BOSTWICK UNIT

Measurements of the water level for observation wells in Cloud, Jewell, and Republic Counties are made periodically. The highest and lowest water levels for the period of record are given in table 6; the difference between the highest and lowest water levels, the net rise or decline in 1951, and the net rise or decline for the period of record are given in table 7; and the water levels for 1951 are given in table 8. Hydrographs of five observation wells are shown in figure 4.

Table 6.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in observation wells in the Bostwick unit.

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
1-5-7bb	4	3.20	July 24, 1951	8.83	Nov. 2, 1948
-7cb	4	15.38	July 24, 1951	22.04	Feb. 7, 1949
-8dc	2	.70	May 3, 1951	4.46	June 30, 1950
-9ba	2	19.51	Oct. 1, 1951	22.10	June 30, 1950
-14dc	2	3.10	June 15, 1951	7.36	June 30, 1950
-16dd	2	9.70	June 15, 1951	12.26	Nov. 30, 1950
-17dd	2	9.10	Aug. 6, 1951	13.12	Feb. 24, 1950
-22ab a/	2	6.10	Aug. 6, 1951	8.99	Apr. 27, 1950
-23cc	2	5.37	Sept.27, 1950	8.17	Jan. 31, 1950
-25cd	2	.90	June 15, 1951	5.09	June 28, 1950
-25dc	2	6.93	Sept.27, 1950	9.55	June 28, 1950
-26cc	2	6.50	Aug. 6, 1951	8.83	June 28, 1950
-26dd	2	2.20	May 3, 1951	6.48	June 28, 1950
-27dc	2	14.10	Aug. 6, 1951	17.33	June 28, 1950
-28aa	2	13.50	(Aug. 6, 1951) (Aug. 31, 1951) (Dec. 3, 1951)	15.81	June 30, 1950
-33ba	2	3.60	Aug. 6, 1951	11.28	Apr. 25, 1950
-34bb	2	12.90	Aug. 6, 1951	20.70	July 6, 1949
1-6-4ac	2	3.58	July 24, 1951	8.16	Apr. 25, 1950
-4dc	4	10.17	July 24, 1951	18.33	Oct. 8, 1947
-5da	4	3.72	July 24, 1951	9.90	Dec. 21, 1948
-5dd	4	10.94	Aug. 19, 1948	32.45	May 20, 1948
-6bc	2	2.17	Oct. 1, 1950	9.95	June 30, 1950

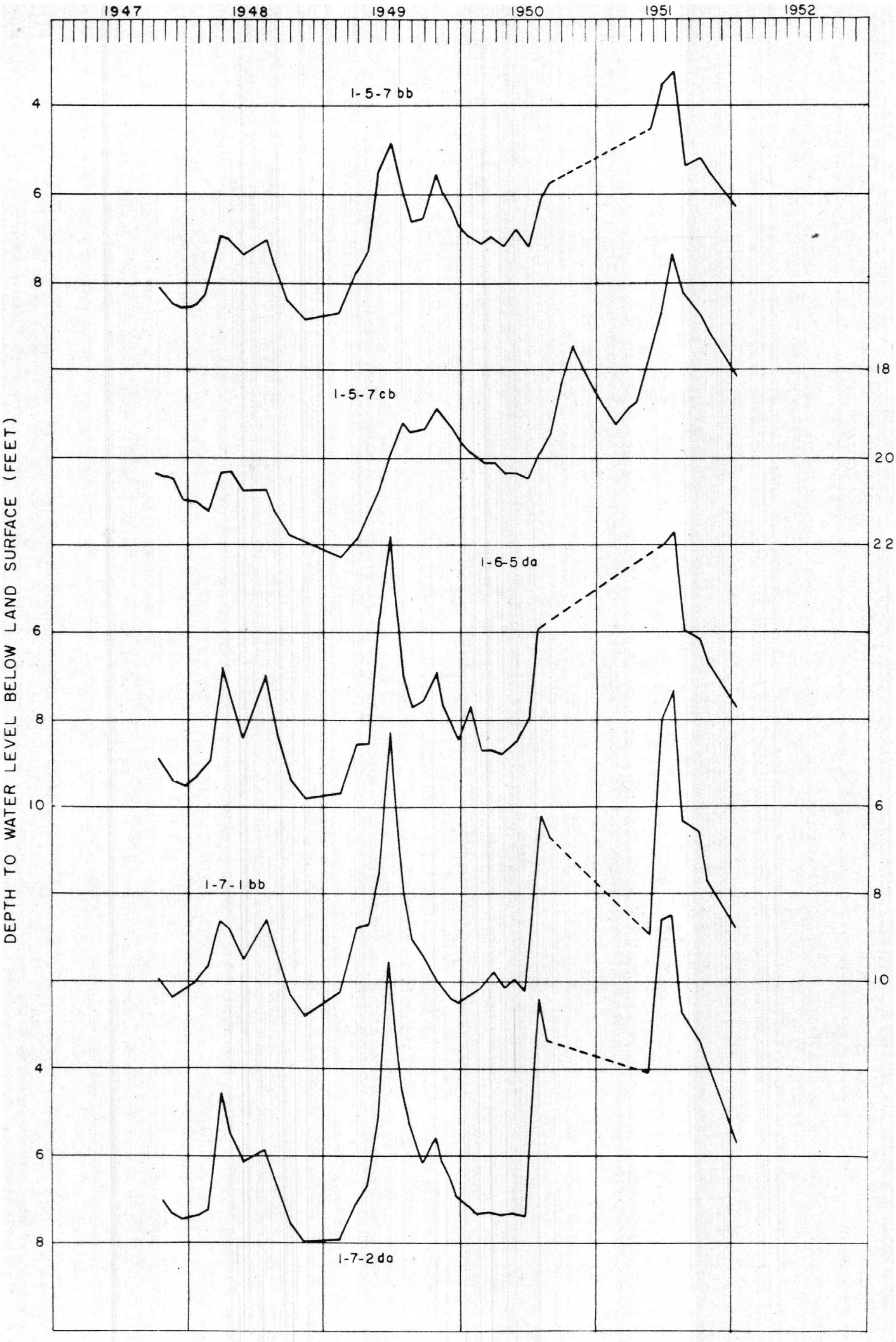

Figure 4.- Hydrographs of five wells, Bostwick unit

Table 6.—Highest and lowest water levels for the period of record, in feet below land-surface datum, in observation wells in the Bostick unit.—Continued

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
1-6-6cc	2	25.88	May 23, 1951	28.04	June 30, 1950
-6da	2	13.73	Aug. 22, 1951	18.50	June 30, 1950
-11aa	2	.68	June 26, 1951	4.18	Oct. 24, 1951
1-7-1bb	4	3.39	July 24, 1951	10.80	Nov. 2, 1948
-2da	4	.42	July 24, 1951	8.00	Dec. 21, 1948
-2dd a/	2	10.48	June 26, 1951	13.72	May 28, 1950
2-4-7ba	2	8.94	Feb. 21, 1950	13.10	May 3, 1951
-18cc	2	10.90	July 5, 1951	15.29	Apr. 25, 1950
-18dc	2	22.00	Dec. 4, 1951	27.92	Feb. 21, 1950
-31aa	2	.50	June 15, 1951	3.96	June 27, 1950
-31cc	2	3.60	June 18, 1951	7.12	Jan. 31, 1950
-32cc	2	.40	June 15, 1951	4.43	Feb. 21, 1950
2-5-1cd	2	7.20	Aug. 6, 1951	9.60	June 27, 1950
-2ac	2	2.30	June 15, 1951	5.43	June 28, 1950
-2ba	2	6.00	Aug. 6, 1951	9.75	Apr. 25, 1950
-11da	2	1.00	June 15, 1951	5.02	Apr. 25, 1950
-13dc	2	1.10	May 3, 1951	5.44	June 27, 1950
-14dd	2	5.70	Aug. 6, 1951	9.15	June 28, 1950
-23dd	2	2.30	July 5, 1951	6.85	June 28, 1950
-24cc	2	4.80	June 15, 1951	7.98	Nov. 29, 1950
-25cc	2	3.80	June 15, 1951	8.83	Apr. 25, 1950
-36ab	2	16.10	Aug. 6, 1951	20.08	June 27, 1950
3-4-7ad a/	2	4.10	July 5, 1951	7.85	Jan. 31, 1950
-7cc	2	4.10	July 3, 1951	12.59	Apr. 27, 1950
-7dc	2	2.18	Aug. 31, 1950	5.94	Apr. 25, 1950
-8bb	2	5.70	July 5, 1951	9.40	Apr. 25, 1950
-8cb	2	3.30	July 5, 1951	7.56	Apr. 25, 1950
-8cc1	2	3.10	July 3, 1951	7.00	June 28, 1950
-8cc2	2	1.90	July 3, 1951	6.44	Feb. 23, 1950
-8cd	2	3.70	July 3, 1951	6.91	June 28, 1950
-17bb	2	2.00	July 3, 1951	6.35	Apr. 27, 1950
-17cc	2	1.20	July 3, 1951	5.70	Apr. 27, 1950
-18ad	2	1.20	July 3, 1951	3.96	Nov. 29, 1950
-18dc	2	5.94	Sept.30, 1950	8.59	Apr. 27, 1950
-19aa	2	2.00	July 3, 1951	5.67	Jan. 31, 1950
-20ba	2	3.70	June 13, 1951	7.00	Dec. 4, 1951
-20bc	2	1.90	May 2, 1951	5.16	Nov. 29, 1950
-28ab	2	17.70	Aug. 1, 1951	25.50	Apr. 27, 1950
-29ab	2	2.50	July 2, 1951	7.17	Apr. 27, 1950
-29bc	2	3.70	June 13, 1951	7.01	June 28, 1950
-29cc	2	5.90	June 13, 1951	9.00	Jan. 31, 1950
-32cb	2	3.80	July 3, 1951	7.54	Nov. 29, 1950
-32cc	2	.70	June 13, 1951	6.10	June 28, 1950

Table 6.—Highest and lowest water levels for the period of record, in feet below land-surface datum, in observation wells in the Bostwick unit.—Continued

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
3-5-1aa	2	2.30	July 5, 1951	5.50	Dry on numerous dates in 1950.
-1ab	2	2.80	June 15, 1951	10.21	Apr. 25, 1950
-9dc	2	1.10	May 3, 1951	4.54	June 28, 1950
-11cc	2	8.60	July 31, 1951	15.70	Apr. 25, 1950
-11dd	2	15.50	Dec. 3, 1951	19.56	June 28, 1950
-16dd	2	1.50	May 2, 1951	6.20	June 28, 1950
-21dd	2	6.00	July 31, 1951	13.13	Apr. 27, 1950
4-4-4aa	2	7.05	Feb. 23, 1950	16.60	Aug. 22, 1951
-4cc	2	4.50	July 2, 1951	10.00	Apr. 27, 1950
-5aa	2	1.80	Aug. 1, 1951	5.73	June 27, 1950
-8bc	2	8.50	June 13, 1951	12.95	Jan. 31, 1950
-17dc	2	2.00	(June 13, 1951) (July 2, 1951)	5.63	June 27, 1950
-20bb	2	1.70	July 2, 1951	6.94	Nov. 28, 1950
-21aa	2	7.00	Aug. 1, 1951	15.88	Apr. 27, 1950
-21bb	2	2.40	Aug. 1, 1951	6.94	Apr. 27, 1950
-27dd[a]	2	15.80	(Aug. 1, 1951) (Aug. 22, 1951)	23.76	Feb. 23, 1950
-28cc	2	1.30	Aug. 1, 1951	6.63	Apr. 27, 1950
-28dd	2	8.90	Aug. 1, 1951	16.99	Apr. 27, 1950
-29cb	2	13.40	July 3, 1951	17.68	June 27, 1950
-32cd	2	3.00	Aug. 1, 1951	21.57	Apr. 27, 1950
4-5-1ac	2	28.00	Sept.20, 1949	34.10	June 28, 1950
5-3-19bb	2	15.40	Aug. 1, 1951	19.97	Apr. 27, 1950
-20aa	2	9.80	July 2, 1951	14.84	Apr. 27, 1950
-20dd	2	5.36	July 27, 1950	9.43	Apr. 27, 1950
-23cb	2	1.90	June 13, 1951	6.17	Apr. 27, 1950
-24cb	2	1.40	Dec. 4, 1951	3.81	June 27, 1950
-27dd	2	1.80	Aug. 22, 1951	7.30	Apr. 27, 1950
-29dd	2	4.60	July 2, 1951	11.45	Apr. 27, 1950
-31bc	2	15.40	Aug. 1, 1951	23.22	Mar. 30, 1950
-34aa	2	9.80	July 2, 1951	20.95	Mar. 30, 1950
5-4-8dd	2	10.30	Aug. 1, 1951	14.51	Apr. 27, 1950
-9aa	2	+.80	July 2, 1951	3.10	Apr. 27, 1950
-11dd	2	12.10	Aug. 1, 1951	20.33	Apr. 27, 1950
-14bc	2	2.90	Aug. 1, 1951	7.37	Apr. 27, 1950
-15aa	2	7.40	July 3, 1951	12.00	Apr. 27, 1950

[a] Measurement discontinued.

Table 7.--Difference between highest and lowest recorded water levels, net change in water level in 1951, and net change in water level for period of record, in feet, in observation wells in Bostwick unit.

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1951	Net rise (+) or net decline (-) for period of record
1-5-7bb	5.63	+0.08	+2.65
-7cb	6.66	+1.03	+3.28
-8dc	3.76	+ .35	+ .37
-9ba	2.59	+ .70	+1.31
-14dc	4.26	+ .58	+ .93
-16dd	2.56	+ .56	+ .33
-17dd	4.02	+ .50	+2.03
-22ab	2.89	+ .69	+1.83
-23cc	2.80	-.16	-.30
-25cd	4.19	-.34	+1.50
-25dc	2.62	-.09	+ .30
-26cc	2.33	+ .31	-1.20
-27dd	4.28	+ .32	+1.10
-27dc	3.23	+1.10	+1.10
-28aa	2.31	+1.40	+1.88
-33ba	7.68	+ .12	+3.70
-34bb	7.80	+1.60	+5.60
1-6-4ac	4.58	+ .73	+1.43
-4dc	8.16	+1.50	+6.01
-5da	6.18	+ .96	+2.27
-5dd	21.51	-1.96	+.90
-6bc	7.78	+1.94	+3.21
-6cc	2.16	+ .75	+1.88
-6da	4.77	+2.39	+3.95
-11aa	3.50	-1.33	-1.35
1-7-1bb	7.41	+1.92	+2.16
-2da	7.58	+1.64	+3.10
-2dd	3.24	a/+1.76	+1.50
2-4-7ba	4.16	-.72	-3.36
-18cc	4.39	+ .05	+2.48
-18dc	5.92	+2.94	+5.92
-31aa	3.46	+ .82	+1.84
-31cc	3.52	+ .49	-1.30
-32cc	4.03	+1.54	+2.83
2-5-1cd	2.40	+1.01	+ .88
-2ac	3.13	+ .72	-.50
-2ba	3.75	+ .46	+1.65
-11da	4.02	+ .20	-1.70
-13dc	4.34	+ .71	+1.51
-14dd	3.45	+1.17	+3.01
-23dd	4.55	+ .37	+1.67

Table 7.--Difference between highest and lowest recorded water levels, net change in water level in 1951, and net change in water level for period of record, in feet, in observation wells in Bostwick unit.--Continued

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1951	Net rise (+) or net decline (-) for period of record
2-5-24cc	3.18	+0.48	-0.80
-25cc	5.03	+.84	+1.90
-36ab	3.98	+1.79	+2.52
3-4-7ad	3.75	+1.16	-.40
-7cc	8.49	+1.68	+2.80
-7dc	3.76	+.82	+.30
-8bb	3.70	+.59	+1.30
-8cb	4.26	+.49	-.20
-8cc1	3.99	+.91	+.55
-8cc2	4.54	+.50	-.50
-8cd	3.21	+.18	-3.00
-17bb	4.35	+.33	+1.65
-17cc	4.50	+.66	+1.60
-18ad	2.76	+.56	+.10
-18dc	2.65	+.69	+1.20
-19aa	3.67	+.32	-.60
-20ba	3.30	-.63	-.80
-20bc	3.26	+1.26	+.40
-28ab	7.80	+2.40	+5.31
-29ab	4.67	+1.18	+2.44
-29bc	3.31	+.72	-1.00
-29cc	3.10	+.78	-.40
-32cb	3.74	+.14	-3.70
-32cc	5.40	+.75	+1.03
3-5-1aa	3.20	+.04	-1.80
-1ab	7.41	+.51	+2.41
-9dc	3.44	+.11	+.30
-11cc	7.10	+4.18	+4.10
-11dd	4.06	+2.17	+2.30
-16dd	4.70	+1.24	+3.10
-21dd	7.13	+3.72	+5.60
4-4-4aa	9.55	-.91	-6.05
-4cc	5.50	+1.22	+1.92
-5aa	3.93	+.81	-.69
-8bc	4.45	+.05	-2.30
-17dc	3.63	+1.12	+.87
-20bb	5.24	+.14	-1.85
-21aa	8.88	+2.77	+4.71
-21bb	4.54	+1.75	+2.74
-27dd	7.96	+7.73	+4.16
-28cc	5.33	+1.27	+3.89

Table 7.—Difference between highest and lowest recorded water levels, net change in water level in 1951, and net change in water level for period of record, in feet, in observation wells in Bostwick unit.—Continued

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (–) in 1951	Net rise (+) or net decline (–) for period of record
4-4-28dd	8.09	+0.26	+3.41
-29cb	4.28	+.69	+.55
-32cd	18.57	+.79	+2.09
4-5-1ac	6.10	+3.15	-2.30
5-3-19bb	4.57	-.25	+.61
-20aa	5.04	-1.04	+.68
-20dd	4.07	-.49	+.10
-23cb	4.27	+.44	+.39
-24cb	2.41	+1.83	+1.09
-27dd	5.50	+.16	+.67
-29dd	6.85	+.27	+2.91
-31bc	7.82	+.41	+2.65
-34aa	11.15	+.13	+4.95
5-4-8dd	4.21	+1.20	+1.38
-9aa	3.90	+.73	+1.37
-11dd	8.23	+.20	+3.17
-14bc	4.47	+.73	+1.19
-15aa	4.60	+.41	+.90

a/ Destroyed.

Table 8.—Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1951.

1-5-7bb.

Date	Water level	Date	Water level	Date	Water level
May 23	4.51	July 24	3.20	Oct. 1	5.15
June 26	3.46	Aug. 22	5.37	24	5.42

1-5-7cb.

May 23	17.76	July 24	15.38	Oct. 1	16.74
June 26	16.68	Aug. 22	16.22	24	17.07

Table 17.—Water-level measurements, in feet below land-surface datum, in the Kanopolis unit, 1951.—Continued

16-2-18abb.

Date	Water level	Date	Water level	Date	Water level
July 2	25.42	Oct. 1	18.28	Nov. 9	20.28
Aug. 17	18.58				

16-2-18cc.

Jan. 24	24.69	July 2	18.21	Oct. 1	12.44
Mar. 15	25.13	24	13.03	Nov. 9	18.97
May 18	22.50	Aug. 17	11.76		

16-2-19ab.

Jan. 24	22.75	July 2	16.10	Oct. 1	11.46
Mar. 15	23.16	24	11.68	Nov. 9	16.69
May 18	20.21	Aug. 17	10.03		

16-3-12bcb.

July 2	12.40	Oct. 1	6.10	Nov. 9	6.89
Aug. 17	8.48				

16-3-13aaa.

July 2	20.33	Oct. 1	13.18	Nov. 9	13.63
Aug. 17	15.45				

16-3-13abb.

July 2	21.50	Oct. 1	15.94	Nov. 9	15.00
Aug. 17	18.16				

16-3-13cd.

Jan. 24	21.38	July 2	20.80	Oct. 1	11.64
Mar. 15	22.10	24	15.06	Nov. 9	12.83
May 18	22.19	Aug. 17	13.76		

Table 17.—Water-level measurements, in feet below land-surface datum, in the Kanopolis unit, 1951.—Continued

16-3-24ddd.

Date	Water level	Date	Water level	Date	Water level
July 2	17.11	Oct. 1	8.60	Nov. 9	10.38
Aug. 17	4.92				

16-3-26aad.

July 2	12.73	Oct. 1	1.44	Nov. 9	2.74
Aug. 17	.14				

16-3-26dc.

Jan. 24	18.76	July 2	16.23	Oct. 1	9.02
Mar. 15	19.50	24	4.96	Nov. 9	11.37
May 18	19.64	Aug. 17	8.29		

16-3-33ddd.

July 2	14.23	Oct. 1	8.77	Nov. 9	9.05
Aug. 17	10.11				

16-3-34dd.

Jan. 24	20.10	July 2	18.39	Oct. 1	9.30
Mar. 15	20.90	24	5.80	Nov. 9	11.43
May 16	20.77	Aug. 17	9.45		

16-6-35bdd.

July 2	16.35	Oct. 1	15.18	Nov. 9	15.42
Aug. 20	24.31				

17-3-2add. Aug. 17, 5.00; Oct. 1, 6.41; Nov. 9, 7.32.

17-3-3ddd.

July 2	17.83	Oct. 1	13.41	Nov. 9	13.39
Aug. 17	13.53				

Table 17.—Water-level measurements, in feet below land-surface datum, in the Kanopolis unit, 1951.—Continued

17-3-4bbb.

Date	Water level	Date	Water level	Date	Water level
July 2	21.20	Oct. 1	19.22	Nov. 9	19.24
Aug. 17	20.09				

17-3-5ccc. Aug. 18, 2.22; Oct. 1, 2.00; Nov. 9, 2.55.

17-3-9bcc.

July 2	16.55	Oct. 1	15.00	Nov. 9	14.54
Aug. 17	15.50				

17-3-9ddd. Aug. 17, 19.18; Oct. 1, 16.97; Nov. 9, 16.22.

17-3-10bbb.

Mar. 1	17.74	Aug. 17	6.65	Nov. 9	9.23
July 2	14.63	Oct. 1	6.86		

17-3-10dcc3. Oct. 1, 12.99; Nov. 9, 12.84.

17-3-16ddd.

July 2	22.72	Oct. 1	14.41	Nov. 9	15.40
Aug. 18	15.58				

17-3-17dd.

Jan. 24	25.10	July 2	22.33	Oct. 1	17.60
Mar. 15	25.58	24	16.75	Nov. 9	19.94
May 15	24.93	Aug. 18	17.49		

17-3-18dd.

Jan. 24	25.08	July 2	21.80	Oct. 1	17.25
Mar. 15	25.65	24	17.60	Nov. 9	18.88
May 16	25.01	Aug. 17	17.38		

Table 17.—Water-level measurements, in feet below land-surface datum, in the Kanopolis unit, 1951.—Continued

17-3-19ddd.

Date	Water level	Date	Water level	Date	Water level
July 2	20.40	Oct. 1	12.60	Nov. 9	13.01
Aug. 20	12.65				

17-3-21cbb.

July 2	15.96	Oct. 2	14.20	Nov. 9	12.95
Aug. 18	14.76				

17-3-30dd.

Jan. 24	28.33	July 2	25.90	Oct. 1	19.54
Mar. 15	29.04	24	19.09	Nov. 9	20.82
May 16	29.70	Aug. 20	19.25		

17-4-20ddd.

July 2	1.73	Oct. 1	3.63	Nov. 9	3.13
Aug. 20	3.49				

17-4-21bcc.

July 2	3.78	Oct. 1	6.03	Nov. 9	6.50
Aug. 20	6.16				

17-4-25dd.

Jan. 24	22.68	July 2	20.44	Oct. 1	15.52
Mar. 15	23.01	24	15.11	Nov. 9	16.42
May 16	22.72	Aug. 20	15.44		

17-4-26ddd.

July 2	20.58	Oct. 1	21.67	Nov. 9	21.95
Aug. 20	21.22				

17-4-29ccc.

July 2	15.40	Oct. 1	7.96	Nov. 9	9.52
Aug. 20	6.52				

Table 17.--Water-level measurements, in feet below land-surface datum, in the Kanopolis unit, 1951.--Continued

17-4-31baa. July 2, 17.02; Aug. 20, 13.06; Oct. 1, 13.26.

17-4-32baa.

Date	Water level	Date	Water level	Date	Water level
July 2	20.01	Oct. 1	10.52	Nov. 9	11.71
Aug. 20	8.80				

17-4-33abb.

July 2	21.18	Oct. 1	17.04	Nov. 9	16.92
Aug. 20	17.72				

17-4-33bbb.

July 2	16.89	Oct. 1	12.51	Nov. 9	13.70
Aug. 20	11.05				

17-4-34add.

July 2	19.64	Oct. 1	14.31	Nov. 9	16.21
Aug. 20	13.11				

17-4-36abb.

July 2	20.08	Oct. 1	15.38	Nov. 9	16.00
Aug. 20	15.23				

17-5-2dad. Measurements discontinued.

17-5-4ddd.

Apr. 8	15.34	Aug. 20	14.67	Nov. 9	14.90
July 2	13.82	Oct. 1	14.00		

Table 17.—Water-level measurements, in feet below land-surface datum, in the Kanopolis unit, 1951.—Continued

17-5-5cdd.

Date	Water level	Date	Water level	Date	Water level
Apr. 8	17.49	Aug. 20	16.25	Nov. 9	14.10
July 2	18.50	Oct. 1	14.90		

17-5-7add.

Mar. 16	14.30	Aug. 20	6.06	Nov. 9	8.40
July 2	10.44	Oct. 1	6.01		

17-5-7bbb.

July 2	17.88	Oct. 1	19.24	Nov. 9	19.55
Aug. 20	18.92				

17-5-8ccc.

July 2	7.85	Oct. 1	3.42	Nov. 9	3.33
Aug. 20	4.34				

17-5-8ddd.

July 2	2.79	Oct. 1	0.90	Nov. 9	1.98
Aug. 20	1.23				

17-5-11bbb.

July 2	5.08	Oct. 1	1.87	Nov. 9	2.68
Aug. 20	2.67				

17-5-16aaa.

Mar. 16	19.20	Aug. 20	10.57	Nov. 9	12.45
July 2	15.19	Oct. 1	10.39		

17-5-21aaa. Measurements discontinued.

Table 17.--Water-level measurements, in feet below land-surface datum, in the Kanopolis unit, 1951.--Continued

17-5-21dad.

Date	Water level	Date	Water level	Date	Water level
July 2	12.37	Oct. 1	6.51	Nov. 9	9.31
Aug. 20	7.01				

17-5-23ccc.

July 2	15.05	Oct. 1	12.30	Nov. 9	17.30
Aug. 20	11.71				

17-5-25aaa.

July 2	11.39	Oct. 1	7.51	Nov. 9	7.62
Aug. 20	9.35				

17-5-26ddd.

July 2	13.87	Oct. 1	7.33	Nov. 9	8.62
Aug. 20	5.00				

17-6-13aaa.

July 2	22.80	Oct. 1	22.36	Nov. 9	22.18
Aug. 20	22.61				

Table 18.—Record of wells in the Kanopolis unit.

Well number: Description of well-numbering system is given in text.

Type of well: B, bored; Dn, driven; Dr, drilled; Du, dug; J, jetted.

Type of casing: GI, galvanized iron; S, stone: GP, galvanized pipe.

Character of material: G, gravel; S, sand; Sh, shale; Si, silt; Ss, sandstone.

Geologic source: A, alluvium, C, colluvium; K, Kiowa shale; N, Ninnescah shale; Td, terrace deposits; W, Wellington formation.

Method of lift: N, none.

Type of power: N, none; W, wind; H, hand.

Use of water: D, domestic; O, observation; S, stock; N, none.

Measuring point: Bpu, base of pump; Tca, top of casing; Tcu; top of curb; Tlbc, top of lower board cover; Tpl, top of platform.

Well number	Owner or tenant	Type of well	Depth of well (feet)	Diameter of well (inches)	Type of casing	Character and geologic source of principal water-bearing material	Method of lift and type of power	Use of water	Measuring point		Depth of water level below measuring point (feet)	Date of measurement
									Description	Distance above land surface (feet)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
					Ellsworth County							
17-6-11cbc	C. Hughes........	Du	18.0	48	S	A	H	S,D	Tcu	0.3	4.46	2- 7-51
-26bbb	.....do...........	Dr	23.0	6	GI	Td	N	N	Tca	.4	11.30	2- 7-51
					McPherson County							
17-3-2add	U. S. Geol. Survey	J	18.0	3/4	GI	Td	N	O	Tca	1.6	6.60	8-17-51
-5cc	.....do...........	J	30.0	3/4	GI	Si,N	N	N	Tca	1.4	3.62	8-18-51

Table 18.—Record of wells in the Kanopolis unit.—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
McPherson County—Continued												
17-3-7cbb	U.S. Geol. Survey	Du	74.0	40	S	N	H	N	Tcu	0.0	35.54	1-25-51
-9ddd	.....do..........	J	24.7	3/4	GI	Td	N	O	Tca	2.5	21.68	8-17-51
-10bbb	.....do..........	J	28.5	3/4	GI	Td	N	O	Tca	2.5	20.24	3- 1-51
-10dcc3	.....do..........	B	30.0	8	GI	A	N	O	Tca	2.8	15.79	10- 1-51
-14cc	.....do..........	Du,Dn	....	40	S	W	W	D	Tcu	.4	20.30	3-14-51
-16ddd	.....do..........	J	30.0	3/4	GI	S,Td	N	O	Tca	2.0	24.72	7- 2-51
-19ddd	.....do..........	J	32.0	3/4	GI	S,Td	N	O	Tca	1.9	22.20	7- 2-51
-24bbb	.....do..........	Dr	41.5	6	GI	W	N	N	Tca	.4	17.90	2- 6-51
-26abb	.....do..........	Du	47.0	40	S	W	H	D,S	Tcu	2.7	15.05	2- 6-51
17-4-1ccc	.....do..........	Dr	....	6	GI	N	W	D	Tca	.8	22.8	2-12-51
-14cdd	.....do..........	Du,Dn	24.6	40	S	K	W	S	Tpl	.0	13.33	2-14-51
-26ddd	.....do..........	J	42.0	3/4	GI	S,Td	N	O	Tca	2.5	23.08	7- 2-51
-34add	.....do..........	J	30.0	3/4	GP	S,Td	N	O	Tca	2.0	21.64	7- 2-51
-36abb	.....do..........	J	23.0	3/4	GI	S,Td	N	O	Tca	3.8	23.88	7- 2-51
17-5-4ddd	.....do..........	J	46.0	3/4	GI	Td	N	O	Tca	4.3	19.64	4- 8-51
-5cdd	.....do..........	J	32.0	3/4	GI	Td	N	O	Tca	2.0	19.49	4- 8-51
-7add	.....do..........	J	27.0	3/4	GI	S,Td	N	O	Tca	3.8	18.10	3-16-51
-11dcd	.....do..........	Du	....	40	S	K	W	S	Tpl	.0	8.77	2- 7-51
-14bab	.....do..........	J	22.0	3/4	GI	Td	N	O	Tca	-.6	7.30	4-16-51
-14dcc	.....do..........	Du	23.0	40	S	N	W	S	Tpl	.2	7.35	2- 7-51
-16aaa	.....do..........	J	25.5	3/4	GI	S,Td	N	O	Tca	2.1	21.30	3-16-51
-21dad	.....do..........	J	21.0	3/4	GI	GA	N	N	Tca	1.2	10.50	12-17-50
-29aaa	School Dist. 124.	Dr	16.0	6	GI	N	H	P,S	Tpl	.6	24.19	2- 7-51
-32baa	....	Du	32.0	40	S	N	H	S	Tpl	.8	12.38	2- 7-51
Saline County												
14-2-19dc	U.S.Geol. Survey	J	30.0	3/4	GI	G,Td	N	O	Tca	1.5	13.88	1-24-51
-30cd	.....do..........	J	30.0	3/4	GI	S,Td	N	O	Tca	2.3	15.80	1-24-51
14-3-25ad	.....do..........	J	25.0	3/4	GI	S,Td	N	O	Tca	2.0	15.94	1-24-51
15-2-6aa	.....do..........	J	29.0	3/4	GI	G,Td	N	O	Tca	1.5	18.54	1-24-51
-6dd	.....do..........	J	30.0	3/4	GI	G,Td	N	O	Tca	2.4	19.15	1-24-51

Table 18.—Record of wells in the Kanopolis unit.—Continued

Saline County—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
15-2-19bb	U.S. Geol.Survey	J	30.0	3/4	GI	S,Td	N	O	Tca	1.5	19.55	1-24-51
15-3-12ab	.....do..........	J	30.0	3/4	GI	S,Td	N	O	Tca	1.4	20.53	1-24-51
-12cd	.....do..........	J	30.0	3/4	GI	S,Td	N	O	Tca	1.0	17.20	1-19-51
-12dd	.....do..........	J	30.0	3/4	GI	Si,Td	N	O	Tca	1.3	15.36	1-19-51
-13ccc	.....do..........	J	28.0	3/4	GI	Si,Td	N	O	Tca	2.2	18.72	1-24-51
-17cbb	Smolan Cemetery.	Dr	44.0	6	GI	W	H	N	Bpu	.0	32.43	1-25-51
-21baa	E. Percival.....	Du,Dr	70.0	60	S,GI	Td	W	D,S	Tcu	1.8	23.75	1-25-51
-22cdd	....	Dr	72.0	6	GI	Td	H	D	Tca	.5	15.80	1-25-51
-26bab	J. Miller.......	Du	41.0	40	S	Td	N	N	Tpl	.1	19.25	1-25-51
-28bba	Carl Brax.......	Du	32.0	36	S	A,Td	H	D	Tca	2.2	16.82	1-26-51
-30abb	....	Du	27.8	40	S	Td	H	N	Tlbc	.0	11.07	1-26-51
16-3-2bba	C. H. Wagner....	Du	47.2	48	S	N	W	S,D	Tcu	.6	23.48	1-26-51
-4aad	....	Du	....	40	S	N	H	N	Tcu	2.4	16.81	1-26-51
-8aaa	....	Du	38.0	40	S	N	H	S	Tcu	3.0	25.70	1-26-51
-10baa	....	Du	35.0	40	S	N	H	D	Tcu	3.4	24.38	1-26-51
-11ccc	C. Rundquist....	Du	47.0	40	S	N	H	D	Tcu	3.8	31.62	1-25-51
-16ddd	....	Du	....	48	S	N	H	D,S	Tpl	1.1	26.82	1-26-51
-20abb	....	Du	55.0	40	S	N	H	D	Tpl	1.1	31.26	1-25-51
-20cbb	....	Du	41.0	48	S	C	N	D,S	Tpl	1.5	18.30	1-25-51
-22dcd	....	Du	51.0	40	S	Td	H	D	Tpl	.2	30.14	1-25-51
-28aab	....	Du	60.0	40	S	C	H	D	Tcu	3.4	21.55	1-25-51
-31ddd	....	Dr	55.0	6	GI	C	W	I*	Bpu	.4	9.50	1-25-51
-33bab	Eldon Johnson...	Du	60.0	40	S	C	W	S	Tpl	.4	39.64	1-25-51
-33ddd	U. S.Geol.Survey	J	40.0	3/4	GP	Td	N	O	Tca	3.5	.....	3- 1-51
-34bbb	Ebling..........	Du	54.0	60	S	Td	H	S	Tpl	3.1	30.85	1-26-51
16-4-32ccd	....	Du	....	48.0	S	N	N	D	Tcu	1.0	8.33	2-14-51
16-6-26dcc	....	Du	61.0	48.0	S	Td	N	N	Tpl	1.1	38.66	2- 7-51
-27ddd	....	Dr	49.0	6	GI	Td	...	D,S	Tca	.8	15.10	2- 7-51

*Garden irrigation.

Table 19.--Logs of jetted observation wells in the Kanopolis unit, 1951.

14-2-19dc. 3 feet west of telephone pole; 0.2 mile east of road terminal.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Topsoil	2	2
Silt, buff	6	8
Clay, silty, gray	1.5	9.5
Silt, buff	9.5	19
Sand, medium to coarse	9	28
Gravel, fine	2	30

14-2-30cd. 23 feet north of center line of east-west road and 14 feet west of center line of lease road.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Topsoil	1.5	1.5
Silt, buff	9.5	11
Clay, silty, gray	3	14
Silt, buff	7.5	21.5
Sand, medium to coarse	8.5	30

14-3-25ad. 12 feet north of center point of road intersection.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Topsoil	1	1
Silt, buff	8	9
Clay, sandy, gray	1.5	10.5
Silt, buff	5.5	16
Sand, fine	9	25
Sand, medium to coarse	5	30

15-2-6aa. 19 feet south of center line of east-west road.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Silt, gray	5	5
Silt, buff	3.5	8.5
Clay, cream	1.5	10
Silt, buff	4	14
Sand, fine to medium	14	28
Sand, coarse, and gravel	2	30

Table 19.—Logs of jetted observation wells in the Kanopolis unit, 1951.—Continued

15-2-19bb. 18 feet east of center line of north-south road and 30 feet south of center line of east-west road.

	Thickness (feet)	Depth (feet)
QUATERNARY-Plesitocene		
Silt, buff	10.5	10.5
Sand, fine	8.5	19
Clay, silty, white	4	23
Silt, buff	7	30

15-3-12ab. On edge of ditch south of east-west road and east of railroad tracks.

QUATERNARY-Pleistocene		
Topsoil	2	2
Silt, buff	5	7
Clay, silty, gray	1.5	8.5
Silt, sandy, buff	6.5	15
Sand, medium	11	26
Sand, coarse, and gravel	4	30

15-3-12cd. 13 feet north of center line of east-west road and 20 feet west of center line of railroad track.

QUATERNARY-Pleistocene		
Topsoil	3	3
Silt, buff	16	19
Clay, cream	2	21
Silt, buff, granular	9	30

15-3-13ccc. 43 feet east of center line of U. S. 81 and 22 feet north of center line of east-west road.

QUATERNARY-Pleistocene		
Silt, buff	17	17
Silt, granular, buff	11	28

16-3-33ddd. 35 feet north of center line of east-west road and 30 feet west of center line of north-south road.

QUATERNARY-Pleistocene		
Topsoil	2	2
Clay, dark	2.5	4.5
Silt, buff; lower part contains fine sand	28.5	33
Sand, very coarse, and gravel	7	40

Table 19.--Logs of jetted observation wells in the Kanopolis unit, 1951.--Continued

17-3-2add. 2 feet north of large hedge corner post on west side of north-south road.

	Thickness (feet)	Depth (feet)
QUATERNARY- Pleistocene		
No sample recovered; however, it is believed that silt occurs to a depth of about 16 feet and that fine sand occurs between 16 and 18 feet.		

17-3-9ddd. 1 foot south of corner post in the northwest corner of the intersection.

QUATERNARY-Pleistocene		
It was learned after completing this well that it is placed in a filled sink-hole. The samples recovered to 30 feet consisted entirely of silt.		

17-3-10bbb. North of telephone post on east side of road 55 feet south of section corner.

QUATERNARY-Pleistocene		
Topsoil................................	2.5	2.5
Clay, tan..............................	6	8.5
Silt, sandy............................	11.5	20
Sand, coarse...........................	7	27
Gravel, fine, and clay balls...........	1.5	28.5

17-3-16ddd. Near fence 60 feet northwest of center point of curve on center line of road.

QUATERNARY-Pleistocene		
Topsoil................................	2	2
Clay, silty, gray......................	18	20
Silt, sandy............................	2	22
Sand, fine to coarse...................	8	30

17-3-19ddd. 27 feet north of center line of east-west road and 50 feet east of upper terrace edge.

QUATERNARY-Pleistocene		
Topsoil................................	2.5	2.5
Silt, clayey, gray.....................	5.5	8
Silt, sandy; iron stained..............	16	24
Sand, silty; iron stained..............	8	32

Table 19.—Logs of jetted observation wells in the Kanopolis unit, 1951.—Continued

17-4-26ddd. 40 feet west of center line of north-south road and 20 feet north of center line of east-west road.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Topsoil	2	2
Silt, gray, loose: contains a few thin clay zones	33	35
Sand, coarse	7	42

17-4-36abb. In southeast corner of intersection of oil well access road and township road.

QUATERNARY-Pleistocene		
Topsoil	2	2
Silt, clayey, nodular	23	25
Sand, medium to fine	6	31

17-5-5cdd. 17 feet north of center line of east-west road and 2 feet southeast of corner post.

QUATERNARY-Pleistocene		
Topsoil	1.5	1.5
Silt, clayey, gray	11.5	13
Silt, red-brown; contains fine sand	17	30

17-5-7add. 10 feet southwest of center line of road from point of maximum curvature.

QUATERNARY-Pleistocene		
Silt, sandy	8	8
Sand, fine to medium	11	19
Sand, coarse, and gravel	8	27

17-5-14bab. 14 feet north and 3 feet west of third telephone pole east of section line on south side of road.

QUATERNARY-Pleistocene		
Clay, slightly silty, dark-gray	5	5
Clay, silty, buff	11	16
Sand, fine to medium	3	19
Sand, coarse	3	22

Table 19.--Logs of jetted observation wells in the Kanopolis unit, 1951.--
Continued

17-5-16aaa. 30 feet south of center line of east-west road and 40 feet east of culvert.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Clay, silty, dark-gray........................	8	8
Clay, silty and slightly sandy, buff........	15.5	23.5
Sand, fine to coarse.........................	1	24.5
Gravel, fine to medium......................	1	25.5
Permian-Leonardian		
Ninnescah shale		
Shale, mottled, red-brown and gray-green....	1	26.5

KIRWIN UNIT

The depth of water has been measured periodically since 1945 in observation wells in the Kirwin unit. The highest and lowest water levels for the period of record are given in table 20; the difference between the highest and lowest water levels, the net rise or decline in the water level in 1951, and the net rise or decline for the period of record are given in table 21; and the water-level measurements that were made in 1951 are given in table 22. During 1951, 50 jetted observation wells were constructed. Data pertaining to these wells are given in tables 23 and 24, and the locations are shown in figure 8. Hydrographs of five wells are shown in figure 9. All ground-water data collected in the Kirwin unit will be given in a report on the geology and ground-water resources of the North Fork of the Solomon River in Mitchell, Osborne, Smith, and Phillips Counties, Kans., by A. R. Leonard.[1]

Table 20.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in observation wells in the Kirwin unit.

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
4-14-34bc	6	39.49	Dec. 10, 1951	45.37	Mar. 22, 1951
-34da	1	12.14	July 21, 1951	13.70	Dec. 11, 1951
-34dd	1	21.71	Nov. 20, 1951	22.80	July 21, 1951
-36ca[a]	1	9.94	July 21, 1951	19.25	Aug. 17, 1951
4-15-31bb	6	25.56	May 14, 1951	36.26	Nov. 30, 1948
-31cb	1	9.37	Aug. 17, 1951	13.76	June 21, 1951
-32aa	1	10.58	July 21, 1951	14.74	Dec. 11, 1951
-33cb	1	8.84	July 21, 1951	14.89	Dec. 11, 1951
-33cc	1	4.74	July 21, 1951	16.24	Dec. 11, 1951
-34bb	1	18.65	July 21, 1951	22.01	Dec. 11, 1951

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[1] Kansas Geological Survey Bulletin

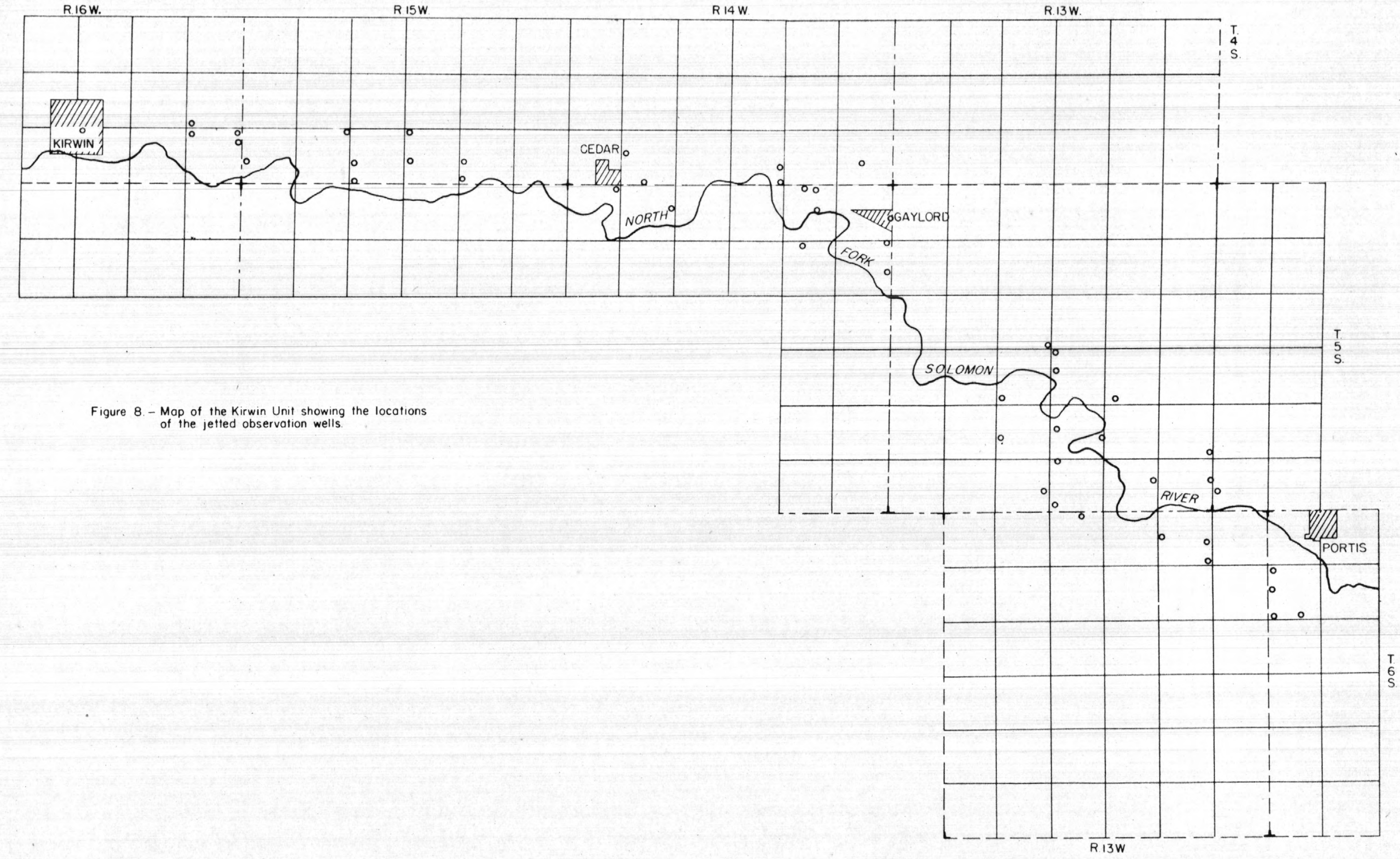

Figure 8.– Map of the Kirwin Unit showing the locations of the jetted observation wells.

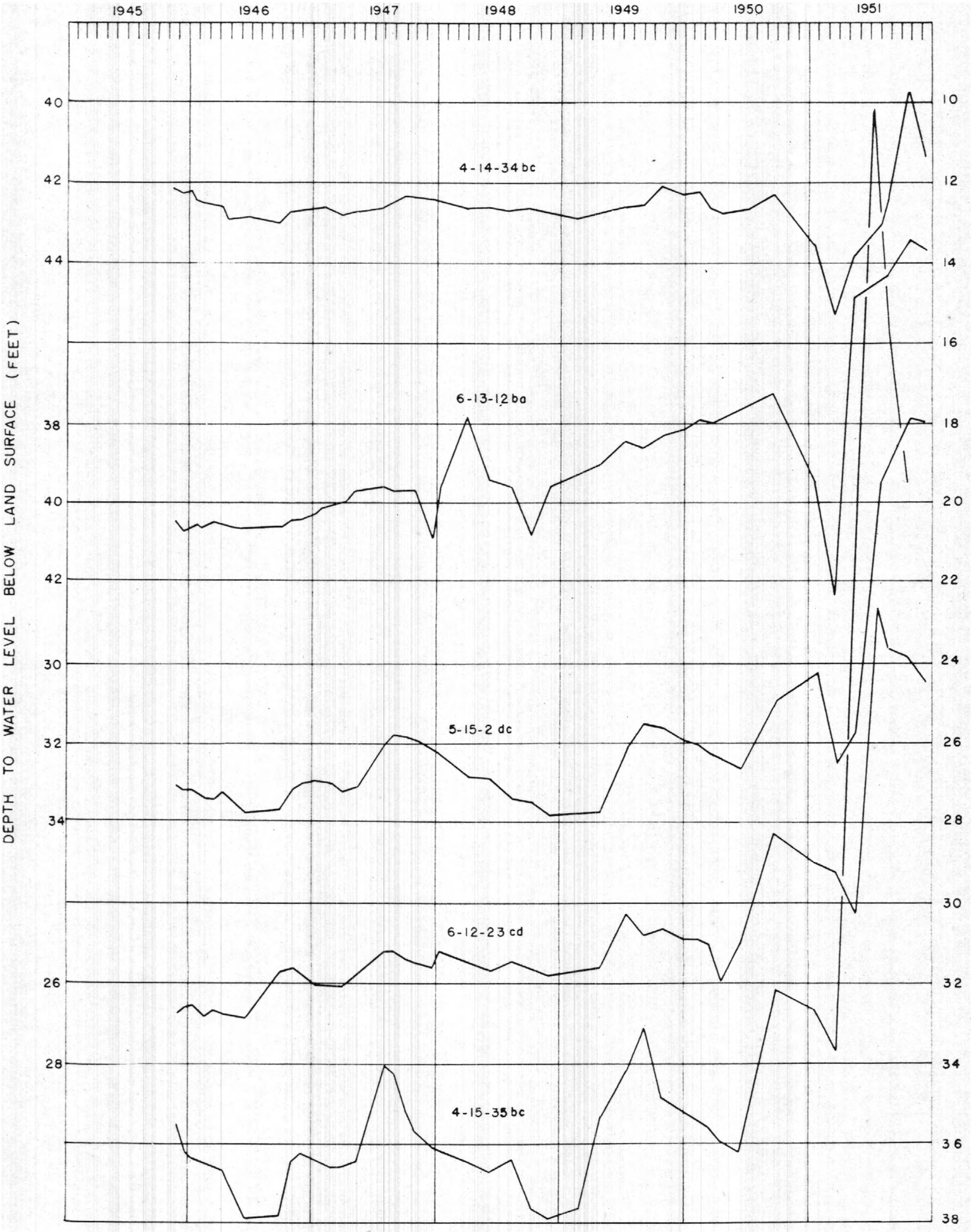

Figure 9.- Hydrographs of five wells, Kirwin Unit

Table 20.—Highest and lowest water levels for the period of record, in feet below land-surface datum, in observation wells in the Kirwin unit.—Continued

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
4-15-34cb	1	4.54	Nov. 20, 1951	5.53	Dec. 11, 1951
-35bc	6	10.18	July 24, 1951	37.99	June 12, 1946
-35cc	1	2.12	Aug. 17, 1951	5.88	Dec. 11, 1951
4-16-25cc	1	16.50	June 14, 1951	22.62	Dec. 11, 1951
-34bb	1	24.55	June 14, 1951	27.49	Dec. 11, 1951
-36aa	1	1.55	July 21, 1951	7.51	Dec. 11, 1951
-36ad	1	25.25	Dec. 11, 1951	27.92	July 21, 1951
-36bb	1	30.67	July 21, 1951	31.75	Dec. 11, 1951
-31bc	6	47.15	Aug. 27, 1951	52.72	Oct. 6, 1948
4-18-30ab	6	4.76	July 25, 1951	20.29	Sept.25, 1946
4-19-35ab	6	8.73	Dec. 11, 1951	15.78	Jan. 19, 1951
4-20-21cc	6	47.75	May 14, 1951	48.92	Feb. 6, 1946
5-12-31cb	1	5.21	Aug. 17, 1951	10.03	May 31, 1951
5-13-4dc	6	10.78	July 24, 1951	35.28	Dec. 17, 1945
-21cc	1	25.59	Nov. 19, 1951	25.64	Aug. 17, 1951
-22bb	1	4.80	Aug. 17, 1951	7.72	June 14, 1951
-22bc	1	1.49	Aug. 17, 1951	2.74	June 14, 1951
-23cc	1	34.35	Dec. 10, 1951	34.73	Aug. 17, 1951
-25cc	6	38.50	Dec. 10, 1951	46.53	Jan. 28, 1946
-25dd	1	12.18	Aug. 17, 1951	13.88	Dec. 10, 1951
-27bc	1	16.39	Aug. 17, 1951	20.30	Dec. 10, 1951
-27da	1	16.03	Aug. 17, 1951	17.87	Dec. 10, 1951
-28cb	1	3.83	Aug. 17, 1951	7.72	Dec. 10, 1951
-33ba	6	10.16	July 24, 1951	30.46	Jan. 2, 1948
-33da	1	7.29	Nov. 19, 1951	8.55	Dec. 10, 1951
-34bb	1	20.70	Aug. 17, 1951	28.30	May 31, 1951
-34cc	1	9.70	Aug. 17, 1951	10.39	Dec. 10, 1951
-35ad	1	19.83	Nov. 19, 1951	21.53	Aug. 17, 1951
-36ad	1	10.11	Aug. 17, 1951	12.87	May 31, 1951
5-14-1da	1	14.50	July 21, 1951	19.47	Dec. 10, 1951
-2ab	1	9.91	Aug. 17, 1951	12.84	Dec. 11, 1951
-2ac	1	7.71	July 21, 1951	12.95	Dec. 11, 1951
-2ba	1	9.66	Aug. 17, 1951	13.16	Dec. 11, 1951
-3bc[a]	5				
-6aa	1	16.77	Aug. 17, 1951	18.86	Dec. 11, 1951
-11ba	1	27.55	Aug. 17, 1951	28.80	Dec. 10, 1951
-12aa	1	25.06	Aug. 17, 1951	25.67	July 21, 1951
-12da	1	25.64	July 21, 1951	27.15	Aug. 17, 1951
5-15-2dc	6	23.95	Oct. 22, 1951	33.84	Nov. 30, 1948
5-16-3aa[a]	5				
5-17-1aa[a]					
-3cd	6	1.18	May 6, 1947	27.00	June 12, 1946
-12aa	6	46.29	May 14, 1951	54.20	Sept.30, 1947

Table 20.—Highest and lowest water levels for the period of record, in feet below land-surface datum, in observation wells in the Kirwin unit.—Continued.

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
6-11-34aa	6	28.44	Dec. 10, 1951	37.07	June 11, 1946
6-12-7bb	1	32.97	Aug. 17	33.19	Dec. 10, 1951
-7bc	1	2.97	17	7.18	Dec. 10, 1951
-7cc	1	24.68	17	34.47	Dec. 10, 1951
-7dc	1	11.55	June 19	15.75	Dec. 10, 1951
-20bb	6	34.80	July 24	43.06	Jan. 28, 1946
-23cd	6	16.68	24	27.17	Apr. 26, 1946
6-13-2bc	1	.70	Aug. 17	3.69	Dec. 10, 1951
-2da	1	26.28	17	26.35	Nov. 19, 1951
-2dd	1	30.59	Dec. 10	32.05	Aug. 17, 1951
-12ba	6	33.48	Oct. 22	42.37	Mar. 20, 1951

a/ Well destroyed.

Table 21.—Difference between highest and lowest recorded water levels, net changes in water level in 1951, and net change in water level for period of record, in feet, in observation wells in the Kirwin unit.

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1951	Net rise (+) or net decline (-) for period of record
4-14-34bc	5.88	+2.85	+2.66
-34da	1.56	-1.56	-1.56
-34dd	1.09	+.94	+.94
-36ca	9.31	-5.82	-5.82
4-15-31bb	10.70	+3.04	+4.51
-31cb	4.39	+2.10	+2.10
-32aa	4.16	-4.16	-4.16
-33cb	6.05	-6.05	-6.05
-33cc	11.50	-11.50	-11.50
-34bb	3.36	-3.36	-3.36
-34cb	.99	-.99	-.99
-35bc	27.81+	-5.79	+2.39
-35cc	3.76	-3.76	-3.76
4-16-25cc	6.12	-6.12	-6.12
-34bb	2.94	-2.94	-2.94
-36aa	6.36	-6.36	-6.36
-36ad	2.67	+2.67	+2.67
-36bb	1.08	-1.08	-1.08
-31bc	5.57	+2.83	+4.03

Table 21.—Difference between highest and lowest recorded water levels, net changes in water level in 1951, and net change in water level for period of record, in feet, in observation wells in the Kirwin unit.—Continued

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1951	Net rise (+) or net decline (-) for period of record
4-18-30ab	15.53	+5.78	+12.38
4-19-35ab	7.05	+2.79	+3.93
4-20-21cc	1.17	+.33	+1.05
5-12-31cb	4.82	+1.94	+1.94
5-13-4dc	24.50	+4.22	+22.37
-21cc	.05	+.02	+.02
-22bb	2.92	+1.03	+1.03
-22bc	1.25	+1.25	+1.25
-23cc	.38	+.38	+.38
-25cc	8.03	+4.35	+6.80
-25dd	1.70	-1.42	-1.42
-27bc	3.91	-3.91	-3.91
-27da	1.84	-1.84	-1.84
-28cb	3.89	-3.89	-3.89
-33ba	20.30	+7.88	+12.63
-33da	1.26	-1.12	-1.12
-34bb	7.60	+7.07	+7.07
-34cc	.69	-.69	-.69
-35ad	1.70	+1.68	+1.68
-36ad	2.76	+1.84	+1.84
5-14-1da	4.97	-4.97	-4.97
-2ab	2.93	-2.93	-2.93
-2ac	5.24	-5.24	-5.24
-2ba	3.50	-2.06	-2.06
-6aa	2.09	-2.09	-2.09
-11ba	1.25	-1.25	-1.25
-12aa	.61	+.28	+.28
-12da	1.51	-.39	-.39
5-15-2dc	9.89	+6.99	+9.15
5-17-3cd	25.82	+6.11	+10.05
-12aa	7.91	+.80	+2.46
6-11-34aa	8.63	+5.18	+7.54
6-12-7bb	.22	-.22	-.22
-7bc	4.21	-4.21	-4.21
-7cc	9.79	-9.79	-9.79
-7dc	4.20	-4.20	-4.20
-20bb	8.26	+4.31	+1.01
-23cd	10.49	+3.79	+8.34
6-13-2bc	2.99	-2.99	-2.99
-2da	.07	-.06	-.06
-2dd	1.46	+1.46	+1.46
-12ba	8.89	+3.54	+6.73

Table 22.—Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1951.

4-14-32bc. Aug. 17, dry; measurements discontinued.

4-14-32cd. Aug. 17, dry; measurements discontinued.

4-14-34bc.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	43.62	July 24	43.05	Oct. 22	39.75
Mar. 22	45.37	Aug. 27	42.40	Dec. 10	39.49
May 14	43.85				

4-14-34da. July 21, 12.14; Nov. 20, 13.49; Dec. 11, 13.70.

4-14-34dd.

July 21	22.80	Nov. 20	21.71	Dec. 11	21.86
Aug. 17	22.18				

4-14-36ca.

July 21	9.94	Nov. 19	14.93	Measurements discontinued	
Aug. 17	19.25	Dec. 10	15.76		

4-15-31bb.

Jan. 19	34.44	July 24	33.40	Oct. 22	31.40
Mar. 22	25.74	Aug. 27	30.90	Dec. 11	31.39
May 14	25.56				

4-15-31cb.

June 21	13.76	Nov. 20	11.26	Dec. 11	11.66
Aug. 17	9.37				

4-15-32aa.

July 21	10.58	Nov. 20	14.21	Dec. 11	14.74
Aug. 17	11.52				

Table 22.--Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1951.--Continued

4-15-33cb.

Date	Water level	Date	Water level	Date	Water level
July 21	8.84	Nov. 20	14.12	Dec. 11	14.89
Aug. 17	9.70				

4-15-33cc.

Date	Water level	Date	Water level	Date	Water level
July 21	4.74	Nov. 20	14.89	Dec. 11	16.24
Aug. 17	5.70				

4-15-34bb.

Date	Water level	Date	Water level	Date	Water level
July 21	18.65	Nov. 20	21.62	Dec. 11	22.01
Aug. 17	19.88				

4-15-34cb. Nov. 20, 4.54; Dec. 11, 5.53.

4-15-35bc.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	32.73	July 24	10.18	Oct. 22	19.57
Mar. 20	33.83	Aug. 27	15.67		

4-15-35cb. Aug. 17, 1.22; Nov. 20, dry; measurements discontinued.

4-15-35cc. Aug. 17, 2.12; Nov. 20, 5.44; Dec. 11, 5.88.

4-16-25cc.

Date	Water level	Date	Water level	Date	Water level
June 14	16.50	Nov. 20	22.19	Dec. 11	22.62
Aug. 17	20.20				

4-16-34bb.

Date	Water level	Date	Water level	Date	Water level
June 14	24.55	Nov. 20	27.03	Dec. 11	27.49
Aug. 17	24.67				

Table 22.--Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1951.--Continued

4-16-36aa.

Date	Water level	Date	Water level	Date	Water level
July 21	1.15	Nov. 20	6.72	Dec. 11	7.51
Aug. 17	5.84				

4-16-36ad.

Date	Water level	Date	Water level	Date	Water level
July 21	27.92	Nov. 20	25.37	Dec. 11	25.25
Aug. 17	26.66				

4-16-36bb.

Date	Water level	Date	Water level	Date	Water level
July 21	30.67	Nov. 20	31.43	Dec. 11	31.75
Aug. 17	30.91				

4-17-31bc.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	50.20	May 14	49.39	Oct. 22	47.58
Mar. 20	49.23	Aug. 27	47.15	Dec. 11	47.36

4-18-30ab.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	12.23	July 25	4.76	Dec. 11	6.92
May 14	12.80	Aug. 27	5.42		

4-19-35ab.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	15.78	July 24	9.84	Oct. 23	8.76
May 14	10.30	Aug. 27	9.45	Dec. 11	8.73

4-20-21cc.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	48.60	July 24	48.03	Oct. 22	47.98
Mar. 20	48.15	Aug. 27	47.98	Dec. 11	47.87
May 14	47.75				

5-12-31cb.

Date	Water level	Date	Water level	Date	Water level
May 31	10.03	Nov. 19	7.79	Dec. 10	8.09
Aug. 17	5.21				

Table 22.--Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1951.--Continued

5-13-4dc.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	15.80	July 24	10.78	Oct. 22	12.41
Mar. 20	15.03	Aug. 27	11.98	Dec. 10	12.73
May 14	14.44				

5-13-16dd. Aug. 17, dry; measurements discontinued.

5-13-21cc. Aug. 17, 25.64; Nov. 19, 25.59; Dec. 10, 25.62.

5-13-22bb.

June 14	7.72	Nov. 19	6.37	Dec. 10	6.69
Aug. 17	4.80				

5-13-22bc. June 14, 2.74; Aug. 17, 1.49.

5-13-23cc. Aug. 17, 34.73; Nov. 19, 34.41; Dec. 10, 34.35.

5-13-25cc.

Jan. 19	42.27	July 24	40.93	Oct. 22	39.06
Mar. 20	42.15	Aug. 27	39.99	Dec. 10	38.50
May 14	42.35				

5-13-25dd.

June 14	12.46	Nov. 19	13.62	Dec. 10	13.88
Aug. 17	12.18				

5-13-27bc. Aug. 17, 16.39; Nov. 19, 19.77; Dec. 10, 20.30.

5-13-27da. Aug. 17, 16.03; Nov. 19, 17.50; Dec. 10, 17.87.

5-13-28cb. Aug. 17, 3.83; Nov. 19, 6.60; Dec. 10, 7.72.

Table 22.—Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1951.—Continued

5-13-33ba.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	23.35	July 24	10.16	Oct. 22	12.93
Mar. 20	23.59	Aug. 27	11.96	Dec. 10	14.17
May 14	23.22				

5-13-33da. Aug. 17, 7.43; Nov. 19, 7.29; Dec. 10, 8.55.

5-13-34bb.

May 31	28.30	Nov. 19	20.87	Dec. 10	21.23
Aug. 17	20.70				

5-13-34cc. Aug. 17, 9.70; Nov. 19, 10.20; Dec. 10, 10.39.

5-13-35ad. Aug. 17, 21.53; Nov. 19, 19.83; Dec. 10, 19.85.

5-13-36ad.

May 31	12.87	Nov. 19	11.01	Dec. 10	11.03
Aug. 17	10.11				

5-14-1da.

July 21	14.50	Nov. 19	19.08	Dec. 10	19.47
Aug. 17	17.05				

5-14-2ab. Aug. 17, 9.91; Nov. 20, 12.55; Dec. 11, 12.84.

5-14-2ac.

July 21	7.71	Nov. 20	12.55	Dec. 11	12.95
Aug. 17	10.34				

5-14-2ba.

July 21	11.10	Nov. 20	12.67	Dec. 11	13.16
Aug. 17	9.66				

Table 22.—Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1951.—Continued

5-14-3bc. Measurements discontinued.

5-14-5ad. Aug. 17, dry; measurements discontinued.

5-14-11ba. Aug. 17, 27.55; Nov. 19, 28.38; Dec. 10, 28.80.

5-14-12aa.

Date	Water level	Date	Water level	Date	Water level
July 21	25.67	Nov. 19	25.34	Dec. 10	25.39
Aug. 17	25.06				

5-14-12da.

July 21	25.64	Nov. 19	25.98	Dec. 10	26.03
Aug. 17	27.15				

5-15-2dc.

Jan. 19	30.26	May 14	31.75	Oct. 22	23.95
Mar. 20	32.58	July 25	25.55	Dec. 11	24.00

5-16-3aa. Measurements discontinued.

5-17-1aa. Destroyed.

5-17-3cd. Jan. 19, 4.08; Mar. 20, 3.99; Oct. 22, 1.69.

5-17-12aa.

Jan. 19	51.85	July 24	50.83	Oct. 22	50.54
Mar. 20	48.99	Aug. 27	50.79	Dec. 11	50.43
May 14	46.29				

Table 22.—Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1951.—Continued

6-11-34aa.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	33.05	July 25	30.61	Oct. 24	28.48
Mar. 20	33.27	Aug. 28	29.48	Dec. 10	28.44
May 14	33.09				

6-12-7bb. Aug. 17, 32.97; Nov. 19, 33.14; Dec. 10, 33.19.

6-12-7bc. Aug. 17, 2.97; Nov. 19, 6.19; Dec. 10, 7.18.

6-12-7cc. Aug. 17, 24.68; Nov. 19, 31.52; Dec.10, 34.47.

6-12-7dc.

June 19	11.55	Nov. 19	15.25	Dec. 10	15.75
Aug. 17	13.29				

6-12-20bb.

Jan. 19	37.56	July 24	34.80	Oct. 22	35.28
Mar. 20	39.27	Aug. 27	35.13	Dec. 10	35.29
May 14	38.66				

6-12-23cd.

Jan. 19	23.05	July 24	16.68	Oct. 22	17.99
Mar. 20	23.24	Aug. 26	17.74	Dec. 10	18.50
May 14	24.25				

6-13-2bc. Aug. 17, 0.70; Nov. 19, 3.23; Dec. 10, 3.69.

6-13-2da. Aug. 17, 26.28; Nov. 19, 26.35; Dec. 10, 26.34.

6-13-2dd. Aug. 17, 32.05; Nov. 19, 30.65; Dec. 10, 30.59.

Table 22.--Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1951.--Continued

6-13-4ab. Nov. 19, dry; measurements discontinued.

6-13-12ba.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	39.47	July 24	34.55	Oct. 22	33.48
Mar. 20	42.37	Aug. 27	34.28	Dec. 10	33.77
May 14	34.87				

Table 23.—Record of observation wells jetted by U. S. Geological Survey in Kirwin unit.

Well number: Description of well-numbering system is given in text.
Character of material: G, gravel; S, sand.
Geologic source: A, alluvium; Td, terrace deposits.

Well number	Depth of well (feet)	Character and geologic source of principal water-bearing material	Distance of measuring point above land surface (feet)	Depth of water level below measuring point (feet)	Date of measurement
(1)	(2)	(3)	(4)	(5)	(6)
		Osborne County			
6-12-7bb	41	S,G,A	0.8	33.77	8-17-51
-7bc	30	S,G,A	.8	3.77	8-17-51
-7cc	61	S,G,A	2.2	26.88	8-17-51
-7dc	41	S,G,Td	1.0	12.55	6-19-51
6-13-2bc	34	S,G,A	1.8	2.50	8-17-51
-2da	31	S,G,A	1.3	27.58	8-17-51
-2dd	41	S,G,A	.8	32.85	8-17-51
-4ab	20	S,G,A	1.5	Dry	11-19-51
		Phillips County			
4-14-32bc	26	S,G,Td	1.5	Dry	8-17-51
-32cd	20	S,G,A		Dry	8-17-51
-34da	41	S,G,Td	1.8	13.94	7-21-51
-34dd	40	S,G,Td	1.1	23.90	7-21-51
-36ca	31	S,G,Td	1.9	11.84	7-21-51
4-15-31cb	30	S,G,A	1.6	15.36	6-21-51
-32aa	41	S,G,Td	.9	11.48	7-21-51
-33cb	35	S,G,Td	1.3	10.14	7-21-51
-33cc	35	S,G,Td	.9	5.64	7-21-51
-34bb	30.6	S,G,Td	1.4	20.05	7-21-51
-34cb	20	S,G,Td	1.3	4.54	11-20-51
-35cb	15	S,G,Td	1.8	3.02	8-17-51
-35cc	10	S,G,A	.9	3.02	8-17-51
4-16-25cc	71	S,G	2.6	19.10	6-14-51
-34bb	35	S,G,A	1.9	26.45	6-14-51
-36aa	41	S,G,Td	2.2	3.35	7-21-51
-36ad	38	S,G,Td	3.6	31.52	7-21-51
-36bb	40	S,G,A	1.3	31.97	7-21-51
5-12-31cb	32	S,G,A	.2	12.03	5-31-51
5-13-16dd	25	S,G,Td	1.0	Dry	8-17-51
-21cc	32	S,G,A	2.8	28.44	8-17-51
-22bb	23.8	S,G,A	2.7	10.42	6-14-51

Table 23.—Record of observation wells jetted by U. S. Geological Survey in Kirwin unit.—Continued

(1)	(2)	(3)	(4)	(5)	(6)
		Phillips County—Continued			
5-13-22bc	24	S,G,A	2.1	4.84	6-14-51
-23cc	39.5	S,G,A	2.1	36.83	8-17-51
-25dd	58	S,G,Td	2.9	15.36	6-12-51
-27bc	41	S,G,A	1.2	17.59	8-17-51
-27da	25	S,G,A	1.4	17.43	8-17-51
-28cb	31	S,G,A	.5	4.33	8-17-51
-33da	20	S,G,A	1.8	9.23	8-17-51
-34bb	41	S,G	.7	29.0	5-31-51
-34cc	35	S,G,A	1.8	11.50	8-17-51
-35ad	31	S,G,A	1.6	23.13	8-17-51
-36ad	26.2	S,G,Td	2.0	14.87	5-31-51
5-14-1da	37.9	S,G,A	4.1	18.60	7-21-51
-2ab	30	S,G,A	1.3	11.21	8-17-51
-2ac	21	S,G,A	.9	8.61	7-21-51
-2ba	35	S,G,Td	2.1	13.20	7-21-51
-5ad	31	......	1.2	Dry	8-17-51
-6aa	25	S,G,Td	1.0	17.77	8-17-51
-11ba	30	S,G,Td	1.8	29.35	8-17-51
-12aa	30	S,G,A	1.6	27.27	7-21-51
-12da	30	S,G,A	1.6	27.24	7-21-51

Table 24.—Logs of jetted observation wells in the Kirwin unit.

4-14-32bc. 0.25 mile north of center line of Kansas Highway 9; 1 foot north and 2 feet west of pole with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, sandy, brown	2	2
Silt, clayey, gray-brown	10	12
Silt, sandy, gray-brown	8	20
Sand, medium	6	26

Table 24.--Logs of jetted observation wells in the Kirwin unit.--Continued

4-14-32cd. 0.5 mile east of section corner; 4 feet south of telephone pole with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, brown........................	1.5	1.5
Silt, clayey, light-brown..................	5.5	7
Silt, blocky, dark-brown...................	4	11
Silt, sandy, light-brown...................	4	15
Sand, fine to medium.......................	11	26
Shale......................................	....	....

4-14-34da. 0.4 mile north of Kansas Highway 9; 3.5 feet east of stake with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, dark gray-brown...............	1.5	1.5
Silt, dark gray-brown......................	2.5	4
Sand, very fine, silty.....................	1	5
Silt, gray-brown...........................	12	17
Clay, tight, gray-brown....................	3	20
Clay, silty, gray-brown....................	3	23
Silt, blocky, gray-brown...................	7	30
Clay, gray-brown...........................	3	33
Silt, blocky, gray.........................	5	38
Sand, medium...............................	2	40
Clay, blue-black (not shale)...............	1	41

4-14-34dd. 40 feet south of center line of Kansas Highway 9 and 50 feet west of center line north-south road; 15 feet north of post with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, gray-brown....................	1	1
Silt, blocky, light gray-brown.............	9	10
Silt, sandy, dark gray-brown...............	5	15
Clay, blocky, dark gray-brown..............	5	20
Sand, very fine, silty.....................	6	26
Silt, sandy, light-brown...................	8	34
Clay, sandy, light-brown...................	2	36
Clay, blocky, sandy, light-brown...........	4	40

Table 24.—Logs of jetted observation wells in the Kirwin unit.—Continued

4-14-36ca. NE corner NE¼ sec. 36, T. 4 S., R. 14 W; 10 feet east of telephone pole with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, black	1	1
Sand; consists of limestone fragments	7	8
Gravel; consists of limestone pebbles	2	10
Clay, gray-brown	2	12
Silt, light gray-brown; contains limestone fragments	9	21
Silt, sandy, light gray-brown; contains limestone fragments	5	26
Silt and clay; contains gravel-size limestone fragments	5	31

4-15-31cb. 0.6 mile south of intersection of Kansas Highway 9 and north-south road; 2 feet west and 1 foot north of fence post with orange stripes.

QUATERNARY-Pleistocene		
Soil, sandy, brown	1	1
Sand, fine	15	16
Sand, coarse; contains limestone fragments	4	20
Clay, granular, light blue-gray	5	25
Silt, gray-brown	4	29
Gravel; contains limestone and shale fragments	1	30

4-15-32aa. 0.2 mile north of intersection of Kansas Highway 9 and north-south road; 2 feet east of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, sandy, dark gray-brown	1	1
Clay, silty, tough, gray-brown	9	10
Silt, blocky, gray-brown	6	16
Silt, sandy; contains limestone gravel	2	18
Silt, gray-brown	5	23
Clay, gray-green, and interbedded very fine sand, tough	6	29
Clay, sandy at bottom, tan	9	38
Clay, tough, gray-brown	2	40
Sand and gravel	1	41

Table 24.--Logs of jetted observation wells in the Kirwin unit.--Continued

4-15-33cb. Well is across road east of door of church at Claudell, Kans.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, black	2	2
Clay, silty, dark gray-brown	4	6
Silt, clayey, gray-brown	4	10
Clay, silty, tough, light gray-brown	5	15
Silt, blocky, brown	10	25
Silt, light gray-brown	10	35

4-15-33cc. 0.2 mile south of church at Claudell, Kans.; 5 feet west of telephone pole with orange stripes.

QUATERNARY-Pleistocene		
Soil, silt, sandy	2	2
Clay, silty, dark gray-brown	5	7
Clay, hard, light gray-brown	3	10
Clay, light-brown	15	25
Clay, sandy, dark-brown	5	30
Sand, very fine to fine, with gray clay	5	35

4-15-34bb. 0.15 mile south of section corner and 0.35 mile north of intersection Kansas Highway 9 and north-south road; 3 feet west of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, sandy	2	2
Silt, clayey, dark-gray	3	5
Clay, light gray-brown; contains limestone fragments	4	9
Clay, tough, light-buff; contains limestone fragments	16	25
Sand, fine to medium, and gray-brown clay	3	28
Sand, medium, to fine gravel	13	41

4-15-34cb. 150 feet south of intersection Kansas Highway and north-south road; 1 foot west of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, brown	1	1
Silt, gray-brown	5	6
Clay, tough, tan to yellow	9	15
Sand, medium to coarse	5	20

Table 24.—Logs of jetted observation wells in the Kirwin unit.—Continued

4-15-35cb. 50 feet south of railroad track; 3 feet west of post with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY–Plesitocene		
Soil, silty, sandy, brown	2	2
Silt, clayey, gray-brown	6	8
Gravel; consists of limestone fragments	1	9
Sand, medium to coarse	6	15

4-15-35cc. 0.3 mile south of Kansas Highway 9; 1 foot west of post with orange stripes.

QUATERNARY–Plesitocene		
Soil, sandy	1	1
Silt, sandy, gray-brown	3	4
Sand, medium to coarse	6	10

4-16-25cc. 160 feet south of Kansas Highway 9 and 20 feet east of center of north-south road.

QUATERNARY–Plesitocene		
Soil, dark gray-brown	1.5	1.5
Silt, gray-brown	12.5	14.0
Silt, blocky, gray	20.0	34.0
Sand, fine	1.0	35.0
Silt, blocky, gray	6.0	41.0
Silt, blocky, dark gray	10.0	51.0
Silt, gray-brown	6.0	57.0
Sand, very fine; contains small limestone fragments	12.0	69.0
Silt, gray (not entire thickness)	2	71

4-16-34bb. 150 feet south from center line east-west road and 25 feet east from center line north-south road; 0.10 foot west of post with orange stripes.

QUATERNARY–Pleistocene		
Soil, clayey, dark gray-brown	1.5	1.5
Clay, light-brown	6.5	8
Clay, silty, light gray-brown	17	25
Sand, fine	2	27
Sand, fine to medium	3	30
Sand, medium to coarse; contains limestone gravel	3	33
Gravel; contains limestone fragments	2	35

Table 24.—Logs of jetted observation wells in the Kirwin unit.—Continued

4-16-36aa. 250 feet north of center of intersection of Kansas Highway 9 and north-south road; 3 feet north and 5 feet east of telephone pole with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, black	5	5
Silt, clayey, gray-brown	10	15
Silt and some gravel, gray-brown	25	40
Sand, fine	1	41

4-16-36ad. 0.3 mile south of road intersection; 12 feet east of telephone pole with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, black	2	2
Silt, gray-brown	5	7
Silt, clayey, light-brown	3	10
Silt, sandy, light-brown	3	13
Clay, light gray-brown	4	17
Silt, gray-brown	4	21
Clay, sandy, light gray-brown	15	36
Clay, hard, gray	2	38

4-16-36bb. 25 feet east of center line of north-south road and 30 feet south of quarter-mile fence line.

QUATERNARY-Pleistocene		
Soil, sandy, gray-brown	1	1
Silt, light-brown	4	5
Silt, gray-brown	1	6
Silt, light-brown	2	8
Clay, blocky, dark gray-brown	3	11
Clay, light-tan	3	14
Clay, blocky, gray-brown	2	16
Silt, clayey, dark-brown	13	29
Clay, silty, light-brown	9	38
Clay, gray-brown	2	40

5-12-31cb. 0.7 mile south of intersection of Kansas Highway 9 and north-south road; 1 foot west and 3 feet south of fence post with orange stripes.

QUATERNARY-Pleistocene		
Silt, sandy, loose, dark-brown	1	1
Sand, very fine, brown	7	8
Sand, fine to medium	12	20
Sand, fine to medium	10	30

Table 25.—Logs of jetted observation wells in the Kirwin unit.—Continued

5-13-16dd. 50 feet south of intersection of Missouri-Pacific Railroad and north-south road; 1 foot east of post with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Plesitocene		
Soil, silty, gray-brown	2	2
Silt, gray-brown	5	7
Clay, tough, dark gray-brown	3	10
Silt, gray-brown	8	18
Silt, sandy, gray-brown	2	20
Silt, blocky, gray-brown	5	25

5-13-21cc. 50 feet north of center line of east-west road; 3 feet west and 1 foot north of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, dark-brown	1.5	1.5
Silt, clayey, gray-brown	4.5	6
Clay, blocky, tough, gray-brown	3	9
Clay, silty, brown	6	15
Clay, sandy, brown	5	20
Sand, fine to medium	5	25
Sand, medium to coarse	7	32

5-13-22bb. 0.5 mile south of intersection; 1 foot south and 1 foot west of fence post with orange stripes.

QUATERNARY-Plesitocene		
Soil, sandy, dark-brown	1	1
Silt, black	6	7
Sand, very fine	8	15
Clay, black	2.5	17.5
Sand, very coarse, and gravel	6.3	23.8

5-13-22bc. 0.35 mile south of road intersection and 500 feet south of lone cottonwood tree.

QUATERNARY-Pleistocene		
Soil, dark-brown	1.0	1
Silt, light-buff	10.0	11
Sand, fine, tan	4.0	15
Sand, fine to medium	3.5	18.5
Sand and gravel; contains limestone pebbles and fragments of black shale	5.5	24

Table 24.--Logs of jetted observation wells in the Kirwin unit.--Continued

5-13-23cc. 0.1 mile east of road intersection across the road north of post with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, black	1.5	1.5
Silt, light gray-brown	4.5	6
Silt, clayey, dark gray-brown	3	9
Silt, light gray-brown	2	11
Clay, buff	10	21
Sand, fine; contains limestone gravel	13	34
Sand, medium to coarse	7	41

5-13-25dd. 90 feet south from center line east-west road and 20 feet east from center line north-south road.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, sandy, silty, light-brown	2	2
Silt, clayey, light-brown	1.5	3.5
Clay and limestone gravel, mixed	5.5	9
Silt, light-brown; contains calcareous nodules	2.2	11.2
Clay, blocky, silty, dark-brown	4.3	15.5
Silt, light-tan	2	17.5
Silt, granular, light-brown	7.5	25
Silt, hard, dark-brown	6	31
Silt, hard, dark brown; contains caliche (drills hard)	12.5	43.5
Sand, very fine to fine	1	44.5
Sand, fine to medium	4.5	49
Sand, coarse	6.5	55.5
Shale, non-calcareous, black	...	....

5-13-27bc. 0.5 mile north of road intersection; 4 feet south and 1 foot west of telephone pole with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, sandy, silt, brown	2	2
Silt, light-brown	5	7
Silt, clayey, gray-brown	6	13
Clay, silty, light-brown	5	18
Silt, sandy, blocky, brown	3	21
Clay, blocky, light-brown; drills hard	6	27
Silt, sandy, light-brown	8	35
Silt, clayey, dark-gray	6	41

Table 24.—Logs of jetted observation wells in the Kirwin unit.—Continued

5-13-27da. 0.3 mile north of section corner; 3 feet east of telephone pole with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, dark-brown	1	1
Silt, clayey, gray-brown	3	4
Silt with thin clay-pans	5	9
Clay, tough, gray-brown	1	10
Silt, sandy, gray-brown	8	18
Sand, medium; contains limestone gravel	5	23
Gravel and limestone fragments	4	27

5-13-28cb. 0.3 mile north of section corner; 2 feet west of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, dark-brown	1	1
Silt, clayey, dark gray-brown	5	6
Silt, clayey, gray-brown; contains limestone fragments	2	8
Silt, clayey, gray-brown	4	12
Silt, granular, dark-gray; very tough; hard to drill	5	17
Silt, granular, light gray-brown	8	25
Silt, sandy, gray-brown	3	28
Sand, medium	3	31

5-13-33da. 0.5 mile south of section corner; 7 feet east of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, clayey, black	1	1
Silt, clayey, tough, gray-brown	5	6
Silt, clayey, blocky, very tough, dark gray-brown and dark-gray	8	14
Silt, clayey, blocky, finer, drills easily, dark gray-brown and dark-gray	6	20

Table 24.—Logs of jetted observation wells in the Kirwin unit.—Continued.

5-13-34bb. 65 feet south of section corner; 3 feet north and 3 feet west of fence post with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Plesitocene		
Soil, clay, loamy	1.5	1.5
Silt, sandy, very fine, buff	4.5	6.0
Clay, silty, light-gray	2.0	8.0
Silt, buff	3.0	11.0
Silt, hard, brown	13.0	24.0
Sand, very fine, brown	16.0	40.0
Sand, coarse, brown, and clay	1.0	41.0
Shale, dark-gray	....	....

5-13-34cc. 0.2 mile north of section corner; 2 feet west of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, black	2	2
Clay, blocky, black	3	5
Clay, very hard, gray-brown	7	12
Silt, limestone fragments, gray-brown	14	26
Sand, fine-medium	7	33
Sand, very coarse; contains limestone fragments	2	35

5-13-35ad. 0.4 mile south of section corner; 1 foot east of telephone pole with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, light gray-brown	1	1
Clay, silty, tough, dark gray-brown	3	4
Silt, clayey, light gray-brown	4	8
Silt, blocky, tough, dark-brown	7	15
Silt, buff	10	25
Sand, fine to medium	6	31

Table 24.--Logs of jetted observation wells in the Kirwin unit.--Continued

5-13-36ad. 0.4 mile south of section corner and 0.6 mile north of river; 20 feet north and 3 feet east of fence corner.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Silt, loose, brown	1	1
Sand, very fine, buff	4	5
Silt, slightly sandy, calcareous, tan	4	9
Silt, clayey, calcareous, light-gray	8	17
Sand, very fine, brown	5	22
Sand, medium; contains clay nodules and some gravel	1	23
Sand, coarse; contains clay nodules and some gravel	.5	23.5
Shale, black	.5	24

5-14-1da. 400 feet north of intersection of Kansas Highway 9 and north-south road; 25 feet west of center line of north south road and 2 feet east of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, dark-brown; contains limestone fragments	2	2
Silt, clayey, light gray-brown	6	8
Silt, sandy, light gray-brown	7	15
Sand, medium to coarse	11	26
Clay, sandy, gray	4	30
Sand, clay balls	3	33
Gravel; contains clay balls and limestone fragments	7	40

5-14-2ab. 60 feet south of center line of Kansas Highway 9; 5 feet south and 2 feet west of pole with orange stripes.

QUATERNARY-Pleistocene		
Soil, sandy, dark gray-brown	1	1
Silt and fine sand	7	8
Sand, fine to medium	11	19
Sand, medium to coarse	11	30

5-14-2ac. SW corner of NE$\frac{1}{4}$ of section; well is next to post with orange stripes.

QUATERNARY-Pleistocene		
Soil, sandy	2	2
Sand, medium	12	14
Gravel, medium	7	21
Shale	..	..

Table 24.--Logs of jetted observation wells in the Kirwin unit.--Continued

5-14-2ba. 0.5 mile northwest of intersection of Kansas Highway 9 and north-south road; 10 feet north of post with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Sand, fine to medium	28	28
Clay, soft, dark-gray	1	29
Sand, medium	1	30
Gravel; contains limestone fragments	5	35

5-14-5ad. 0.5 mile south of section corner; 2 feet east of telephone pole with orange stripes.

QUATERNARY-Pleistocene		
Soil, sandy, light-brown	1	1
Silt, gray-brown	14	15
Silt and sand, fine	3	18
Sand, fine; contains limestone fragments	3	21

5-14-6aa. 45 feet south and 20 feet west of center of intersection; 2 feet south and 2 feet east of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, gray-brown	2	2
Clay, silty, tough, gray-brown	5	7
Clay, light-tan	8	15
Clay, light-tan; contains fine sand	4	19
Sand, medium to coarse	5	24
Gravel, fine	1	25

5-14-11ba. Northeast corner $NW\frac{1}{4}$ of section; 2 feet north of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, black	2	2
Clay, silty, light gray-brown	6	8
Clay, blocky, tough, dark gray-brown	4	12
Clay, tough, light-tan	8	20
Sand, fine, light-tan; contains clay	7	27
Sand, medium to coarse	3	30

Table 24.--Logs of jetted observation wells in the Kirwin unit.--Continued

5-14-12aa. Section corner south of Gaylord; 5 feet north and 3 feet east of telephone pole with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, black	1.0	1
Clay, tough, gray-brown	3	4
Silt, nodular, gray-brown	14	18
Silt, sandy	4	22
Sand, medium	6	28
Sand and gravel	4	32

5-14-12da. 0.5 mile south of section corner; 2 feet north and 2 feet east of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, dark-brown	1.5	1.5
Silt, blocky, light gray-brown	5	6.5
Silt, blocky, dark-brown	2.5	9
Clay, blocky, light gray-brown	4	13
Clay, sandy, light gray-brown	3	16
Sand, medium	4	20
Sand, coarse	5	25
Gravel, coarse	5	30

6-12-7bb. 0.1 mile south of center line of intersection; 3 feet south and 1 foot west of telephone pole.

QUATERNARY-Pleistocene		
Soil, silty, black	1	1
Clay, tight, gray-brown	14	15
Silt, gray-brown	20	35
Sand, very fine	6	41

6-12-7bc. 0.5 mile south of road intersection; 1 foot east and 1 foot south of post with stripes.

QUATERNARY-Pleistocene		
Soil, silty, gray-brown	1	1
Silt, clayey, tough, gray-brown	6	7
Clay, very tough, gray-brown	3	10
Silt, sandy, light-brown	14	24
Sand, fine to medium	2	26
Sand, coarse	4	30

Table 24.--Logs of jetted observation wells in the Kirwin unit.--Continued

6-12-7cc. 45 feet north from center line east-west road and 25 feet east from center line north-south road.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, black	1.5	1.5
Silt, dark-gray-brown	3.5	5
Clay, light-brown	3	8
Clay, blocky, brown	11	19
Clay, light-tan; contains limestone fragments	5	24
Clay, silty, light-tan	4	28
Clay and very coarse limestone and quartz gravel, light-tan	4	32
Clay, dark-brown; contains a few limestone fragments	5	37
Sand, medium; contains clay	3	40
Gravel, medium	5	45
Gravel, coarse to very coarse	7	52
Gravel, very coarse	9	61

6-12-7dc. 150 feet west from center line of culvert and 20 feet north from center line of east-west road.

QUATERNARY-Pleistocene		
Soil, silty, dark-brown	1.5	1.5
Silt, clayey, gray-brown	5.5	7
Silt, clayey, light-brown	3	10
Silt, granular, light-brown	10	20
Silt, granular, light-tan	7	27
Clay, blocky, sandy, light-tan	7	34
Sand, fine to very fine	1	35
Sand, medium to coarse	2	37
Sand, coarse to gravel	4	41

6-13-2bc. 0.5 mile north of road intersection; 1 foot north and 3 feet west of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, sandy, gray-brown	1	1
Silt, clayey, gray-brown	5	6
Silt, clayey, light gray-brown	4	10
Silt, blocky, gray-brown	6	16
Silt and coarse sand	8	24
Silt, dark gray-brown	4	28
Sand, medium coarse	3	31
Sand, very coarse	2	33
Sand, medium	1	34

Table 24.—Logs of jetted observation wells in the Kirwin unit—Continued

6-13-2da. 0.5 mile north of road intersection; 2 feet south of post with orange stripes.

	Thickness (feet)	Depth (feet)
QUATERNARY-Pleistocene		
Soil, silty, gray-brown	1	1
Silt, clayey, gray-brown	6	7
Clay, blocky, silty, gray-brown	7	14
Silt, sandy, gray-brown	6	20
Sand, silty	4	24
Sand, fine to medium	3	27
Gravel, medium to coarse	4	31

6-13-2dd. 115 feet north from center line of east-west road and 25 feet west from center line north-south road; 3 feet south of telephone pole with orange stripes.

QUATERNARY-Pleistocene		
Soil, blocky, silty	1	1
Clay, blocky, dark-brown	6	7
Clay, silty, blocky, hard, light-brown	3	10
Silt, blocky, gray-brown	9	19
Clay, sandy, light-tan	7	26
Clay, sand, light gray-brown	3	29
Sand, fine	4	33
Gravel, fine to very coarse	8	41

6-13-4ab. 0.5 mile east of road intersection; 1 foot north of post with orange stripes.

QUATERNARY-Pleistocene		
Soil, silty, black	1.5	1.5
Silt, light-brown	5.5	7
Silt, sandy, light-brown	6	13
Sand, very fine; contains some silt	3	16
Silt, blocky, light brown; very tough drilling	2	18
Silt, dark-brown	2	20

ST. FRANCIS UNIT

As a continuation of the observation-well program that was begun in 1946, periodic measurements of the water levels in 12 wells were made in 1951. The highest and lowest water levels for the period of record are given in table 25; the difference between the highest and lowest water levels, and the net rise or decline for the period of record are given in table 26; and the water-level measurements that were made in 1951 are given in table 27. Hydrographs of five wells are shown in figure 10.

Table 25.—Highest and lowest water levels for the period of record, in feet below land-surface datum, in observation wells in the St. Francis unit.

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
1-38-1cd	4	21.57	July 25, 1951	23.09	Oct. 5, 1948
-8dd	6	11.24	(Feb. 25, 1947) (June 8, 1947)	14.83	Aug. 2, 1949
-17cd	6	11.07	July 25, 1951	12.57	Oct. 5, 1948
2-39-10bb	5	25.35	July 25, 1951	27.10	Aug. 3, 1948
-27bb	6	16.37	July 25, 1951	19.50	Mar. 27, 1946
3-40-9ba	6	11.69	Feb. 25, 1947	20.05	July 25, 1951
-22ab	6	10.02	July 29, 1947	15.18	Mar. 9, 1946
-28bd	6	10.02	Mar. 20, 1946	12.75	Aug. 16, 1946
-33dd	6	11.90	July 29, 1947	14.50	Mar. 4, 1946
4-41-2aa	6	20.04	July 12, 1950	28.53	Oct. 4, 1949
-32dd	6	113.10	July 25, 1951	114.76	Aug. 16, 1946
4-42-24ca	6	24.48	July 25, 1951	25.89	Sept. 7, 1947

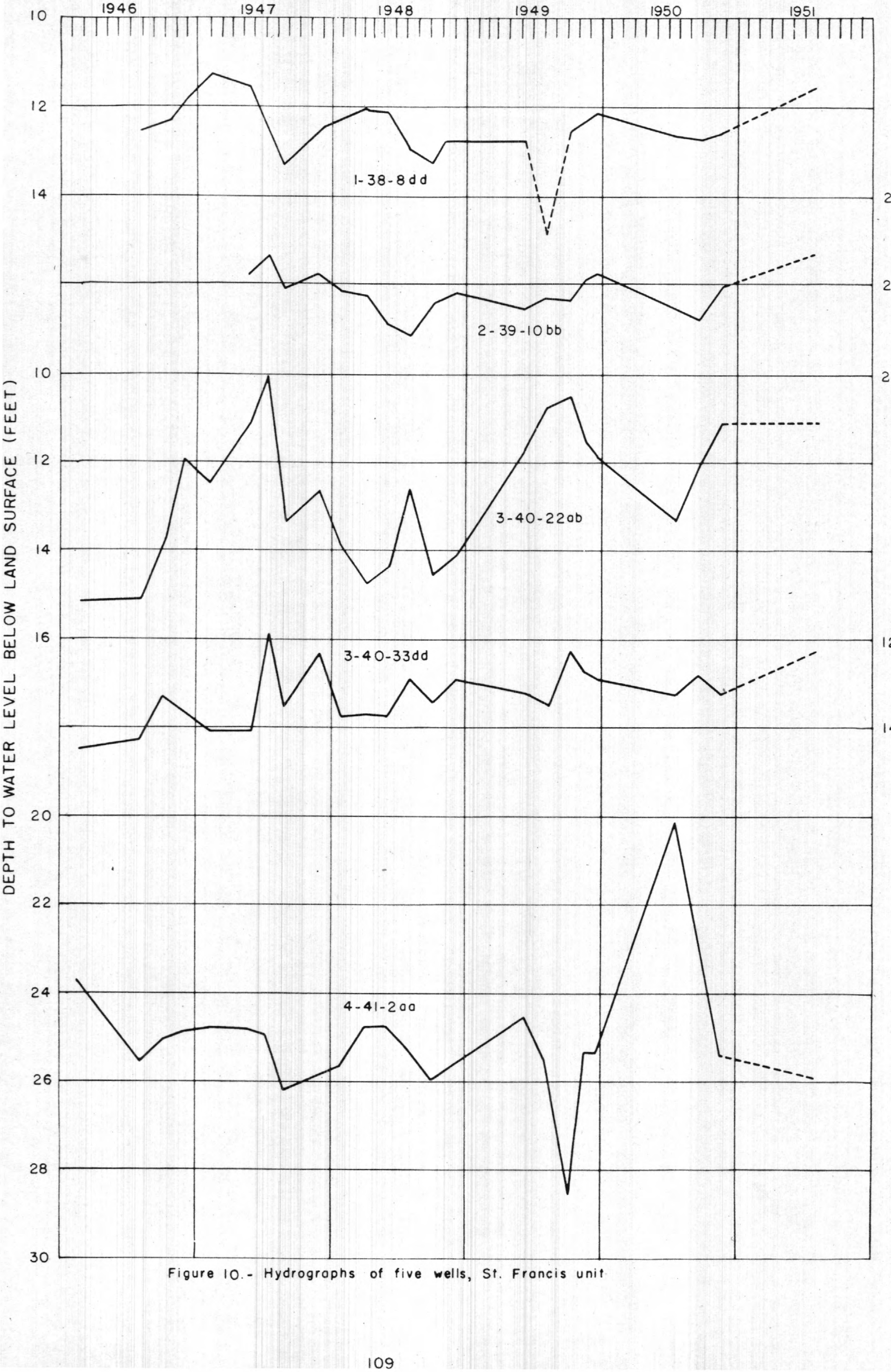

Figure 10.- Hydrographs of five wells, St. Francis unit

Table 26.—Difference between highest and lowest recorded water levels and net change in water level for period of record, in feet, in observation wells in the St. Francis unit.

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (–) for period of record
1-38-1cd	1.52	+0.92
-8dd	3.59	+.92
-17cd	1.50	+.67
2-39-10bb	1.75	+.40
-27bb	3.13	+3.13
3-40-9ba	8.36	-7.75
-22ab	5.16	+4.07
-28bd	2.73	-.98
-33dd	2.60	+2.23
4-41-2aa	8.49	-2.32
-32dd	1.66	+1.60
4-42-24ca	1.41	+1.30

Table 27.—Water-level measurements, in feet below land-surface datum, in the St. Francis unit, 1951.

1-38-1cd. July 25, 21.57.

1-38-8dd. July 25, 11.60.

1-38-17cd. July 25, 11.07.

2-39-2cb. Measurements discontinued.

2-39-10bb. July 25, 25.35.

2-39-17ba. Measurements discontinued.

2-39-19ccc. Measurements discontinued.

2-39-27bb. July 25, 16.37.

3-40-9ba. July 25, 20.05.

3-40-22ab. July 25, 11.11.

3-40-28bd. July 25, 11.00.

3-40-33dd. July 25, 12.27.

Table 27.--Water-level measurements, in feet below land-surface datum, in the St. Francis unit, 1951.--Continued

3-41-13cc.	Measurements discontinued.
4-41-2aa.	July 25, 25.99.
4-41-32dd.	July 25, 113.10.
4-42-24ca.	July 25, 24.48.
5-42-4aa.	Measurements discontinued.

WEBSTER UNIT

Periodic measurements of the water levels have been made since 1946 in eight observation wells in the valley of the South Fork of the Solomon River in Osborne County. The highest and lowest water levels for the period of record are given in table 28; the difference between the highest and lowest water levels, the net rise or decline in 1951, and the net rise or decline for the period of record are given in table 29; and the water level measurements made in 1951 are given in table 30. Hydrographs of five wells are shown in figure 11.

Table 28.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in observation wells in the Webster unit.

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
7-11-26aa	6	13.20	Jan. 19, 1951	26.42	Nov. 15, 1950
7-12-28ab	6	27.09	Oct. 24, 1951	34.60	Jan. 7, 1947
7-13-15da	6	29.14	July 25, 1951	38.94	Sept. 30, 1947
7-14-6cb	6	19.97	Aug. 27, 1951	24.19	Nov. 29, 1948
-10dd	6	29.93	Sept. 21, 1950	32.22	Feb. 4, 1947
7-15-8cc	6	14.80	May 26, 1950	27.75	Apr. 14, 1950
-12dc	6	10.60	June 29, 1949	23.85	Apr. 12, 1950

Table 29.--Difference between highest and lowest recorded water levels, net change in water level in 1951, and net change in water level for period of record, in feet, in observation wells in the Webster unit.

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1951	Net rise (+) or net decline (-) for period of record
7-11-26aa	13.22	-11.72	+5.10
7-12-28ab	7.51	+3.01	+6.63
7-13-15da	9.80	+1.37	+1.27
7-14-6cb	4.22	+1.20	+2.68
-10dd	2.29	-.48	+1.83
7-15-8cc	12.95	+2.17	+3.76
-12dc	13.25	+.19	+1.60

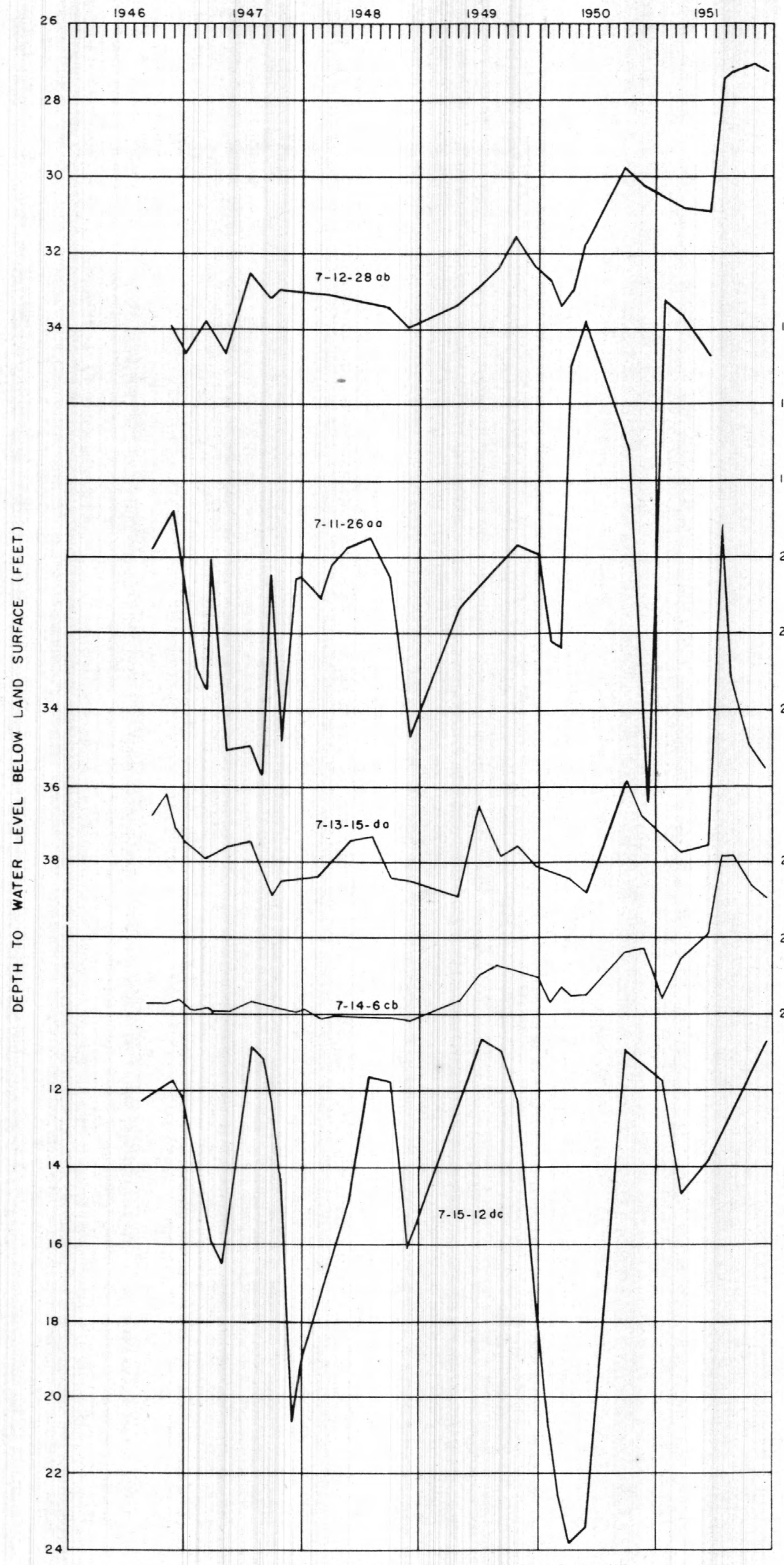

Figure 11 - Hydrographs of Five Wells, Webster Unit

Table 30.--Water-level measurements, in feet below land-surface datum, in the Webster unit, 1951.

7-11-21da. Measurements discontinued.

7-11-26aa. Jan. 19, 13.20; Mar. 19, 13.66; June 12, 14.70.

7-12-28ab.

Date	Water level	Date	Water level	Date	Water level
Jan. 19	30.49	July 25	27.41	Oct. 24	27.09
Mar. 19	30.80	Aug. 27	27.26	Dec. 12	27.21
June 12	30.89				

7-13-15da.

Mar. 19	37.65	July 25	29.14	Oct. 23	34.83
June 12	37.50	Aug. 27	33.12	Dec. 12	35.53

7-14-6cb.

Jan. 19	23.62	July 25	19.98	Oct. 23	20.68
Mar. 19	22.63	Aug. 27	19.97	Dec. 12	21.02
June 12	21.99				

7-14-10dd. Jan. 19, 30.35; Mar. 19, 30.59; June 12, 30.58.

7-15-8cc.

Jan. 19	22.09	July 25	19.09	Oct. 23	18.95
Mar. 19	23.84	Aug. 27	18.55	Dec. 12	19.53
June 12	22.55				

7-15-12dc.

Jan. 19	11.76	June 12	13.83	Dec. 12	10.74
Mar. 19	14.67				

WILSON UNIT

Measurements of the water levels in 14 wells have been made periodically since 1947. The highest and lowest water levels for the period of record are given in table 31; the difference between the highest and lowest recorded water levels, the net rise or decline of the water level in 1951, and the net rise or decline of the water level for the period of record are given in table 32; and the water-level measurements that were made in 1951 are given in table 33. Hydrographs of five wells are shown in figure 12.

Table 31.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in observation wells in the Wilson unit.

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
11-7-32dc	5	57.96	July 25, 1951	74.67	Sept. 8, 1947
12-6-12cd	5	11.64	Aug. 9, 1948	15.72	Jan. 12, 1948
-16cc	5	6.52	July 25, 1951	24.87	Nov. 28, 1947
12-7-18aa	5	2.47	July 25, 1951	23.55	May 26, 1950
-19dd	5	7.53	Oct. 23, 1951	13.18	Jan. 12, 1948
-23aa	5	1.60	July 25, 1951	13.43	Jan. 12, 1948
-34ad	5	48.60	Dec. 27, 1951	50.84	Feb. 21, 1947
12-8-6aa	5	5.09	May 11, 1951	10.53	Sept. 8, 1947
-8cd	5	2.29	July 25, 1951	14.30	Jan. 12, 1948
-11cb	5	4.76	July 25, 1951	19.48	Mar. 17, 1951
12-9-10ad	5	6.41	Oct. 22, 1951	20.26	Jan. 12, 1948
12-10-8bb	5	9.58	Oct. 22, 1951	16.58	Jan. 12, 1948
-13aa	5	8.62	July 25, 1951	24.48	Jan. 12, 1948
-21dd	5	19.58	Oct. 22, 1951	27.85	Apr. 26, 1949

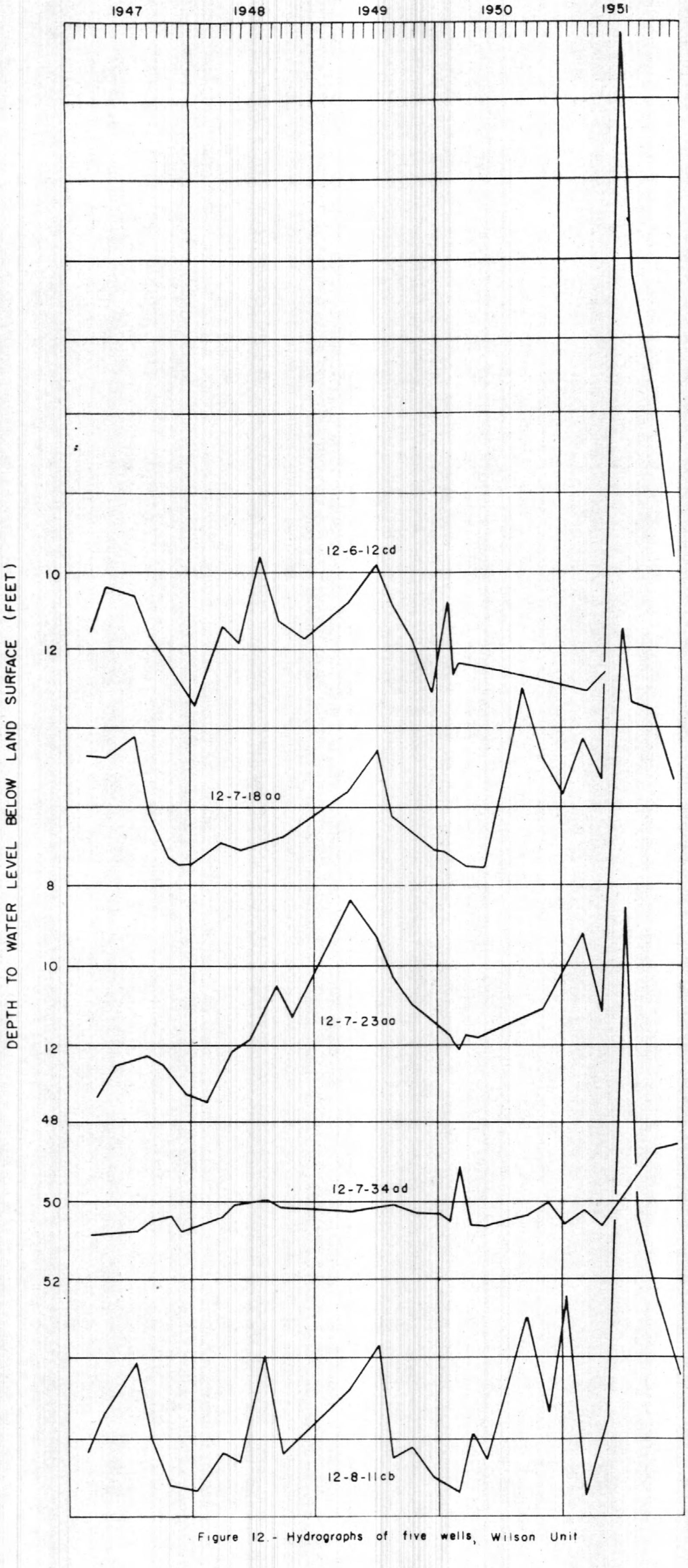

Figure 12.- Hydrographs of five wells, Wilson Unit

Table 32.--Difference between highest and lowest recorded water levels, net change in water level in 1951, and net change in water level for the period of record, in feet, in observation wells in the Wilson unit.

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1951	Net rise (+) or net decline (-) for period of record
11-7-32dc	16.71	+4.22	+4.73
12-6-12cd	4.08	+.46	-1.11
-16cc	18.35	+7.98	+7.77
12-7-18aa	21.08	+6.01	+4.87
-19dd	5.65	+2.34	+4.05
-23aa	11.83	+3.89	+7.99
-34ad	2.24	+2.00	+2.20
12-8-6aa	5.44	+.69	+.80
-8cd	12.01	+8.60	+10.27
-11cb	14.72	-1.99	+1.95
12-9-10ad	13.85	+8.62	+10.14
12-10-8bb	7.00	+5.09	+6.62
-13aa	15.86	+8.65	+13.68
-21dd	8.27	+5.51	+6.31

Table 33.--Water-level measurements, in feet below land-surface datum, in the Wilson unit, 1951.

11-7-32dc.

Date	Water level	Date	Water level	Date	Water level
Jan. 23	73.79	July 25	57.96	Oct. 22	65.12
Mar. 17	73.43	Aug. 21	69.59	Dec. 27	69.57
May 11	73.47				

12-6-12cd. Mar. 17, 15.17; May 11, 14.71.

12-6-16cc.

Jan. 23	21.41	July 25	6.52	Oct. 22	10.54
Mar. 17	21.06	Aug. 21	9.73	Dec. 27	13.43
May 11	21.53				

12-7-18aa.

Jan. 23	21.74	July 25	2.47	Oct. 22	11.70
Mar. 17	20.29	Aug. 21	8.71	Dec. 27	15.73
May 11	21.30				

Table 33.--Water-level measurements, in feet below land-surface datum, in the Wilson unit, 1951.--Continued

12-7-19dd.

Date	Water level	Date	Water level	Date	Water level
Jan. 23	10.89	July 25	7.55	Oct. 23	7.53
Mar. 17	10.19	Aug. 21	8.06	Dec. 27	8.55
May 11	10.15				

12-7-23aa.

Mar. 17	9.30	July 25	1.60	Oct. 22	3.69
May 11	11.29	Aug. 21	3.46	Dec. 27	5.41

12-7-34ad.

Jan. 23	50.60	May 11	50.63	Oct. 22	48.75
Mar. 17	50.28	Aug. 21	49.50	Dec. 27	48.60

12-8-6aa.

Jan. 23	6.09	July 25	6.96	Oct. 22	5.15
Mar. 17	5.98	Aug. 21	5.16	Dec. 27	5.40
May 11	5.09				

12-8-8cd.

Jan. 23	12.03	July 25	2.29	Oct. 22	2.92
Mar. 17	12.37	Aug. 21	4.02	Dec. 27	3.43
May 11	7.25				

12-8-11cb.

Jan. 23	14.46	July 25	4.76	Oct. 22	14.68
Mar. 17	19.48	Aug. 21	12.50	Dec. 27	16.45
May 11	17.67				

12-9-10ad. Jan. 23, 18.08; Oct. 22, 6.41; Dec. 27, 9.46.

12-10-8bb.

Jan. 23	14.67	May 11	13.25	Oct. 22	9.58
Mar. 17	14.80				

Table 33.--Water-level measurements, in feet below land-surface datum, in the Wilson unit, 1951.--Continued

12-10-13aa.

Date	Water level	Date	Water level	Date	Water level
Jan. 23	19.07	July 25	8.62	Oct. 22	9.22
Mar. 17	20.05	Aug. 21	9.64	Dec. 27	10.42
May 11	18.53				

12-10-17ab. Measurements discontinued.

12-10-21dd.

Jan. 23	26.10	May 11	26.13	Oct. 22	19.58
Mar. 17	26.28	Aug. 21	20.29	Dec. 27	20.59