

Manitoba
Energy and Mines
Petroleum



LOWER PALEOZOIC
FORMATION WATER ANALYSES
BAKKEN TO PRECAMBRIAN
DECEMBER, 1971

INCLUDING SUPPLEMENT TO DECEMBER^R 1983

TABLE OF
LOWER PALEOZOIC
FORMATION WATER ANALYSES
BAKKEN TO PRECAMBRIAN

Data included in the following tables are intended to supplement the "Table of Lower Paleozoic Drill Stem Tests and Oil and Gas Shows", which lists only the amount and type of fluid recovery, pressures, and times of the tests. This information is not repeated in the present table. All known drill stem tests of Ordovician, Silurian and Devonian strata, for which water analyses were made, are listed in the table. The table is arranged firstly according to formation, from oldest to youngest, and secondly according to township and range location.

Salinities are recorded as milligrams per litre; this is approximately the same as parts per million, at least for the lower range of salinities ($\text{p.p.m.} = \frac{\text{mg/l}}{\text{Sp. Gr.}}$). A few of the earlier analyses were reported as parts per million. Calculated values normally included in water analyses, such as milliequivalents per litre and milliequivalent per cent have not been included.

Where drill stem tests straddle two or more formations, this is noted in parentheses, and the results are listed under both formations. B, M, and T, where used, refer to bottom, middle and top samples from the fluid column.

The salinity maps are included in order to show the distribution of the well data, and to indicate possible regional variations in salinity. The problems inherent in obtaining true samples of formation fluids in the drill stem tests (e.g. dilution by drilling fluids), must be taken into account in any interpretation of these data, especially the iso-salinity contours. Where several analyses are reported for a single drill stem test, or where several drill stem tests have been taken in the same formation, the highest measured salinity is the one plotted on the map.

REFERENCES

Bannatyne, B.B.

1960: Potash Deposits, Rock Salt, and Brines in Manitoba;
Man. Mines Br., Publ. 59-1.

Hitchon, B.



1964: Formation Fluids; in Geological History of Western Canada,
McCrossan, R. G. and Glaister, R. P. editors; Alberta
Soc. Petrol. Geol., Calgary, Alberta.

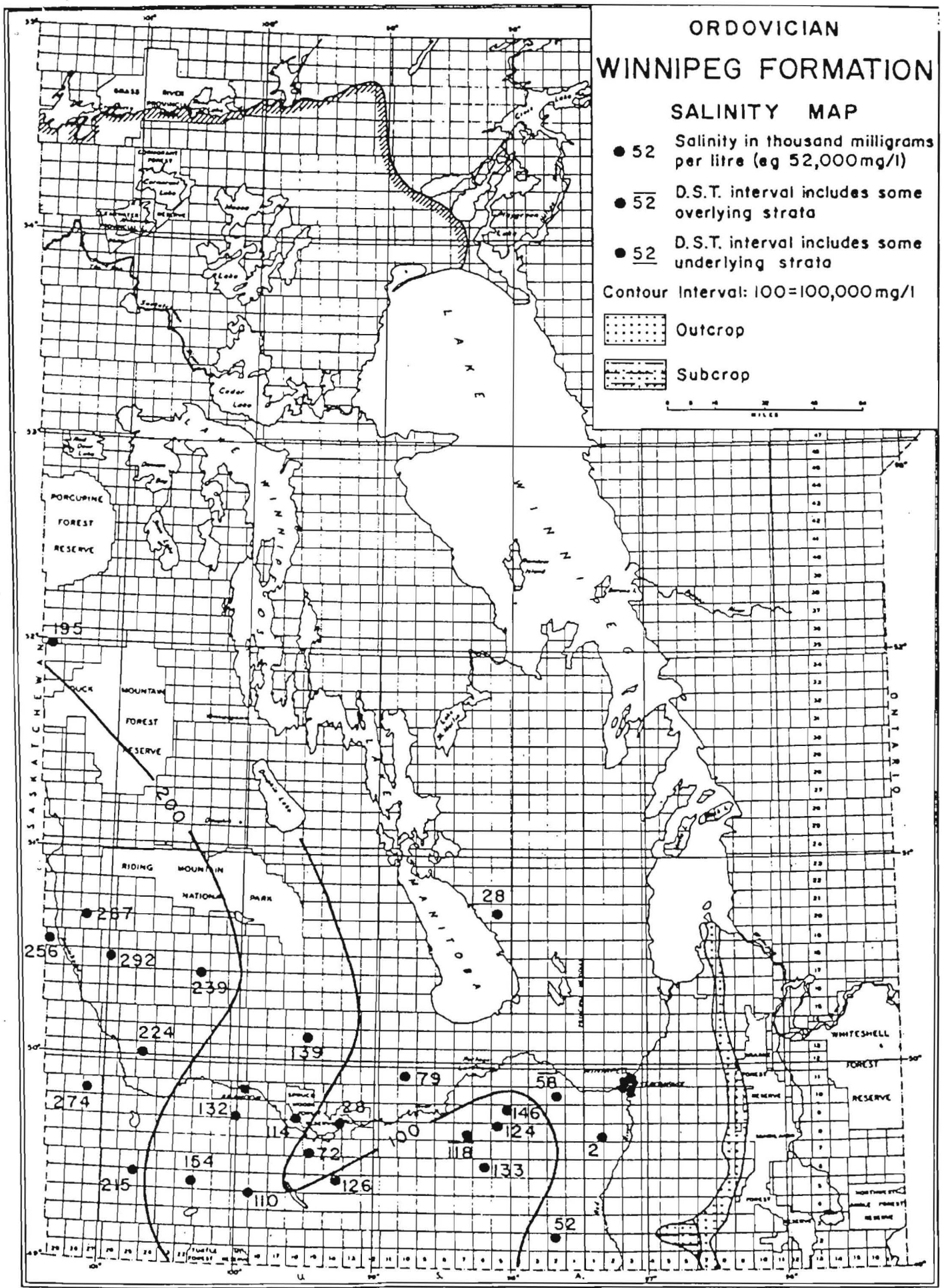
ORDOVICIAN WINNIPEG FORMATION

SALINITY MAP

- 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)
- 52 D.S.T. interval includes some overlying strata
- 52 D.S.T. interval includes some underlying strata

Contour Interval: 100=100,000mg/l

-  Outcrop
-  Subcrop



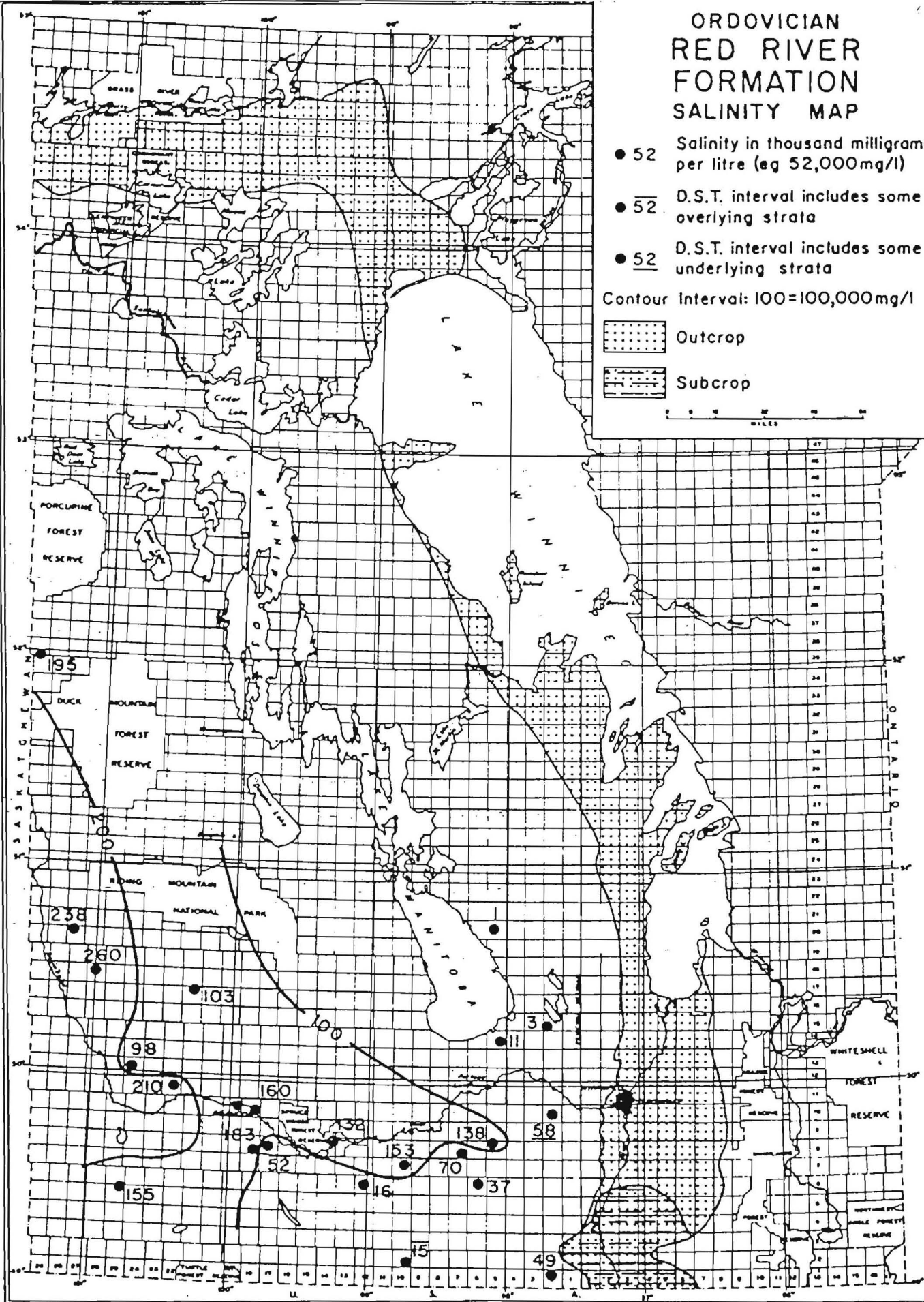
ORDOVICIAN RED RIVER FORMATION SALINITY MAP

- 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)
- 52 D.S.T. interval includes some overlying strata
- 52 D.S.T. interval includes some underlying strata

Contour Interval: 100=100,000mg/l

●●●●● Outcrop



▨▨▨▨▨ Subcrop

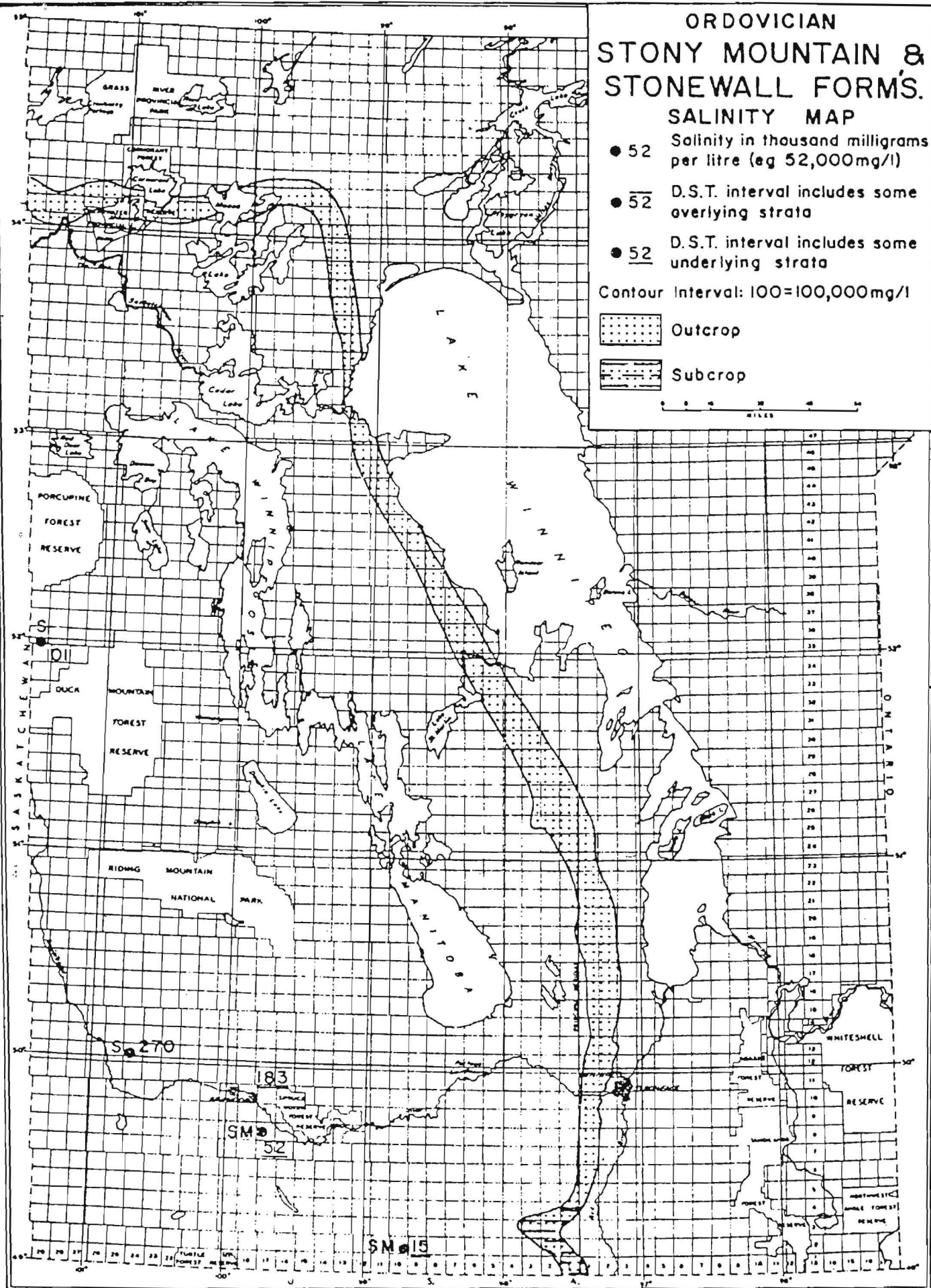


ORDOVICIAN STONY MOUNTAIN & STONEWALL FORMS. SALINITY MAP

- 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)
- 52 D.S.T. interval includes some overlying strata
- 52 D.S.T. interval includes some underlying strata

Contour Interval: 100=100,000mg/l



 Outcrop
 Subcrop

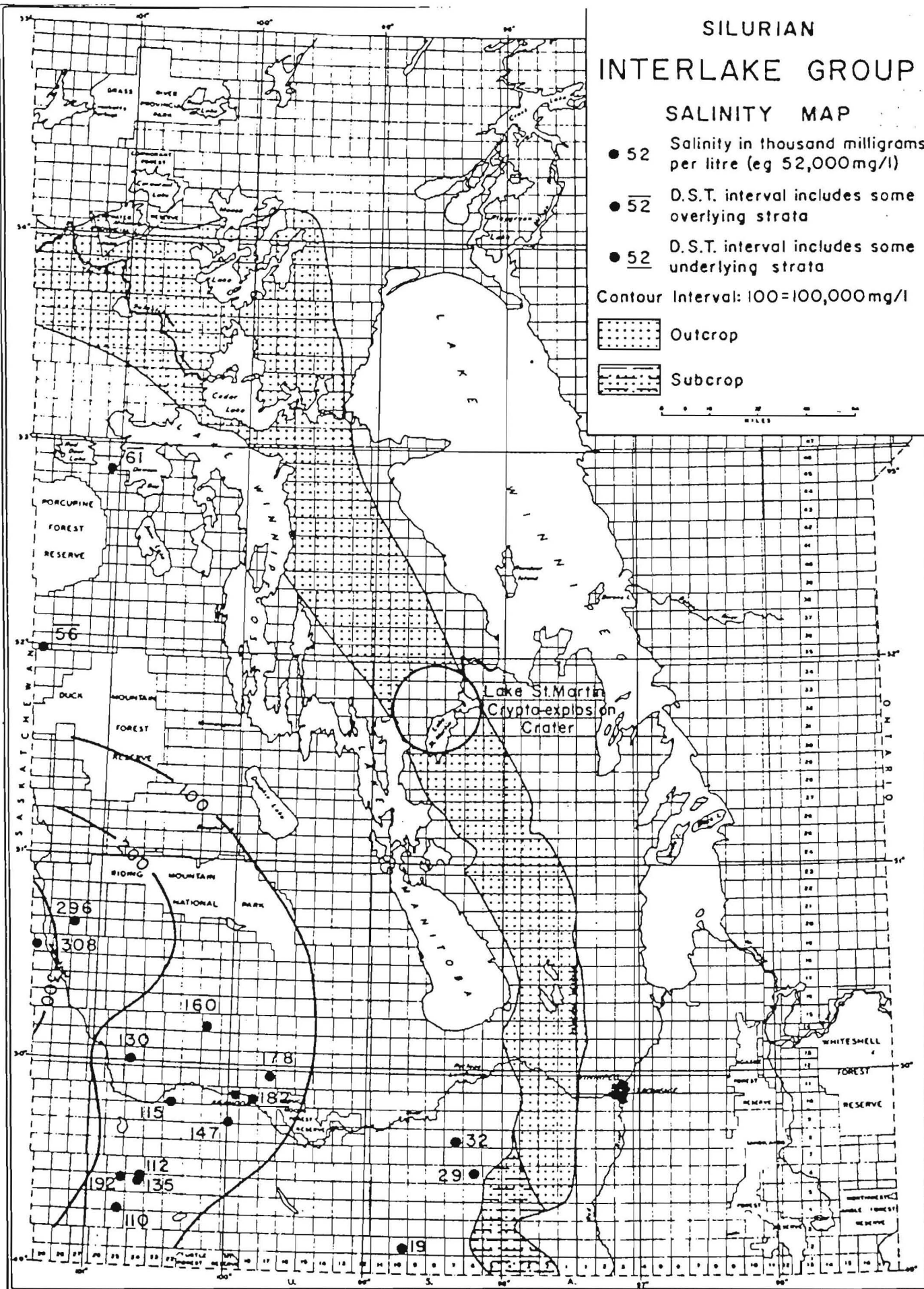
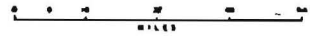


SILURIAN INTERLAKE GROUP

SALINITY MAP

- 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)
 - 52 D.S.T. interval includes some overlying strata
 - 52 D.S.T. interval includes some underlying strata
- Contour Interval: 100=100,000mg/l



-  Outcrop
-  Subcrop

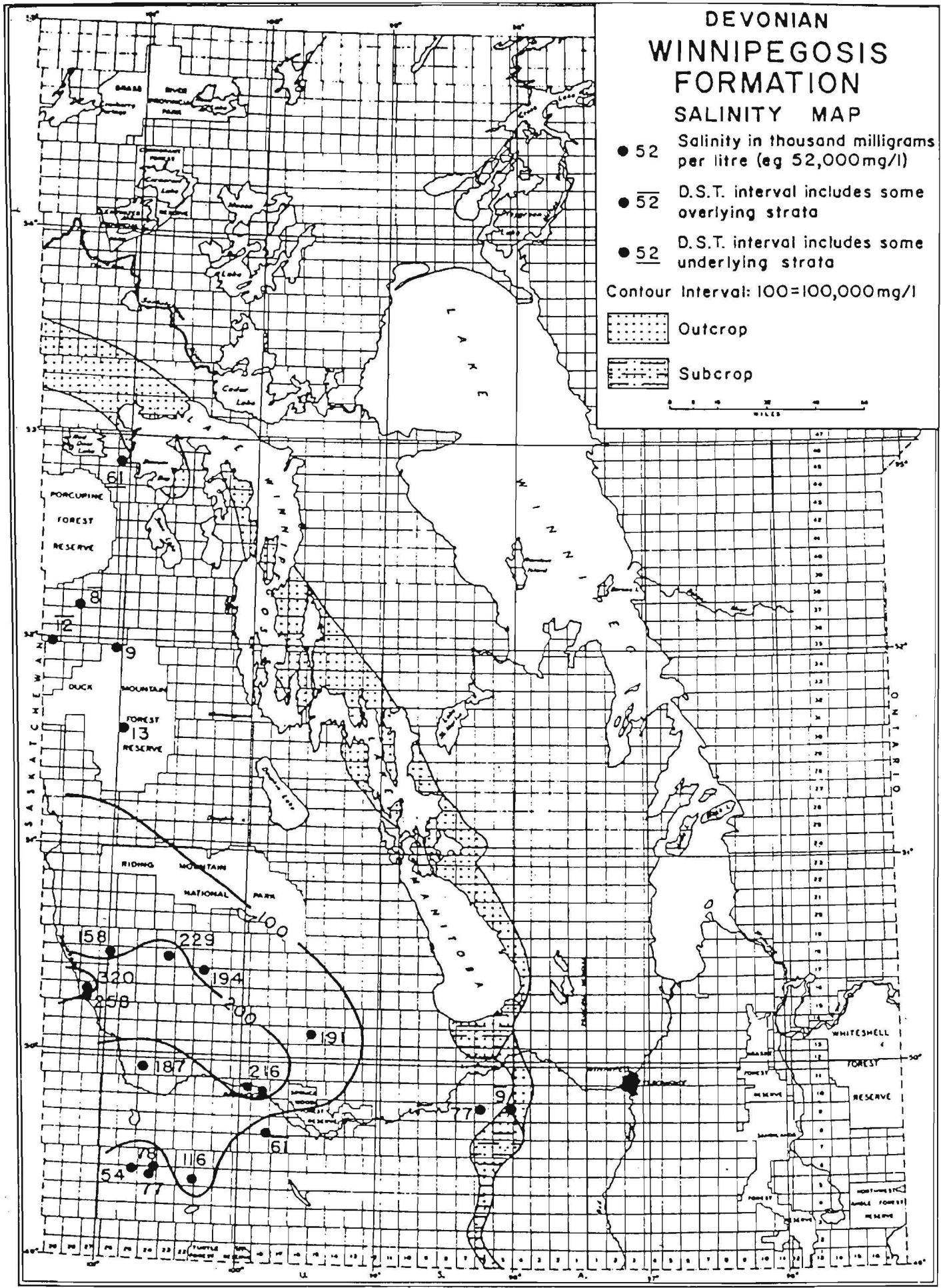


DEVONIAN WINNIPEGOSIS FORMATION SALINITY MAP

- 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)
- 52 D.S.T. interval includes some overlying strata
- 52 D.S.T. interval includes some underlying strata

Contour Interval: 100=100,000mg/l



-  Outcrop
-  Subcrop

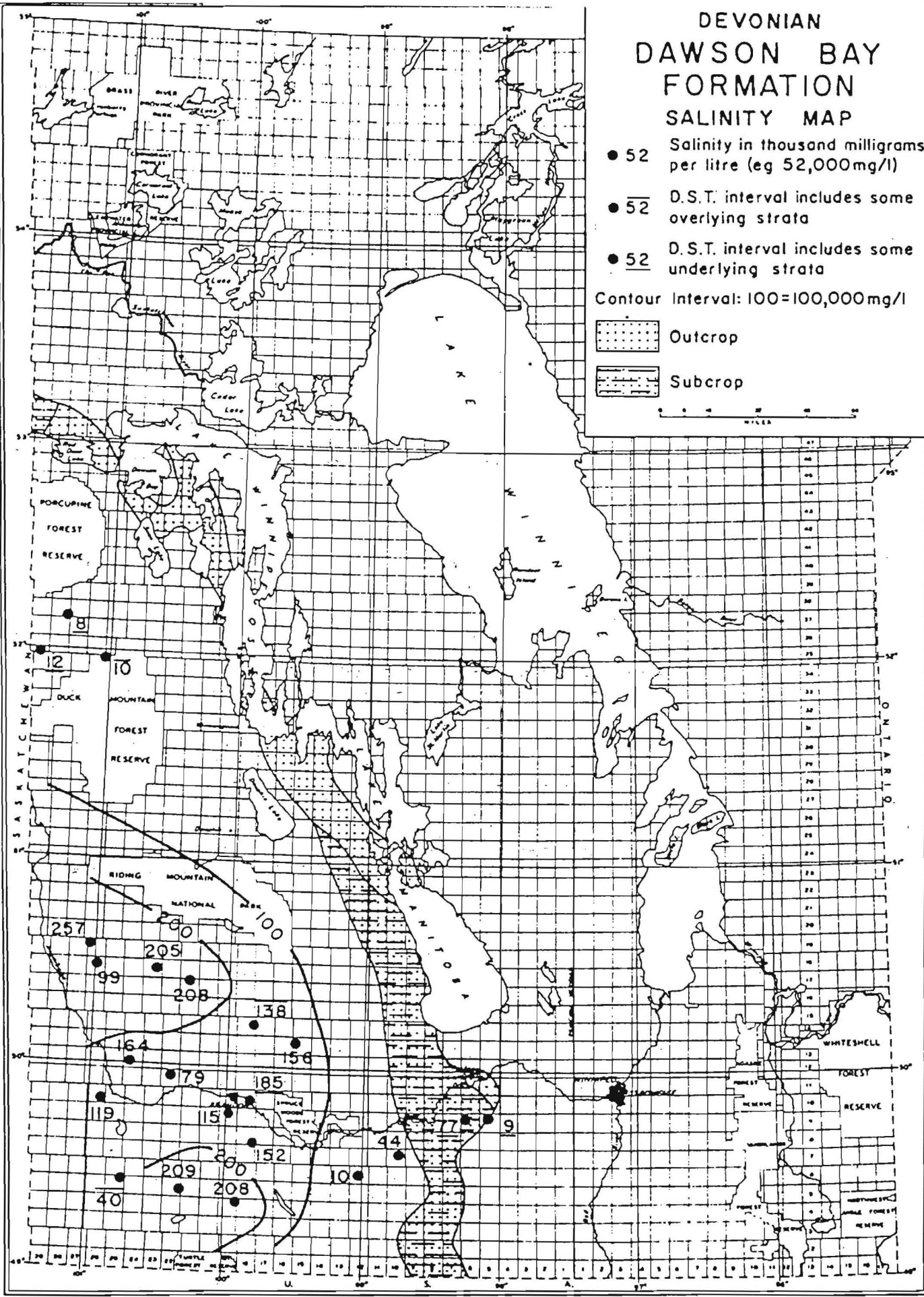


DEVONIAN DAWSON BAY FORMATION SALINITY MAP

- 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)
- 52 D.S.T. interval includes some overlying strata
- 52 D.S.T. interval includes some underlying strata

Contour Interval: 100=100,000mg/l


-  Outcrop
-  Subcrop

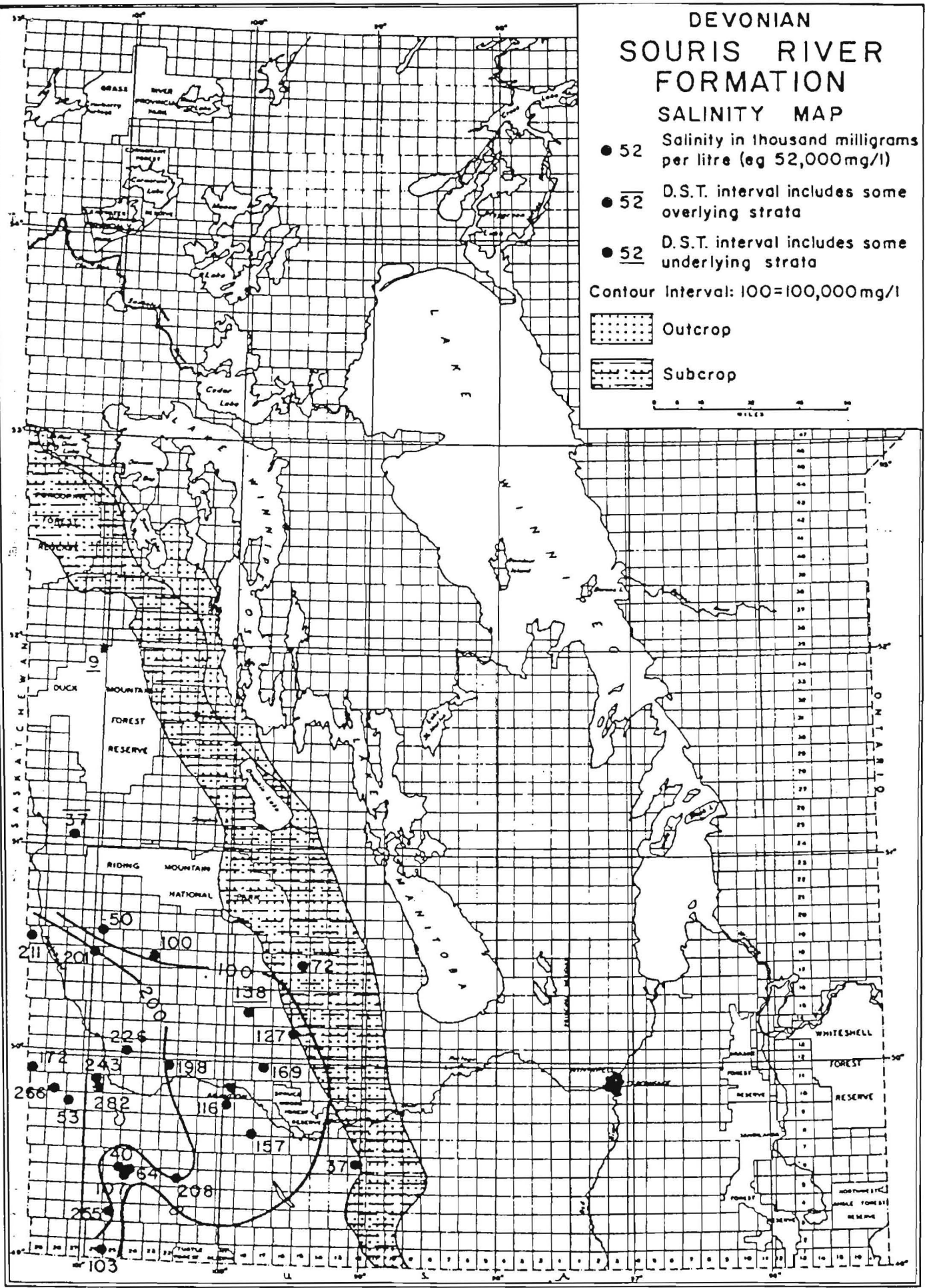


DEVONIAN SOURIS RIVER FORMATION SALINITY MAP

- 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)
- 52 D.S.T. interval includes some overlying strata
- 52 D.S.T. interval includes some underlying strata

Contour Interval: 100=100,000mg/l

-  Outcrop
-  Subcrop



DEVONIAN DUPEROW FORMATION

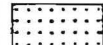
SALINITY MAP

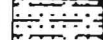
● 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)

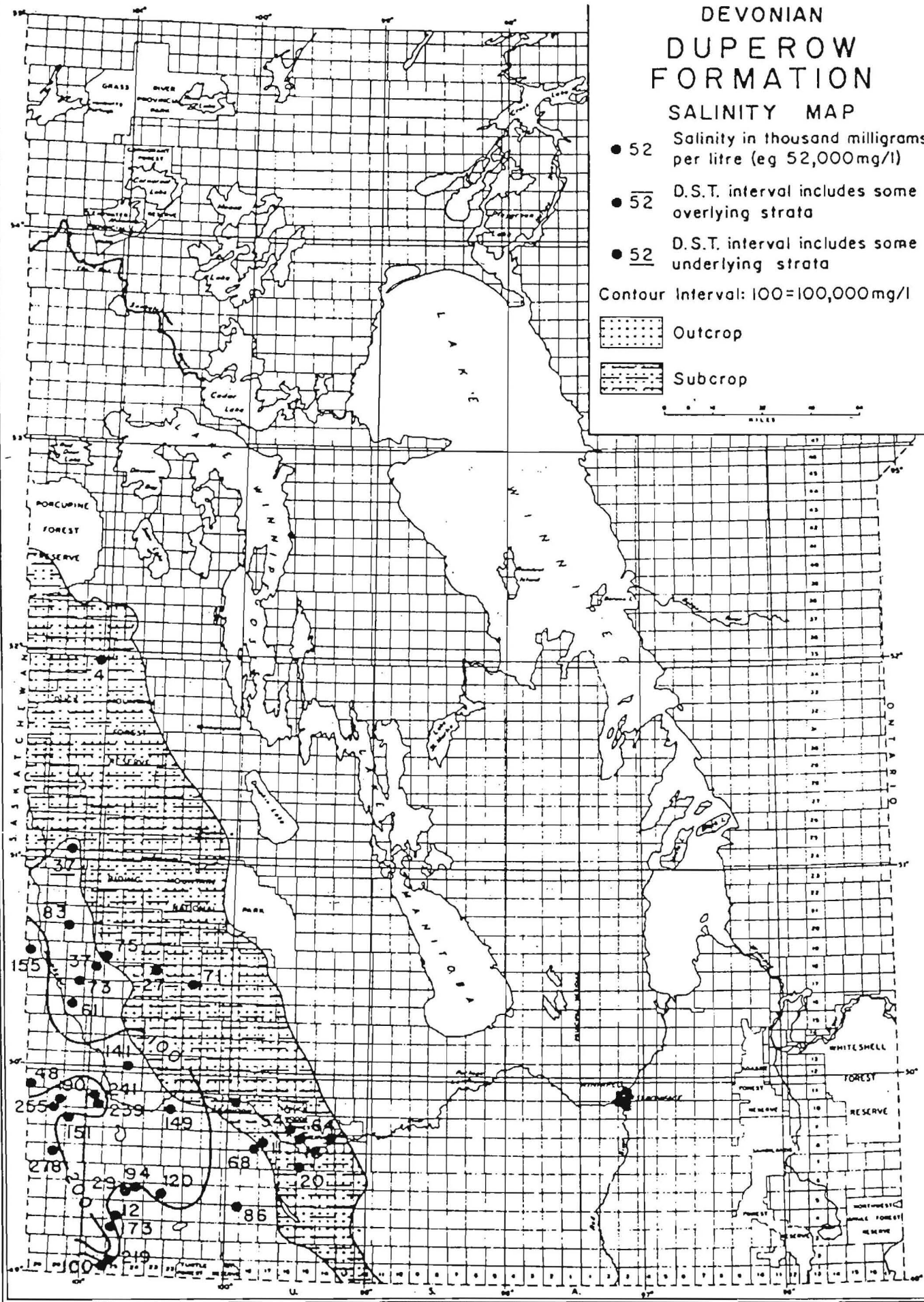
● 52 D.S.T. interval includes some overlying strata

● 52 D.S.T. interval includes some underlying strata

Contour Interval: 100=100,000mg/l

 Outcrop

 Subcrop



DEVONIAN NISKU FORMATION

SALINITY MAP

● 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)

● 52 D.S.T. interval includes some overlying strata

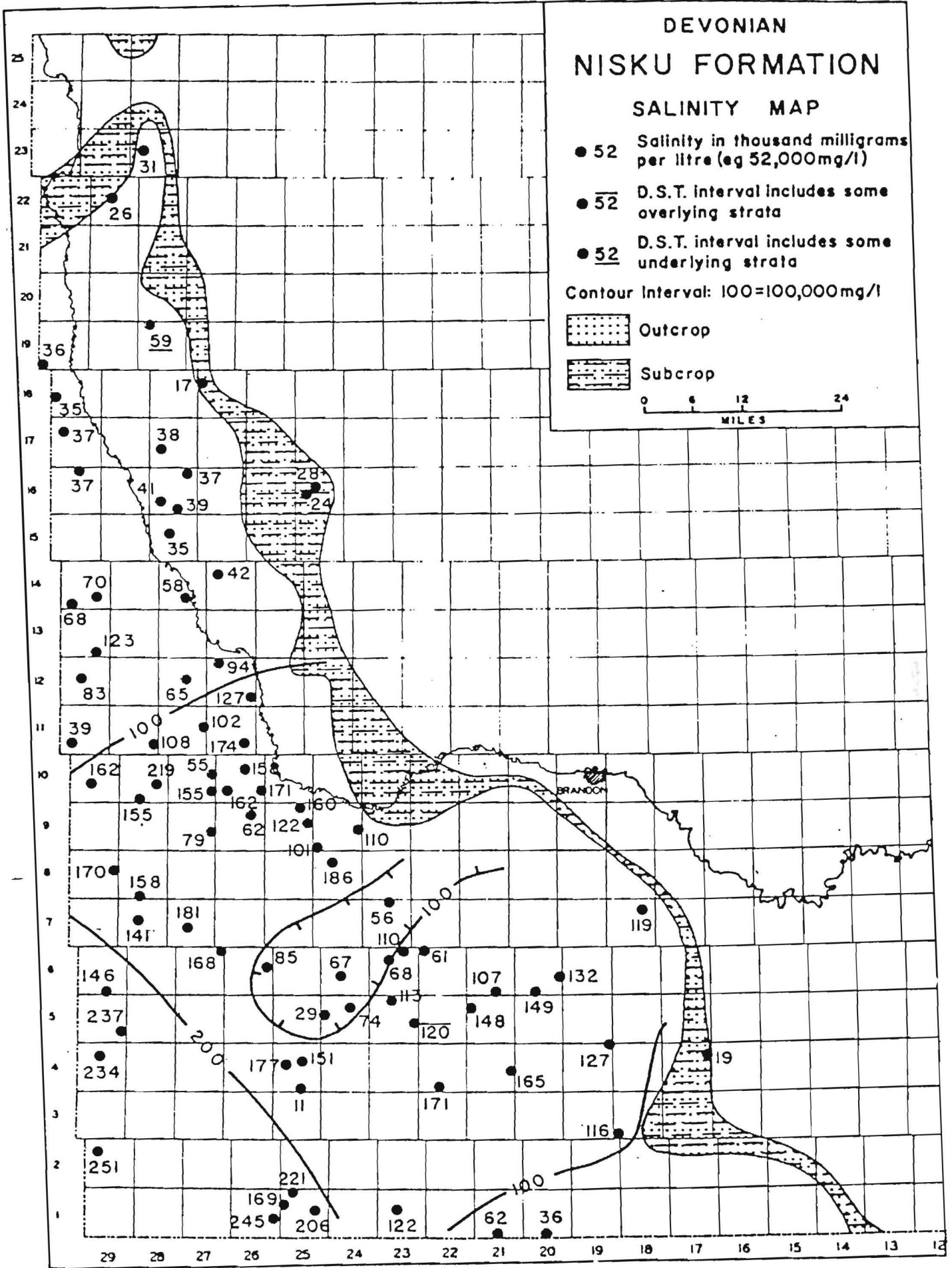
● 52 D.S.T. interval includes some underlying strata

Contour Interval: 100=100,000mg/l

▨ Outcrop

▨ Subcrop

0 6 12 24
MILES



DEVONIAN-MISSISSIPPIAN BAKKEN-LYLETON FORMATIONS

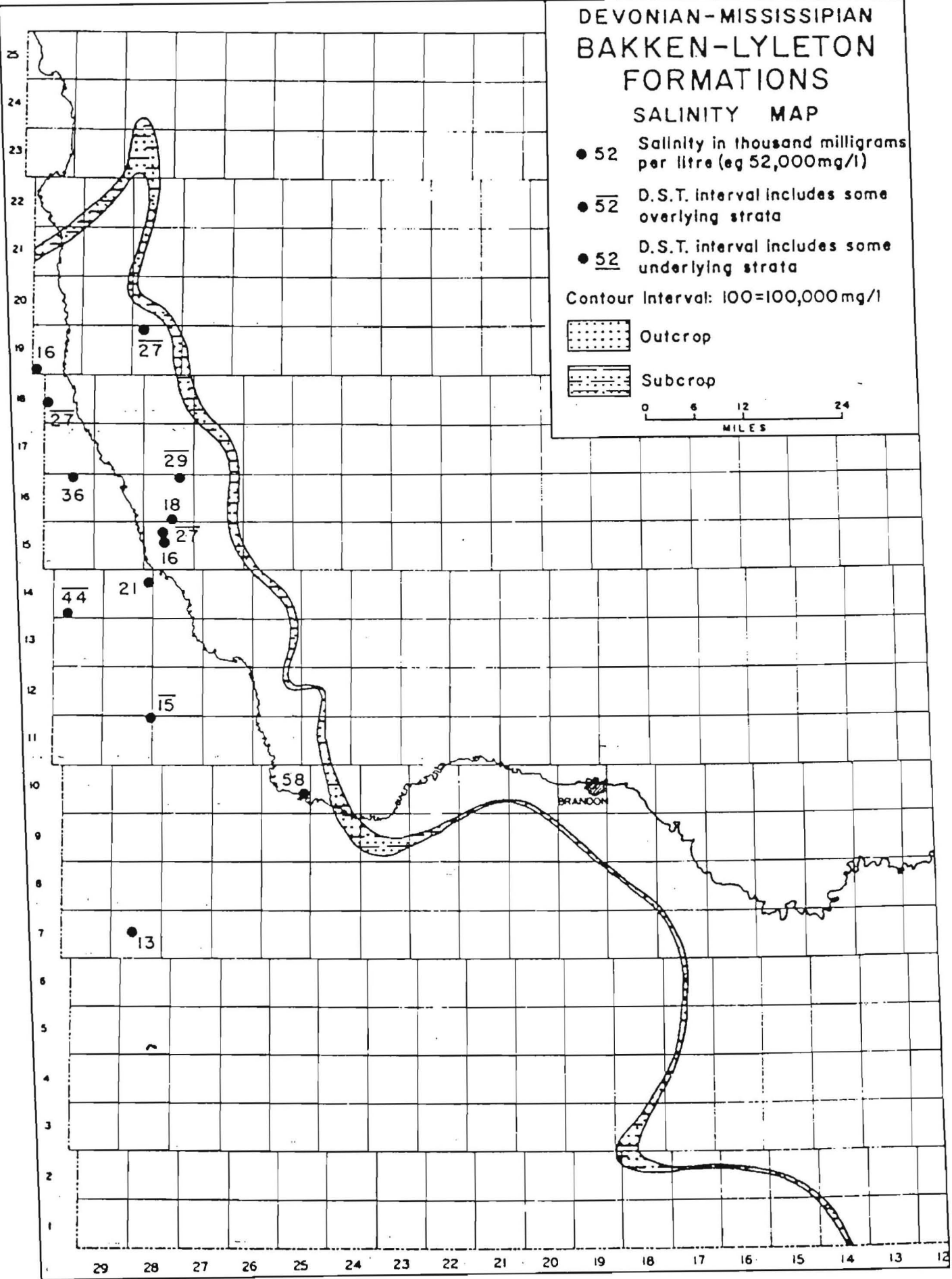
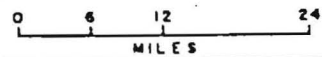
SALINITY MAP

- 52 Salinity in thousand milligrams per litre (eg 52,000mg/l)
- $\overline{52}$ D.S.T. interval includes some overlying strata
- $\underline{52}$ D.S.T. interval includes some underlying strata

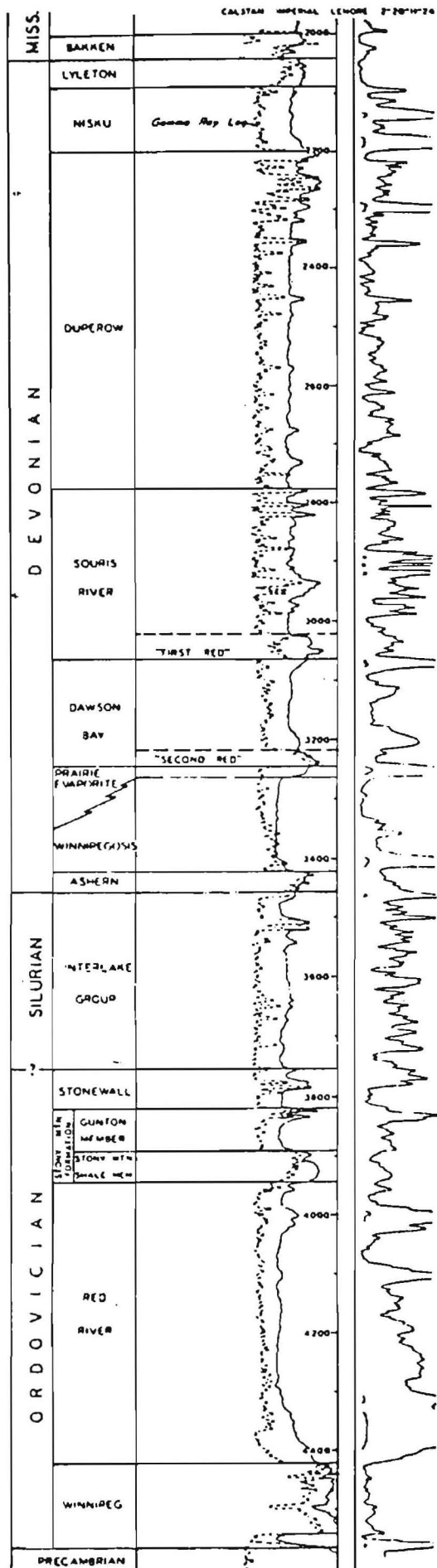
Contour Interval: 100=100,000mg/l

 Outcrop

 Subcrop



TYPICAL STRATIGRAPHIC SECTION
 LOWER PALAEOZOIC
 SOUTHWESTERN MANITOBA



Tops for the formations used in this table have been published in the "Table of Lower Palaeozoic Formation Tops", supplement to January 1, 1971, issued by the Manitoba Mines Branch.

The accompanying stratigraphic section shows the characteristic markers used to define formation tops in southwestern Manitoba. The formation names and boundaries, in general, agree with those picked by most oil companies, except for the marker at the top of the Souris River Formation. Many companies pick the top of the Souris River at the top of the shaly zone roughly 50 feet above the top shown in this figure. This higher marker correlates with the type section of the Souris River Formation as reported in the "Stratigraphy of the Williston Basin", published by the North Dakota Geological Society in April, 1954. (The Souris River has been omitted, accidentally, from the more recent "Lexicon of Geologic Names" published by the Alberta Society of Petroleum Geologists in 1960.) In the following table, the stratigraphically lower marker has been retained in order to correspond with the previously published data in the Schedule of Wells, and with the top of the Manitoba Group as originally defined by Baillie in Mines Branch Publication 52-5 (page 25, plate 3).

A Stratigraphic Map series is available from the Geological Division of the Manitoba Department of Mines, Resources and Environmental Management. These maps show the thicknesses and structure contour for most of the stratigraphic units listed in this table.

Note:

An appendix of supplementary data is included at the end of the table.

WILMINGTON FORMATION

Well Location	Depth	Specific Gravity at 60°F	Resistivity at (68°F)	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
12-8-1E	622-712 M	1.003	3.15	7.9	694	34	8	316	800	210	2,062
1-28-1-2N	1050-1075 B 1170-1206				17,176 17,158	1,782 1,650	581 457	3,543 4,552	28,662 27,297	85 104	51,829 51,218
13-36-4-1Y	4514-4540 M 4514-4540 B				38,718 38,099	3,171 3,183	499 496	4,113 4,114	63,693 62,662	98 207	110,292 108,795
1-27-5-14	3267-3292	1.089	0.076	6.8	43,425	3,712	1,188	3,954	74,000	175	126,365
5-13-5-22	5047-5061 T 5047-5061 M 5047-5061 B				49,328 51,814 53,759	4,849 6,370 4,315	1,121 883 1,323	2,878 2,915 2,472	85,530 91,597 92,506	488 159 146	144,194 153,738 154,521
9-35-5-25	5285-5380	1.146	0.057	6.6	76,405	5,656	1,065	1,608	129,750	60	214,514
9-22-6-6	1533-1563 T 1533-1563 M 1533-1563 B				36,629 41,198 47,905	2,886 3,619 3,218	346 494 497	4,709 4,471 4,065	58,840 67,757 77,948	512 573 146	103,921 118,112 133,779
13-5-7-15	3400-3456 T 3400-3456 B				22,415 20,678	4,454 4,587	512 482	4,289 4,251	40,642 37,913	244 634	72,556 68,545
7-32-8-5	1534-1560	1.089	0.09	5.5	42,213	4,386	969	2,216	74,000	115	123,841
6-11-8-7 (Red River)	1677-1702	1.084	0.09	6.0	41,587	2,706	819	4,742	67,750	135	117,670
8-36-8-14	2710-2722 2750-2765				7,062 7,857	1,380 1,422	625 707	3,585 3,650	12,313 13,733	342 464	25,307 27,833
5-26-9-5	1264-1288 B 1366-1396 M 1366-1396 B				44,965 48,852 49,177	4,763 5,802 5,793	1,004 1,068 1,068	2,294 2,085 2,075	78,858 87,168 87,654	232 49 61	132,116 145,024 145,768
10-2-9-16	3249-3264 M	1.075	0.07 @ 24°C	7.5	39,149	4,152	509	4,078	66,119	110	114,117
3-5-9-19	3928-3937	1.086	0.08	5.0	47,231	2,898	665	4,215	76,750	110	131,813
NE-15-10-2 (Red River)	828-907	1.043	0.144	7.5	19,711	2,147	308	3,370	32,500	200	58,134
15-18-10-27	5334-5368				94,600	6,098	718	10,050	162,600	10	274,076
2-16-11-10	2069-2094	1.0598	0.093 @ 77.8°F	7.5	25,815	3,433	716	3,308	45,500	122	78,924
3-17-12-24	4470-4511				80,435	5,708	738	2,212	134,652	61	223,806
3-9-13-15	2852-2879	1.099	0.07	5.5	49,700	3,395	602	3,881	81,500	110	139,132
8-34-16-21	3807-3852	1.157	0.052	6.0	87,326	4,344	946	2,847	143,000	85	238,505
1-27-17-26	4128-4154				110,458	2,873	845	2,806	175,307	104	292,393
15-18-18-29	4284-4310				94,355	4,282	817	2,657	153,470	110	255,691
16-32-19-27	4057-4073				99,321	3,777	866	2,669	160,385	85	267,103
14-17-20-5	1003-1072	1.022	0.62 @ 75°F	7.5	9,107	942	185	3,484	13,527	256	27,501
13-3-35-29 (Red River)	2355-2373	1.126	0.055	6.0	72,203	2,444	900	4,729	114,724	100	195,049

RED RIVER POPULATION

Well Location	Depth	Specific Gravity at 60°F	Resistivity at (68°F)	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	100%	Total Solids
1-28-1-24	500-535				16,282	1,632	457	4,307	26,084	122	48,882
16-11-2-10 (Stony Mt.n.)	2410-2450				4,077	873	207	3,146	5,366	427	14,596
9-35-5-25	4688-4760	1.108	0.069	7.1	54,383	4,446	885	3,510	91,500	425	154,933
9-22-6-6	1070-1100 (1) 1070-1100 (2)				8,127 12,581	1,431 1,324	280 139	4,560 4,788	12,238 18,441	482 305	27,118 37,578
13-16-6-12	2427-2474 2490-2505	1.006 1.015	2.2 0.63	6.5 6.5	398 4,130	633 1,083	501 377	2,558 3,570	1,250 6,625	100 220	5,389 15,893
16-22-7-10	2060-2100	1.119	0.062 @ 74°F	7.35	54,251	3,690	1,095	1,500	92,190	117	152,843
7-32-8-5	914-924 1040-1050 1413-1423	1.030 1.009 1.097	0.33 1.1 0.08	6.0 7.0 5.5	11,729 2,134 48,926	1,184 507 3,416	382 68 880	2,734 1,306 3,756	19,000 2,875 81,250	488 943 103	35,269 7,354 138,279
6-11-8-7 (Winnipeg)	1214-1250 1310-1361 1677-1702	1.053 1.036 1.084	0.13 0.3 0.09	8.0 8.0 6.0	24,258 14,622 41,587	1,759 1,506 2,706	444 33 819	4,872 5,512 4,742	38,125 21,100 67,750	110 185 135	69,549 42,901 117,670
8-36-8-14	2162-2226				45,524	3,893	1,004	3,947	77,098	146	131,552
10-17-8-17 (Stony Mt.n.)	2960-2990	1.043		6.4	15,384	2,366	1,283	4,213	28,375	300	51,769
3-1-8-18	3331-3345	1.119		6.0	64,678	4,702	1,223	2,701	109,557	100	182,910
ME15-10-2 (Winnipeg)	828-907	1.043		7.5	19,711	2,147	308	3,370	32,500	200	58,134
4-27-11-22	3448-3460	1.144	0.054	6.0	76,209	2,691	1,945	2,963	125,750	90	209,602
3-17-12-24	3880-3910 3960-4005				34,209 23,258	2,735 2,106	622 505	4,011 4,208	56,292 37,761	287 354	98,156 68,192
7-11-14-5	800-830 T 800-830 B				3,092 3,287	557 540	185 201	1,915 1,893	4,671 4,731	311 781	10,755 11,457
4-6-15-2	450-500 T 450-500 M 450-500 B 589-635 T 589-635 M 589-635 B 755-800 T 755-800 B	1.004 1.004 1.001 1.003 1.005 1.002 1.004 1.003	4.0 3.7 4.2 3.1 4.7 3.8 3.3 3.6	7.0 8.0 7.0 7.5 7.0 7.0 7.0	336 342 330 483 262 307 571 755	127 76 51 140 127 89 51 89	31 123 69 38 77 77 31 108	330 539 344 471 305 309 370 368	220 285 250 250 245 220 445 1,125	460 545 450 760 500 550 480 330	1,355 1,651 1,296 1,811 1,341 1,347 1,759 2,650
8-34-16-21	3530-3590	1.074	0.090	6.0	35,947	2,484	904	4,854	58,750	260	103,057
1-27-17-26	3734-3760				97,688	2,823	832	3,675	155,290	165	260,473
16-32-19-27	3628-3658				86,296	4,344	1,505	2,705	143,158	49	238,057
14-17-20-5	514-556 514-556	1.003 1.003	6.35 @ 74°F 6.1 @ 73.4°F	8.15 8.1	322 325	29 36	25 29	390 437	213 207	207 207	1,186 1,241
13-35-29 (Winnipeg)	2355-2373	1.126	0.055 @ 72°F	6.0	72,203	2,444	900	4,729	114,724	100	195,049

SIKONY MOUNTAIN FORMATION

Well Location	Depth	Specific Gravity at 60°F	Resistivity at (68°F)	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
16-11-2-10 (Red River)	2410-2450				4,077	873	207	3,146	5,866	427	14,595
10-17-8-17 (Red River)	2960-2990	1.043		6.4	15,384	2,366	1,283	4,213	28,375	300	51,769
3-17-12-24	3675-3700				100,593	3,692	962	2,538	162,569	92	270,445
13-3-35-29	1937-1967	1.073	0.079 @ 74°F	6.0	38,778	1,858	513	4,603	61,000	300	106,900
<u>STONEMALL FORMATION</u>											
16-11-2-10	2137-2195				5,599	1,078	228	3,643	8,310	360	19,218
5-3-4-25	4743-4745	1.084	0.080	6.7	38,909	2,924	631	2,346	64,900	690	110,050
7-27-5-24	3966-4000				47,560	3,640	800	3,460	79,420	290	135,170
16-33-5-24	3858-3876				39,750	2,475	669	4,240	64,200	294	111,628
9-35-5-25	4165-4240	1.129	0.062	6.8	68,638	4,100	1,380	2,729	115,000	245	191,968
9-22-6-6	790-840 H 790-840 B				7,870 9,397	1,001 1,155	22 204	6,253 5,089	8,335 13,042	573	23,481 29,460
6-11-8-7	936-983	1.027	0.4	6.8	10,186	1,425	194	3,760	16,000	30	31,587
3-5-9-19	3112-3126	1.009	0.07	5.5	52,599	2,981	1,004	4,030	86,250	200	116,962
13-4-10-22	3180-3200	1.080	0.088	7.2	40,997	2,620	660	5,086	66,000	85	115,405
7-26-11-17	2240-2265	1.127	0.054	7.2	63,396	4,125	1,140	1,950	106,850	132	177,593
3-17-12-24	3395-3440				45,445	3,599	971	2,732	77,220	104	130,071
2-7-14-20	3155-3195	1.110	0.062	7.2	57,461	3,310	960	3,060	94,860	224	159,915
16-18-18-29	3469-3505				116,779	2,236	983	3,285	184,406	195	307,884
16-32-19-27	3230-3295				112,015	2,375	829	3,747	176,521	183	295,670
13-3-35-29 (Ashern)	1580-1629	1.040	0.130 @ 78°F	7.0	19,194	1,529	500	4,048	30,566	350	56,009
<u>WINNIFEROSIS FORMATION</u>											
5-13-5-22	3773-3805 T 3773-3805 M 3773-3805 B				7,144 38,983 41,008	2,394 4,152 2,561	389 880 804	2,904 4,337 4,327	13,673 66,605 66,726	982 403 350	27,492 115,366 115,785
7-27-5-24	3658-3694				25,410	3,100	620	4,910	42,550	542	77,130
16-33-5-24	3680-3700				27,300	1,925	592	4,900	42,750	335	77,803
9-35-5-25	4041-4075	1.042	0.135	7.4	17,982	1,951	660	4,793	28,750	345	53,915
3-1-8-18 (Prairie Evap.)	2564-2578	1.040		6.5	20,492	2,022	535	3,980	33,558	402	60,782
5-26-9-5 (Dawson Bay)	338-368				3,359	10	4	4,660	889		9,922

MINNEAPOLIS FORMATION (continued)

Well Location	Depth	Specific Gravity at 60°F	Resistivity at 60°F	Na & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
8-20-9-6 (Dawson Bay)	560-620	1.049	0.148 @ 77°F	27,843	1,600	228	4,600	43,000	52	77,323
2-20-11-24	3263-3293 T 3261-3291 M 3263-3293 B	1.084 1.123 1.125	0.099 0.069 0.071	41,507 64,651 67,481	3,609 3,705 3,561	827 1,827 1,068	4,672 4,043 4,025	69,250 108,500 110,500	220 220 165	119,773 182,834 186,736
3-19-13-15	1675-1695	1.131	0.06	68,499	4,244	1,155	2,998	114,250	135	191,212
10-8-15-27	3256-3285 M			154,076	3,094	96,308	439	3,476		258,379
9-21-15-27	3271-3301 T 3271-3301 M 3271-3301 B			121,773 98,565 98,106	2,184 3,005 2,932	764 1,158 1,144	4,358 3,422 3,146	190,472 158,080 157,473	390 201 85	319,841 264,431 262,886
8-34-16-21	2698-2714	1.132	0.060	70,663	3,333	1,079	3,643	115,250	185	194,059
6-23-17-23	2704-2726	1.151	0.061	84,803	2,567	1,293	3,464	136,500	120	228,686
1-27-17-26	3096-3109			57,895	2,523	745	4,839	92,203	275	154,480
16-18-30-25	2277-2327	1.012		4,531	347	117	1,333	6,804	270	13,265
16-35-34-26	1707-1727	1.007	0.795	3,211	170	44	829	4,550	380	8,991
13-3-35-29 (Dawson Bay)	1241-1277	1.007	0.524 @ 78°F	4,078	212	88	1,212	5,719	525	11,567
9-1-37-28 (Dawson Bay)	837-890	1.005	1.0 @ 72°F	3,352	49	25	838	316	1,550	8,298

DAWSON BAY FORMATION

13-36-4-19	3103-3123			77,095	2,905	917	4,192	123,140	238	208,487
5-13-5-22	3585-3639 T 3585-3639 B			74,470 78,103	4,725 3,989	1,585 912	2,839 2,573	125,687 128,235	116 91	209,422 213,900
9-35-5-25 (Souris River)	3811-3851	1.032	0.22	11,757	1,754	1,110	4,336	21,000	475	40,191
13-16-6-12	1735-1765	1.011	0.99	2,104	847	364	3,398	3,125	300	9,986
16-22-7-10	1410-1496	1.039	0.163 @ 74°	14,707	1,930	214	2,500	24,780	154	44,285
3-1-8-18	2390-2408	1.100		54,902	2,751	970	4,657	88,830	135	152,176
5-26-9-5 (Winnipegosis)	338-368			3,359	10	4	4,660	889		8,922
8-20-9-6 (Winnipegosis)	560-620	1.049	0.148 @ 77°F	27,843	1,600	228	4,600	43,000	52	77,323
16-27-9-19	2296-2315			40,847	2,503	680	4,665	65,816	268	114,779
3-11-10-26	3338-3370 T 3338-3370 M 3338-3370 B			18,966 38,634 38,203	2,892 3,513 2,940	1,653 2,494 2,538	4,359 4,682 4,657	35,750 69,500 68,000	390 220 165	63,812 118,931 116,419
4-27-11-22	2593-2604	1.061	0.11	27,142	2,339	665	4,253	44,500	530	79,160
3-17-12-24	3010-3035			58,192	3,969	1,101	3,342	97,359	287	164,250
3-19-13-15	1480-1492	1.106	0.06	56,664	2,815	703	5,256	90,500	105	155,990
16-26-14-18 (Souris River)	2124-2154 B	1.095	0.077	48,232	2,960	1,495	4,290	80,750	110	137,796
8-34-16-21	2500-2535	1.141	0.059	76,908	2,546	1,042	4,588	122,750	75	207,871

DAWSON LAKE EXPANSION (continued)

Well Location	Depth	Specific Gravity at 60°F	Reactivity at 68°F	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
5-23-17-23	2512-2524	1.143	0.064	5.0	75,770	2,318	1,155	4,492	121,000	60	204,765
1-27-17-26	2864-2879				34,690	2,094	782	5,516	55,201	378	98,661
4-30-18-26	2807-2823				96,615	2,510	847	3,732	153,106	122	256,932
16-35-34-26 (Souris River)	1527-1552	1.006	0.717	8.1	3,636	100	47	879	4,800	915	9,864
13-3-35-29 (Winnipegosis)	1580-1629	1.007	0.52 @ 78°F	7.5	4,078	212	88	1,212	5,719	525	11,567
9-1-37-28 (Winnipegosis)	837-890	1.005	1.15 @ 72°F	10.1	3,352	49	25	838	316	1,550	8,298
SOURIS RIVER FORMATION											
9-13-1-26	4582-4602	1.066	0.081 @ 69°F	7.7	33,525	5,145	847	2,307	61,352	360	103,353
5-13-5-22	3167-3379 T 3367-3379 M				32,901 66,945	8,199 11,613	740 1,300	2,454 1,724	65,088 126,172	897 281	110,279 208,035
1-19-5-24	3736-3756				37,180	3,326	682	3,762	62,176	464	107,590
1-29-5-24	3540-3576	1.046		6.65	20,999	2,486	661	3,647	35,486	903	64,182
9-35-5-25 (Dawson Bay)	3811-3851	1.032	0.22	7.7	11,757	1,754	1,110	4,336	21,000	475	40,191
13-16-6-12	1605-1640	1.031	0.38	6.8	11,569	1,448	592	4,409	18,750	225	36,879
3-1-8-18	2301-2307	1.102		6.0	57,117	2,930	699	4,658	91,791	100	157,244
16-27-9-19	2201-2212				41,193	2,524	655	4,528	66,423	236	115,579
5-18-9-27	3628-3646				17,509	1,193	769	6,055	26,622	443	52,366
3-11-10-26	3250-3282 T 3250-3282 M 3250-3282 B				46,600 79,889 83,008	3,179 3,800 4,087	1,856 3,002 2,161	4,842 3,288 3,114	79,250 136,250 139,250	165 55 49	135,808 226,236 281,644
7-27-10-26	3236-3270		0.052	4.5	89,476	3,659	1,236	2,798	146,000	61	243,199
12-4-10-28	3556-3608 3724-3760	1.040 1.167	0.164 0.057	7.5 6.5	18,198 94,249	100 7,296	11 1,380	4,015 1,803	25,073 160,866	395 90	47,591 265,638
7-26-11-17	1740-1755	1.122	0.055	7.15	61,701	2,865	950	3,000	100,720	80	169,316
4-27-11-22	2484-2499	1.134	0.056	5.0	73,255	2,505	866	4,624	116,500	80	197,789
7-8-11-29	3792-3807	1.110		6.0	62,148	3,087	1,144	4,025	101,558	155	172,038
3-17-12-24	2995-2945				32,292	4,320	1,087	2,804	135,636	67	226,206
3-19-13-15	1380-1392	1.092	0.08	5.5	45,702	2,153	879	5,822	72,500	130	127,120
16-26-14-18	2055-2075 B (Dawson Bay)	1.040 1.095	0.16 0.077	6.0 6.5	16,750 48,232	1,748 2,960	514 1,495	4,148 4,290	27,250 80,750	205 110	50,511 137,796
16-11-17-15	890-915	1.055	0.133 @ 66°F	7.9	24,918	2,190	425	2,850	41,300	224	71,907
6-23-17-23	2396-2420	1.080	0.095	6.0	35,718	2,132	527	5,126	56,500	215	100,109
1-27-17-26	2746-2775				74,309	2,594	1,022	4,303	118,894	201	201,323
4-30-18-26	2710-2722				16,570	1,677	472	4,510	26,296	476	50,001

Well Location	Depth	Specific Gravity at 60°F	Resistivity at (68°F)	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
6-18-18-29	2499-2517 2631-2680				74, 111 49, 996	6,022 2,690	1,404 586	3,038 4,706	126,779 72,185	92 366	211,456 130,529
13-4-24-27 (Duperow)	2050-2065				11,781	1,308	568	4,685	18,410	470	37,222
16-35-34-26 (Lawson Bay)	1527-1552	1.006	0.717	8.1	3,636	100	47	879	4,800	815	9,854
DUPEROW FORMATION											
1-30-1-25	3966-4041	1.034	0.35	7.0	11,046	2,210	314	4,593	17,875	1,036	36,548
9-13-1-26	4290-4324	1.064	0.087 @ 69°F	7.7	32,852	4,416	858	2,596	58,858	335	99,745
13-36-4-19	2395-2415				28,876	2,739	1,022	4,063	49,134	464	86,298
5-3-4-25	3512-3514	1.014	0.671	7.4	3,682	677	210	3,712	3,200	1,720	12,328
18-13-5-23 (Misku-Lyleton)	2793-2914	1.086	0.11	6.0	41,903	3,314	838	3,805	70,000	238	119,977
1-19-5-24	3127-3182				7,763	2,402	468	4,223	14,316	268	29,440
7-27-5-24	3143-3159				32,340	2,720	780	4,700	53,360	230	94,130
13-5-7-15	1598-1629 T 1598-1629 B				4,507 5,165	1,339 1,292	394 574	3,359 3,466	7,764 9,099	390 464	17,753 20,062
2-21-7-28	3384-3396 3589-3605 3701-3717 3771-3787	1.178 1.032 1.174		7.1 7.7 7.0	93,846 13,694 95,233	10,505 1,908 7,975	2,481 520 1,988	933 3,073 1,188	3,751 169,764 23,441 165,816	110 510 85	277,583 42,887 272,242
8-36-8-14	1108-1122 T 1108-1122 M 1108-1122 B				17,656 13,568 12,535	4,578 4,057 3,759	1,334 974 788	3,192 2,984 2,883	36,759 28,571 25,932	171 305 390	63,690 50,459 46,287
4-33-8-15	1331-1426	1.016	0.56	6.0	5,317	1,118	254	3,128	8,500	196	18,416
10-17-8-17	1628-1648	1.016	0.990	6.8	1,215	1,076	928	3,753	3,500	370	10,454
3-1-8-18	1698-1723	1.042		6.5	21,992	2,587	1,020	2,512	39,480	215	67,697
13-11-9-16	1360-1410 1410-1455	1.034 1.046	0.21 0.15	6.8 6.8	11,106 16,534	2,064 2,928	698 851	3,631 3,307	20,000 30,625	240 175	37,617 54,331
5-18-9-27	3029-3054 3130-3174	1.098 1.036		6.0 7.0	54,779 17,509	2,594 1,193	788 769	4,321 6,055	87,754 26,622	695 443	150,578 52,366
13-4-10-22	2198-2363	1.103	0.074	7.0	49,118	5,022	2,508	2,558	90,000	135	149,272
3-11-10-26	2790-2776 T 2750-2776 M 2750-2776 B			5.5 5.5 6.8	65,283 65,464 83,062	5,617 2,276 6,357	2,378 2,276 2,509	2,519 2,534 1,841	115,900 115,500 145,250	370 390 440	151,479 151,666 239,087
7-27-10-26	2630-2665 2765-2800			5.0 4.5	72,380 84,954	3,291 5,781	1,115 2,104	3,707 1,858	118,500 146,000	125 66	199,255 240,730
12-4-10-28	3245-3281	1.164	0.060	7.0	89,893	6,384	2,208	1,860	154,908	90	255,297
8-14-10-28	3113-3125			5.6	58,247	2,686	1,453	4,722	95,000	610	162,128
4-27-11-22	2210-2225	1.130	0.057	5.0	64,972	5,506	2,221	2,570	114,500	75	129,804
7-8-11-29	3315-3330 3378-3406	1.030 1.030		7.0 7.0	15,601 14,105	1,258 1,179	843 860	6,087 5,939	23,910 21,692	575 455	47,982 43,777

DUFEKX FORMATION (cont'd)

Well Location	Depth	Specific Gravity at 60°F	Resistivity at (68°F)	pH at 75°F	Ma & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
3-17-12-24	2280-2301 2341-2370 2325-2365 2620-2660				48,819 26,332 31,458 29,107	3,989 3,040 3,175 3,063	1,172 778 776	3,497 3,957 3,877 3,839	83,104 44,888 53,381 50,045	159 342 262 291	110,710 79,219 92,943 87,411
9-21-15-27	2372-2405 T 2372-2405 M				10,212 20,761	1,235 1,662	325 536	4,041 4,712	15,529 32,878	503 244	31,963 60,817
8-34-16-21	1871-1890 1890-1949	1.055	0.12	6.0	4,801 24,076	1,107 2,474	107 565	3,270 4,691	7,125 39,625	222 135	16,528 71,497
14-35-16-27	2214-2235	1.054	0.12	6.4	25,060	1,944	573	5,165	39,750	355	72,667
6-23-17-23	1930-1954	1.026	0.49	6.0	8,423	1,242	326	3,861	12,750	735	27,062
1-27-17-26	2297-2323 2445-2468				11,156 11,619	1,244 1,315	533 559	4,927 4,988	17,136 17,894	427 519	35,423 36,894
2-7-18-25	1930-1997 T 1930-1997 M 2003-2020 B	1.033 1.0546 1.0296	0.165 @ 80°F 0.115 @ 80°F 0.180 @ 80°F	7.2 7.3 7.45	15,792 25,725 13,594	1,501 1,701 1,413	548 832 449	4,914 5,908 4,716	24,477 40,642 20,928	860 164.7 622	48,092 74,972 11,722
16-18-18-29	2221-2236				56,375	2,597	848	4,849	90,383	104	155,156
16-32-19-27 (Niaku)	1840-1926 1932-2070				20,694 29,496	1,461 2,041	328 188	4,101 4,253	32,384 46,466	61	59,010 82,517
13-4-24-27 (Souris River)	1722-1741 2050-2065				10,391 11,781	1,192 1,308	513 568	4,195 4,685	16,287 18,410	427 470	33,005 37,222
16-35-34-26	1173-1185	1.002		9.1	1,586	39	3	623	1,745	330	4,267

NISKU FORMATION

16-4-1-20	3554-3580	1.031	0.32	6.4	11,602	1,756	286	3,731	19,000	242	36,448
16-4-1-21	3736-3746				20,270	2,470	600	3,850	33,950	1,030	62,120
10-21-1-23	4042-4082				40,061	5,153	1,197	2,582	71,882	1,241	121,936
10-23-1-25	2988-2998 3836-3861	1.1107 1.1418	0.057 @ 75°F 0.047 @ 75°F	6.20 5.70	57,118 71,912	3,390 4,121	1,129 2,704	3,487 1,617	94,714 125,414	122 59	159,960 206,007
1-30-1-25	3860-3896	1.116	0.08	6.0	57,224	6,630	1,201	2,521	101,500	242	169,198
3-32-1-25	3907-3944				73,676	9,860	1,432	1,527	134,059	146	220,700
9-13-1-26	3947-3963	1.152	0.505 @ 69°F	6.9	81,382	10,734	2,027	919	149,640	110	244,756
2-29-2-29	4360-4375				71,354	18,273	4,854	805	155,896	134	251,316
9-6-3-18	2540-2570			7.7	40,606	2,930	990	3,997	67,636	159	116,318

WISKEY EXHAUSTION (continued)

Well Location	Depth	Gravity at 60°F	Resistivity at 68°F	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
16-25-4-217	1895-1930		0.430	6.4	5,264	1,159	281	3,490	8,120	310	18,565
13-36-4-19	2288-2320 H 2288-2320 K				44,555 42,546	2,919 2,886	1,108 1,040	4,516 4,449	73,701 70,366	146 201	126,945 121,488
4-13-4-21	2730-2745				56,317	5,342	1,659	2,959	98,876	286	155,349
4-4-4-22	3040-3060				58,318	5,746	1,547	2,296	102,819	207	170,933
5-3-4-25	3305-3307	1.011	0.738	7.2	2,931	841	146	3,679	3,100	1,070	11,224
8-20-4-25	3280-3335 T 3280-3335 M 3280-3335 B				35,627 56,276	2,510 2,866	608 854	4,504 4,030	57,506 91,293 97,663	573 165	101,328 155,484 176,970
3-22-4-25	3239-3312	1.04	0.06 @ 76°	7.1	53,688	3,395	933	3,880	88,564	134	150,594
4-28-4-29	4015-4060		0.08	6.0	75,839	13,252	1,078	1,551	142,250	315	234,125
3-30-5-21	2560-2606 T 2560-2606 H 2560-2606 B				35,364 40,392 51,501	3,405 3,622 3,991	952 1,059 1,249	3,592 3,513 3,457	60,053 89,152 87,350	1,110 95 415	104,476 117,833 147,963
15-13-5-23 (Duperon-Lyleton)	2793-2914	1.059	0.11	6.0	41,903	3,314	838	3,805	70,000	238	119,977
5-33-5-23	2772-2808				40,316	3,081	168	4,286	64,906	73	112,730
1-19-5-24	2840-2862				8,473	2,131	101	4,495	13,830	281	29,311
7-27-5-24	2604-2626				25,200	2,360	610	4,960	40,950	360	74,440
5-12-5-29 (Lyleton)	3800-3901 T 3800-3901 B	1.157		5.0	50,597 78,077	7,541 11,273	1,897 1,815	1,950 1,223	95,236 144,750	378 40	157,369 237,158
6-4-6-20	2340-2367				51,896	3,949	1,371	3,675	88,260	104	149,255
2-13-6-20	2195-2220				45,656	3,751	1,120	3,735	77,523	79	131,864
16-3-6-21	2404-2430				36,518	2,965	1,117	4,331	61,570	110	106,611
1-31-6-22	2416-2452 T 2416-2452 B				20,393 20,304	2,047 2,035	578 571	4,198 4,104	33,515 33,363	287 329	61,028 60,706
12-28-6-23	2519-2541 T 2519-2541 H				22,875 19,314	1,933 1,880	654 616	5,101 4,941	36,699 31,114	250 262	67,512 58,127
1-33-6-23	2465-2479				38,371	2,765	817	4,544	62,904	323	109,736
14-16-6-24	2735-2762 T 2735-2762 B				19,195 22,897	1,641 1,889	493 611	4,640 4,901	30,239 36,547	488 476	56,696 67,321
12-24-6-26	2981-3007 T 2981-3007 H 2981-3007 B				29,336 25,741 14,701	1,996 2,033 1,762	830 789 415	5,294 5,040 3,964	47,012 41,431 23,172	482 775 1,556	84,950 75,809 45,570
6-36-6-27	3113-3158				57,492	6,072	1,073	2,280	100,695	366	167,998
4-3-6-29	3812-3827	1.100	0.081	7.3	50,015	4,410	1,586	2,829	87,384	120	146,283
5-26-7-18	1583-1648		0.079	7.4	41,946	2,643	1,118	4,181	69,500	98	119,436
16-34-7-24	2420-2447				18,916	1,692	455	4,204	30,027	329	55,541
2-16-7-27	3200-3210				62,745	5,253	1,468	2,647	108,338	116	180,567
2-21-7-28	3221-3237	1.096		7.5	46,663	5,496	1,734	2,323	84,882	225	141,209

NLSKU FORMATION (continued)

Well Location	Depth	Gravity at 60°F	Refractivity at (68°F)	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	KCO ₃	Total Solids
11-28-8-24	2315-2345	1.125	0.061	6.0	66,124	3,788	1,610	3,504	110,750	105	185,828
3-4-8-28	3164-3197	1.112	0.056 @ 75°F	7.1	55,163	4,197	1,262	3,620	93,416	122	157,780
5-24-8-29	3215-3250	1.119	0.052 @ 75°F	6.65	59,689	4,340	1,466	3,201	101,545	134	170,375
13-6-9-24	2397-2417 T 2397-2417 B				12,651 34,903	2,190 2,715	454 803	3,464 4,364	20,837 57,445	2,269 543	41,865 100,773
1-13-9-24	2193-2240				33,761	3,212	1,050	3,886	63,814	531	110,254
4-24-9-25	2431-2451 T 2431-2451 T 2431-2451 B				43,256 31,507 43,645	2,431 2,297 2,411	794 632 796	5,021 4,551 4,887	69,456 50,348 70,062	299 1,373 409	121,257 90,708 122,210
12-35-9-25	2408-2422 T 2408-2422 B				56,940 41,642	3,348 2,962	1,117 859	3,769 4,158	94,085 68,546	244 598	159,503 118,777
1-22-9-26	2508-2536 M				21,122	1,797	534	4,860	33,363	628	62,304
5-18-9-27	2777-2802	1.051		7.0	27,502	1,794	732	4,830	43,877	465	78,964
2-8-10-26	2526-2536 2526-2536	1.109 1.107	0.071 0.066	5.5 6.0	55,615 57,554	3,409 3,496	1,086 1,193	3,939 3,869	92,000 95,500	110 155	156,118 161,688
1-12-10-26	2392-2405				59,523	4,978	1,202	3,750	101,302	98	170,853
7-27-10-26	2395-2430			5.0	56,734	2,879	1,262	4,389	93,000	88	158,307
4-12-10-27	2580-2615 T 2580-2615 M				39,697 53,560	4,216 4,796	912 1,176	4,441 3,685	67,939 91,718	232 159	117,437 155,094
1-24-10-27	2565-2625 T				18,198	1,263	960	3,901	29,529	1,196	55,047
12-4-10-28	2884-2912	1.102	0.070	7.0	57,011	2,189	773	2,868	91,853	100	154,743
8-14-10-28	2718-2744	1.147	0.052	5.0	77,317	5,284	1,896	2,160	132,500	83	219,198
4-16-10-29	3051-3090 T 3051-3090 B				12,618 60,086	1,075 2,145	240 601	3,198 2,895	12,618 95,840	1,867 427	27,726 161,994
5-11-11-25	2309-2334	1.112	0.071	7.6	62,416	3,087	1,586	4,053	103,272	100	174,463
3-24-11-27	2492-2529				35,917	2,248	650	4,633	57,324	909	101,681
7-8-11-29	2918-2942	1.026		7.0	12,794	1,243	552	4,884	19,720	360	39,370
1-10-12-26	2266-2278 T 2266-2278 B				30,598 45,002	2,237 2,638	665 872	5,159 5,003	49,135 72,792	256 238	88,050 126,545
4-32-12-26	2324-2345 2325-2340 2325-2340				32,752 23,817 2,121	2,212 1,865 2,278	821 655 854	5,211 4,952 5,255	52,774 38,064 5,641	353 390 409	94,123 69,743 16,558
4-12-12-27	2300-2330				37,964	2,607	777	4,669	61,873	201	108,091
9-22-12-27	2232-2257	1.042	0.126 @ 69°F	7.6	23,127	1,715	69	5,648	34,117	530	65,237
5-21-12-24	2765-2790				28,802	2,060	627	4,860	46,162	256	82,767
11-2-13-24	2522-2555				42,998	3,304	841	4,780	70,972	207	123,102
1-29-14-24	1976-2000 T 1976-2000 B	1.0303 1.0310	0.169 @ 77°F 0.166 @ 77°F	7.05 7.01	13,605 13,699	1,253 1,314	591 576	6,127 576	20,079 20,545	551 517	42,206 42,448
15-10-14-27	1724-1744				19,067	1,857	730	4,153	31,422	580	57,809
14-5-14-29	2386-2398				23,664	1,273	541	6,723	35,274	134	67,621
9-11-14-29	2265-2290				24,070	1,555	716	6,783	36,851	183	70,158

MISCU FERRATION (continued)

Well Location	Depth	Gravity at 60°F	Reactivity at 68°F	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
7-21-15-27 (Lytleton)	1779-1798 T				7,711	1,306	332	3,070	12,108	1,373	25,900
	1779-1798 M				12,004	498	458	1,288	9,645		25,950
	1779-1798 S								19,047	1,225	34,555
4-17-16-24 (Jurassic)	1763-1808 B	1.0165	0.290 @ 75°F	7.65	7,974	538	231	2,772	11,389	234	23,752
	1730-1790 B	1.0203	0.225 @ 75°F	7.2	9,110	691	400	3,740	13,284	578	27,903
3-3-16-27	1825-1853 T			7.95	8,116	1,021	472	3,796	13,042	366	27,413
	1825-1853 B			7.95	12,271	1,237	579	4,494	17,798	2,804	35,145
9-8-16-27	1803-1844		0.210	6.3	13,251	1,347	552	4,695	20,645	560	40,766
14-33-16-27	1909-1942	1.029	0.34	6.8	11,833	1,249	580	5,064	18,125	505	37,100
12-34-16-29	1850-1860				11,645	1,329	493	4,307	18,198	641	36,613
15-17-17-27	1915-1938 T	1.018	0.65	6.8	6,137	1,231	602	4,424	9,875	450	22,491
	1915-1938 B	1.028	0.41	6.8	11,040	1,458	1,109	4,886	19,000	410	37,595
6-29-17-29 (Lytleton)	1768-1782 T	1.029	0.41	6.8	11,793	1,392	550	4,886	18,375	480	37,232
	1768-1782 B	1.029	0.41	6.8	11,908	1,392	522	4,855	18,500	470	37,408
4-30-18-26	1790-1810				4,864	1,038	235	3,789	7,018	299	17,273
16-18-18-29 (Lytleton)	1732-1756				11,198	1,333	493	4,355	17,591	350	35,390
16-32-19-27 (Lytleton) (Duperow)	1735-1754				11,396	1,232	538	4,465	17,761	27	35,837
	1840-1926				20,694	1,461	328	4,101	32,384		59,010
13-6-19-29	1732-1746	1.028	0.21	6.0	11,408	1,524	508	4,618	18,125		34,390
1-21-22-28	1630-1658	1.020		7.55	7,976	933	383	3,268	12,071	1,000	25,631
2-20-23-27	1541-1558	1.031		7.85	9,857	982	458	3,920	15,165	317	30,699
14-16-23-29	1559-1573	1.021		8.4	7,215	550	228	2,835	10,251	671	21,750

BARREN-LITTLE FORMATIONS

Well Location	Depth	Gravity at 60°F	Resistivity at (68°F)	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
2-21-7-28 (Lytleton)	3072-3088	1.096		6.95	3,681	799	135	3,647	4,442	600	12,999
3-13-10-25	1930-1949				21,213	1,171	204	290	35,071	244	58,153
12-36-11-28 (Lodgepole)	2545-2586				4,127	793	152	4,245	4,822	390	14,553
9-25-14-28	1835-1875 T 1835-1875 M 1835-1875 B		0.704 @ 75°F 0.208 @ 75°F 0.216 @ 75°F						4,998 20,686 19,471		
14-5-14-29 (Lodgepole)	2242-2264				14,133	1,351	647	4,556	22,444	439	43,582
9-21-15-27 (Lodgepole)	1692-1711 T 1692-1711 M 1692-1711 B								1,735 1,213 1,237		16,440 12,108 11,084
10-28-15-27 (Lodgepole)	1660-1705	1.0226	0.202 @ 81°F	8.23	9,545	280	365	125	15,727	630	26,734
3-3-16-27 (Lytleton)	1725-1750			7.9	6,109	402	264	1,723	9,281	604	18,483
14-35-16-27 (Lodgepole)	1790-1828	1.026	0.40	6.8	9,094	1,320	384	4,650	13,750	520	29,454
12-34-16-29	1700-1725 T 1700-1725 B				6,651 11,394	999 1,340	216 506	3,902 4,289	9,372 17,950	695 525	21,835 36,004
16-18-18-29 (Lodgepole)	1570-1614				8,534	1,041	357	3,459	13,244	427	27,062
16-32-19-27 (Lodgepole)	1610-1631				8,714	887	373	3,263	13,466	323	27,056
13-6-19-29	1583-1600	1.016	0.43	7.0	5,299	439	177	1,314	8,125	470	15,619

WATER ANALYSIS DATA TO DECEMBER, 1971

Well Location	Formation(s) Tested	Depth	Specific Gravity at 50°F	Resistivity at (58°F)	pH at 75°F	Na & K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
11-15-2-27	Misku	3951-3973	1.141	0.245 @ 30°F	7.2	69,404	2,268	284	5,110	107,974	183	185,223
11-20-3-25	Souris River	4200-4240 T	1.038	0.15 @ 30°F	8.3	15,245	2,256	127	5,221	23,960	77	45,888
		4200-4240 M	1.180	0.04 @ 30°F	6.85	81,964	12,805	2,782	806	156,503	85	254,945
		3709-3736	1.125	0.07 @ 80°F	7.6	64,353	2,434	230	6,286	99,482	134	172,919
16-10-10-18	Dawson Bay-Prairie Evap.	1990-2170	1.025	0.33 @ 79°F	8.1	7,428	1,037	27	5,754	8,977	244	23,467
		1990-2170 M	1.1025	0.062 @ 79°F	8.0	47,767	2,579	625	4,785	76,432	122	132,310
		1990-2170 B	1.120	0.053 @ 79°F	7.9	68,929	2,814	235	4,486	108,581	85	185,130
		2180-2300 T	1.070	0.085 @ 79°F	7.9	33,266	3,426	328	4,938	54,594	122	96,674
Winnipegosis	Interlake-Stonewall-Stony Mountain	2180-2300	1.130	0.050 @ 79°F	7.7	78,909	4,262	584	3,064	128,599	85	215,503
		2180-2300 B	1.130	0.049 @ 79°F	7.65	72,203	4,324	227	2,967	117,377	122	197,220
		2520-2700 T	1.047	0.12 @ 79°F	7.9	19,570	1,817	181	4,676	30,330	232	56,806
		2520-2700	1.117	0.053 @ 79°F	7.7	60,631	4,115	355	3,015	99,482	159	167,757
Stony Mountain-Red River	Stony Mountain-Red River	2520-2700 B	1.125	0.051 @ 79°F	7.4	65,692	4,600	440	2,788	108,581	122	182,223
		2715-2995 T		0.11 @ 79°F	7.9	59,141	3,847	320	4,791	33,666	122	163,139
		2715-2995 B	1.112	0.054 @ 79°F	7.7	66,132	4,417	369	3,260	96,449	122	182,609
Red River	Red River	3112-3202 B	1.110	0.55 @ 79°F	7.5	57,088	3,892	739	3,203	94,630	116	159,668
		3112-3202	1.110	0.55 @ 79°F	7.65	56,915	3,894	407	3,223	93,416	122	157,977
11-8-45-25	Winnipeg-Interlake	185-643 T	1.0463	0.120 @ 75°F	7.25	21,319	1,473	405	3,300	33,939	488	60,924

TABLE OF LOWER PALEOZOIC FORMATION WATER ANALYSES

Supplement: December 1971 to November 1978 (Metrication date)

Well Location	Formation	Depth (feet)	Specific Gravity @ 60°F	Resistivity @ 68°F	pH @ 75°F	Na + K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
2-30-2-26W	Nisku (Birdbear)	3851-3870	1.0168	0.36	8.0	6 709	936	99	5 566	8 151	49	21 510
9-15-2-27	Nisku (Birdbear)	3961-3973	1.141	0.045 @ 80°	7.2	69 404	2 268	284	5 110	107 974	183	185 223
15-20-3-25	Souris River	4200-4240 T	1.038	0.15 @ 80°	8.3	15 245	2 256	127	5 221	23 960	79	46 888
	Duperow	4200-4240 M	1.180	0.04 @ 80°	6.8	81 964	12 805	2 782	806	156 503	85	254 945
		3709-3736	1.125	0.07 @ 80°	7.6	64 353	2 434	230	6 286	99 482	134	172 919
5-3-4-25	Nisku (Birdbear)	3305-3307	1.011 @ 75°	0.738	7.2	2 931	841	146	3 679	3 100	1 070	11 224
16-10-10-18	Dawson Bay- Prairie Evap.	1990-2170	1.025	0.33 @ 79°	8.1	7 428	1 037	27	5 754	8 977	244	23 467
		1990-2170 M	1.1025	0.062 @ 79°	8.0	47 767	2 579	625	4 785	76 432	122	132 310
		1990-2170 B	1.120	0.053 @ 79°	7.9	68 929	2 814	235	4 486	108 581	85	185 130
	Winnipegosis	2180-2300 T	1.070	0.085 @ 79°	7.9	33 266	3 426	328	4 938	54 594	122	96 674
		2180-2300	1.130	0.050 @ 79°	7.7	78 909	4 262	584	3 064	128 599	85	215 503
		2180-2300 B	1.130	0.049 @ 79°	7.6	72 203	4 324	227	2 967	117 377	122	197 220
	Interlake- Stonewall- Stony Mountain	2520-2700 T	1.047	0.12 @ 79°	7.9	19 570	1 817	181	4 676	30 330	232	56 806
		2520-2700 B	1.117	0.053 @ 79°	7.7	60 631	4 115	355	3 015	99 482	159	167 757
		2715-2995 T	1.125	0.051 @ 79°	7.4	65 692	4 600	440	2 788	108 581	122	182 223
		2715-2995	1.112	0.11 @ 79°	7.9	59 141	3 847	320	4 791	33 666	122	163 139
		2715-2995 B	1.125	0.054 @ 79°	7.7	66 132	4 417	369	3 260	96 449	122	182 609
		3112-3202 B	1.110	0.55 @ 79°	7.5	57 088	3 892	739	2 988	108 581	122	159 668
		3112-3202	1.110	0.55 @ 79°	7.6	56 915	3 894	407	3 203	94 630	116	157 977
10-28-15-27	Bakken	1687-1705	1.0226	0.202 @ 80°	8.2	9 545	280	365	125	15 727	-	26 734
2-7-18-25	Duperow	1930-1997	1.0353 @ 75°	0.165 @ 78°	7.2	15 792	1 501	548	4 914	24 477	860	48 092
	Duperow	2003-2020	1.0296 @ 75°	0.180 @ 78°	7.4	13 594	1 413	449	4 716	20 928	622	41 722
10-4-19-26	Dawson Bay	2700-2860	1.088	0.077	8.4	44 503	2 162	846	5 959	70 500	57	124 037
16-15-20-6	Winnipeg	1101-1123	1.011	2.93 @ 75°	8.1	1 051	96	104	191	279	1 416	3 137
16-19-21-11	Red River- Winnipeg	1384-1450	1.009	1.35 @ 75°	7.1	66 995	3 964	507	2 798	109 673	85	184 022
14-22-21-15	Red River- Winnipeg	1680-1880 T	1.0368	0.135 @ 75°	8.2	18 014	1 993	243	4 810	28 381	146	53 587
		1680-1880 M	1.1018	0.059 @ 75°	7.9	53 963	3 307	370	5 320	86 132	122	149 214
		1680-1880 B	1.0708	0.074 @ 75°	8.2	37 377	2 589	277	4 453	59 657	137	104 490

TABLE OF LOWER PALEOZOIC FORMATION WATER ANALYSES

Supplement: December 1971 to November 1978 (Metrication date)

Well Location	Formation	Depth (feet)	Specific Gravity @ 60°F	Resistivity @ 68°F	pH @ 75°F	Na + K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
13-34-23-12	Red River-Winnipeg	1272-1478	1.0325 @ 75°	0.146 @ 80°	8.7	15 856	1 125	215	1 683	25 801	35	44 724
4A-28-25-26	Dawson Bay	2105-2121	1.009	1.35 @ 75°	7.1	1 236	552	115	3 026	970	24	5 923
5-6-26-5	Red River-Winnipeg	820-840 B 820-840 T	1.003 1.003	1.85 @ 75° 1.90 @ 75°	11.7 11.7	249 219	301 301	8 13	57 50	26 24	- -	1 020 1 053
8-30-29-8	Red River-Winnipeg	760-827 M 760-827 B	1.006 1.008	2.35 @ 74° 1.6 @ 74°	7.5 7.5	916 1 358	80 153	23 36	880 1 721	722 1 037	342 281	2 953 4 586
11-8-45-25	Winnipeg-Interlake	185-643 T	1.0463	0.120 @ 75°	7.2	21 319	1 473	405	3 300	33 939	488	60 924

TABLE OF LOWER PALEOZOIC FORMATION WATER ANALYSES

Supplement: November 1978 to December 1984. All data metric

Well Location	Formation	Depth (feet)	Specific Gravity @ 60°F	Resistivity @ 68°F	pH @ 75°F	Na + K	Ca	Mg	SO ₄	Cl	HCO ₃	Total Solids
9-6-2-26	Winnipegosis	1520-1535	1.082 @ 15.6°	0.07	7.8 @ 26°	40 600	4 400	625	4 000	65 500	174	115 100
6-29-5-24	disturbed Paleozoic??	575-585	1.002	1.06	8.1	2 990	71	59	2 795	2 750	207	8 876
9-30-5-24	disturbed Paleozoic Souris River??	920-931	1.014	0.371	8.1	7 705	521	61	9 720	4 750	451	22 687
4-25-6-26	Duperow	945-956	1.032	0.170	7.4 @ 23°	12 815	1 802	632	1 671	20 750	1 952	39 622
14-13-9--28	Winnipegosis	1280-1300	1.177	0.043	7.1 @ 24°	106 237	3 003	608	3 225	157 000	122	293 400
15-11-12-26	Misku (Birdbear)	680-693	1.091 @ 15.4°	0.061	6.7	46 250	2 455	799	5 210	73 344	174	128 233
	Winnipeg	1399-1406	1.167 @ 15.4°	0.042	5.8	90 500	4 690	537	1 620	146 815	42	244 204
	Winnipeg-Precambrian	1421-1446	1.165 @ 15.4°	0.043	6.9	88 650	5 245	687	1 464	145 716	60	241 822