Appendix A

West Lyons Field Sampling

West Lyons field is in west-central Kansas. The reservoir occurs in Mississippian (Lower Carboniferous) sediments deposited in the shallow epicontinental seas that covered much of North America in the Late Paleozoic. The data, collected as part of an engineering study by Kewanee Oil Company, are on the Internet at http://www.kgs.ukans.edu/Mathgeo/Books/Geostat/index.html and may be downloaded from that site.

Table A.1. West Lyons field sampling.

Well	Easting (miles)	Northing (miles)	Porosity (%)	Well	Easting (miles)	Northing (miles)	Porosity (%)
3	2.097	4.611	12.7	5	1.863	4.370	14.1
6	2.112	4.371	11.6	7	2.175	4.317	11.2
10	1.634	4.136	15.2	11	1.880	4.126	14.7
12	2.096	4.129	13.3	14	1.613	3.885	17.2
15	1.841	3.883	14.7	16	2.113	3.881	12.4
18	1.610	3.628	13.4	19	1.861	3.627	13.7
20	2.088	3.627	13.9	21	2.358	3.627	14.5
23	1.365	3.381	13.1	24	1.614	3.382	14.5
25	1.863	3.380	13.2	26	2.088	3.380	11.9
29	1.342	3.270	13.4	30	1.177	3.131	12.1
31	1.363	3.131	13.8	32	1.614	3.130	13.6
33	1.862	3.132	11.5	34	2.117	3.129	12.5
36	1.118	2.883	12.4	37	1.363	2.880	14.7
38	1.614	2.881	11.7	39	1.861	2.882	11.5
40	1.924	2.943	11.5	41	2.113	2.878	11.4
44	1.151	2.628	12.8	45	1.362	2.628	12.1
46	1.615	2.631	10.6	47	1.862	2.629	11.5

(*cont.*)

Table A.1. West Lyons field sampling (*concluded*).

Well	Easting (miles)	Northing (miles)	Porosity (%)	Well	Easting (miles)	Northing (miles)	Porosity (%)
48	2.088	2.626	10.8	49	1.140	2.381	11.4
50	1.373	2.380	11.4	51	1.615	2.378	11.7
52	1.862	2.379	11.3	53	2.127	2.388	10.5
54	2.363	2.377	10.3	57	1.142	2.127	10.7
58	1.364	2.129	11.1	59	1.616	2.127	10.5
60	1.864	2.127	13.9	61	2.092	2.124	10.6
62	2.363	2.125	9.9	63	2.612	2.124	10.5
65	1.121	1.878	10.9	66	1.369	1.880	11.7
67	1.676	1.937	11.2	68	1.866	1.880	11.7
69	2.116	1.881	10.4	70	2.339	1.875	10.4
73	1.123	1.626	11.5	74	1.369	1.627	11.6
75	1.614	1.628	11.6	76	1.867	1.627	11.1
77	2.117	1.626	10.3	80	0.887	1.396	18.2
81	1.157	1.371	11.3	82	1.372	1.373	11.5
83	1.616	1.374	10.9	84	1.868	1.386	11.3
86	1.137	1.133	10.8	87	1.373	1.122	11.0
88	1.616	1.123	10.5	89	1.867	1.121	11.9
91	1.121	0.872	8.0	92	1.400	0.874	11.1
93	1.592	0.899	10.5	94	1.849	0.872	10.4
95	1.120	0.616	9.5	96	1.397	0.619	9.7
97	1.623	0.639	10.2	99	1.374	0.371	9.7

Appendix B

High Plains Aquifer Sampling

This sampling is a subset of a larger annual measurement of water levels in the Kansas portion of the High Plains aquifer. The survey was conducted by the State Board of Agriculture of Kansas and the United States Geological Survey during the period December 1980 to March 1981. The High Plains aquifer is late Tertiary to Quaternary and consists of alluvial, dune-sand, and valley fill deposits from streams flowing eastward from the Rocky Mountains. In the following table, L.S.E. stands for land surface elevation, W.D. for water depth, and W.T.E. for water table elevation. The data are on the Internet at http://www.kgs.ukans.edu/Mathgeo/Books/Geostat/index.html and may be downloaded from that site.

Table B.1. Kansas High Plains aquifer sampling.

ID	County	Legal description of location	Easting (miles)	Northing (miles)	L.S.E. (ft)	W.D. (ft)	W.T.E. (ft)
15	Cheyenne	2S 40W 28DBA 1	33.02509	211.16249	3452.0	113.5	3338.5
16	Cheyenne	2S 41W 27BBD 1	27.60393	211.75963	3620.0	201.0	3419.0
17	Cheyenne	2S 42W 14DDD 1	23.47554	213.19019	3693.0	232.5	3460.5
18	Cheyenne	3S 37W 19BBC 1	48.10212	206.00024	3468.0	228.8	3239.2
19	Cheyenne	3S 37W 21DDD 1	50.91596	205.15459	3422.0	218.2	3203.8
20	Cheyenne	3S 37W 36ADB 1	53.70786	203.69003	3381.0	201.4	3179.6
21	Cheyenne	3S 39W 20DAC 1	37.90396	205.87445	3450.0	141.8	3308.2
22	Cheyenne	3S 39W 24DDD 1	41.98035	205.47758	3505.0	220.0	3285.0
23	Cheyenne	3S 39W 32BDB 1	37.34115	204.27779	3490.0	154.2	3335.8
24	Cheyenne	3S 40W 9BAA 2	32.67124	208.68553	3358.0	20.5	3337.5
27	Cheyenne	3S 40W 35AAC 1	34.86293	204.49368	3445.0	101.2	3343.9
28	Cheyenne	3S 41W 16AAC 1	27.06479	207.79530	3570.0	134.3	3435.7
29	Cheyenne	3S 41W 33ABB 1	26.69602	204.94556	3594.0	173.5	3420.5
30	Cheyenne	3S 42W 4AAA 1	21.35551	210.17715	3727.0	231.1	3495.9

(*cont.*)

Table B.1. High Plains aquifer sampling (*continued*).

ID	County	Legal description of location		Easting (miles)	Northing (miles)	L.S.E. (ft)	W.D. (ft)	W.T.E. (ft)
31	Cheyenne	4S 37W 14BAB	1	52.11569	201.01073	3405.0	200.9	3204.1
32	Cheyenne	4S 37W 25DCA	1	53.37287	198.23169	3374.0	151.1	3222.9
33	Cheyenne	4S 38W 4BAC	1	44.25118	203.15585	3509.0	215.4	3293.6
34	Cheyenne	4S 38W 20CCC	1	42.85724	199.47672	3485.0	155.6	3329.4
35	Cheyenne	4S 38W 21ADC	1	44.61671	199.91013	3491.0	185.9	3305.1
36	Cheyenne	4S 39W 2DBC	1	40.50639	202.79491	3520.0	200.8	3319.2
37	Cheyenne	4S 39W 15CCA	1	39.05595	200.73232	3492.0	150.4	3341.6
38	Cheyenne	4S 39W 18CAB	1	36.21449	201.08405	3530.0	156.9	3373.1
39	Cheyenne	4S 39W 27CCA	1	38.97412	198.74550	3502.0	135.4	3366.6
40	Cheyenne	4S 40W 22BCB	1	32.94634	200.45740	3520.0	125.2	3394.9
41	Cheyenne	4S 41W 16DAA	1	26.91493	201.44768	3403.0	15.8	3387.2
42	Cheyenne	4S 41W 25BCB	1	28.93127	199.61497	3571.0	142.1	3428.9
43	Cheyenne	4S 41W 31ACA	1	24.58318	198.80919	3552.0	98.7	3453.3
44	Cheyenne	4S 42W 26BDB	1	22.27446	199.90916	3487.8	18.6	3469.2
45	Cheyenne	5S 37W 15DBB	1	51.11561	194.58136	3397.0	152.1	3244.9
46	Cheyenne	5S 38W 13BAD	1	47.03086	195.10007	3390.0	77.5	3312.5
47	Cheyenne	5S 38W 22ACB	1	45.12255	194.04909	3437.0	97.6	3339.4
48	Cheyenne	5S 38W 26CCA	1	45.68245	192.53780	3460.0	117.7	3342.3
49	Cheyenne	5S 39W 11CBC	1	39.72585	195.85860	3530.0	152.6	3377.4
50	Cheyenne	5S 39W 18CCC	1	35.69878	194.75821	3630.0	216.1	3413.9
51	Cheyenne	5S 39W 25CDA	1	40.96551	192.70605	3533.0	132.1	3400.9
52	Cheyenne	5S 40W 4CBD	1	31.93300	197.13242	3653.0	207.9	3445.1
53	Cheyenne	5S 40W 15ACB	1	33.23453	195.46733	3650.0	226.2	3423.8
54	Cheyenne	5S 40W 27BBA	1	32.78741	193.74037	3658.0	204.2	3453.8
55	Cheyenne	5S 41W 12ADC	1	29.53741	196.47363	3679.0	211.9	3467.1
56	Cheyenne	5S 41W 20DAA	1	25.63076	194.52692	3742.0	225.4	3516.6
57	Cheyenne	5S 42W 4AAB	1	20.70889	198.23430	3515.0	17.9	3497.1
58	Cheyenne	5S 42W 14CBC	1	21.83602	195.56645	3687.0	153.6	3533.4
59	Cheyenne	5S 42W 36CCB	1	22.69358	192.41327	3800.0	212.8	3587.2
61	Decatur	1S 26W 18DDB	1	114.35582	216.42046	2413.0	31.5	2381.5
62	Decatur	1S 29W 3DDB	1	99.57481	218.75893	2539.0	31.6	2507.4
63	Decatur	1S 29W 19BDD	1	96.20944	216.23335	2572.0	24.0	2547.9
64	Decatur	1S 30W 34DDD	1	93.66951	213.81834	2610.0	35.1	2574.9
65	Decatur	2S 26W 11BBA	1	117.58112	212.08537	2509.0	85.2	2423.8
66	Decatur	2S 28W 13ABA	1	107.20194	211.35425	2487.0	29.9	2457.1
67	Decatur	2S 29W 24BCC	1	100.57094	210.15475	2682.2	94.8	2587.4
68	Decatur	2S 30W 26DCC	1	94.14078	208.82616	2835.0	137.2	2697.8
69	Decatur	3S 26W 30CBB	2	113.27920	202.75702	2610.0	126.0	2484.0
70	Decatur	3S 28W 6DCB	1	101.96583	206.76294	2571.0	44.8	2526.1
71	Decatur	3S 28W 32BCA	1	102.47420	202.27351	2749.0	142.7	2606.3

(*cont.*)

Table B.1. High Plains aquifer sampling (*continued*).

ID	County	Legal description of location	Easting (miles)	Northing (miles)	L.S.E. (ft)	W.D. (ft)	W.T.E. (ft)
72	Decatur	3S 29W 12BBA 1	100.60022	206.54837	2556.1	31.8	2524.3
73	Decatur	3S 29W 17DCB 1	96.98643	204.89520	2587.0	24.6	2562.4
74	Decatur	3S 29W 31DCC 1	95.91154	201.81171	2633.0	26.9	2606.1
75	Decatur	3S 30W 3CBA 1	92.73382	207.24669	2807.0	101.1	2705.9
76	Decatur	4S 26W 8DDD 1	115.04419	199.34091	2455.7	31.9	2423.8
77	Decatur	4S 26W 19DCA 1	113.76634	197.51254	2464.0	17.2	2446.8
78	Decatur	4S 27W 17DAC 1	108.97080	198.74921	2648.0	105.2	2542.8
79	Decatur	4S 27W 33BBB 1	109.15633	196.38132	2528.0	19.5	2508.6
80	Decatur	4S 28W 15AAA 1	105.14063	199.46748	2700.0	92.2	2607.8
81	Decatur	4S 28W 30DDD 1	102.08223	196.68979	2726.0	91.2	2634.8
82	Decatur	4S 30W 7BBB 1	89.45439	200.85693	2697.0	15.3	2681.7
83	Decatur	5S 26W 5ADD 1	114.93300	194.86301	2607.0	127.6	2479.4
84	Decatur	5S 26W 26DDA 1	117.77794	190.42242	2437.0	23.6	2413.4
85	Decatur	5S 26W 33DCC 1	115.41256	189.37129	2475.0	18.9	2456.1
86	Decatur	5S 27W 21CCA 1	109.15672	191.65317	2675.0	98.7	2576.3
87	Decatur	5S 28W 7BBC 1	101.15601	194.47743	2644.0	20.0	2624.0
88	Decatur	5S 28W 10BBB 1	104.13999	194.51997	2600.0	10.9	2589.1
89	Decatur	5S 28W 14ADD 1	105.96646	193.10306	2723.0	134.5	2588.5
90	Decatur	5S 28W 17DAC 1	102.85614	192.93822	2734.0	101.7	2632.4
91	Decatur	5S 29W 11BAA 1	99.54774	194.63818	2670.0	13.1	2656.9
92	Decatur	5S 29W 22CBB 1	98.11600	192.18419	2686.0	15.8	2670.2
372	Gove	11S 26W 4CDC 1	116.29624	158.43758	2583.0	63.1	2519.9
373	Gove	11S 27W 16AAA 1	110.98627	157.46828	2713.0	110.3	2602.7
374	Gove	11S 27W 36BCC 1	112.96054	154.06345	2676.0	77.2	2598.8
375	Gove	11S 29W 4DAD 1	99.28117	159.16090	2844.0	113.5	2730.5
376	Gove	11S 30W 27ABB 1	93.82134	155.98224	2922.0	130.3	2791.7
377	Graham	6S 21W 19CDC 1	143.88550	184.84438	2305.0	102.2	2202.8
378	Graham	6S 22W 19CCC 1	137.67519	184.90807	2400.0	108.5	2291.5
379	Graham	6S 22W 28ACA 1	140.27769	184.50719	2360.0	114.3	2245.7
380	Graham	6S 23W 13BBB 1	136.72041	186.79459	2350.0	57.9	2292.1
381	Graham	6S 24W 28BAB 1	127.98153	184.98848	2479.0	99.2	2379.8
382	Graham	6S 24W 29BAB 1	126.98682	185.00719	2510.0	123.1	2386.9
383	Graham	6S 24W 35DDD 1	130.55019	183.07536	2492.0	146.6	2345.4
384	Graham	6S 25W 28CBC 1	121.73193	184.47917	2540.0	107.3	2432.7
385	Graham	6S 25W 35CCA 1	123.82757	183.31992	2512.0	98.8	2413.2
386	Graham	7S 22W 10BBC 1	140.59123	181.64490	2217.0	8.8	2208.2
387	Graham	7S 22W 19BBB 1	137.56969	179.81061	2295.0	38.9	2256.1
388	Graham	7S 24W 8CBA 1	126.77754	181.52431	2519.0	126.5	2392.5
389	Graham	7S 25W 24BBB 1	124.62090	180.06818	2495.0	86.2	2408.8
390	Graham	9S 22W 19BBB 1	137.32347	167.87659	2416.0	95.7	2320.4

(*cont.*)

Table B.1. High Plains aquifer sampling (*continued*).

ID	County	Legal description of location	Easting (miles)	Northing (miles)	L.S.E. (ft)	W.D. (ft)	W.T.E. (ft)
391	Graham	9S 24W 22BAA 1	128.70850	168.04491	2491.0	93.9	2397.1
392	Graham	9S 25W 14DDD 1	124.20194	168.24323	2534.0	91.4	2442.6
833	Logan	11S 32W 4ACD 1	81.24866	159.91974	3059.0	111.7	2947.3
834	Logan	11S 32W 19AAB 1	79.29759	157.38274	3073.0	102.9	2970.1
835	Logan	11S 36W 6ADD 2	55.74755	160.73698	3380.0	162.5	3217.5
836	Logan	11S 36W 6DBB 2	55.36806	160.62888	3386.0	172.6	3213.4
968	Rawlins	1S 33W 29CCC 1	73.20178	215.37129	2992.0	114.0	2878.0
969	Rawlins	2S 31W 3CAD 1	87.23461	213.25276	2665.0	20.3	2644.7
970	Rawlins	2S 32W 14DCA 1	82.50986	211.26065	2723.0	23.2	2699.8
971	Rawlins	2S 32W 20DCD 1	79.54680	210.22064	2735.0	15.4	2719.6
972	Rawlins	2S 35W 13ABB 1	65.67006	212.50679	3178.0	152.6	3025.4
973	Rawlins	2S 35W 34CAA 1	63.44318	209.10126	3064.0	31.0	3033.0
974	Rawlins	2S 36W 13DDD 1	60.06818	211.83514	3286.0	190.6	3095.4
975	Rawlins	2S 36W 15CDD 1	57.60354	211.90451	3334.0	213.4	3120.6
976	Rawlins	2S 36W 18CCB 1	54.28070	212.12453	3380.0	230.0	3150.0
977	Rawlins	2S 36W 36BAA 1	59.49897	209.73721	3263.0	176.7	3086.3
978	Rawlins	3S 33W 3DCC 1	75.39347	207.35251	2823.0	30.5	2792.5
979	Rawlins	3S 33W 8CDC 1	73.13605	206.42188	2855.0	27.9	2827.1
980	Rawlins	3S 34W 3ABB 1	69.49242	208.39978	2882.0	15.9	2866.1
981	Rawlins	3S 34W 26BAC 1	70.09028	204.27596	2900.0	14.9	2885.1
982	Rawlins	3S 34W 33BCC 1	67.82110	203.10432	2945.0	18.5	2926.5
983	Rawlins	3S 35W 24CBB 1	64.91588	205.06747	3001.0	28.5	2972.5
984	Rawlins	3S 36W 14CBB 1	58.01420	206.29720	3332.0	221.4	3110.6
985	Rawlins	3S 36W 17CCC 1	55.03520	206.01144	3375.0	210.9	3164.1
986	Rawlins	4S 31W 16ABD 1	86.09967	199.83231	2761.0	13.0	2748.0
987	Rawlins	4S 31W 25DDD 1	89.21709	196.99953	2755.0	18.7	2736.3
988	Rawlins	4S 33W 18DDA 1	72.52644	199.60220	3068.0	85.6	2982.4
989	Rawlins	4S 33W 28DCA 1	74.19326	197.56693	3125.0	155.9	2969.1
990	Rawlins	4S 34W 33CBC 1	67.60480	196.89149	3160.0	119.7	3040.3
991	Rawlins	4S 35W 6DCD 1	60.45597	201.86806	3252.0	154.8	3097.2
992	Rawlins	4S 35W 13DAD 1	65.60748	199.94058	3002.0	16.4	2985.6
993	Rawlins	4S 35W 29DDD 1	61.55627	197.84683	3219.0	154.0	3065.0
994	Rawlins	4S 36W 6BBB 1	53.92708	202.93695	3370.0	190.0	3180.0
995	Rawlins	5S 31W 10DDA 1	87.16438	194.19531	2820.0	45.7	2774.3
996	Rawlins	5S 31W 20CCA 1	84.39804	192.28889	2865.0	37.4	2827.6
997	Rawlins	5S 31W 23DDD 1	88.08633	192.04869	2950.0	122.1	2827.9
998	Rawlins	5S 32W 14CDD 1	81.71686	193.24323	3020.0	130.8	2889.2
999	Rawlins	5S 33W 29BDA 1	72.76231	192.13731	3042.0	20.0	3022.0
1000	Rawlins	5S 34W 1BBB 1	70.55563	196.42740	3137.0	116.0	3021.0
1001	Rawlins	5S 34W 28ADC 1	68.18063	192.14781	3207.0	135.1	3071.9

(*cont.*)

Table B.1. High Plains aquifer sampling (*continued*).

ID	County	Legal description of location	Easting (miles)	Northing (miles)	L.S.E. (ft)	W.D. (ft)	W.T.E. (ft)
1002	Rawlins	5S 35W 10CDD 1	62.94145	194.81029	3267.0	167.6	3099.4
1003	Rawlins	5S 36W 21BCD 1	55.68056	193.55966	3220.0	20.0	3200.0
1234	Sheridan	6S 27W 3DCD 1	111.60567	188.48280	2560.0	34.9	2525.1
1235	Sheridan	6S 27W 8DCA 1	109.60543	187.65971	2588.0	20.8	2567.2
1236	Sheridan	6S 27W 19DAB 1	108.69437	185.93782	2610.0	30.8	2579.2
1237	Sheridan	6S 27W 27BCC 1	110.89686	185.00931	2716.0	159.4	2556.6
1238	Sheridan	6S 28W 28ADD 1	104.83452	185.16824	2682.0	46.8	2635.2
1239	Sheridan	6S 29W 10DBC 1	99.60456	188.04247	2823.0	131.1	2691.9
1240	Sheridan	6S 29W 24ABB 1	101.53125	186.62839	2781.0	102.3	2678.7
1241	Sheridan	6S 29W 33CDA 1	98.39173	183.96124	2828.0	104.5	2723.5
1242	Sheridan	6S 30W 2BCA 1	94.34391	189.52928	2780.0	22.8	2757.2
1243	Sheridan	6S 30W 13BAA 1	95.54009	187.76160	2875.0	126.7	2748.3
1244	Sheridan	6S 30W 14CCD 1	94.27328	186.91888	2884.0	109.2	2774.8
1245	Sheridan	6S 30W 24DDC 2	95.86261	185.88857	2898.0	138.2	2759.8
1246	Sheridan	7S 26W 6AAB 1	114.55729	183.29419	2634.0	129.8	2504.2
1247	Sheridan	7S 26W 12BAC 1	118.93845	182.04451	2559.0	98.4	2460.6
1248	Sheridan	7S 26W 15BDD 1	117.07079	180.85069	2622.0	142.2	2479.8
1249	Sheridan	7S 26W 19BBC 1	113.74282	180.20013	2625.0	123.3	2501.7
1250	Sheridan	7S 26W 28CAB 1	115.91517	178.76468	2634.0	154.4	2479.6
1251	Sheridan	7S 27W 24BBD 1	112.87737	180.22231	2639.0	128.9	2510.1
1252	Sheridan	7S 28W 8BDC 1	103.14765	182.22333	2808.0	160.6	2647.4
1253	Sheridan	7S 28W 19BBA 1	101.99171	180.63542	2800.0	147.1	2652.9
1254	Sheridan	7S 28W 21ABB 1	104.34249	180.57063	2774.0	155.9	2618.1
1255	Sheridan	7S 28W 36ABA 1	107.38273	178.49336	2725.0	139.3	2585.7
1256	Sheridan	7S 29W 2DBD 1	100.57860	183.03732	2838.0	151.8	2686.2
1257	Sheridan	7S 29W 21ABB 1	98.42858	180.72293	2860.0	149.8	2710.2
1258	Sheridan	7S 29W 27CCC 1	98.87034	178.84390	2869.0	177.1	2691.9
1259	Sheridan	7S 29W 30ABA 1	96.55903	179.77374	2886.6	151.9	2734.7
1260	Sheridan	8S 26W 14DAA 1	118.39418	174.70265	2398.0	16.4	2381.6
1261	Sheridan	8S 26W 16CDD 1	115.92953	174.39923	2447.0	36.0	2411.0
1262	Sheridan	8S 27W 11DCD 1	112.26002	175.49921	2504.0	10.4	2493.6
1263	Sheridan	8S 27W 33BBD 1	109.69800	172.32497	2554.0	19.9	2534.1
1264	Sheridan	8S 28W 9ABC 1	104.23516	176.46024	2766.0	136.0	2630.0
1265	Sheridan	8S 29W 1DCB 1	101.27975	176.91501	2823.0	145.8	2677.2
1266	Sheridan	8S 29W 29BAA 1	97.13605	173.78354	2844.0	98.4	2745.6
1267	Sheridan	8S 30W 11CBC 1	93.85859	176.22948	2941.0	177.0	2764.0
1268	Sheridan	8S 30W 13DAA 1	95.69942	175.31519	2891.0	138.9	2752.1
1269	Sheridan	8S 30W 30ABC 1	90.31005	173.82915	2962.0	127.8	2834.2
1270	Sheridan	9S 27W 12CCC 1	112.47791	169.50900	2678.0	110.3	2567.7
1271	Sheridan	9S 27W 19DDD 1	108.33349	167.62460	2750.0	128.5	2621.5

(*cont.*)

Table B.1. High Plains aquifer sampling (*continued*).

ID	County	Legal description of location	Easting (miles)	Northing (miles)	L.S.E. (ft)	W.D. (ft)	W.T.E. (ft)
1272	Sheridan	9S 28W 4BCC 1	103.60425	171.24298	2677.0	27.0	2650.0
1273	Sheridan	9S 28W 6CCB 1	101.61727	170.92456	2691.0	8.3	2682.7
1274	Sheridan	9S 29W 17BAB 1	96.90593	169.80618	2854.0	99.4	2754.6
1275	Sheridan	9S 29W 26BAA 1	99.93206	167.73027	2863.0	136.4	2726.6
1276	Sheridan	9S 30W 3AAB 2	93.49164	171.88503	2933.0	143.0	2790.0
1277	Sheridan	9S 30W 16CDA 1	92.04995	169.18459	2882.0	60.5	2821.5
1278	Sheridan	10S 27W 22DBA 1	110.91667	161.94460	2568.0	19.8	2548.2
1279	Sheridan	10S 28W 29DAA 1	103.21741	161.15854	2691.0	28.9	2662.1
1280	Sheridan	10S 29W 20CCC 2	96.44839	161.97681	2776.0	13.7	2762.3
1281	Sheridan	10S 30W 8DDD 1	91.41414	164.10204	2930.0	104.8	2825.1
1282	Sheridan	10S 30W 17DAD 1	91.39418	163.35661	2895.5	68.8	2826.7
1283	Sherman	6S 37W 3BCC 1	51.73390	190.70708	3424.0	163.8	3260.2
1284	Sherman	6S 37W 7BBA 1	48.89315	190.18529	3304.0	9.5	3294.5
1285	Sherman	6S 37W 16CDD 1	51.02580	188.24353	3460.0	172.9	3287.1
1286	Sherman	6S 37W 19ABB 1	49.18134	188.18285	3476.0	160.9	3315.1
1287	Sherman	6S 38W 9ABD 1	45.44776	190.18095	3510.0	164.2	3345.8
1288	Sherman	6S 38W 20ACC 1	44.25284	187.98090	3407.0	14.8	3392.2
1289	Sherman	6S 39W 9DDD 1	39.73153	189.63351	3585.0	147.5	3437.5
1290	Sherman	6S 40W 10AAC 1	34.71583	190.55556	3641.0	160.4	3480.6
1291	Sherman	6S 40W 30DCC 1	31.38486	186.93774	3718.0	164.8	3553.2
1292	Sherman	6S 40W 35BCC 1	34.77565	186.31969	3668.0	154.6	3513.4
1293	Sherman	6S 41W 1ABB 1	30.62508	191.82243	3675.0	157.9	3517.1
1294	Sherman	6S 41W 9BCB 1	27.08215	190.73161	3759.0	190.0	3569.0
1295	Sherman	6S 41W 19DBD 1	25.60803	188.42812	3792.0	180.3	3611.7
1296	Sherman	6S 41W 27DBD 1	28.54822	187.30367	3741.0	162.1	3578.9
1297	Sherman	6S 42W 2AAA 1	24.01697	192.11134	3777.0	197.6	3579.4
1298	Sherman	6S 42W 8CBB 1	20.06495	190.78448	3841.0	208.9	3632.1
1299	Sherman	6S 42W 22DCC 1	22.46836	188.31265	3837.0	192.8	3644.2
1300	Sherman	6S 42W 30ADA 1	19.81929	188.05193	3871.0	199.7	3671.3
1301	Sherman	7S 37W 4BBC 1	50.53291	185.02501	3455.0	137.8	3317.2
1302	Sherman	7S 37W 5CCB 1	49.52494	184.43678	3472.0	138.2	3333.8
1303	Sherman	7S 37W 11ACB 1	52.94997	183.82552	3445.0	156.2	3288.8
1304	Sherman	7S 37W 17BDA 1	49.83546	182.93269	3472.0	136.5	3335.5
1305	Sherman	7S 39W 9BBB 1	38.65215	184.56400	3589.0	115.0	3474.0
1306	Sherman	7S 39W 24BAA 1	41.93498	182.45557	3587.0	146.4	3440.6
1307	Sherman	7S 39W 30CCB 1	36.50347	180.90379	3643.0	140.0	3503.0
1308	Sherman	7S 40W 6ADB 1	31.56581	185.56163	3722.0	166.1	3555.9
1309	Sherman	7S 40W 29BBA 1	31.76271	181.82031	3708.0	138.3	3569.7
1310	Sherman	7S 40W 35BBB 1	34.53346	180.72491	3650.0	125.7	3524.3
1311	Sherman	7S 40W 36BAB 1	35.75742	180.68134	3643.0	132.5	3510.5

(*cont.*)

Table B.1. High Plains aquifer sampling (*continued*).

ID	County	Legal description of location	Easting (miles)	Northing (miles)	L.S.E. (ft)	W.D. (ft)	W.T.E. (ft)
1312	Sherman	7S 41W 7BCB 1	24.82813	184.84738	3840.0	194.7	3645.3
1313	Sherman	7S 41W 10BBA 1	27.94381	184.96346	3770.0	160.0	3610.0
1314	Sherman	7S 41W 16ADC 1	27.50986	183.61134	3775.0	156.9	3618.1
1315	Sherman	7S 41W 28DBB 1	27.16651	181.50797	3774.0	126.3	3647.7
1316	Sherman	7S 42W 7DAA 1	19.67677	184.81651	3903.0	199.6	3703.4
1317	Sherman	7S 42W 17CCC 1	19.74179	183.44263	3864.0	137.1	3726.9
1318	Sherman	7S 42W 27AAB 1	22.45147	182.20541	3862.0	162.7	3699.3
1319	Sherman	8S 37W 3ADB 1	52.02509	178.88210	3476.0	157.6	3318.4
1320	Sherman	8S 37W 6ADB 1	49.06211	178.97443	3506.0	140.7	3365.3
1321	Sherman	8S 37W 21CCC 1	50.15672	175.33160	3496.0	140.7	3355.3
1322	Sherman	8S 37W 28ABC 1	50.64236	175.06825	3482.0	130.4	3351.6
1323	Sherman	8S 37W 32ABB 1	49.61774	174.22791	3468.0	97.1	3370.9
1324	Sherman	8S 38W 17CDD 1	43.67566	176.53969	3603.0	162.2	3440.8
1325	Sherman	8S 38W 24AAB 1	47.96551	176.27036	3513.0	123.2	3389.8
1326	Sherman	8S 38W 28ACC 1	44.72049	175.00900	3587.0	145.3	3441.7
1327	Sherman	8S 39W 17DCD 1	37.95541	176.74100	3672.0	183.4	3488.6
1328	Sherman	8S 39W 27AAB 1	40.03354	175.54578	3647.0	179.3	3467.7
1329	Sherman	8S 39W 28CAB 1	38.51342	175.10149	3660.0	169.6	3490.4
1330	Sherman	8S 40W 12DBA 1	36.02020	178.18118	3670.0	169.1	3500.9
1331	Sherman	8S 40W 17CDB 1	31.67053	177.09312	3727.0	131.6	3595.4
1332	Sherman	8S 40W 20CBC 3	31.38518	176.23216	3719.0	120.1	3598.9
1333	Sherman	8S 40W 20CCC 1	31.37397	175.98398	3716.0	114.6	3601.4
1334	Sherman	8S 40W 20DAA 1	32.25087	176.32513	3668.0	72.8	3595.2
1335	Sherman	8S 40W 24AAA 1	36.20305	176.67961	3692.0	185.4	3506.6
1336	Sherman	8S 40W 25AAC 1	36.03314	175.56479	3701.0	182.5	3518.5
1337	Sherman	8S 40W 35CCB 1	34.24227	174.01089	3732.0	173.6	3558.4
1338	Sherman	8S 41W 17CBA 1	25.62610	177.58594	3843.0	143.1	3699.9
1339	Sherman	8S 41W 25BBC 1	29.39015	175.81178	3754.0	115.1	3638.9
1340	Sherman	8S 42W 4BBC 1	20.60259	180.16501	3912.0	181.3	3730.7
1341	Sherman	8S 42W 15DDB 1	22.24408	177.47783	3859.0	122.1	3736.9
1342	Sherman	8S 42W 19ABB 1	19.30151	177.36766	3929.0	171.2	3757.8
1343	Sherman	8S 42W 29ACB 1	19.92053	176.08041	3904.0	124.3	3779.7
1344	Sherman	8S 42W 31DCD 1	19.20080	174.50024	3872.0	76.7	3795.3
1345	Sherman	8S 42W 34DCB 1	21.86174	174.50229	3914.0	148.7	3765.3
1346	Sherman	9S 39W 2BAB 1	40.45297	173.53732	3646.0	168.2	3477.8
1347	Sherman	9S 39W 17BBA 1	37.24487	171.65956	3697.0	152.4	3544.6
1348	Sherman	9S 40W 8CCB 1	31.19815	172.13147	3773.0	155.7	3617.3
1349	Sherman	9S 40W 8CDB 1	31.44484	172.12192	3766.0	167.0	3599.0
1350	Sherman	9S 40W 13CDC 1	35.34099	170.85701	3722.0	161.0	3561.0
1351	Sherman	9S 40W 29BBB 1	31.09635	169.89441	3782.0	156.4	3625.6

(*cont.*)

Table B.1. High Plains aquifer sampling (*continued*).

ID	County	Legal description of location	Easting (miles)	Northing (miles)	L.S.E. (ft)	W.D. (ft)	W.T.E. (ft)
1352	Sherman	9S 41W 5DCC 1	25.80398	173.21733	3860.0	166.1	3693.9
1353	Sherman	9S 41W 14BBC 1	28.21891	171.87453	3835.0	172.0	3663.0
1354	Sherman	9S 41W 28AAA 1	27.02320	170.05399	3854.0	182.7	3671.3
1355	Sherman	9S 41W 34BAB 1	27.34864	169.04491	3841.0	152.5	3688.5
1356	Sherman	9S 42W 8AAA 1	20.17598	173.32742	3943.0	155.4	3787.6
1357	Sherman	9S 42W 11CCC 1	22.27091	172.36679	3923.0	166.5	3756.5
1358	Sherman	9S 42W 14AAA 1	23.14339	172.20526	3901.0	166.5	3734.5
1359	Sherman	9S 42W 16CDD 2	20.59580	171.43996	3943.0	144.2	3798.8
1360	Sherman	9S 42W 35ABB 1	22.63613	169.23540	3916.0	139.5	3776.5
1361	Sherman	10S 37W 23ABB 1	52.22285	164.20740	3421.0	192.8	3228.2
1362	Sherman	10S 40W 10ADC 1	33.66611	166.43591	3624.0	16.6	3607.4
1363	Sherman	10S 41W 15CAD 1	27.30863	165.43434	3762.0	20.9	3741.1
1364	Sherman	10S 42W 21BBB 1	19.95131	165.35930	3963.0	106.3	3856.7
1365	Sherman	10S 42W 24BAB 1	23.21457	165.22356	3903.0	98.3	3804.6
1492	Thomas	6S 31W 3ADB 1	88.03283	189.68837	2957.0	120.1	2836.9
1493	Thomas	6S 31W 33CCD 1	86.27667	184.14677	2916.0	30.9	2885.1
1494	Thomas	6S 32W 12CBC 1	83.33239	188.46915	3020.0	120.0	2900.0
1495	Thomas	6S 32W 29CDC 1	79.54514	185.35164	3077.0	124.4	2952.6
1496	Thomas	6S 32W 34CBC 1	81.24179	184.55247	3032.0	93.8	2938.2
1497	Thomas	6S 33W 7BBB 1	72.46165	189.40816	3177.0	137.4	3039.6
1498	Thomas	6S 33W 23DDD 1	77.22980	186.41675	2997.0	14.3	2982.7
1499	Thomas	6S 33W 31CAB 1	72.56495	184.93230	3065.0	14.9	3050.1
1500	Thomas	6S 34W 11CDD 1	70.83594	188.58569	3218.0	163.2	3054.8
1501	Thomas	6S 34W 17CBC 1	67.49432	187.93924	3261.0	157.8	3103.2
1502	Thomas	6S 35W 2CDD 1	64.96323	189.76530	3245.0	130.1	3114.9
1503	Thomas	6S 35W 26ACB 1	64.96938	186.40483	3300.0	154.4	3145.6
1504	Thomas	6S 36W 6BCD 1	54.79759	190.60039	3408.0	190.9	3217.1
1505	Thomas	6S 36W 11ACC 1	59.11987	189.47089	3360.0	170.3	3189.7
1506	Thomas	6S 36W 30DCB 1	55.01444	186.24393	3417.0	154.5	3262.5
1507	Thomas	6S 36W 34DDB 1	58.21449	185.14299	3334.0	101.6	3232.4
1508	Thomas	7S 32W 7ACA 1	78.84848	183.00844	3056.0	78.5	2977.5
1509	Thomas	7S 32W 13AAA 1	83.99976	182.10432	3037.0	120.0	2917.0
1510	Thomas	7S 33W 7BDA 1	72.63266	183.19026	3203.0	165.7	3037.3
1511	Thomas	7S 33W 21DBC 1	74.66895	180.76814	3141.0	116.7	3024.3
1512	Thomas	7S 33W 35ADD 1	76.97072	178.95763	3145.0	150.3	2994.7
1513	Thomas	7S 34W 8BBB 1	67.34478	183.59052	3224.0	99.1	3124.9
1514	Thomas	7S 34W 25AAA 1	72.04672	180.47380	3167.0	114.8	3052.2
1515	Thomas	7S 34W 26DBD 1	70.79427	179.88715	3177.0	109.6	3067.4
1516	Thomas	7S 35W 9CCC 1	62.36182	182.88557	3315.0	129.6	3185.4
1517	Thomas	7S 36W 17CCC 1	55.36419	182.12965	3417.0	145.2	3271.8

(*cont.*)

Table B.1. High Plains aquifer sampling (*concluded*).

ID	County	Legal description of location	Easting (miles)	Northing (miles)	L.S.E. (ft)	W.D. (ft)	W.T.E. (ft)
1518	Thomas	7S 36W 35CBB 1	58.25497	179.41635	3341.0	88.9	3252.1
1519	Thomas	8S 31W 3CDD 1	87.30879	177.15088	3003.0	130.3	2872.7
1520	Thomas	8S 31W 20CDD 1	85.24763	174.22964	3026.0	114.7	2911.3
1521	Thomas	8S 32W 7BAA 1	78.40262	177.29623	3102.0	119.1	2982.9
1522	Thomas	8S 32W 12DBC 1	83.46031	176.52344	3057.0	113.7	2943.4
1523	Thomas	8S 32W 27DAB 1	81.63478	173.71512	3078.0	115.6	2962.4
1524	Thomas	8S 33W 2CDA 1	76.42622	177.60487	3141.0	145.8	2995.2
1525	Thomas	8S 33W 7AAB 1	72.81794	177.46820	3194.0	155.3	3038.7
1526	Thomas	8S 33W 34BBC 1	74.91335	173.29839	3168.0	149.5	3018.5
1527	Thomas	8S 34W 1BAC 1	71.36143	178.38045	3179.0	123.7	3055.3
1528	Thomas	8S 34W 6CBC 1	66.16714	178.02809	3266.0	137.8	3128.2
1529	Thomas	8S 34W 23CBD 1	70.13652	174.93497	3232.0	174.3	3057.7
1530	Thomas	8S 36W 18ABA 2	54.80698	177.05264	3428.0	128.3	3299.7
1531	Thomas	9S 31W 10BBB 1	86.76484	171.07378	2999.0	88.2	2910.8
1532	Thomas	9S 31W 22ABD 1	87.32386	168.94270	2990.0	84.8	2905.2
1533	Thomas	9S 32W 9BDA 1	80.17787	171.02068	3043.0	76.8	2966.2
1534	Thomas	9S 32W 27BCD 1	80.82378	167.89110	3076.0	117.0	2959.0
1535	Thomas	9S 33W 15ACC 1	75.29806	170.05145	3135.0	129.2	3005.8
1536	Thomas	9S 33W 26DAD 1	76.58128	167.76878	3145.0	150.4	2994.6
1537	Thomas	9S 33W 30CAA 1	72.13621	168.04466	3216.0	201.3	3014.7
1538	Thomas	9S 33W 35AAD 1	76.56408	167.27162	3145.0	152.8	2992.2
1539	Thomas	9S 34W 12ADA 1	71.74692	171.28859	3199.0	155.4	3043.6
1540	Thomas	9S 35W 32DAA 1	61.67787	167.34541	3361.0	187.0	3174.0
1541	Thomas	10S 31W 26AAA 1	88.37382	162.07260	2891.0	10.7	2880.3
1542	Thomas	10S 32W 4CAB 1	79.87989	165.80264	3091.0	120.3	2970.6
1543	Thomas	10S 32W 29DCB 1	78.98564	161.59683	3064.0	93.9	2970.1
1544	Thomas	10S 33W 3DBC 1	75.15380	165.82703	3145.0	148.5	2996.5
1545	Thomas	10S 33W 19CBD 1	71.72309	162.96425	3161.0	104.8	3056.2
1546	Thomas	10S 33W 27BBB 1	74.54624	162.48935	3119.0	104.0	3015.0
1547	Thomas	10S 34W 12BCD 1	70.80587	165.22482	3220.0	180.5	3039.5
1548	Thomas	10S 36W 36ACC 1	59.09651	161.57820	3359.0	171.8	3187.2
1767	Wallace	11S 38W 35CCC 2	46.76602	155.53662	3372.0	140.1	3231.9
1550	Wallace	11S 42W 8DDC 1	20.95668	160.45091	3953.0	107.4	3845.6

Appendix C

UNCF Sampling

This sampling relates to elevation of an unconformity (Jones *et al.*, 1986, Table B.4). The data are the property of Exxon Production Company, which reserved the right to withdraw some information. According to the senior author's recollection (Jones, 1995, personal communication), the coordinates are in meters and the depth in feet. The data are available on Internet for downloading at http://www.kgs.ukans.edu/Mathgeo/Books/Geostat/index.html.

Table C.1. UNCF sampling.

Easting (m)	Northing (m)	ID	Depth (ft)	Easting (m)	Northing (m)	ID	Depth (ft)
32000	87015	1	−7888	38600	87030	2	−8020
44000	86400	3	−7943	48200	87060	4	−8003
30650	82200	5	−7918	35030	80901	6	−7905
39476	80970	7	−7900	44198	80910	8	−7998
33530	76230	9	−7879	38024	76170	10	−7817
42440	76650	11	−8018	46955	76620	12	−7890
30350	71700	13	−7903	35195	71745	14	−7815
39650	71760	15	−7966	44180	71766	16	−7913
48800	70215	17	−7818	29240	81960	1610	−7920
32270	83760	1614	−7923	33770	84720	1616	−7918
35240	85590	1618	−7927	36740	86520	1620	−7969
39680	88350	1624	−8043	41240	89250	1626	−8059
29840	67560	2068	−7932	31280	66600	2070	−7883
32720	65610	2072	−7842	34190	64650	2074	−7842
35720	63720	2076	−7874	37100	62700	2078	−7871
31730	63000	3078	−7740	33500	63720	3080	−7799
36680	65160	3084	−7902	38300	65790	3086	−7943

(*cont.*)

Table C.1. UNCF sampling (*concluded*).

Easting (m)	Northing (m)	ID	Depth (ft)	Easting (m)	Northing (m)	ID	Depth (ft)
39830	66540	3088	−7962	41420	67200	3090	−7967
43010	67920	3092	−7931	44690	68580	3094	−7876
46250	69300	3096	−7854	30200	76500	4546	−7849
31640	75420	4548	−7880	33080	74280	4550	−7869
34520	73260	4552	−7820	37280	71070	4556	−7892
38660	70020	4558	−7965	40040	69000	4560	−8008
41450	67890	4562	−7986	42800	66900	4564	−7922
44240	65730	4566	−7852	45500	64710	4568	−7773
33800	89220	5003	−7896	34880	87720	5005	−7915
35840	86280	5007	−7943	37040	84720	5010	−7948
37940	83160	5012	−7928	40784	79260	5018	−7923
42740	75120	5022	−8004	43730	74610	5024	−8001
44660	73200	5026	−7927	45680	71700	5028	−7877
46760	70200	5030	−7857	47600	68790	5032	−7824
48500	67380	5034	−7768	49520	65940	5036	−7696
42320	89100	6192	−8032	43700	88080	6194	−7971
45080	87000	6196	−7946	46520	86010	6198	−7973
47900	85050	6200	−8003	49400	84000	6202	−8032

Appendix D

Dakota Aquifer Sampling

The Dakota aquifer sampling was prepared at the Kansas Geological Survey from interpretations of gamma ray logs. The measurements are part of a larger effort to characterize the aquifer throughout Kansas. The subset in Appendix D extends over a square area of three by three townships (9.65 km × 9.65 km) in south-central Hodgeman county, close to outcrops. The Dakota aquifer comprises—from oldest to most recent—the Cheyenne Sandstone, the Kiowa Formation, and the Dakota Formation, all Lower Cretaceous in age. The Dakota Formation is subdivided into the top "D" and the thicker "J" sandstones. Most of the "D" sandstone is missing due to fluvial erosion in the eastern side of the study area, so it was discarded from the subdivision of cumulative sandstone thickness to eliminate the influence of such modern erosion. Based on depositional trends, the "J" sandstone was further subdivided into the basal 120 ft and the remainder of the deposits below the "D" sandstone. Except for the last 16 wells, discarding of shales in all cumulative sandstone thickness calculations was done automatically by computer from digitized logs. Data for the Dakota aquifer sampling are on the Internet and may be downloaded from http://www.kgs.ukans.edu/Mathgeo/Books/Geostat/index.html.

Table D.1. Dakota aquifer sampling.

			Formation	Cumulative sandstone thickness			
ID	Easting (ft)	Northing (ft)	thickness (ft)	Upper "J" (ft)	Lower "J" (ft)	Kiowa (ft)	Cheyenne (ft)
5	1631797	546606	286.0	0.0	27.0	0.0	54.4
9	1635275	545570	280.0	13.0	9.0	2.0	58.3
12	1641860	545503	279.0	95.0	112.0	83.3	68.1
31	1630041	536362	340.0	33.0	96.0	56.3	49.1
32	1631291	535016	341.0	28.5	80.0	20.5	14.5
38	1643084	532306	273.0	17.9	51.0	8.9	30.5

(*cont.*)

Table D.1. Dakota aquifer sampling (*continued*).

ID	Easting (ft)	Northing (ft)	Formation thickness (ft)	Cumulative sandstone thickness Upper "J" (ft)	Lower "J" (ft)	Kiowa (ft)	Cheyenne (ft)
40	1643137	534940		2.0	42.0	2.0	23.6
42	1648014	533313		73.0	70.0	32.6	60.1
48	1658548	530399	257.5	53.7	75.0	8.9	47.2
49	1660208	529439	230.5	6.0	34.0	8.9	52.1
50	1657520	526895		22.0	6.0	0.0	19.7
52	1658854	526844	230.0				
57	1652223	524384	257.0	2.1	58.0	25.8	21.6
59	1619712	547175	298.5	0.0	69.5	0.5	38.5
60	1607855	548835	316.5	16.0	94.0	0.0	33.0
61	1598543	549051	296.5	0.5	96.0	0.0	21.0
64	1611762	544744		38.3	84.0	1.5	70.5
68	1618670	544228	275.5	8.5	90.0	39.0	69.5
69	1617687	544248	288.5	1.5	63.0	0.0	33.0
70	1622289	544483	277.5	26.5	89.0	9.5	68.0
72	1626236	543077	283.5	46.5	73.0	0.0	50.0
75	1627484	539064	317.0	19.0	74.0	23.5	31.0
76	1620905	539390	315.0	95.5	55.5	11.0	37.0
79	1617557	536348	318.5	91.0	91.5	47.5	43.0
80	1610319	538152	256.5	0.5	0.0	0.0	50.0
81	1604730	539296	314.0	0.0	0.5	0.0	43.0
82	1606034	539265	290.5	56.5	11.5	16.0	37.0
83	1598477	541111	316.0	16.0	16.5	12.5	52.5
84	1602404	538352	334.5	166.5	120.0	102.5	76.0
85	1602364	535691	317.5	31.0	19.0	23.0	49.5
87	1598759	534150	302.0	1.0	14.5	11.0	51.0
88	1599379	532145	292.0	25.5	25.5	8.0	40.5
89	1604990	534296	259.5	3.0	11.0	0.0	32.0
91	1616880	535363	328.5	5.5	45.5	10.5	44.5
92	1618118	531339	308.5	62.5	51.0	36.5	55.0
93	1623388	531203	325.5	3.0	69.0	0.0	4.0
94	1626054	532477	303.5	5.0	0.0	5.0	7.5
95	1627411	535098	336.0	48.0	74.5	53.0	44.0
97	1627694	531443	277.0	18.5	7.0	0.0	0.0
101	1615428	527431	298.5	36.0	0.0	0.0	32.5
104	1598727	530844	302.0	38.5	58.0	0.0	35.5
105	1600941	526476	305.5	73.0	92.0	27.5	80.5
106	1616657	523435	290.0	34.5	2.5	3.0	24.5
107	1617968	522083	296.5	105.0	78.5	21.0	23.0
108	1619267	520414		3.5	6.5	58.5	53.0

(*cont.*)

Table D.1. Dakota aquifer sampling (*continued*).

ID	Easting (ft)	Northing (ft)	Formation thickness (ft)	Cumulative sandstone thickness Upper "J" (ft)	Lower "J" (ft)	Kiowa (ft)	Cheyenne (ft)
109	1623278	524586	273.0	40.5	14.0	18.5	37.5
112	1593222	549092	294.5	24.0	38.5	0.0	30.5
113	1595911	551702	295.0	20.5	31.0	0.0	8.0
114	1589279	551731	287.5	40.0	22.0	22.0	23.0
115	1587945	551746	279.5	2.5	4.5	5.5	9.0
116	1589238	549114	340.0	117.0	116.0	20.0	32.0
117	1586593	549133	289.0	0.0	41.5	0.0	0.0
118	1582610	549150	282.5	63.0	68.0	95.0	30.5
119	1581312	551771	279.0	15.0	83.0	3.5	0.0
120	1577424	549170	293.5	16.5	37.5	30.0	33.0
121	1573371	547856	285.5	1.0	54.0	9.5	22.5
122	1574698	550486	296.5	38.5	9.0	0.0	15.5
123	1572083	550477	267.0	19.0	22.0	22.5	34.5
124	1574674	547858	261.0	19.0	57.0	12.5	18.5
127	1573367	546534	308.0	25.0	20.5	19.0	32.0
128	1574670	546535	318.5	23.5	13.5	19.5	21.5
129	1572038	546533	283.5	15.5	35.0	0.0	21.5
130	1579926	542551	352.5	94.0	109.0	10.0	51.0
131	1578934	544212	325.5	40.0	66.0	0.0	11.0
132	1585232	546514	322.0	80.0	108.5	0.0	0.0
133	1594535	545127	272.0	17.5	73.5	90.0	26.5
134	1594533	543799	308.5	0.0	44.0	46.5	35.0
135	1590518	537219	327.5	13.0	67.5	0.0	13.5
136	1583908	541206	360.5	37.5	31.0	0.0	67.5
138	1581226	537274	308.5	8.5	5.0	0.0	47.0
139	1573283	541245	352.5	81.5	111.0	10.0	21.5
140	1571907	537271	307.5	9.0	4.5	0.0	47.0
141	1567911	533340	340.0	31.0	75.5	0.0	27.5
142	1579869	533288	281.0	17.0	9.0	6.5	49.5
143	1577213	533286	300.0	64.5	4.0	48.5	53.5
144	1586525	535925	319.5	40.5	66.5	19.0	41.5
145	1586523	534597	275.5	62.0	69.0	88.5	37.5
146	1586502	533263	312.0	68.0	4.5	9.5	52.0
147	1586499	531941	320.5	154.0	117.5	116.5	46.5
148	1591460	532243	324.5	22.0	71.5	12.0	29.0
149	1588483	531932	309.0	7.5	108.5	34.0	31.0
150	1597100	531552	313.5	42.5	65.0	1.5	33.5
151	1592775	530917	310.5	0.0	104.5	17.0	35.0
152	1596115	530561	284.0	46.0	86.5	96.5	40.5

(*cont.*)

Table D.1. Dakota aquifer sampling (*continued*).

ID	Easting (ft)	Northing (ft)	Formation thickness (ft)	Cumulative sandstone thickness Upper "J" (ft)	Lower "J" (ft)	Kiowa (ft)	Cheyenne (ft)
153	1597431	530224	297.0	3.0	3.0	0.0	35.0
154	1591802	529276	332.0	16.0	84.0	0.5	30.5
155	1586496	530624	321.5	38.0	53.0	10.5	13.5
156	1576865	530969	300.0	0.0	1.0	0.0	24.0
158	1566564	530705	346.5	52.5	108.5	50.0	59.0
159	1567861	528039	332.5	19.5	116.0	6.0	65.0
162	1587693	521375	293.0	3.0	89.5	41.5	74.5
163	1590455	525323	316.0	41.5	94.5	1.5	27.0
164	1587754	525342	322.0	111.5	99.0	20.5	71.5
165	1595746	525270	299.5	0.5	66.0	12.5	52.0
166	1660074	518849	252.5	0.0	37.0	0.0	1.0
167	1660023	516188	234.0	53.0	92.5	104.5	22.5
170	1645547	518976	263.0	0.0	51.0	0.0	0.0
172	1632313	513836	268.0	0.0	0.0	0.0	0.0
173	1637517	511137		46.0	55.5	1.0	31.0
174	1644409	510045		61.2	31.0	47.0	48.0
175	1645310	513673		10.0	70.5	17.5	21.5
176	1645442	512348		0.5	78.0	25.5	35.5
180	1657332	513561	228.0	1.5	5.0	1.0	2.0
181	1657231	505627		18.5	0.0	0.0	9.5
182	1655933	508283		0.0	0.0	0.0	0.0
183	1658211	503959		23.0	0.0	0.0	8.5
186	1641382	504456		0.0	0.0	0.0	8.5
187	1638777	507136		67.5	38.5	125.0	26.0
188	1629429	500645	281.5	11.0	6.0	0.0	32.5
190	1637376	501970	282.5	17.5	0.0	1.5	15.0
194	1645180	492553		0.0	0.0	0.0	20.0
196	1659722	491076		40.5	12.0	0.0	14.5
200	1612504	515610		59.5	82.5	30.5	42.5
201	1598092	510693	305.0	9.5	43.5	6.0	66.0
202	1607242	511741	306.0	10.0	80.0	0.0	53.0
203	1617728	510145	314.0	97.0	113.5	117.5	60.0
204	1613780	514247	303.5	75.0	84.5	12.5	59.0
206	1620423	512752	269.0	28.0	0.0	6.5	41.0
209	1624242	504707	313.0	85.5	108.0	43.0	42.0
210	1620180	506103		79.0	94.5	95.5	53.5
211	1621621	507067		24.0	15.0	0.0	17.5
212	1621629	505088		8.5	25.5	0.5	28.0
213	1617709	508811	313.0	36.0	49.5	4.0	39.5

(*cont.*)

Table D.1. Dakota aquifer sampling (*continued*).

ID	Easting (ft)	Northing (ft)	Formation thickness (ft)	Cumulative sandstone thickness Upper "J" (ft)	Lower "J" (ft)	Kiowa (ft)	Cheyenne (ft)
214	1603136	503894	303.5	40.5	73.5	7.5	71.0
215	1608410	502405	335.5	79.0	112.0	22.5	72.5
217	1626793	500687	312.0	24.5	94.0	0.0	15.5
219	1623072	496783	276.0	13.0	61.5	5.5	36.0
220	1613493	494335	314.5	12.0	75.5	16.0	62.0
221	1605694	498516	325.5	15.5	68.5	18.5	61.0
224	1602927	493317	325.0	50.5	88.0	37.0	70.0
225	1608186	491845	321.5	24.5	58.0	4.5	68.5
226	1609537	493126	303.5	17.5	71.0	20.5	71.0
227	1614707	490372	312.0	26.5	53.5	1.5	39.0
228	1618663	490272	311.5	20.0	61.0	16.0	30.5
229	1620032	492875	301.5	72.5	53.0	23.5	27.0
230	1590299	518562	283.0	120.5	116.5	107.5	111.0
231	1583971	518421	308.0	92.0	102.5	87.0	82.5
233	1581198	511851		56.3	38.5	29.0	87.5
234	1576550	513236		2.0	61.3	4.0	110.5
235	1584833	510794	293.5	58.0	61.0	25.0	98.5
236	1585197	514429	309.0	0.0	49.0	14.0	79.5
237	1583875	512471		4.0	11.0	8.0	71.5
239	1587483	513410	314.0	3.0	68.0	8.5	92.5
240	1589811	513091	337.5	3.5	51.5	16.0	74.5
241	1587027	511761	313.5	11.5	0.0	9.0	87.0
242	1593182	513751	317.5	12.5	22.5	18.5	91.0
243	1592497	513761	286.5	4.5	12.0	31.5	89.5
244	1584688	506796	280.0	0.0	3.0	0.0	61.5
245	1579420	506900	328.0	40.5	37.0	0.0	49.0
246	1584514	500119	308.0	34.0	27.0	49.5	126.5
247	1588487	500097	300.0	11.5	0.0	0.0	44.0
248	1594927	502433		39.0	60.5	86.5	101.0
249	1592456	497486	279.0	29.0	0.0	3.0	93.0
250	1590160	499115	303.0	42.5	19.5	16.5	115.5
251	1588760	495803	304.0	11.0	32.5	39.5	124.5
252	1586747	496434	307.5	9.0	7.0	31.5	130.5
253	1586795	498411	305.0	53.0	26.0	4.5	133.5
254	1585465	499099	304.0	3.0	25.0	42.5	118.5
257	1579042	490924	273.0	11.5	30.0	5.0	126.5
258	1576774	493989	255.5	34.0	80.5	135.5	177.5
259	1577070	492973	261.5	0.5	44.0	35.0	164.5
260	1576349	489633	336.0	0.0	31.5	0.0	41.0

(*cont.*)

Table D.1. Dakota aquifer sampling (*continued*).

ID	Easting (ft)	Northing (ft)	Formation thickness (ft)	Cumulative sandstone thickness Upper "J" (ft)	Lower "J" (ft)	Kiowa (ft)	Cheyenne (ft)
262	1637835	486794		2.5	10.5	43.0	39.5
272	1638333	476736	259.0	26.5	0.0	0.0	0.0
273	1628959	475530	283.5	0.0	0.0	0.0	15.5
275	1644813	467420	312.0	46.0	42.5	21.0	124.0
277	1650124	467367	265.0	62.0	16.0	117.5	98.5
279	1652711	466027	281.5	7.5	1.0	23.0	92.0
280	1647401	463451	295.5	25.0	0.0	2.0	147.5
281	1638137	462197	285.5	22.0	8.5	26.0	112.8
284	1634123	459611	276.0	2.0	0.0	0.0	114.5
285	1657895	459399	327.0	91.5	114.5	161.5	165.5
288	1625201	486167	275.5	0.0	3.5	0.0	29.0
289	1615874	483699	328.5	58.5	11.0	0.0	52.5
290	1614542	483740	317.0	103.5	65.5	117.5	113.5
292	1598661	478505	337.0	16.0	58.0	76.5	119.0
293	1599690	481129	335.5	61.0	18.5	3.5	80.0
294	1601363	482732	333.5	63.0	84.5	101.5	124.0
295	1610566	482514	270.5	9.0	9.0	12.5	118.0
296	1611879	481161	277.0	5.5	1.5	11.5	73.0
297	1610174	478558	275.5	0.0	18.0	0.0	83.5
300	1621988	475327		6.5	52.0	7.5	151.0
301	1613139	475836	323.5	151.5	36.0	34.5	149.5
302	1617103	477085	317.5	38.0	90.5	15.0	114.5
304	1608176	476958	313.5	3.5	53.5	14.5	91.5
306	1609481	476600	328.0	11.0	16.0	87.0	136.0
308	1602571	476085	363.0	18.0	82.0	15.5	63.5
309	1598626	476177	370.0	145.0	113.5	55.5	154.0
310	1597327	477547	363.5	7.0	88.0	10.0	89.0
311	1612109	471534	335.0	16.5	87.5	26.5	135.0
312	1588233	485531	303.0	113.5	112.5	122.0	130.0
313	1581968	487883	284.0	28.0	13.5	6.5	176.0
315	1578574	482924	275.0	1.5	25.0	7.0	222.0
319	1637587	546548	279.5	8.0	25.0	24.5	53.0
320	1637907	545549	326.5	29.0	28.5	1.5	34.5
321	1639175	538904	282.5	27.5	46.0	5.0	46.0
325	1641780	533625		84.0	87.5	6.5	36.5
326	1652918	530001		10.9	49.0	2.5	12.5
329	1605370	538951	308.0	0.0	0.0	7.0	37.0
330	1606022	537936	257.0	1.0	24.0	3.0	44.0
331	1599714	531806	291.0	16.0	31.5	1.0	33.5

(*cont.*)

Table D.1. Dakota aquifer sampling (*concluded*).

ID	Easting (ft)	Northing (ft)	Formation thickness (ft)	Cumulative sandstone thickness Upper "J" (ft)	Lower "J" (ft)	Kiowa (ft)	Cheyenne (ft)
332	1582626	550461	300.0	30.5	34.5	22.5	9.0
333	1586626	551754	278.5	29.5	31.5	2.5	17.5
334	1569436	551821	274.5	4.0	1.5	3.5	29.0
340	1641496	512402		8.0	74.5	2.0	27.0
343	1638644	497928		0.0	0.0	0.0	9.0
346	1617747	511484	315.0	78.0	109.5	112.0	72.5
348	1604307	495921		58.0	99.0	61.5	81.5
349	1613456	493020	309.0	0.0	0.0	0.0	1.0
350	1583973	518425	309.0	77.5	102.5	86.0	82.5
351	1584794	497789	309.0	108.5	111.5	131.0	68.0
357	1654281	481877	256.5	9.5	25.5	0.0	28.5
359	1609180	478592	331.0	7.5	29.5	5.0	33.0
360	1614522	482411	308.0	75.5	32.5	9.0	101.5
361	1615845	482374	324.5	104.0	47.5	0.5	92.0
362	1589619	488188	303.5	20.5	22.0	14.5	127.5
501	1624500	460500		59.0	105.0	12.0	98.0
502	1591000	461500		0.0	10.0	5.0	56.0
503	1596000	468000		55.0	66.0	9.0	157.0
504	1656000	501000		12.0	6.0	10.0	25.0
505	1638500	499000		0.0	0.0	0.0	10.0
506	1642000	487500		0.0	48.0	18.0	35.0
507	1604000	463000		19.0	22.0	7.0	208.0
508	1628500	519000		0.0	15.0	0.0	18.0
509	1594000	514000		5.0	15.0	15.0	80.0
510	1566000	507000		25.0	0.0	2.0	125.0
511	1573500	473500		10.0	20.0	20.0	270.0
512	1643500	472000		42.0	10.0	4.0	60.0
513	1627000	517000		0.0	0.0	0.0	0.0
514	1596000	513500		5.0	10.0	12.0	92.0
515	1654000	495500		7.0	35.0	18.0	45.0
516	1614500	501500		61.0	25.0	18.0	42.0