$$h = H_o + ax + by, \qquad (1)$$

in a Cartesian coordinate system and by the correlation coefficient that indicates the quality of the fit between the equation and the point values. (H_o is the hydraulic head of the origin $x = y = o$.) This fit is illustrated in Table 4, and both relative signs and magnitudes of the coefficients a and b can be used to characterize and compare, qualitatively, the trends of potentiometric surfaces.

In the first column of Table 4, aquifer system refers to the grouping of contiguous aquifers that are in hydraulic continuity but have different hydraulic parameters. Because of the formations' geometric complexity, the hydraulic continuity may be only partial over subdomains of the region considered; composite potentiometric surfaces are then constructed.

Cross sections of hydraulic-head profiles are useful in flow analysis because they give an insight into the potential relationships between aquifers in the third dimension. Cross sections are easily constructed from the regular grids of the potentiometric surfaces. Similarly, but at a more local scale, pressure head ($p_f/\rho g$, with p_f = formation pore pressure, ρ = in-situ density of formation water, and g = gravity acceleration) versus depth plots can be constructed for data measured in the same well to evaluate hydraulic continuity between aquifers and to give a comparative appraisal of the hydraulic resistance of intervening aquitards, as illustrated in Figure 13. On pressure head versus depth plots, if the slope of the straight line joining the data points is unity, only lateral flow in the aquifer is present, that is, there is no cross-formational flow. Slopes less than unity indicate a downward flow component, and slopes greater than unity mean that there is an upward flow component. For adjacent aquifers, if the data points plot in a straight line, hydraulic continuity exists between the aquifers through the intervening aquitard. Pressure head versus depth plots permit a clearer diagnosis than the classical pressure versus depth plots, because density-dependent features can complicate the analysis.

The horizontal components of the Darcy velocity can be computed using an equivalent "freshwater hydraulic head" calculated with a constant reference density (Lusczynski, 1961). For the Swan Hills area, the maximum Darcy velocity in the aquifers is less than 5 m/year.

VIRTUAL POTENTIOMETRIC SURFACES FOR HYDRODYNAMIC ENTRAPMENT OF HYDROCARBONS

The u and v surfaces of Hubbert's (1953, p. 1989) equation 54 result from his general equation 45 (p. 1985). It may

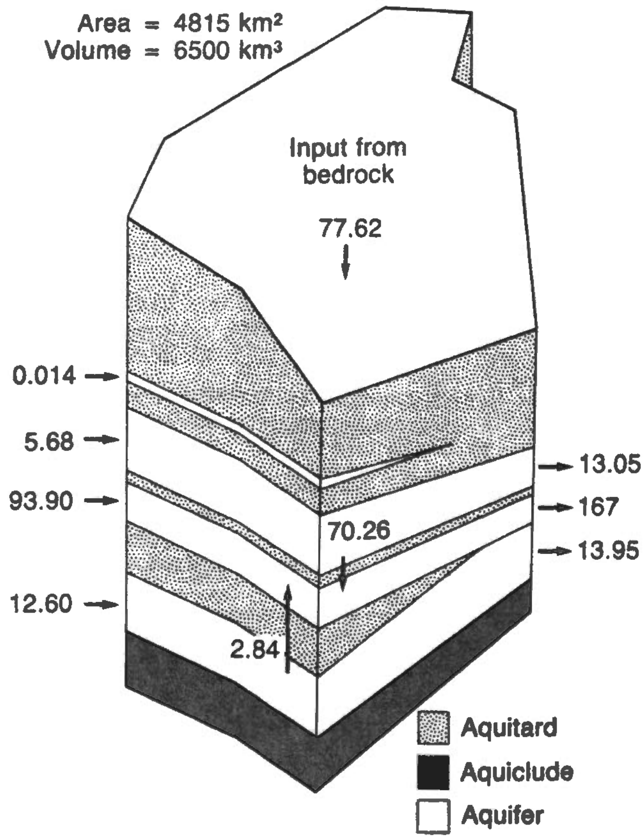

Figure 15—Block diagram of portion of Phanerozoic sequence in Cold Lake area showing input, output, and cross-formational flow rates (all flow rates in m^3/day).

fluid is corrected for its dependence on temperature and salinity. The temperature and salinity, when not reported, are estimated from the geothermal gradient and from salinity distribution maps, respectively. Core data provide information about porosity and the horizontal and vertical components of the permeability tensor. The explicit dependence on density is taken into account when computing hydraulic conductivity and hydraulic-head values. When the density of the fluid is not indicated in the drill-stem test report, its value is estimated from density-distribution maps resulting from the formation-water analyses and from the density's dependence on temperature, salinity, and pressure.

Synthesizing vast amounts of point data into representative information is done through an iterative hybrid human-computer process; the process combines automatic processing with individual examination of data only when possible errors are flagged for checking. The geometry and stratigraphy of the subsurface environment are obtained by using special cartographic grid manipulation and contouring software. The flow data are then assigned to their respective stratigraphic units by automatic interpolation in the three-dimensional stratigraphic sequence. Parameters that depend on the solid matrix (e.g., permeability) are statistically analyzed and characterized. Data distributions for variables with continuous variation, such as chloride content, temperature, and hydraulic head, are converted into regular grid distributions and analyzed for trends. Pressure head versus depth plots are used to analyze the continuity between aquifers, and the strength of the lateral and vertical components of fluid flow. Global mass-balance calculations help define and refine the average effective values of the hydraulic parameters and insure the consistency of the set of values characterizing a sedimentary block. Dimensional analysis assesses the importance of convective versus conductive heat transfer in the subsurface environment.

At the end of the entire process of data processing and synthesis, each stratigraphic unit in a sedimentary block is characterized by representative values of geochemical, thermal, and hydraulic parameters. The natural fluid and heat-flow regimes are characterized by potentiometric and thermal fields, hydraulic and geothermal gradients, and fluid-flow fluxes. These baseline conditions may then be used for a more direct and accurate method of assessing the potential for hydrodynamic entrapment of oil in a given aquifer and for further evaluation of anthropogenic or geologic perturbations.

APPENDIX 1

PROCESSING OF POINT INFORMATION

Stratigraphic Data

Most stratigraphic information is available in electronic form from the ERCB well data system file. Errors in the raw data are commonly culled when the data are synthesized in map form or as cross sections. When appropriate, well log interpretation has been used to provide additional information for selected aquifers, aquitards, or aquicludes.

Formation-Water Analyses

The main objective of all culling, graphical, and statistical techniques for evaluating formation-water analyses is to obtain information that is not readily apparent from the analyses. The specific treatment technique depends, to a great extent, on the nature of the required information and the size of the data base. Culling criteria, several simple graphical procedures, using dummy values and data transformation techniques, and four fairly sophisticated statistical techniques for the treatment of standard formation-water analyses were presented by Hitchon (1985). The size of the ERCB data base, however, together with the rather simplistic nature of the chemical and physical data available, means that sophisticated statistical techniques for data analysis are not generally justified. Further, as noted by Hitchon (1985), most simple graphical methods have limited utility with large data bases, and this is particularly true when only the major ions have been determined. As a result of these limitations, the approach to treating the vast number of data present in the ERCB formation-water data file has been to develop automatic culling criteria for removing analyses that are not representative of the formation water in the underground environment, and to find methods of treating the remaining data, which is still rather voluminous, to produce maps with reasonably smooth regional trends.

Most of the formation-water samples were collected from drill-stem tests, or surface facilities such as well heads, treaters, and separators. Some samples came from holding tanks or were produced by bailing, and are, consequently, of questionable quality. Formation waters from drill-stem tests, or from surface facilities produced early in the history of the well, may be contaminated with drilling fluid or mud-filtrate water. A poor (high) recovery position in the drill-stem test fluid column is commonly indicative of a diluted formation water. Additional contamination may result from the use of KCl muds, acid washes, or washes from cement jobs. In water samples obtained from producing oil fields, contamination may also be due to water injection into the reservoir; this can probably be evaluated with knowledge of the reservoir history. Although poor collection procedures and inadequate sample preservation are criteria that would normally justify culling, the pertinent information is commonly not available. Knowing an equivocal analytical procedure would also justify removing the sample from the data base. In addition to these limitations, generally only the common ions—Ca, Mg, Cl, SO_4, HCO_3, and CO_3—are determined, with Na being calculated stoichiometrically as the difference between the sum of the anions and the sum of the cations. Thus, although incomplete analyses and a poor ionic balance would normally be additional reasons for culling formation-water analyses, the latter is not a valid criterion where Na has been determined by difference. Despite all these variables, which may effect the composition of formation waters in the ERCB data base, it has been possible to develop automatic culling criteria and data-manipulation techniques that result in reliable maps of the regional chemical and physical properties of the formation waters.

Following manual entry of the formation-water analyses and ancillary information from the ERCB data file, the chemical information is examined by a culling routine, the objective of which is to remove incomplete and obviously erroneous analyses. Thus, samples that are clearly contaminated with washes from cement jobs, acid washes, and KCl muds are removed; also excluded are analyses where Ca and Mg have been determined as equivalent Ca, and those for which any of the following are missing: Ca, Mg, Cl, SO_4, HCO_3, and CO_3 (a zero value for the latter can be accepted). For the few analyses in which Na and K have been determined separately, a check is made on the cation/anion balance. Sodium is then calculated "by difference" (diff) on the remaining analyses. Even if Br and I are reported, which is rare, the Na (diff) value is calculated without the values for Br and I. Total dissolved solids (TDS) are then calculated. The need to recalculate Na (diff) and total dissolved solids (calculated) results from our observation that these numbers are sometimes in error in the hard-copy files. The resulting formation water culled data record contains the following information for further testing: Na (diff), Ca, Mg, Cl, *Br, I*, HCO_3, CO_3, SO_4, TDS (calculated), *TDS (evap. 110°C)*, *TDS (ignition)*; and *density*, and *resistivity*. The italicized values are optional.

Temperature Data

The temperature data are obtained from ERCB data files and drill-stem tests reports whenever recorded. Most of the data are collected by producing companies under unknown and uncontrolled conditions. The data are gathered by a number of different individuals, using a variety of tools and techniques. Some uncertainty also exists concerning the reported depth at which the temperature is measured. The Horner method commonly used to correct temperatures for the lack of thermal equilibrium between the measuring device and the environment cannot generally be applied due to the absence of sufficient time information. Although questions concerning the accuracy of the data must arise, no realistic attempt at error analysis can be made; therefore, it is accepted that the data represent the real temperature. Whenever values are measured at different times, the last value is chosen. Furthermore, where data at the same location are recorded at successive depths, they are checked for consistency (i.e., inversions of temperature and abrupt changes in the local thermal gradient are singled out and individually checked).

Thermal properties of the rocks and the fluids, such as specific heat and thermal conductivity, are not commonly measured. As a result, information about these parameters is scarce, and is not included in the data base. Values for these parameters are obtained from literature regarding heat flow in the Western Canada sedimentary basin (Majorowicz and Jessop, 1981).

Hydraulic Parameters

For steady-state natural fluid flow in sedimentary basins, the relevant hydraulic parameters are the hydraulic head and the hydraulic conductivity of the (rock + fluid) system. The hydraulic conductivity (K) is defined by

$$K = k\rho g/\mu, \qquad (4)$$

where k is the intrinsic permeability of the solid matrix, ρ = the fluid density at that point, g = the gravity acceleration, and μ = the fluid dynamic viscosity.

The hydraulic head (h) is defined by

$$h = p_f/\rho g + z, \qquad (5)$$

where z = the elevation (relative to sea level datum) of the measured pore pressure (p_f).

Both p_f and k are deduced from the interpretation of drill-stem test data, where k is obtained for radial flow conditions (bulk permeability). Core analyses provide an insight to the three components of the tensor of permeability measured in plane uniform flow and under disturbed conditions. The dominant fluid in a sedimentary basin is formation water; in Alberta, it is essentially a sodium chloride solution for which the density is measured at laboratory conditions and the dynamic viscosity can be reasonably estimated on the basis of its temperature and salinity dependence.

Drill-Stem Test Data

The technology of drill-stem testing is well established (Timmerman and Van Poollen, 1972). The criteria used to judge whether a test is mechanically successful or not are based on the physical significance of the various components of the recorded pressure charts. When a test is conclusive, the charts are broken down (or "digitized") into time and/or pressure increments necessary to perform the quantitative analysis.

Drill-stem test reports generally include the pressure charts, the pressure increments, and additional information about the test necessary for a complete quantitative analysis. In Alberta, considering only drill-stem tests for which the pressure charts have been digitized is usually sufficient, given the abundance of such tests; however, additional pressure charts can be digitized when the data distribution is poor for a given hydrostratigraphic unit.

The plot of the pressure (p) versus log $[(t + t')/t']$, where t = the flowing time and t′ = the shut-in time, should be a straight line in the late portion of the plot if the assumptions of the line-source solution are valid. This solution assumes that production is from a homogeneous and isotropic aquifer of infinite lateral extent, at a constant rate, and from a well of infinitely small diameter. Moreover, this plot reflects the pore-pressure changes with time at a certain radial distance from the producing well, which is supposed to penetrate the aquifer completely. Clearly, from the general knowledge we have of the lithology and of the testing procedure, these conditions are generally not met. Nevertheless, most of the departures from the ideal conditions are either active at early times (partial penetration, finite well diameter, variations of the flow rate, natural fracturing) or at late times (finite lateral extent of the aquifer, cross-formational flow). Despite these limitations, which are well recognized, using the line-source solution to analyze drill-stem test data provides, statistically, the best local estimates of the hydraulic characteristics of deep formations. The "straight-line" method (Horner analysis) generally used is based on the late time logarithmic approximation of the exponential integral solution. The shape of the semilog plot indicates the degree of interpretability and reliability of the deduced hydraulic parameters; for example, a zero slope reflecting pressure stabilization for both shut-in periods may suggest a high permeability, although its numerical value cannot be obtained. The analysis may also be qualitative because of problems such as severe formation damage (or "skin effect"), an insufficient flow period when heterogeneities are present (Streltsova and McKinley, 1984), or lack of key parameters for the interpretation. A test is suspect when too severe a difference ("depletion") exists between both shut-in extrapolated pressures at log $[(t + t')/t'] = 1$. A reasonable depletion may indicate that the aquifer is laterally bound.

Three types of semilog plots are considered: (1) where the produced fluid is a liquid (formation water and/or crude oil) with minimal content of drilling mud, the conventional Horner plot was used, that is, p versus log $[(t + t')/t']$; (2) where the produced fluid is a gas flowing at the surface at a virtually constant rate (q_g) the plot is of p^2 versus log $[(t + t')/t']$; and (3) where the produced fluid is a gas flowing at the surface at a variable rate, the plot is of p versus

$$\sum_{j=1}^{N} (q_j/q_N)\log[(t_N - t_{j-1} + t')/(t_N - t_j + t')],$$

where t_N is the total flow period, t_j is the time step of the flow period for which q_j is assumed to remain constant, and q_N is the last value of the flow rate measurement.

The intercept of the best fitting line with the pressure axis—at log $[(t + t')/t'] = 1$ (i.e., when the shut-in time t′ tends toward infinity)—gives the pore pressure (p_f) of the formation; this is general for the three plot types.

The slope of the straight line is used to calculate the intrinsic permeability with the following SI equations:

Case (1) $k = 2.12 \times 10^{-9} q\mu/Mb$, (6)

Case (2) $k = 1.49 \times 10^{-9} q_g \mu ZT/M'b$, and (7)

Case (3) $k = 7.44 \times 10^{-10} q_N \mu ZT/M'' p_f b$, (8)

where k is in m^2; q, q_g, q_N = the respective flow rates (in m^3/day); μ and μ_g = the fluid dynamic viscosities (in Pa sec); Z = the gas supercompressibility factor (dimensionless); T = the temperature at recorder depth (in Kelvins); b = the interval thickness (in m); M = the Horner slope for liquid (in kPa/log cycle); M′ = the Horner slope for constant rate gas (in kPa^2/log cycle) and and M″ = the Horner slope for variable rate gas (in kPa/log cycle).

A typical example of a shut-in analysis where only liquid was recovered is shown in Figure 16.

Where gas is produced, the flow rates q_g, q_j, and q_N are given in the drill-stem test reports; where liquid is produced, an average value of q is obtained by calculating the produced volume from the height of the recovered column in the drill-pipe and drill-collar and dividing this volume by the total flow time.

The dynamic viscosity (μ) of the formation water is sometimes given in the drill-stem test report. Where not reported, the dynamic viscosity is estimated from its variation with temperature and salinity (Earlougher, 1977, p. 241), neglecting its variation with pressure. Where reported, the salinity and temperature are retrieved directly from the data base for that particular drill-stem test. If one or both of them are not reported, they are computed for that particular location from salinity grids and/or from the average geothermal gradient (G) in the area, according to

$$T = Gd + T_o, \quad (9)$$

where d is the depth of the drill-stem test recorder and T_o is the intercept at the surface of the regression line expressing the temperature dependence with depth. The relationship in equation 9 is computed based on all the temperature measurements in the area.

In the few wells producing only crude oil, both density and dynamic viscosity are given in the drill-stem test report. The dynamic viscosity for gas usually ranges between 1×10^{-5} and 1.5×10^{-5} Pa sec, so that an average value of 1.25×10^{-5} Pa sec may be used when μ_g is missing. The coefficient Z generally ranges between 0.81 and 0.98, and a standard value of 0.92 has been adopted where the value of Z is missing.

Given the large number of drill-stem test records, an interactive software package (automatic plots and spreadsheet calculator) is used to interpret the digitized shut-in data. This program produces, on a terminal screen, an automatic Horner plot of the time-pressure data entered in the first level (A) of the drill-stem test data base, together with the best fitted line through these data points. Commonly, because of early-time effects of various origins, this fitted line is not the most appropriate to retain, so the user has the option of modifying it as desired. There is also the option of choosing between the first and second shut-in periods as to which slope and pressure intercept is to be used for the calculations. Then, both slope and intercept are passed to the spread-sheet calculator to compute the basic hydraulic parameters p_f and k.

Core Data

The core data base contains information concerning the horizontal maximum permeability, the horizontal permeability at 90° to the maximum permeability, and the vertical permeability.

The permeability data are all measured in the laboratory, but the methods of measurement are not reported in the core data base; for instance, no specific information exists on the type of fluid (air or liquid) and on the pressure conditions prevailing during the permeability measurements. Examining a few hard-copy, original reports issued by the laboratories shows no standard overburden pressure measurement and no correction for the Klinkenberg effect induced by the general use of air as a measuring fluid.

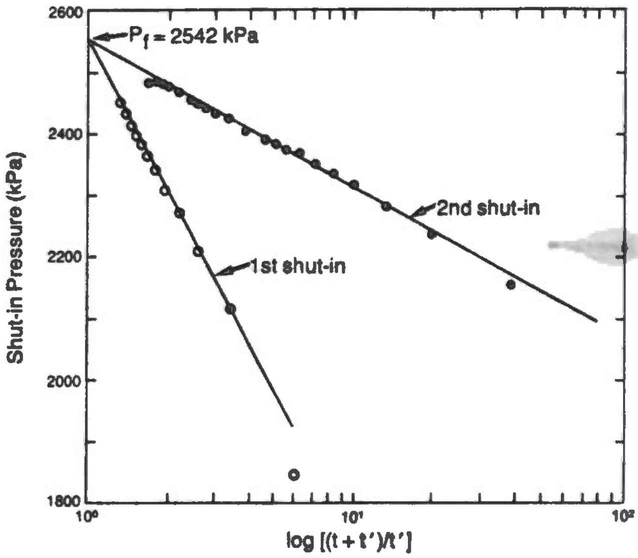

Figure 16—Typical shut-in Horner plot for drill-stem test with only liquid recovered.

Other factors causing errors are related to the disturbed character of the core sample caused by stress relief and by drying used to carry out the measurement and eliminate potential water-clay reactions. The complexity of these cumulative effects is such that the correction factors that should be applied to core permeabilities are very difficult to evaluate and are usually overestimated.

The core data base contains the permeability results obtained on plugs a few centimeters long, and representative values for the whole cored interval are weighted as follows:

$$\bar{k} = \sum_{i=1}^{r} k_i L_i / \sum_{i=1}^{r} L_i, \quad (10)$$

where $\bar{k}$ is the weighted permeability, k_i is the permeability value measured for the plug i of length L_i, and r is the number of plugs in the considered interval.

Equation 9 is applied successively to the three types of permeability given in the core data base, k_{max}, k_{90}, k_{vert}, to obtain $\bar{k}_{max}$, $\bar{k}_{90}$, and $\bar{k}_{vert}$, all in m^2. The horizontal permeability k_h for the cored interval is calculated by

$$k_h = \left([\bar{k}_{max}]^2 + [(\bar{k}_{90})^2]\right)^{1/2}, \quad (11)$$

and the vertical permeability (k_v) of the interval is kept as $\bar{k}_{vert}$. A cored interval is thus characterized by both values of k_h and k_v. The vertical location is defined by the elevation of the midpoint and by the elevation of the top of the cored interval, so that four parameters fully describe the core permeability.

Hydraulic Conductivity and Hydraulic Head

The hydraulic conductivity is obtained using equation 3. The scaling of the permeabilities by $\rho g/\mu$ requires knowledge of the properties of formation water. On drill-stem test recoveries, where a chemical analysis of the sample is available, the point density is measured at laboratory conditions (15.6°C and 1 atm, usually). Literature curves or tables (Earlougher, 1977) are necessary to estimate the viscosity at reservoir temperature (either given or estimated from the geothermal gradient) and the sodium chloride content (either given or approximated from grid values obtained by regional evaluation of the hydrochemical data) prevailing at that location (point values) in the aquifer. Where the hydrochemical data do not coincide with the drill-stem test interval or where core analyses are used, density point values can be estimated only from regional trends. Where the three factors—pressure, temperature, and sodium chloride content—are known or estimated for a given interval, the density point values can be obtained from the empirical relationship presented by Long and Chierici (1959, their equation 1).

Hydraulic heads are computed at the point level using equation 5. The equation involves, however, the formation-water density at the point of measurement. An arbitrary freshwater value of 1,000 kg/m^3 is commonly used. To appreciate the impact of the density on hydraulic-head calculations, a sensitivity analysis was conducted for the Beaverhill Lake aquifer system in the Cold Lake area of Alberta. This aquifer system was chosen because it has both enough chemical information at the points of pressure determination and relatively fresh formation waters, thereby providing a measure of the minimal impact of density on the values of hydraulic heads. The range in aquifer conditions are recorder elevations, −210 m to +90 m; pore pressures, 3.5-7.4 MPa; temperature, 22°-30°C; and sodium chloride content, 23.5-108 g/L.

With these conditions, the calculated formation-water density ranges between 1,011 and 1,067 kg/m^3 (at 15.6°C and 1 atm, the range is 1,018-1,089 kg/m^3). The use of the arbitrary value of 1,000 kg/m^3 introduces a systematic overestimation of the computed hydraulic heads with a maximum deviation of 47 m. The relative error varies between 0.9 and 9.2% from point to point. The resulting potentiometric surfaces are not parallel (shifted by a constant value) and the flow-regime analysis, based on the trends of the potentiometric surface, is altered accordingly. In the basal Cambrian aquifer in the Swan Hills area of Alberta, which lies at depths ranging between 1.8 and 3.3 km, the same error can be up to 75%, equal to a maximum overestimation of the hydraulic head by 392 m.

Calculating point values for hydraulic heads and hydraulic conductivities is not always a straightforward process in the data-processing sequence. If density and viscosity point data are available for the tested interval, then computing hydraulic heads and hydraulic conductivities is independent of synthesizing geochemical and/or geothermal information. When there are no density and viscosity measurements at a particular location, it is necessary to synthesize the geochemical and geothermal data first in order to be able to evaluate the salinity and temperature values needed for the correction of density and viscosity.

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