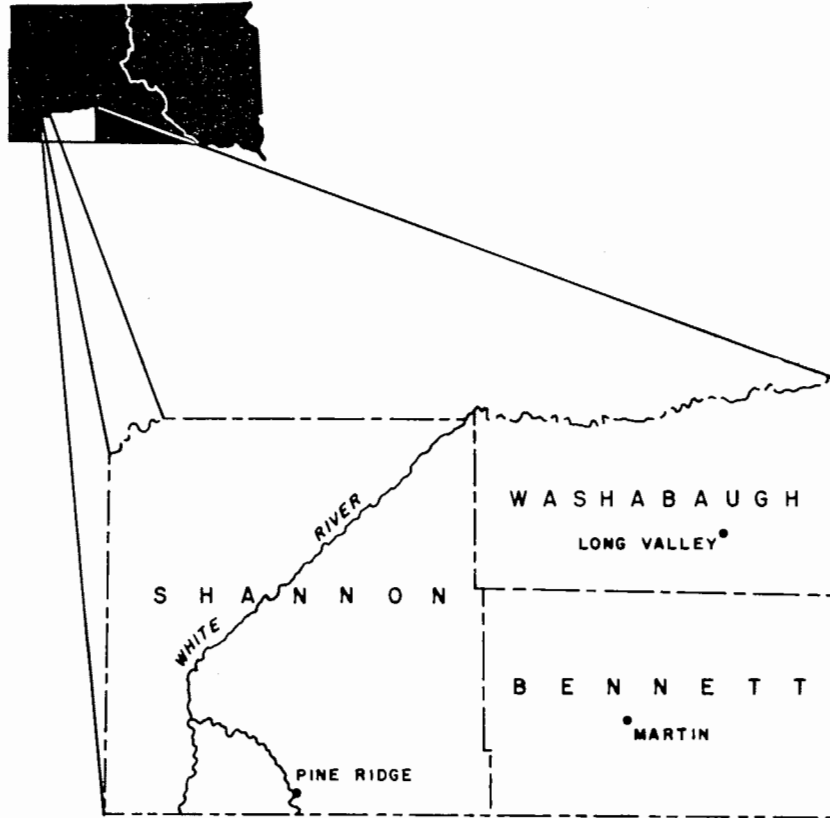


SOUTH DAKOTA GEOLOGICAL SURVEY
AND
SOUTH DAKOTA WATER RESOURCES COMMISSION

WATER RESOURCES REPORT NO. 4



BASIC HYDROGEOLOGIC DATA
PINE RIDGE INDIAN RESERVATION,
SOUTH DAKOTA

by
D. G. Adolphson and M. J. Ellis
U. S. Geological Survey

Vermillion, 1969

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U. S. Geological Survey

Science Center
University of South Dakota
Vermillion, South Dakota
1969

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INTRODUCTION

In July 1961, the U. S. Geological Survey began a 3-year investigation to inventory and evaluate the water resources of the Pine Ridge Indian Reservation in southwestern South Dakota. The area of investigation includes Shannon and Washabaugh Counties and that part of Bennett County north of Highway 18. (See fig. 1.) The study was made at the request of the Bureau of Indian Affairs as part of the program of the United States Department of the Interior for development of the Missouri River basin.

The results of the investigation are published in two parts – this report and a separate interpretive report. This report contains the basic geologic and hydrologic information collected in the course of the field work. The interpretive report, entitled "Hydrogeology of the Pine Ridge Indian Reservation, South Dakota," describes the rock units pertinent to water supply, the occurrence and availability of water supplies, and the chemical quality of the water. The interpretive report, U. S. Geological Survey Hydrologic Atlas HA-357 (Ellis, M. J., and Adolphson, D. G., 1969) is more valuable if accompanied by this basic-data report. Publication in two parts affords release of the basic data in advance of the interpretive report, which cannot be prepared until the basic data have been assembled.

Each well, spring, or test hole for which data are given in the following tables has been assigned an identifying number based on its location with respect to the Federal land-survey system as it applies to South Dakota. The number consists of the township, range, and section numbers separated by hyphens. Three or more lowercase letters after the section number indicate respectively: the quarter section (160 acres); quarter-quarter section (40 acres); quarter-quarter-quarter section (10) acres; etc., in which a well, test hole, or spring is located. (see fig. 2).

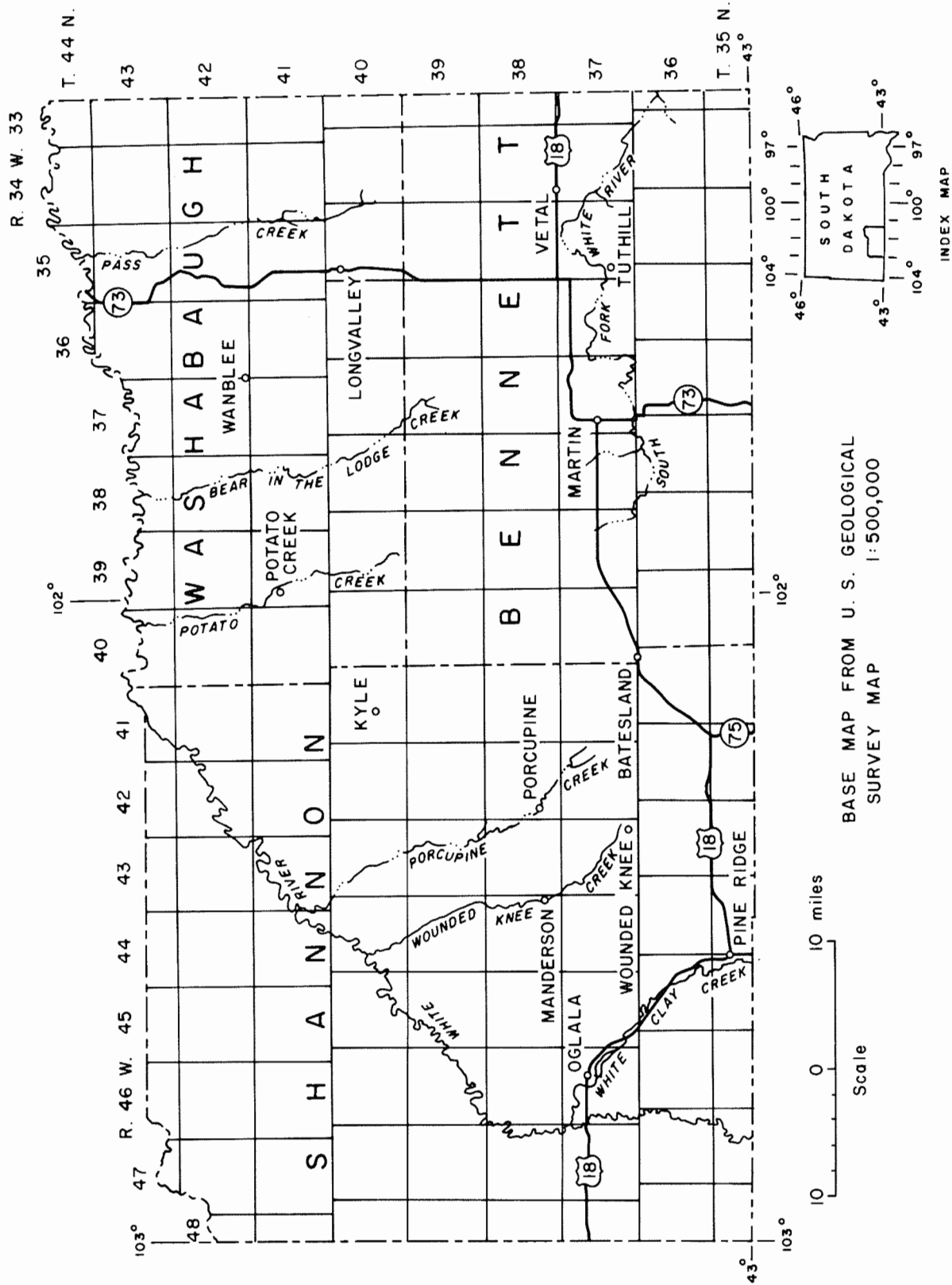


Figure 1. Pine Ridge Indian Reservation.

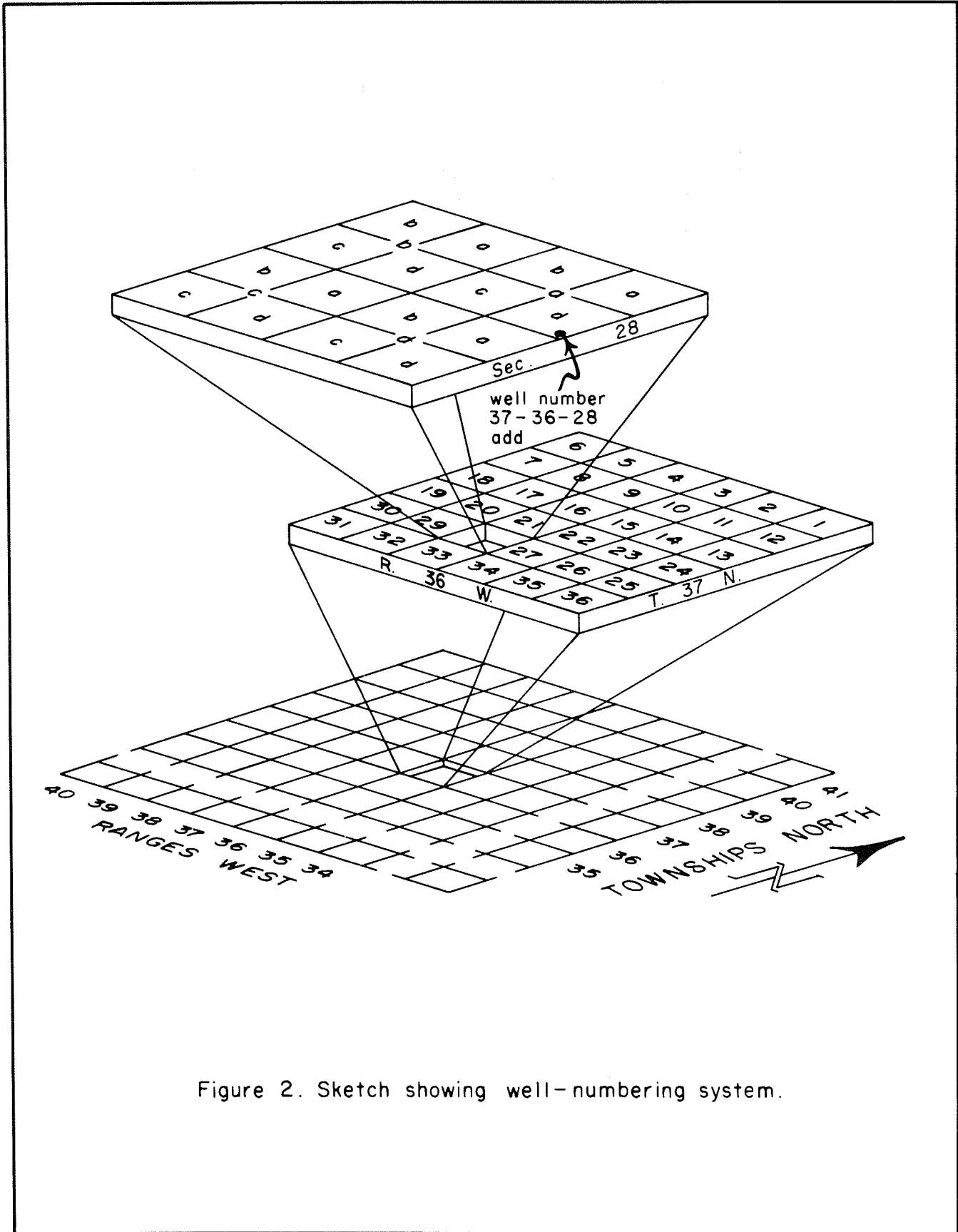


Figure 2. Sketch showing well-numbering system.

BASIC DATA

Table 1.--Records of Test Holes and Wells

Data from a comprehensive inventory of existing water wells and records of test holes are listed in table 1. The inventory was made during field work for this investigation to determine the water level, depth, age, type, condition, and capacity of as many wells as possible. Geologic and hydrologic data were obtained from a study of logs and of material collected from test drilling.

Table 1.--Records of test holes and wells.

Location (1)	Owner, tenant or source of data (2)	Depth of well (3)	Type and diameter (inches) (4)	Depth to water (5)	Date of measurement (6)	Use (7)	Remarks (8)
<p>Owner, tenant, or source of data: BIA, refers to information provided by U. S. Bureau of Indian Affairs.</p> <p>Depth to water: Reported and estimated depths below land surface are given in feet; measured depths in hundredths.</p> <p>Depth of well: Reported depths are given to nearest foot; measured depths to nearest tenth of foot.</p> <p>Type of well: Dr, drilled; DU, dug.</p> <p>Use: D, domestic; PS, public supply; S, stock watering; T, test hole; N, not used; I, irrigation.</p> <p>Remarks: Chemical analyses are in table 4; test hole logs are in table 6; well logs are in table 7.</p>							
BENNETT COUNTY							
37-37-17cb1	Martin City Well No. 2	500	Dr 8	—	5-15-62	PS	Chemical analysis
17cb2	Martin City Well No. 3	500	Dr 10	160	5-15-62	PS	Well log
18ac	Martin City Well No. 1	495	Dr 8	—	5-15-62	PS	
37-38-3bbc1	A. Dirks	250	Dr 3	—	10-2-63	D	
3bbc2	A. Dirks	215	Dr 4	—	10-2-63	D,S	
4acc	A. Dirks	300	Dr 4	200	10-2-63	S	
37-39-6bbb	H. Beadt	220	Dr	—	10-2-63	D	
37-40-17abb	J. Bursh	160	Dr	60	10-1-63	S	
30dad	J. Bursh	165	Dr	65	10-1-63	D,S	
38-35-33cc	L. Rayhill	96	Dr 4	58	11-30-62	D	Chemical analysis
38-39-10bc	Allen Day School	120	Dr 6	—	5-16-62	PS	Chemical analysis
10bd1	Allen Store	90	Dr	15	10-1-63	D	
10bd2	Allen Village	100	Dr	—	10-1-63	D	
21ddb	H. Hicks	80	Dr	—	10-1-63	S	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	6
38-40- 24ddd 32db 33ccc	K. Clausen F. Sterkel F. Sterkel	240 200 230	Dr 4 Dr Dr	90 — —	10-2-63 10-1-63 10-1-63	D,S S D,S		
39-39- 33cc	H. Russell	200	Dr	—	10-1-63	D,S		
35-41- 4bc	R. Swick	120	Dr 6	60	11-30-62	D	Chemical analysis	
35-42- 1bb 3bc 8bd	G. Leavitt G. Leavitt M. Nelson	60 80 20	Dr Dr 4 Dr 4	20 4 1	8-8-62 8-8-62 8-8-62	D D D,S		
35-43- 2ab 2ba 2bd 2ca1 2ca2 11cc 13ad 15dd	Denby Store — A. Lapoint Denby Post Office Denby Store J. Lee J. Lee J. Lee	110 110 65 48 48 108 145 190	Dr Dr Dr 4 Dr 6 Dr 6 Dr Dr 4 Dr	30 30 — — — 35 45 50	8-1-62 8-15-62 8-8-62 8-1-62 8-15-62 8-15-62 8-8-62 8-15-62	S N D S S S S S		
35-45- 5cd 5dd 8ca 10aa 10ad 11cc 12abb 12cb 12dab	M. Sierra M. Sierra BIA B. Horncloud B. Horncloud R. Elk Boy Pine Ridge Well No. 2 Pine Ridge School Pine Ridge Well No. 1	57 260 228 127 127 245 220 350 120	Dr 4 Dr 4 Dr 6 Dr 4 Dr 4 Dr 4 Dr 8 Dr 10 Dr 8	54 — — 52 52 50 — 125 —	8-14-62 8-14-62 — 8-14-62 8-14-62 8-14-62 5-15-62 5-15-62 5-15-62	N N S D,S D D PS PS PS	Chemical analysis	
35-47- 4aa	Ballard	85	Dr 4	—	8-15-62	D,S		

SHANNON COUNTY

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
35-47 (cont.) 5ab	Santel	25	Dr 18	10	8-15-62	S	
36-41-	C. Weaver	150	Dr 5	—	8-10-62	D,S	
1bd	Batesland Store	180	Dr 5	30	8-10-62	PS	
2aa	Jensen	168	Dr 4	12	8-8-62	D,S	
14aa	G. Conroy	120	Dr 4	60	8-8-62	D,S	
15aa	S. Shepard	100	Dr 4	40	8-15-62	S	
16cc	S. Shepard	60	Dr	10	8-15-62	S	
17aa	S. Shepard	150	Dr 4	—	8-15-62	D	
17ca	S. Shepard	180	Dr	90	8-15-62	S	
17cc	S. Shepard	100	Dr 4	15	8-15-62	S	
17da	S. Shepard	100	Dr 4	60	8-8-62	D,S	
22cb	G. Conroy	85	Dr 4	90	—	S	Well log
22dd	BIA	156	Dr 2	30	11-30-62	D,S	Chemical analysis
29a	F. Slaby	120	Dr 5	30	10-27-60	I	Well log
29ac	F. Slaby	320	—	—	8-8-62	D,S	
34dd	Provo	50	Dr 4	32	8-8-62	S	
35cc	Provo	80-100	Dr 4	50	8-8-62	S	
36-42-	Wounded Knee	100	Dr	40	8-1-62	S	
8bb	Battlefield Store	230	Dr	100	8-7-62	D,S	
12bb	C. Gutormson	60	Dr	30	8-1-62	S	
19dc	—	200	—	140	8-8-62	D,S	
27cd	G. Leavitt	20	Dr	6	8-8-62	D,S	
31ca	—	180	Dr 4	—	—	S	Well log
36dd	BIA						
36-43-	Trading Post	100	—	40	8-1-62	S	
1cc	Trading Post	80	Dr	40	8-1-62	D,S	
14ab	—	60	Dr	30	8-1-62	D,S	
14ac	BIA	202	Dr 6	120	—	S	
16aa	BIA	240	Dr 6	130	—	S	Well log
17cc	BIA	92	Dr	30	8-15-62	S	
25cc1	Denby Store	65	Dr 6	25	8-1-62	D,S	
25cc2	Denby Post Office	92	—	30	8-1-62	—	
25cc3	Denby Post Office	65	Dr 6	25	8-15-62	D	
25cc4	Denby Store	200	Dr	—	8-15-62	D	
29bb	Johnson	92	Dr 4	40	8-9-62	D,S	Chemical analysis
32ab	W. R. Nelson	125	Dr 4	40	8-1-62	D,S	
35aa1	R. Faulk		Dr 4				

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	∞
36-43- (cont.)								
35aa2	R. Faulk	75	Dr 4	25	8-1-62	S		
36ab1	Denby Post Office	100	Dr	40	8-1-62	D		
36bb2	Denby Store	100	Dr	40	8-15-62	D		
36dd	J. Lee	80	Dr 4	35	8-8-62	D		
36-44-								
2bc	Johnson	250	Dr	180	8-15-62	S		
2dd	Johnson	200	Dr	180	8-15-62	S		
3bd	Johnson	280	Dr	—	8-15-62	S		
7cb	R. Faulk	250	Dr	—	8-15-62	S		
9ca	R. Johnson	200	—	150	8-15-62	S		
10dc	R. Johnson	365	Dr	260	8-15-62	S		
15bd	R. Johnson	365	—	275	8-15-62	S		
21bd	R. Johnson	300	—	—	8-15-62	S		
23bc	R. Johnson	365	—	265	8-15-62	S		Chemical analysis
25bd	R. Johnson	250	—	—	8-15-62	S		
27ca	R. Johnson	300	Dr	—	8-15-62	S		
30aa	—	330	Dr	180	8-15-62	S		
31aa	—	420	Dr	150	8-15-62	D,S		
31dc1	—	38	—	12	8-15-62	D,S		
31dc2	—	39	Dr	3	8-15-62	S		
33cc	—	380	Dr	150	8-15-62	S		
36-45-								
5cd	County Ext. Service	135	Dr 4	—	8-15-62	D		
8cc	—	60	—	35	8-15-62	D		
9dc	J. Jones	100	Dr 4	—	8-9-62	D		
10ba	R. Faulk	350	Dr	200	8-15-62	S		
				(20 ft. spring) (75 ft. fall)				
12cc	R. Faulk	175	Dr	—	8-15-62	S		
14cc	E. Tobacco	70	Dr 4	—	8-9-62	D		
15dbb	Test Hole	34	Dr 4	10	9-21-62	T		Test hole log
15dd	Indian village well	150	Dr	—	8-9-62	D		
15bc	Indian village well	150	Dr 4	—	8-9-62	D		
16ad	G. Sitting Holy	105	Dr 4	35	8-9-62	D		
16aa	Redhair	108	Dr 4	—	8-9-62	D		
17ca	R. Faulk	300	Dr	200	8-15-62	S		
20da	R. Faulk	300	Dr	200	8-15-62	S		
23dc	—	100	Dr 4	—	8-8-62	D		
25cc	—	72	Dr 4	—	8-8-62	D		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
36-47-							
12cc	Ballard	235	Dr 4	150	8-15-62	D,S	
14dd	—	580	Dr 4	—	8-15-62	N	
16cd	Ballard	100	—	85	8-15-62	S	
19ac	Santel	320	Dr	40	8-15-62	S	
19cd	Santel	45	—	—	8-15-62	D,S	
23b	W. Williams	71	Dr 6	48	11-29-62	S	Chemical analysis
23dc	W. Williams	180	Dr 4	—	8-15-62	D,S	
23ddc	Test hole	38	Dr 4	29.00	9-20-62	T	Test hole log
24aa	BIA	61	—	48	—	S	Well log
24bad	Test hole	55	Dr 4	27.50	9-20-62	T	Test hole log
24cc	Ballard	75	Dr	35	8-15-62	D	
25aa	BIA	20	—	19	—	S	Well log
26ab	W. Williams	80	Dr 4	57	8-15-62	D	Chemical analysis
28bd	Santel	170	Dr 4	45	8-15-62	S	
34cb	Santel	300	Dr 4	—	8-15-62	N	
36-48-							
12aa	H. Kubo	60	Dr	—	8-15-62	D,S	Chemical analysis
37-41-							
3bc	Schortling	200	—	—	8-13-62	S	
5da	Schortling	370	Dr 4	—	8-13-62	S	
7bc	Decher	250	Dr	90	8-13-62	D,S	Chemical analysis
7cc	Decher	150	Dr	—	8-13-62	N	
10cd	Kehn	300	Dr	—	8-7-62	D,S	
21bb	B. Bolte	349	—	—	8-7-62	S	
24aa	A. Krause	200	Dr	50	9-24-63	S	
30dd	W. Rust	125	Dr	45	8-13-62	D,S	
32cd	S. Kruze	250	Dr	—	8-7-62	D	
34bb	B. Bolte	200	—	—	8-7-62	D	
36ca	A. Krause	+150	Dr 4	50	9-24-63	D,S	
37-42-							
9ab	G. Sheppardson	187	Dr	—	8-1-62	D	
9bb	G. Sheppardson	187	—	—	8-1-62	S	
11bd	W. School	160	Dr	—	8-1-62	N	
12ad	Decher	40	Dr	—	8-13-62	S	
14bb	BIA	54	Dr 4	—	—	S	
15cb	BIA	312	Dr	—	8-1-62	S	
17bc	—	400	Dr 3	—	8-1-62	N	
17cc	BIA	358	Dr 4	200	1936	S	Well log

37-42- (cont.)

24ab	Guton	250	Dr 4	—	8-13-62	N	
25bb	Guton	160	Dr 4	100	8-13-62	S	Well log
30ca	BIA	214	Dr 4	—	—	S	
31ab	—	348	Dr	—	8-1-62	S	
35ab	Guton	200	Dr	—	8-13-62	N	Well log
35ca	BIA	336	Dr 4	—	—	S	
12ac	BIA	239	Dr 6	177	—	S	
22da	Phillips	120	Dr	—	8-1-62	D,S	
23ab	Walls	380	Dr	—	8-1-62	S	
23ba	Walls	420	Dr	—	8-1-62	S	
23bc	Walls	120	Dr 4	—	8-1-62	D,S	Test hole log
25dcc	Test hole	19.5	Dr 4	—	—	T	
26ad	Catholic Church	170	Dr	—	8-1-62	D	
33ad	Matthew	100	Dr	—	8-1-62	—	
33cd	Adams	75	Dr	—	8-1-62	S	
33da	Matthew	90	Dr	—	8-1-62	D,S	
33db	BIA	162	Dr 6	102	—	S	
36ac	Trading Post owner	110	Dr	—	8-1-62	D	
36bc	Trading Post owner	115	—	40	8-1-62	D	Test hole log
36bdd	Test hole	15.5	Dr 4	8.13	11-5-62	T	
37-44-							
7cd	C. Clooms	345	Dr	—	8-15-62	S	Well log
9ca	BIA	172	Dr 6	70	—	S	
10ad	C. Clooms	115	—	—	8-15-62	S	
10cc	C. Clooms	300	Dr	—	8-15-62	S	
16bd	C. Clooms	276	Dr	—	8-15-62	S	
20da	C. Clooms	400	Dr	—	8-15-62	S	
27bd	BIA	127	Dr 6	97	—	S	
32dd	BIA	165	Dr 6	90	—	S	
36dc	Johnson	300	Dr	230	8-15-62	S	Well log
36dd	BIA	306	Dr 6	150	—	S	
37-45-							
2ab	C. Clooms	280	Dr	—	8-15-62	S	
4ba	C. Clooms	390	Dr	—	8-15-62	S	
12bc	C. Clooms	392	Dr 4	—	8-15-62	S	
14db	C. Clooms	410	Dr	—	8-15-62	S	
15dd	C. Clooms	565	Dr	—	8-15-62	S	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
37-45- (cont.)							
20cc	C. Clooms	115	—	—	8-15-62	S	
26bd	C. Clooms	432	Dr	275	8-15-62	S	
30da	C. Clooms	280	Dr	—	8-15-62	S	
30dcd	Test hole	47	Dr 4	10	9-21-62	T	Test hole log
32ca	J. Lusli	40	Dr	25	8-15-62	D	
37-46-							
4bb	BIA	234	—	—	—	—	Well log
6bb	BIA	37	Dr 15	30	—	—	Well log
9ba	Oglala—Loneman School	65	Dr 8	—	5-15-62	PS	Chemical analysis
14ac	—	165	Dr	30	8-15-62	D,S	
15bba	Test hole	42	Dr 4	7	9-18-62	T	Test hole log
18aaa	Test hole	35	Dr 4	13.47	9-18-62	T	Test hole log
18bab	Test hole	52	Dr 4	12.40	9-18-62	T	Test hole log
25dd	BIA	216	Dr 6	125	—	S	Well log
31aaa	Test hole	42	Dr 4	12.48	9-14-62	T	Test hole log
31abb	Test hole	32	Dr 4	10.76	9-14-62	T	Test hole log
31bbb	Test hole	37	Dr 4	—	—	T	Test hole log
31cc	BIA	62	—	—	—	S	Test hole log
37-47-							
1ddad	Test hole	33	Dr 4	18	10-1-62	T	Test hole log
5bb	J. Hagman	21	Dr	10	11-29-62	D,S	Chemical analysis
6ba	G. Norman	35	—	—	8-15-62	D,S	
37-48-							
2ba	G. Norman	30	Dr	20	8-15-62	S	
10dd	Johnson	30	Dr	1	8-15-62	S	
14bd	Johnson	30	Dr	2	8-15-62	D,S	
22bb	Hickey	40	Dr 24	10	8-15-62	S	
22db	Hickey	45	— 36	12	8-15-62	S	
23bb	Hickey	36	—	3	8-15-62	S	
27ab	Monohom	27	Dr 6	—	8-15-62	S	
27ac	Monohom	22	Dr 16	3	8-15-62	S	
27bb	Monohom	36	—	16	8-15-62	S	
38-41-							
3cd	W. Martinize	165	Dr 4	90	8-7-62	D,S	
10dd	J. American Horse	180	Dr	—	8-7-62	D	
12bb	BIA	277	Dr 6	190	—	S	Well log
19cc	Decker	175	Dr	—	8-1-62	S	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	12
38-41- (cont.)								
21cc	BIA	189	Dr 4	—	—	S	Well log	
25bb	BIA	148	Dr 6	40	—	S	Well log	
29bc	Decker	200	Dr	—	8-13-62	D		
29dd	BIA	240	Dr 6	124	—	S	Well log	
31dd	Decker	90	Dr	—	8-13-62	N		
32aa	Schearliling	280	Dr	200	8-13-62	D		
38-42-								
4ca	Decker	200	Dr 4	100	8-13-62	N		
8da	Decker	320	Dr 6	—	8-13-62	N		
9bc	BIA	276	Dr 6	165	—	S	Well log	
10aa	Decker	320	Dr 4	—	8-13-62	S		
11cc	BIA	230	Dr 4	—	—	S		
14bd	Decker	260	Dr 4	120	8-13-62	S		
19dc	F. Lock	60	Dr 4-6	—	8-1-62	D		
22dd	Decker	80-90	—	23	8-13-62	S		
24cc	Decker	160	Dr	—	8-1-62	S		
25ad	Decker	128	Dr	50	8-1-62	D,S		
29bbc	Test hole	37	Dr 4	10.75	11-6-62	T	Test hole log	
29bca	Test hole	37	Dr 4	17.65	11-5-62	T	Test hole log	
29bc	BIA	130	Dr	50	9-25-63	D		
29bdb	Test hole	30	Dr 4	10.35	11-5-62	T	Test hole log	
32bd	Jake	190	Dr	40	9-25-63	D,S		
34cd	Gruenwold	165	Dr	—	8-1-62	D,S		
35bb	Gruenwold	290	—	—	8-1-62	S		
38-43-								
2daa	Test hole	37	Dr 4	—	—	T	Test hole log	
2dd1	S. Thunder Hawk	150	Dr 6	40	8-1-62	N		
2dd2	S. Thunder Hawk	100	Dr 6	40	8-1-62	D		
10ac	BIA	151	Dr 6	75	—	S		
13ad	B. Ecoffey	150	Dr 4	50	8-1-62	D,S		
32ca	BIA	351	Dr 6	96	—	S	Well log	
38-44-								
6aa	BIA	75	Dr 6	—	—	S		
7bd	N. Cech	200	Dr 4	60	8-15-62	S		
7dd	BIA	170	Dr 6	80	—	S		
19ca	C. Clooms	196	Dr	—	8-15-62	S		
20ca	C. Clooms	215	—	—	8-15-62	S		
23ca	C. Clooms	290	—	—	8-15-62	S		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
38-44- (cont.)							
24dba	Test hole	30	Dr 4	7.32	11-7-62	T	Test hole log
24dcc	Test hole	33	Dr 4	4.39	11-7-62	T	Test hole log
25c	Manderson Day School	190	Dr 8	90	5-16-62	PS	Chemical analysis
25da	Manderson Trading Store	125	Dr 4	60-70	8-15-62	D	
25db	Manderson Trading Store	203	Dr	—	8-15-62	D	
25dd	Manderson Day School	270	Dr 12-6	52	8-15-62	PS	Well log
26db	C. Clooms	272	Dr	70	8-15-62	S	
27ba	C. Clooms	100	—	—	8-15-62	S	
31cd	C. Clooms	310	Dr	—	8-15-62	S	
33dd	C. Clooms	315	Dr	—	8-15-62	S	
35aa	C. Clooms	150	Dr	—	8-15-62	S	
35ac	BIA	350	Dr 4	90	—	S	
36dd	C. Clooms	161	Dr	60	8-15-62	S	
38-45-							
28dd	BIA	310	Dr 6	288	—	S	Well log
32ca	C. Clooms	70	Dr	—	8-15-62	S	
36aa	C. Clooms	200	—	—	8-15-62	D,S	
38-46-							
10cc	BIA	121	Dr 6	—	—	S	Well log
16cc	BIA	185	—	—	—	—	Well log
38-47-							
12dbdd	Test hole	34	Dr 4	7.32	11-7-62	T	Test hole log
13cada	Test hole	31	Dr 4	4.39	11-7-62	T	Test hole log
13dc	W. R. Bolden	50	Dr	—	11-29-63	D,S	Chemical analysis
18ac	—	20	Dr	11	10-26-46	S	
23daa	Test hole	82	Dr 4	47.30	9-19-62	T	Test hole log
24caa	Test hole	47	Dr 4	12	9-19-62	—	Test hole log
24cba	Test hole	42	Dr 4	15.40	9-19-62	—	Test hole log
24dab	Test hole	32	Dr 4	27.25	9-19-62	T	Test hole log
26bd	BIA	51	Dr 15	43	—	S	Well log
35bb	BIA	49	Dr 15	42	—	S	Well log
39-41-							
6ba	P. One Feather	165	Dr 4	—	8-7-62	D	
6cb	Toeshech	30	—	15	8-7-62	D,S	
6cb	Test hole	32	Dr 4	—	—	T	Test hole log
7ab	Church	110	Dr 4	—	8-7-62	D	
7bba	Test hole	32	Dr 4	17	11- -62	T	Test hole log

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	14
39-41- (cont.)								
11cc	BIA	128	Dr 4	75	---	S		
17ac	BIA	146	Dr 4	65	---	S	Well log	
18ad	A. Hernandez	100	Dr 4	50	8-7-62	D		
18dd	D. Red Owl	94	Dr 4	---	8-7-62	D		
20bd	J. R. Wolf	96	Dr 4	---	8-7-62	D		
29dd	H. Clifford	140	Dr 4	---	8-7-62	D		
32aba	Test hole	42	Dr 4	---	---	T	Test hole log	
33bbb	Test hole	17	Dr 4	---	---	T	Test hole log	
39-42-								
5ac	Glover	150	Dr	80	8-2-62	S		
7bb	Glover	300	Dr	100	8-2-62	S		
8db	BIA	140	Dr 6	61	---	S		
11dd	BIA	100	Dr 4	25	---	S	Well log	
22aa	BIA	150	Dr 4	54	---	S	Well log	
22cc	Dozarks	170	Dr	---	8-2-62	D		
22cd	Hernandez	190	Dr	---	8-7-62	D		
22da	---	50	Dr 10	35	8-7-62	D		
32ba	Glover	400	Dr	150	8-2-62	S		
39-43-								
2aa	Test hole	15	Dr 4	---	---	T	Test hole log	
2bba	Test hole	32	Dr 4	16.20	11- -62	T	Test hole log	
4ba	BIA	100	---	---	---	S		
4dd	J. Glover	300	Dr 4	100	8-2-62	S		
5bb	BIA	250	---	---	---	S		
10bb	J. Glover	175	Dr 4	90-100	8-2-62	S	Chemical analysis	
11bd1	J. Glover	60	Dr 2	---	11-28-62	D,S		
11bd2	J. Glover	120	Dr 4	40	8-2-62	D,S		
13bb	J. Glover	110	Dr 4-6	80	8-2-62	S		
15bb1	BIA	181	Dr 6	---	---	S		
15bb2	BIA	167	Dr 4	71	---	S		
15da1	J. Hernandez	40	Dr 4	---	8-2-62	D		
15da2	W. Bush	90	Dr 4	40	8-2-62	D		
25bb	BIA	109	---	---	---	S		
26bdd	Test hole	47	Dr 4	30	11-6-62	T	Test hole log	
30cc	Tribe well	192	Dr 4	---	9-11-62	N		
36cbb	Test hole	102	Dr 4	22.15	11-6-62	T	Test hole log	
39-44-								
1bb	BIA	132	Dr 4	75	---	S	Well log	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
39-44- (cont.)							
3aa	Beesacker	200	Dr 4	—	8-16-62	S	Test hole log
36abb	Test hole	32	Dr 4	5.98	11-7-62	T	
36cc	BIA	170	Dr 6	80	—	S	
36dd	A. Plume	68	Dr	—	9-11-63	D,S	
36ddd	E. Young	130	Dr	—	9-11-63	D	
39-45-							
8caa	Test hole	27	Dr 4	—	—	T	Test hole log
8dcb	Test hole	27	Dr 4	10.05	11- 62	T	Test hole log
18abda	Test hole	17	Dr 4	10	10-5-62	T	Test hole log
39-46-							
24ccaa	Test hole	35	Dr 4	18	10-4-62	T	Test hole log
29cd	G. Boresahole	86	Dr 4	—	11-29-62	D	Chemical analysis
32abb	Test hole	42	Dr 4	16.50	9-20-62	T	Test hole log
32abc	Test hole	46	Dr 4	15.65	9-20-62	T	Test hole log
33baaa	Test hole	45	Dr 4	16	10-4-62	T	Test hole log
40-41-							
6ad	—	165	Dr 4	35	8-7-62	D,S	
6ba	R. Bullbear	80	Dr 4	—	8-7-62	D,S	
7aa	L. Hunter	110	Dr 4	35	8-7-62	D,S	
9bc	R. Tyrest	360	Dr 4	—	8-7-62	S	
10bc	R. Tyrest	350	Dr 4	—	8-7-62	S	
14cc	R. Tyrest	+150	Dr 4	70	8-7-62	S	
16dc	R. Tyrest	160	Dr 4	30	8-7-62	S	
17aa	R. Tyrest	90	Dr 6	20	11-28-63	D,S	Chemical analysis
17ca	Test hole	37	Dr 4	16	11- -62	T	Test hole log
17bd1	BIA	180	Dr 6	24	—	S	Well log
17bd2	Test hole	22	Dr 4	—	—	T	Test hole log
17dd	S. Good Voice Elk	100	Dr	—	8-7-62	D	
20cc	A. Hunter	60	Dr 4	10	8-7-62	D,S	
21ab	Kyle Day School	280	Dr 8	—	5-15-62	PS	Chemical analysis
23aa	BIA	312	Dr 6	50	—	S	
23ad	R. Tyrest	60	—	18	8-7-62	D,S	
27ba	Test hole	27	Dr 4	14-16	11- -62	T	Test hole log
40-42-							
7dc	C. Pourier	300	Dr	100	9-26-62	N	
8aa	H. O'Bryan	250	Dr	100	9-25-63	S	

40-42- (cont.)

10bd	W. Pourier	220	Dr 4	50	8-7-62	S	Well log
11ac	A. Hunter	150	Dr 4	100	8-7-62	S	
17ac	H. O'Bryan	250	Dr	100	9-25-62	S	
24ad	H. O'Bryan	180	Dr	35	9-25-62	D	
25ac	BIA	110	Dr 4	—	—	S	
28bb	Glover	350	Dr	—	8-2-62	S	
34cc	Glover	300	—	30	8-2-62	S	

40-43-

16cc	F. Brewer	125	Dr 4	—	8-2-62	D	
25bd	BIA	100	Dr	40	9-25-63	S	
25db	H. O'Bryan	250	Dr 2	30	9-25-63	D,S	
26b	BIA	109	Dr 6	40	—	S	Well log
28aa	M. Pourier	82	Dr 4	18	8-2-62	D	
29bd	Ruhman	80	Dr	30	8-2-62	S	
32dc	Ruhman	150	Dr	90	8-2-62	S	
34aa	Ruhman	275	Dr	150	8-2-62	S	
34cc	Sharps Trading Post	180	Dr 4	32	8-2-62	D	
34dd	Glover	120	Dr	40	8-2-62	S	
34ddc	Test hole	35	Dr 4	7.50	11- -62	T	Test hole log

40-44-

8dd	E. Stone	50	Dr 4	—	11-29-63	D	Chemical analysis
8ddc	Test hole	10	Dr 4	—	—	T	Test hole log
9ccc	Test hole	32	Dr 4	—	—	T	Test hole log
9cdd	Test hole	22	Dr 4	—	—	T	Test hole log
12da	E. Godsell	30	Dr 4	—	8-2-62	D,S	Chemical analysis
16aaa	Test hole	30	Dr 4	15	9-12-62	T	Test hole log
17abb	Test hole	30	Dr 4	18	9-12-62	T	Test hole log
19dac	Test hole	24	Dr 4	—	—	T	Test hole log
19dad	Test hole	30	Dr 4	—	—	T	Test hole log
19dba	Test hole	20	Dr 4	—	—	T	Test hole log
21cdd	Test hole	27	Dr 4	—	11-7-62	T	Test hole log
28bba	Test hole	22	Dr 4	5.17	11-7-62	T	Test hole log
28bd	Beesacher	50	Dr 4	7.72	11-7-62	T	Test hole log
28cd	Beesacher	90	Dr 24	24	8-16-62	S	Test hole log
29babb	Test hole	24	Dr	—	8-16-62	N	Test hole log
34ad	Beesacher	80	Dr 4	—	—	T	Test hole log
35cc	Beesacher	100	Dr 6	—	8-16-62	S	
			Dr 24	—	8-16-62	D,S	

40-45-

26ccc	Test hole	20	Dr 4	—	—	T	Test hole log
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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
40-45- (cont.)							
27daa	Test hole	20	Dr 4	13.78	9-13-62	T	Test hole log
27dda	Test hole	20	Dr 4	—	—	T	Test hole log
27ddd	Test hole	25	Dr 4	19.92	9-13-62	T	Test hole log
33adda	Test hole	27	Dr 4	—	—	T	Test hole log
34dacd	Test hole	50	Dr 4	—	—	T	Test hole log
35dadd	Test hole	62	Dr 4	—	—	T	Test hole log
41-41-							
9ba	M. Cherry	200	Dr 4	—	8-16-62	S	
15ca	M. Cherry	500	Dr 4	—	8-16-62	S	
21bb	M. Cherry	340	Dr 4	—	8-16-62	S	
28ad	M. Cherry	180	Dr	—	8-16-62	D,S	
33bb	R. Bull Bear	300	Dr 4	—	8-7-62	D	Chemical analysis
41-42-							
27ac	BIA	116	Dr 6	—	—	—	
36ba	W. Pourier	120	Dr 4	—	8-7-62	D	
41-43-							
19bada	Test hole	18	Dr 4	15.80	10-5-62	T	Test hole log
31ca	Consolidated School	55	Dr 36	41	9-10-63	PS	
41-44-							
25db	Rockyford Store	150	Dr	130	9-10-63	D	Chemical analysis
25bcd	Test hole	10	Dr 4	—	—	T	Test hole log
25cb	W. Twiss	55	Dr 24	25	9-12-63	D,S	
25cca	Test hole	42	Dr 4	—	—	T	Test hole log
25ccb	Test hole	22	Dr 4	—	—	T	Test hole log
25cda	Test hole	15	Dr 4	—	—	T	Test hole log
25cdb	Test hole	22	Dr 4	12.68	9-11-62	T	Test hole log
25dbc	Test hole	22	Dr 4	—	—	T	Test hole log
41-45-							
4cb	L. Cuny	110	Dr	—	9-12-63	D,S	
8ccd	L. Cuny	88	Dr 4	—	9-12-63	S	
17aaa	Test hole	127	Dr 4	—	—	T	Test hole log
18dd	J. May	120	Dr 6	—	11-29-62	S	Chemical analysis
41-46-							
31da1	L. Cuny	144	Dr 4	—	9-12-63	S	
31da2	L. Cuny	160	Dr 4	—	9-12-63	D	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
42-41-35db	J. Benedict	90	Dr	60	8-16-62	D,S	Chemical analysis
42-44-36ab	—	25	Dr 24	8	9-10-63	S	
42-47-10ba	H. Kills Hunter	27	Dr 24	10	11-29-62	D,S	Chemical analysis
43-42-29bad	Test hole	137	Dr 4	—	—	T	Test hole log
43-47-27dd	Red Shirt School	25	Dr 4	—	11-29-62	D	Chemical analysis
WASHABAUGH COUNTY							
40-33-7dc	J. Allard	200	Dr 5	20-30	9-14-61	S	
8bd1	W. Gibson	108	Dr 5	25-30	9-14-61	D,S	
8bd2	W. Gibson	110	Dr 5	25-30	9-14-61	D,S	Chemical analysis
16ca	J. Allard	200	—	40	9-14-61	S	
19ab	J. Allard	200	—	30	9-14-61	S	
20cc	J. Allard	200	—	—	9-14-61	D	
20cd	J. Allard	200	—	—	9-14-61	S	
31ca	J. Allard	325	—	—	9-14-61	S	
32bd	J. Allard	300	Dr	55	9-14-61	S	
40-34-8dd	Steinbaugh	100+	—	—	9-14-61	D,S	
13dd	L. Reynolds	180	Dr 5	110	9-14-61	S	
14ac	L. Reynolds	180	Dr 5	100	9-14-61	S	
15dd	L. Reynolds	263	Dr 6	120	9-14-61	S	Well log
16ba	Torrhelson	80	—	—	7-17-62	S	
16cd	Torrhelson	130	—	—	7-17-62	S	
17aa	Steinbaugh	120	—	—	9-14-61	D,S	
18ad	Steinbaugh	120	—	30	9-14-61	S	
21ca	Torrhelson	240	Dr 6	—	7-17-62	D	
22db	L. Reynolds	190	Dr 5	120	9-14-61	S	
24ac	BIA	161	Dr 6	48	—	S	Well log
25ab	L. Reynolds	190	Dr 5	120	9-14-61	S	
26db	L. Reynolds	340	Dr 5	180	9-14-61	S	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
40-34- (cont.)							
28aa	L. Reynolds	280	Dr 5	125	9-14-61	D,S	
28ac	L. Reynolds	200	Dr 5	80	9-14-61	D,S	
40-35-							
4bc	Arnold	125	—	—	7-19-62	D	
4cc1	Woodward	150	Dr	40	7-19-62	D	
4cc2	Woodward	90	old	50	7-19-62	S	
6da	I. Richardson	160	Dr 5	50	7-24-62	D	
7ab	W. Gropper	150	Dr	—	7-19-62	S	
7ad	W. Gropper	245	Dr	—	7-19-62	D	
7ca	W. Gropper	200	Dr	—	7-19-62	S	
10ab	C. Gropper	180	Dr 12-2	20	7-17-62	D,S	
18dc	W. Gropper	250	Dr	—	7-19-62	S	
20db	H. Zickrick	150	Dr 4	50	9-14-61	S	
20dd	I. Richardson	170	Dr	30-40	7-24-62	S	
23cc	S. C. Harn	135	Dr 5	15	9-14-61	S	
26bd	Mrs. Barbar	130	Dr 5	35	9-14-61	D,S	
27ca	W. Hamar	92	— 4	10	9-14-61	S	
29ca	H. Zickrick	150	— 4	50	9-14-61	S	
32aa	H. Zickrick	50-60	Dr 4	30	9-14-61	S	
33ba	W. Hamas	150	Dr 4	—	11-27-62	D,S	Chemical analysis
33bb	W. Zickrick	150	Dr 4	52	9-14-61	D,S	Well log
35aa	BIA	300	Dr 6	75	—	S	
35ac	H. Zickrick	350	Dr 5	180	9-14-61	S	
40-36-							
2aa	I. Richardson	170	Dr 5	—	7-24-62	S	
4ac	Searby	80	Dr 5	—	7-19-62	D	
5ad	I. Richardson	300	Dr	—	7-24-62	S	
5bc	W. Kemphe	265	Dr	—	7-19-62	D	
6ad	A. Good	265	Dr	40	7-19-62	D	
7cc	A. Good	250	Dr	35	7-19-62	S	
9bb	Thompson	250	Dr	—	7-19-62	S	
11aa	I. Richardson	270	Dr 5	—	7-24-62	S	
12ac	BIA	232	Dr 4	52	—	S	Well log
15dd	Torrhelson	140	Dr	—	7-17-62	S	
16cc	A. Good	250	Dr	—	7-19-62	S	
16db	—	186	—	—	9-14-61	S	
17cc	School	100	Dr	—	7-19-62	PS	
17dc	W. Brill	50	Du	—	7-19-62	D	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	20
40-36- (cont.)								
19ac	H. Zickrick	50	--	8	9-14-61	D,S		
19cb	H. Zickrick	190	--	--	9-14-61	S		
20bb	Michael	150	Dr 5	--	7-19-62	D,S		
23aa	BIA	208	Dr 6	150	---	S	Well log	
26bc	C. Addler	140	Dr	--	7-19-62	S		
28cd	C. Addler	140	Dr-	--	7-19-62	D		
29bb	G. Adler	140	Dr	--	7-19-62	D	Chemical analysis	
40-37-								
10ac	W. Becher	150+	--	--	7-25-62	S		
16ca	W. Becher	150	Dr 4	--	7-25-62	S		
18bc	C. Y. Porch	150	Dr 4	25	7-25-62	S		
20cc	BIA	126	Dr 6	--	---	S	Well log	
24bb	A. Good	270	Dr-	--	7-19-62	N		
25da	G. Adler	180	--	--	7-19-62	S		
34ca	BIA	202	Dr 4	160	---	S	Well log	
40-38-								
3ad	J. Reamy	40	Dr 4	10	7-25-62	D,S		
14dd	C. Y. Porch	80	Dr 2½	22	7-25-62	D,S		
20cd	W. Porch	250	Dr 6	80	7-25-62	D,S		
25aa	W. Porch	80	Dr	22	7-25-62	D,S		
25dd	U. S. Post Office	65	Dr	--	7-25-62	D		
40-39-								
4ab	E. Guptill	300	Dr	--	8-16-62	D,S		
15bb	BIA	298	Dr 4	90	---	S	Well log	
6cc	Mays	320	Dr 4	100	8-16-62	D		
21cd	BIA	206	Dr 6	131	---	S	Well log	
25ba	H. Boomer	150	Dr	80	11-28-62	D,S	Chemical analysis	
34ac	BIA	148	Dr 5	--	---	S	Well log	
40-40-								
2bb	Mays	273	Dr 4	60	8-16-62	S		
3aa	Heuber	275	Dr 5	150	8-16-62	S		
5cc	Mays	420	Dr 4	120	8-16-62	S		
7db	BIA	262	Dr 4	190	---	--		
7dd	Heuber	308	Dr	150	8-16-62	S		
9ac	C. Underbaggage	60	Dr 4	30	8-3-62	D		
9ad	C. Underbaggage	87	Dr 4	40	8-3-62	D		
9bd	C. Underbaggage	150	Dr 4	40	8-3-62	D		
10da	J. Bull Bear	102	Dr 4	--	8-3-62	D,S		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
40-40- (cont.)								
14aa	Mays	40	Dr 4	30	8-16-62	S	Chemical analysis	
14ac	Heuber	60	—	—	8-16-62	D,S		
15bb	Mays	100	Dr 24	20	8-16-62	S	Well log	
15dd	Mays	320	Dr 4	90	8-16-62	S		
16ab	Heuber	100	Dr	40	8-16-62	S		
16ca	BIA	64	Dr 4	—	—	S		
17dd	Rystad	350	Dr 4	40	8-16-62	S	Chemical analysis	
23dd	Mays	300	Dr	140	8-16-62	S		
27cc	Mays	370	Dr	90	8-16-62	S		
34bb	BIA	160	Dr 6	—	—	—		
41-33-								
3bc	H. Stodlard	30	Dr 24	9	7-17-62	D,S	Chemical analysis	
17aa	K. Beny	25	—	—	7-17-62	S		
17bd	K. Beny	15	Dr 24	7	7-17-62	S		
20bc	K. Beny	175	Dr 6	—	7-17-62	N		
41-34-								
5cc	B. Young	80	Dr 6	—	7-18-62	D,S	Chemical analysis	
5dd	J. Little Thunder	80	Dr	—	7-18-62	D,S		
6db	BIA	203	Dr 4	—	—	S		
12ad1	P. Brunch	255	Dr 6	—	7-18-62	D		
12ad2	P. Brunch	85	Dr 24	—	7-18-62	S		
16db	Vanderanoy	95	Dr	—	7-18-62	D,S		
16dd	Vanderanoy	110	—	—	7-18-62	D,S		
18bc	W. Allen	100	Dr	10	7-18-62	D,S		
18dc	K. Ditrmer	120	Dr 2	30	7-18-62	D,S		
21aa	Vanderanoy	84	Dr	—	7-18-62	D,S		
33bb	K. Bauman	30	Dr 6	—	7-18-62	D,S		
41-35-								
6bc	Kulok	120	Dr 5	—	7-24-62	S		Chemical analysis
12dd	Allen	100	Dr	10	7-18-62	D,S		
13cc	Allen	85	—	10-15	7-18-62	D,S		
19bb	I. Stephenson	115	Dr	—	7-19-62	S		
19da	I. Stephenson	115	Dr 6	—	7-19-62	D,S		
20dc1	D. Sharpe	100	Dr 5	25	7-24-62	S		
20dc2	D. Sharpe	100	Dr 5	25	7-24-62	D		
41-36-								
4da	D. Sharpe	160	Dr 24	80	7-18-62	D		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
41-36- (cont.)							
6ab	J. Shurburne	160	—	—	7-24-62	S	
8bd	J. Shurburne	160	Dr 6	—	7-24-62	S	
9aa	—	200	—	80-90	7-18-62	S	
17cc	T. Wiedmann	130	Dr 4	—	7-24-62	D,S	
19cc	T. Wiedmann	150	—	—	7-24-62	N	
22aa	Katendaugh	240	Dr 5	—	7-19-62	S	
26cd	A. Kempke	100	Dr	40	7-19-62	D	
27ab	L. Thompson	150	Dr	20	7-19-62	S	
27bc	L. Thompson	250	Dr 9"-5"	60	7-19-62	S	
27da	L. Thompson	260	Dr	60	7-19-62	D	
29ca	T. Wiedmann	150	Dr 6	—	7-24-62	D,S	
30ad	T. Wiedmann	150	—	—	7-24-62	S	
32aa	A. Good	250	—	—	7-19-62	S	
33ac	A. Kempke	200	Dr 6	90	7-19-62	S	
34ab	A. Kempke	210	Dr	95	7-19-62	S	
35aa	A. Kempke	144	Dr	80	7-19-62	S	
35cc	A. Kempke	140	Dr	90	7-19-62	D	
							Chemical analysis
41-37-							
2bb	BIA	351	Dr 6	20	—	S	Well log
4ddc	Test hole	22	Dr 4	9.00	11- -62	T	Test hole log
6dc	M. Williams	74	Dr 12	—	7-24-62	D	
9da	Riggins	180	Dr	75	7-25-62	D,S	
16bb	K. Weaver	234	Dr 4	75	7-25-62	D,S	
16dd1	K. Weaver	180	Dr	75	7-25-62	D,S	
16dd2	C. Y. Porch	100	—	—	7-25-62	S	
17cc	K. Weaver	350	—	Dry	7-25-62	N	
18ba	K. Weaver	350	—	75	7-25-62	S	
18da	C. Porch	100	Dr 24	75	7-25-62	D,S	
20bb	K. Weaver	55	Dr 18	22	7-25-62	S	
20db	K. Weaver	140	—	—	7-25-62	S	
27ca	J. Chipps	40	Dr 6	—	7-24-62	D	
28bd	BIA	401	Dr 6	276	—	S	Well log
29ba	C. Y. Porch	450	Dr 3	Dry	7-25-62	N	
29dd	C. Y. Porch	180	Dr 6	80	7-25-62	S	
32bb	C. Y. Porch	60	Dr 24	20	7-25-62	S	
41-38-							
4dc	F. Livermont	75	Dr	—	7-25-62	D	Test hole log
12ddc	Test hole	22	Dr 4	5.91	11- -62	T	
13cb	P. Weaver	20	Dr	—	7-25-62	D,S	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
41-39-10cc	BIA	244	Dr 4	120	—	S	Well log
20bb1	C. Hibbert	196	—	—	8-16-62	D,S	
20bb2	C. Hibbert	200	Dr 4	—	8-16-62	S	
21cc	Mays	100	Dr 4	30	8-16-62	S	
22aa	A. Wanless	167	—	—	8-16-62	D,S	
24cc	J. Mays	100	Dr 4	—	8-16-62	N	
25ab	J. Mays	100	Dr 6	—	11-28-62	S	Chemical analysis
27cc	J. Mays	320	Dr 4	80	8-16-62	S	
32bb	J. Mays	290	Dr 4	190	8-16-62	S	
33aa	J. Mays	310	Dr 4	140	8-16-62	S	
34dd	J. Mays	320	Dr 4	80	8-16-62	S	
35db	J. Mays	360	Dr 4	100	8-16-62	S	
41-40-24dd	Mays	140	Dr	45	8-16-62	S	Chemical analysis
25bd	BIA	145	Dr 4	—	—	S	Well log
42-33-33ad	—	25	Dr	12	7-17-62	—	
42-34-36dd	P. Brunch	510	Dr	80	7-18-62	S	
42-35-4ca	Rock Ranch	20	Dr	—	11-27-62	S	Chemical analysis
11ab	Rock Ranch	155	Dr 30	40	7-10-62	D	
29dd	BIA	344	Dr 6	96	—	S	Well log
30cc	J. Quiver	310	Dr 3	10-15	7-18-62	D	
42-36-23dd1	L. Riggins	134	Dr 6	—	7-18-62	N	
23dd2	L. Riggins	108	Dr 6	—	7-18-62	D	
27db	C. Munger	140	—	70	7-18-62	D,S	
30cb	P. Livermont	90	Dr 4	40	7-24-62	D,S	
31ac	J. Livermont	90	Dr	—	7-24-62	D,S	
31cb	Wanblee Day School	245	Dr 8	—	5-16-62	PS	Chemical analysis
31dd	J. Shurburne	170	Dr	60	7-24-62	D,S	
32ca	J. Shurburne	150	Dr	60	7-24-62	S	
33ab	Kulok	120	Dr 5	40	7-24-62	D,S	
33cd	Kulok	120	Dr 5	—	7-24-62	S	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
42-37-12aa	R. Burkholder	200	Dr 4	—	7-25-62	D,S	Well log
26bb	BIA	210	—	—	—	S	
31cd	C. Vogelsong	54	Dr 12	—	7-24-62	D,S	
32ad	L. Hicks	50	Dr 4	—	7-24-62	D,S	
34ad1	D. Barber	100+	Dr 5	—	7-24-62	D	
34ad2	D. Barber	98	Dr 5	20	7-24-62	S	
42-38-31cb	E. Sicler	246	Dr	—	7-25-62	D	D,S
32cd	V. Young	100	Dr 24	—	7-25-62	D,S	
42-39-15ac2	C. Twiss	110	Dr 4	—	11-28-62	D,S	Chemical analysis
36cc	B. Evans	160	Dr	—	7-25-62	S	
36da	B. Evans	80	Dr	—	7-25-62	D	
42-40-19dd	BIA	176	Dr 4	90	—	S	
43-34-5da	L. Johnson	10	Du	8	7-23-62	D	D,S
12bb1	D. Roohs	30	Dr	—	7-17-62	D,S	
12bb2	D. Roohs	50	Dr	—	7-17-62	S	
43-35-17ac	G. Olson	35	Du 30	34	7-10-62	D	D,S
19ab	F. Munger	45	Dr 24	39	7-10-62	D	
21ab	W. Sears	55	—	—	7-10-62	D	
27dc	Pettijohn Ranch	40	Du 36	15	7-10-62	S	
34ad	Pettijohn Ranch	15	Du 7	12	7-10-62	D,S	
43-36-1aa1	K. Fisher	44	Dr 30	35	7-10-62	D	Test hole log
1aa2	K. Fisher	50	Dr 30	34	7-10-62	S	
1aa3	K. Fisher	50	Dr 30	38	7-10-62	D,S	
1daa	Test hole	29	Dr 4	—	—	T	
1dc	K. Fisher	14	Dr 30	10	7-10-62	S	
2cdd	Test hole	52	Dr 4	—	—	T	
2dc	C. Seidler	70	Dr 5	60	7-10-62	D,S	
3cc	C. Uhlir	23	Du 36	13	7-10-62	D	
5dc	C. Hood	40	Dr 48	38	7-16-62	D,S	
12ad	White River School	—	Dr 4	—	11-27-62	PS	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
43-36- (cont.)							
12ba	K. Fisher	76	Dr	75	7-10-62	S	
24bd	F. Munger	30	Dr 30	20	7-10-62	S	
43-38-							
19cc	W. Sharpe	60	—	—	8-16-62	D,S	
20ca	Hershel	300	Dr 4	19	8-16-62	N	
20cd	Hershel	30	—	—	8-16-62	D,S	Chemical analysis
23cc	BIA	167	Dr 4, 6	—	—	S	Well log
27bbc	Test hole	22	Dr 4	—	—	T	Test hole log
43-39-							
22cd	V. Young	40	Dr 24	—	7-25-62	S	
23abd	Test hole	27	Dr 4	9.32	11- -62	T	Test hole log
23baa	Test hole	22	Dr 4	8.74	11- -62	T	Test hole log
24cdd	Test hole	22	Dr 4	—	—	T	Test hole log
44-33-							
20da	W. Jensen	60	Dr 24	42	7-17-62	N	
21da	N. Brownworth	24	—	—	7-17-62	S	
33bd	W. Osborn	35	—	—	7-17-62	D,S	Chemical analysis
44-34-							
23ab	F. Ireland	20	Du	—	7-17-62	N	
23bb	F. Ireland	29	Du 48	14	7-17-62	S	
23cd	F. Ireland	23	Du 48	18	7-17-62	D,S	
36ba	Patterson	65	Dr	—	7-17-62	S	
44-35-							
26bc	Ziegeldorf	20	Dr	—	7-23-62	D,S	
31aa	Test hole	17	Dr 4	—	—	T	Test hole log
31bd	Whidby Brothers	16	Du 48	11	7-10-62	D,S	
31daa	Test hole	22	Dr 4	—	—	T	Test hole log
44-36-							
35ac	K. Fisher	24	Du	14	7-10-62	S	
36ca	Whidby Brothers	26	Dr 36	18	7-10-62	S	

Table 2.—Records of Well Depths in Bennett County

The locations and depths of selected wells, north of U. S. Highway 18, in Bennett County, are listed in the following table. The data were obtained from the files of the South Dakota Geological Survey and the U. S. Bureau of Indian Affairs. The depths of these wells are an indication of the general depths to which wells must be drilled in the area.

Table 2.—Records of well depths in Bennett County

Location	Depth	Location	Depth	Location	Depth
37-36-		38-36-		39-35-	
1bb	160	14b	48	18cc	75
2db	138	17aa	233	19bc	100
6bd	255	19d	243	31cc	155
37-37-		21a	200+	32ac	165
3d	240	21b	180+	33c	250
4aa	120	23b	65	34cc	154
18ad	150	23d	20		
31ac	300	27ba	90	39-36-	
37-38-		27cc	200	5dd	a248
1acc	224	28d	170	6ab	135
37-39-		29cc	250	6ab	305
11bb	180	30cb	160	7bb	160
37-40-		31bc	350	15c	325
2bc	200+	31d	180	15	150
16cca	200	34d	120	17d	200
38-33-		38-37-		22ca	159
7aa	100	7b	296	23bb	a155
19b	160	9b	190	32d	148
29bc	410	10d	185	33c	110
30bb	a326	32a	275	39-37-	
32bb	350	38-39-		8d	205
38-34-		7d	214	17bb	170
6b	22	9bb	70	28dc	144
7ca	a170	14c	180	32d	368
10aa	a232	15dc	220	39-38-	
20dab	50	21da	135-140	1c	420
22bb	190	23bc	135	1d	330
22db	260	23dd	190	3c	355
24a	400	38-40-		8dd	a222
25bb	249	12ac	a290	15bb	a145
30dab	60	14ad	361	18bb	300
31d	65	22aa	281	18dd	a220
32b	105	39-33-		24a	350
38-35-		17ab	100	27a	280
6b	100-125	18cb	125	33aa	300
8b	140	19cb	130	33c	235
11a	100	39-34-		39-39-	
11db	107	5cb	90	2d	292
14b	a235	10aa	180	6cc	a306
20bd	52	11ac	a98	15bd	a210
25cb	100	13bd	150	16d	300
30a	324	20ab	60	17c	350
38-36-		20ca	100	18cc	a270
1dd	115	27ba	200	19d	400
3aa	114	32ca	27-150	20c	280
6b	185	39-35-		26aa	a216
9bb	100	1cd	150	39-40-	
13ad	90	9d	304	1c	420
		14c	250	2a	357
		17c	102	12a	205
		18bc	95-120		

a. See drillers' log.

Table 3.—Records of Springs

Springs listed in the following table are generally those which are used or have been developed for use. More than 200 springs or seeps were observed in the Reservation and their locations are shown on a map in the interpretive report. Data are from field inventory and from Soil and Range Survey Summaries for Shannon and Washabaugh Counties; which were provided by the Land Operations Section of the U. S. Bureau of Indian Affairs, Aberdeen, South Dakota.

Location	Source of data	Remarks
SHANNON COUNTY		
35-42-		
3bc	BIA	Undeveloped, flow 3 gpm.
8bd	M. Nelson	Undeveloped springs in area.
8ca	BIA	2 springs; one undeveloped, other 8-10 gpm.
36-46-		
23ca	BIA	Developed for tanks; dependable water supply
27cc	BIA	Undeveloped.
27dc	BIA	Developed for domestic use.
37-42-		
3aa	BIA	Developed for domestic use and stock.
37-46-		
10ca	BIA	Developed for stock.
38-41-		
4ab	BIA	Developed for domestic use and stock.
38-47-		
6da	BIA	Developed for pipe; small flow.
40-43-		
7dd	Twiss	Developed for domestic use and stock.
40-44-		
30dc	BIA	Developed for tanks.
40-48-		
10dc	BIA	2 springs piped to tanks.
41-42-		
36ba	W. Pourier	Many undeveloped in area.
41-44-		
31ba	W. Pourier	Developed; piped to tanks; used.
31bd	W. Pourier	Undeveloped; used.
41-45-		
7aa	W. Pourier	Undeveloped; others in area.
22cc	Twiss	Developed for domestic and stock.
23bc	BIA	Undeveloped; excellent.

Location	Source of data	Remarks
41-45- (cont.)		
23cd	BIA	Undeveloped; excellent.
27bb	BIA	Undeveloped; used for stock.
41-46-		
12ad	BIA	Used heavily.
24dd	BIA	Ponded with spillway.
25bd	W. Dayman	Developed for domestic and stock; chemical analysis.
41-47-		
13cb	W. Dayman	Undeveloped; good flow.
18ba	W. Dayman	Developed; poor condition.
42-41-		
12bb	W. Dayman	Used with tank.
26aa	W. Dayman	Used with tank.
42-42-		
2bb	J. Pourier	Developed; excellent; many in area.
2ba	L. Pourier	Seven springs; excellent; chemical analysis.
18ba	BIA	Undeveloped; adequate flow.
42-43-		
10db	BIA	Used with tank; dependable.
15dc	BIA	Undeveloped.
22dd	BIA	Undeveloped.
26aa	BIA	Unused with tank; adequate supply.
29bd	BIA	Collects in small pond.
29cd	BIA	Unused; adequate supply.
30ab	Vaughn	Developed for domestic and stock.
30ba	BIA	Undeveloped.
31bc	BIA	Undeveloped.
33bb	Temple	Developed for domestic and stock.
42-44-		
12da	BIA	Developed with pipes; adequate supply.
42-47-		
11cd	BIA	Undeveloped; used as public supply.
42-48-		
25	BIA	Undeveloped.
43-41-		
23ab	BIA	Undeveloped; adequate supply; many in area.
23bc	BIA	Undeveloped; adequate supply.
27b	BIA	Undeveloped; excellent development possibilities
28db	BIA	Undeveloped; excellent development possibilities.
32ab	BIA	Undeveloped; excellent development possibilities.
33a	BIA	Undeveloped; minor development possibilities.
43-43-		
32bd	BIA	Developed with dam; adequate supply.

Location	Source of data	Remarks
43-44- 35d	Harney or Ash Grove	Used with tank; adequate supply; chemical analysis.
WASHABAUGH COUNTY		
40-40- 17cd 19ad 30ac	BIA K. Beny BIA	Adequate supply. Undeveloped. Adequate supply.
41-34- 4ba 14bc	C. Count BIA	Undeveloped. Undeveloped; fair supply.
41-37- 8aa 22ba 34aa	BIA BIA BIA	Undeveloped; public supply. Undeveloped; public supply. Undeveloped; public supply.
41-38- 9ba 10cd 11aa 13cb 15da 21bd 22bc	BIA BIA BIA P. Weaver BIA BIA BIA	Undeveloped. Developed. Developed. Developed for domestic and stock. Undeveloped. Developed. Developed.
41-39- 2da 5db	BIA BIA	Undeveloped; inadequate supply. Undeveloped, inadequate supply.
42-34- 21ab	BIA	Developed with tank.
42-35- 18db 19ca	BIA BIA	Undeveloped; small stream. Developed with pipes.
42-36- 30ac	J. Livermont	Developed for domestic and stock.
42-37- 19dc 21ab 21da 24ba 32ba 32da 33db 36ad	BIA F. Cutt E. Red Elk BIA BIA BIA BIA BIA	Developed; small supply. Developed for domestic use. Developed for domestic use. Developed with pipes. Undeveloped. Undeveloped. Developed with pipes. Undeveloped.

Location	Source of Data	Remarks
42-38-		
4dd	BIA	Many undeveloped springs in area.
5bc	BIA	Undeveloped, adequate supply.
7bb	BIA	Two springs; undeveloped.
14bd	BIA	Undeveloped; adequate supply.
16ca	BIA	Adequate supply.
17dd	BIA	Many undeveloped springs in area.
20ab	BIA	Many undeveloped springs in area.
22bc	BIA	Developed with pipes
30cb	BIA	Developed with dam.
31ab	BIA	Undeveloped.
32cb	BIA	Undeveloped.
35da	BIA	Undeveloped.
42-39-		
1ac	BIA	Developed; piped to tank.
5ca	B. Brafford	Developed for domestic and stock.
10ab	B. Brafford	Undeveloped; seeps.
15ac	C. Twiss	Developed for domestic and stock.
15dd	BIA	Undeveloped.
42-40-		
1dc	BIA	Undeveloped; heavily used; adequate supply.
11bd	BIA	Developed; heavily used.
16bd	BIA	Undeveloped; heavily used.
18bb	W. Lang	Developed for domestic and stock; chemical analysis.
20bb	BIA	Many undeveloped springs in area.
27bd	BIA	Undeveloped; seeps; many in area.
43-34-		
9ac	Pettyjohn	Developed for domestic and stock; chemical analysis.
18ab	Jakeaway	Developed for domestic use.
43-35-		
5db	C. Seidler	Developed; unused; large supply; chemical analysis.
43-36-		
3cc	C. Uhlir	Many undeveloped springs in area.
24bd	F. Munger	Developed for stock; chemical analysis.
43-38-		
19cc	W. Sharpe	Many undeveloped springs in area.
44-33-		
21 da	N. Brownworth	Many undeveloped springs in area.
44-34-		
21 da	L. Johnston	Developed for domestic and stock; many in area.

Table 4.—Chemical analyses of Ground Water

Water samples from 43 wells and 7 springs were collected during the study and analyzed by the U. S. Geological Survey. Samples were collected to give representative areal coverage of the more commonly used sources of ground water. The analyses are listed, by county, in table 4. Analysis of water samples collected by the South Dakota Geological Survey are contained in reports listed in the selected references. The concentrations of the dissolved constituents in samples obtained were determined according to analytical methods described by Rainwater and Thatcher (1960) and are generally given in milligrams per liter. Chemical analyses, and suspended sediment and temperature data for surface waters in the region are contained in U. S. Geological Survey publications on quality of surface water listed in the selected references. Records are available on the White River at a station near Kadoka from 1946 to 1957 and at a station near Ogalala from 1949 to 1954.

Table 4. --Chemical analyses of water
[Analytical results in milligrams per liter except as indicated.]

Well or spring number	Date of collection	Depth of well (feet)	Temperature (°F)	Silica (SiO ₂)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180° C)	Calcium, magnesium	Non-carbonate	Specific conductance (micro-mhos per cm at 25° C)	pH	Percent sodium	Sodium adsorption ratio		
BENNETT COUNTY																										
37-37-17cb2	5-15-62	500	62	69	0.06	0.00	51	12	17	10	233	0	25	4.5	0.5	2.0	0.06	304	176	0	428	7.8	16	0.6		
38-35-33cc	11-30-62	96	---	77	.02	.00	28	8.3	52	14	230	0	28	8.5	.1	1.9	.15	332	104	0	446	7.6	48	2.2		
38-39-10bc	5-16-62	120	56	66	.06	.00	51	6.8	12	6.1	211	0	8.8	2.3	.4	1.9	.03	263	155	0	357	7.7	14	.4		
SHANNON COUNTY																										
35-41-4bc	11-30-62	120	55	61	.12	.00	124	58	17	12	205	0	201	109	.3	76	.06	934	550	382	1,140	7.3	6	.3		
35-45-12cb	5-15-62	350	59	79	.04	.00	124	15	66	20	345	0	221	6.3	.2	.1	.17	731	371	88	958	7.7	27	1.5		
36-41-29a	11-30-62	120	52	71	.07	.00	30	16	8.7	9.2	176	0	12	4.8	.5	8.3	.06	258	142	0	332	7.3	11	.3		
36-43-32ab	11-28-62	92	53	61	.02	.00	35	6.4	5.1	5.9	138	0	8.8	2.4	.3	4.7	.04	207	114	1	256	7.2	8	.2		
36-44-23bc	11-29-62	365	---	68	.11	.00	57	10	17	9.6	233	0	30	3.6	.2	3.8	.05	322	185	0	437	7.2	16	.5		
36-47-23b	11-29-62	71	54	61	.15	.01	30	3.4	160	13	349	0	135	8.2	.6	9.0	.30	601	89	0	854	7.4	77	.7		
36-47-26ab	11-29-62	80	55	42	1.7	1.4	330	72	278	26	350	0	1,340	18	.7	4	.42	2,360	1,120	833	2,680	7.1	34	3.6		
36-48-12aa	11-29-62	60	---	58	.11	.00	89	52	484	71	444	0	1,070	36	.2	4.0	.37	2,140	434	70	2,390	7.8	67	10		
37-41-7bc	11-28-62	250	---	73	.73	.00	44	8.0	21	9.0	197	0	26	5.8	.4	1.6	.07	287	143	0	377	7.3	23	.8		
37-46-9ba	5-15-62	65	56	56	.05	.00	23	3.0	148	9.1	346	0	99	7.5	1.3	.7	.19	518	70	0	758	7.8	80	.8		
37-47-5bb	11-29-62	21	54	34	.22	.00	194	81	546	46	332	0	1,640	18	.4	3.7	.74	2,840	817	545	3,460	7.2	58	8.3		
38-44-25c	5-16-62	190	52	58	.08	.00	63	6.8	62	12	302	0	74	4.7	.3	1.6	.09	445	244	0	620	8.1	40	2.0		
38-47-13dc	11-29-62	50	---	33	3.8	1.0	74	14	135	15	325	0	259	3.1	.6	1.0	.28	699	244	0	1,010	7.2	53	3.8		
39-43-11bd1	11-28-62	60	51	52	.02	.00	68	8.6	100	11	449	0	41	8.3	.4	4.1	.21	521	205	0	782	7.2	50	3.0		
39-46-29cd	11-29-62	86	---	31	4.9	.75	107	35	795	42	564	0	1,580	19	.5	.3	.74	2,910	410	0	3,780	7.5	79	1.7		
40-41-17aa	11-28-62	90	50	54	.02	.00	46	6.1	87	13	362	0	33	5.9	.7	1.0	.10	432	140	0	636	7.5	55	3.2		
40-41-21ab	5-15-62	280	64	58	.08	.00	51	2.2	80	15	349	0	32	5.6	.3	1.5	.09	419	136	0	611	7.9	53	3.0		
40-44-8dd	11-29-62	50	---	45	.48	.00	48	7.1	220	16	520	14	151	20	.4	9.8	.32	803	149	0	1,170	8.4	74	7.8		
40-44-12da	11-29-62	30	---	55	.28	.00	7.6	1.0	245	7.7	454	0	91	31	.6	5.7	.37	743	23	0	1,080	7.9	94	22		
41-41-33bb	11-29-62	300	50	55	.09	.01	2.6	1.6	187	6.1	359	13	73	17	1.0	.3	.52	543	13	0	795	8.5	95	23		
41-44-25db	11-29-62	150	---	35	.09	.00	3.2	.2	498	24	545	40	504	31	.6	9.9	.60	1,440	9	0	2,120	8.8	96	72		
41-45-18dd	11-29-62	120	---	59	.01	.00	20	9.2	63	8.8	242	0	19	6.3	.3	8.2	.18	324	88	0	444	7.6	58	.3		
41-46-25bd	11-29-62	Spring	---	58	.01	.00	26	14	43	11	230	0	20	13	.3	6.9	.15	320	121	0	436	7.5	41	1.7		
42-41-35dd	11-29-62	90	51	61	.03	.01	1.6	1.0	126	5.2	272	16	16	9.2	.5	3.6	.24	385	8	0	528	8.6	95	19		
42-42-2bb	11-30-62	Spring	---	47	.04	.01	53	6.3	39	11	283	0	15	1.5	.4	5.2	.16	331	158	0	473	7.8	33	1.4		
42-47-10ba	11-29-62	27	---	21	.17	.00	60	9.8	52	11	239	0	84	5.0	.5	2.8	.19	389	190	0	604	7.6	36	1.6		
43-44-35d	11-30-62	Spring	---	33	.07	.00	51	3.6	55	6.0	286	0	27	1.4	.3	.3	.05	322	142	0	487	7.5	44	2.0		
43-47-27dd	11-29-62	25	---	16	3.7	.02	206	63	325	26	247	0	1,080	147	.4	.7	.29	2,030	774	571	2,570	7.3	47	5.1		
WASHAUGH COUNTY																										
40-33-8bd2	11-27-62	110	---	68	.02	.01	14	.2	80	10	252	0	12	2.8	.3	1.9	.11	317	36	0	420	8.0	78	5.8		
40-35-33ba	11-27-62	150	---	62	.06	.02	57	2.4	77	12	346	0	32	8.9	.1	6.2	.12	438	152	0	617	8.2	50	2.7		
40-36-29bb	11-27-62	140	---	71	.01	.01	23	2.3	59	9.2	219	0	22	2.0	.3	2.7	.09	294	67	0	389	7.9	62	3.1		
40-39-25ba	11-28-62	150	---	61	.02	.01	6.3	.1	93	10	244	0	21	3.7	.4	1.9	.14	315	16	0	433	7.8	87	10		
40-40-15bb	11-28-62	100	---	59	.68	.05	17	.6	68	16	235	0	15	2.8	.1	2.5	.08	296	45	0	399	7.6	69	4.4		
41-34-18dc	11-27-62	120	---	47	.06	.01	7.5	.1	158	5.9	378	0	26	20	.4	2.0	.14	481	19	0	707	8.0	93	16		
41-36-27da	11-27-62	260	---	65	.05	.04	21	.4	90	11	284	0	31	.9	.9	1.3	.07	366	54	0	501	7.8	74	5.3		
41-39-25ab	11-28-62	100	---	57	.13	.00	25	5.0	86	8.7	304	0	20	4.9	.3	4.9	.15	359	83	0	521	7.6	67	4.1		
41-40-24dd	11-28-62	140	---	65	1.4	.02	13	.1	90	11	248	0	29	4.3	.4	1.5	.16	334	33	0	457	7.6	81	6.8		
42-35-4ca	11-27-62	20	---	6.7	3.6	.07	11	.1	316	8.0	819	0	44	8.0	2.0	.6	.49	817	28	0	1,290	8.2	95	26		
42-36-31cb	5-16-62	245	54	54	.07	.00	33	.4	93	8.6	338	0	11	3.4	.2	2.6	.07	278	84	0	544	7.9	68	4.4		
42-39-15ac2	11-28-62	110	---	55	1.4	.01	45	3.3	31	8.8	219	0	12	2.8	.3	1.3	.06	376	126	0	394	7.6	33	1.2		
42-40-18bb	11-28-62	Spring	---	48	.02	.00	47	4.3	59	12	294	0	24	7.5	.3	4.3	.11	355	135	0	524	7.5	46	2.2		
43-34-9ac	11-27-62	Spring	---	48	.02	.01	63	5.6	42	7.7	295	12	16	3.8	.3	3.8	.06	342	180	0	502	8.5	32	1.4		
43-35-5db	11-27-62	Spring	---	38	.46	.02	34	2.7	98	7.1	321	0	34	11	.4	7.8	.32	557	101	0	596	8.0	66	4.2		
43-36-2dc	11-27-62	70	---	40	.08	.01	38	4.4	89	8.5	271	0	58	7.5	.2	2.3	.27	415	113	0	607	7.6	61	3.6		
43-36-12ad	11-27-62	---	---	26	.41	.10	3.4	.4	132	3.3	217	27	58	12	.5	2.1	.52	397	10	0	591	9.1	95	18		
43-36-24bd	11-27-62	Spring	---	33	.98	.44	121	11	61	8.9	518	0	40	12	.6	3.4	.13	555	346	0	861	7.3	27	1.4		
43-38-20cd	11-28-62	30	---	41	.03	.00	20	1.0	97	5.3	282	0	26	6.6	.4	4.7	.15	338	54	0	504	7.8	78	5.7		
44-33-33bd	11-26-62	35	---	45	.01	.01	47	6.9	26	8.0	220	0	14	6.2	.2	1.2	.05	272	146	0	407	7.4	27	.9		

Table 5.--Summary of Streamflow Records

Streamflow data in U. S. Geological Survey Water-Supply Papers and unpublished data in the files of the U. S. Geological Survey were used to compile the surface-water information in tables 5a, 5b, and 5c.

Table 5a.--Annual runoff of selected streams in Pine Ridge area, in acre-feet.

Drainage area (sq. mi.)	2,200	5,000	310	58	120	590	4,120	10
Water Year								
1905							334,000	
1906							179,000	
1913							155,000	
1914							88,000	
1915							361,000	
1916							188,000	
1917							182,000	
1918							133,000	
1929							177,000	
1930							158,000	
1931							63,700	
1939			11,430	10,030	7,260			1,870
1940			7,880	13,070	2,240		69,120	1,790
1941							86,120	
1942							416,500	
1943		159,600						
1944	60,930	416,000						
1945	50,530	157,400						
1946	47,590	203,600						
1947	103,000	308,200						
1948	42,510	294,400						
1949	87,170	229,500						
1950	27,980	158,500						
1951	33,510	197,000						
1952	36,470	232,200						
1953	31,940	278,500						
1954	18,690	106,200						
1955	41,600	207,900						
1956	24,020	121,400						
1957	85,030	317,100						
1958	30,840	181,000						
1959	18,990	124,000						
1960	28,670	139,900				44,020		
1961	11,940	65,200				30,870		
1962	78,270	352,900				46,580		
1963	36,850	156,200	13,880	14,560	10,540	38,910		
1964	11,770	193,200	11,740	14,630	11,560	32,940		
Average	43,150	209,200				38,660	185,300	

Table 5b --Maximum, average, and minimum discharges of selected streams in Pine Ridge area, in cubic feet per second (cfs).

Gaging station	Drainage area (sq. mi.)	Period of record (years)	Average discharge for period of record (cfs)	Extremes of discharge (cfs)		Average discharge per square mile of drainage area (cfs/sq. mi.)
				Maximum	Minimum	
White River near Oglala, South Dakota	2,200	21	59.6	5,200	0	0.027
White River near Interior, South Dakota	4,120	14	256	17,100	0	.062
White River near Kadoka, South Dakota	5,000	22	289	21,700	0	.058
South Fork White River near Vetal, South Dakota	590	5	53.0	1,120	10	.091

Table 5c.--Low-flow partial record of flow in
Bear in the Lodge Creek.

Gaged near Wanblee, South Dakota, SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 12, T. 41 N., R. 38 W., at culvert on highway between Wanblee and Headlee Ranch, 7 miles southwest of Wanblee. Drainage area 365 square miles.

Water Year	Date of measurement	Discharge (cfs)	Water Year	Date of measurement	Discharge (cfs)
1951	1-8-51	6.04	1959	8-25-59	0
1954	10-12-53	5.13	1960	10-26-59	2.92
1955	8-31-55	13.6	1961	10-10-60	.08
	9-28-55	4.03		8-8-61	0
1956	10-17-55	3.36		8-28-61	.04
	5-16-56	21.5	9-21-61	.44	
	6-12-56	6.77	1962	10-10-61	0.37
	6-27-56	3.38		10-31-61	5.03
	7-10-56	2.74	1963	8-5-63	1.43
	7-24-56	1.46		8-19-63	.73
	8-8-56	63.2		9-17-63	.66
	8-21-56	15.2		1964	10-1-63
9-11-56	7.51	10-29-63	4.49		
1957	7-17-57	24.2	11-12-63		4.43
	8-6-57	4.24	6-2-64		10.2
	8-27-57	7.29	7-1-64		8.71
	9-17-57	3.90	8-11-64	.63	
1958	7-18-58	7.90	8-24-64	2.02	
	8-6-58	7.52	9-9-64	.85	
	8-27-58	2.59	9-22-64	1.15	
	9-16-58	2.44			

Table 6.--Logs of Test Holes

Logs of test holes were prepared from samples collected and examined at the drilling sites and are listed in the following table. The U. S. Geological Survey (USGS) drilled 71 test holes in 1961 and 1962 with a power auger. Most of the test holes were drilled in the alluvium along the White River and its major tributaries to determine the availability of shallow ground water for domestic supplies. Logs of 11 test holes drilled in 1962 with a rotary-drilling machine by the U. S. Bureau of Reclamation (USBR) are also included. These test holes were drilled in alluvial soils as part of an irrigation feasibility study to classify soils and to determine soil drainage. The interpretive report contains a test hole location map. The depth listed for each material zone in the logs is the depth to the bottom of that zone. The depth to water was not measured in some of the test holes drilled by USBR.

SHANNON COUNTY

Test hole 36-45-15dbb. Depth to water about 10 feet (estimated September 21, 1961). Drilled on 1st terrace of White Clay Creek by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	1	1
Sand, very fine, light-brown	4	5
Sand, very fine to fine, light-brown	5	10
Sand, very fine to fine; gravel, fine to coarse, intermixed	13	23
Clay, light-brown, sandy	10	33
Clay, light-gray, may have gravel (very hard drilling)	1	34

Test hole 36-47-23ddc. Altitude 3,000 feet. Depth to water 29.0 feet (measured September 20, 1962). Drilled on 2nd terrace west of river by USGS. Ranchers report wells 80 feet deep with highly mineralized water at this terrace.

Material	Thickness (feet)	Depth (feet)
Silt, buff to pink	10	10
Clay, olive-gray	11	21
Clay, olive-gray; gravel, coarse, intermixed	17	38
Rock or hard bedrock at 38 feet		

Test hole 36-47-24bad. Altitude 2,990 feet. Depth to water 27.5 feet (measured September 20, 1962). Drilled 2nd or 3rd terrace on east side of river by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, olive-gray	8	8
Clay, light-gray	18	26
Clay, light-gray, sandy	20	46
Clay, dark-brown (bedrock?)	9	55

Shannon County -- continued

Test hole 37-43-25dcc. Drilled by USGS. Drilled 2nd terrace, dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	6	6
Silt, buff	6	12
Gravel, fine to coarse, silty, dry	5	17
Sand, very fine, silty, light-gray, (bedrock, very hard drilling)	2½	19½

Test hole 37-43-36bdd. Depth to water 8.13 feet (measured November 5, 1962). Drilled 50 yards east of river by USGS. Moist at 7 feet.

Material	Thickness (feet)	Depth (feet)
Silt, dark-brown, sandy	5	5
Sand, very fine, dark-brown, silty	10	15
Sand, very fine, light-gray, silty (bedrock, very hard drilling)	½	15½

Test hole 37-45-30dcd. Depth to water about 10 feet (estimated September 21, 1962). Drilled 150 yards from White Clay Creek on 1st terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, dark-gray, sandy	3	3
Sand, very fine to fine, clean	14	17
Gravel, coarse	1	18
Sand, very fine to fine	3	21
Sand, very fine to fine; gravel, fine, clayey	10	31
Clay, buff to pink, very sandy (bedrock?) ...	9	40
Clay, light-gray to pink, very sandy	7	47

Test hole 37-46-15bba. Depth to water about 7 feet (estimated September 18, 1962). Drilled 50 yards west of White Clay Creek by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, light-brown, sandy	4	4
Sand, light-brown, fine, clayey	6	10
Sand, medium to coarse	13	23
Gravel, fine to coarse	3	26
Sand, fine	5	31
Clay, light-brown, sandy (bedrock?)	9	40
Clay or shale, buff to light-brown	2	42

Test hole 37-46-18aaa. Altitude 2,910 feet. Depth to water 13.5 feet (measured September 18, 1962). Drilled in ditch 100 yards east of White River by USGS.

Shannon County -- continued.

Test hole 37-46-18aaa -- continued.

Material	Thickness (feet)	Depth (feet)
Clay, light-brown, sandy	8	8
Sand, very fine, light-brown, clayey	8	16
Clay, light-brown; gravel, fine to coarse	6	22
Sand, light-brown, coarse; gravel, fine to coarse, clayey	8	30
Shale, dark-gray (bedrock)	5	35

Test hole 37-46-18bab. Altitude 2,910 feet. Depth to water 12.4 feet (measured September 18, 1962). Drilled in ditch 200 yards west of White River by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, light-brown, sandy	7	7
Sand, light-brown, clayey	8	15
Gravel, fine to coarse, clayey	2	17
Sand, light-brown, fine; gravel, fine to coarse, clayey	3	20
Clay, light-brown, sandy; gravel, fine	15	35
Shale, dark-gray (bedrock)	17	52

Test hole 37-46-31aaa. Altitude 2,935 feet. Depth to water 12.5 and 13.30 feet (measured September 14, 1962 and November 7, 1962). Drilled on lower terrace 100 yards from White River by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown, sandy	3	3
Sand, brown, very fine, silty	4	7
Sand, light-brown, fine	17	24
Gravel, fine to coarse; sand, fine, clayey	6	30
Clay, brown; gravel, fine to coarse	6	36
Shale, dark-gray (bedrock)	6	42

Test hole 37-46-31abb. Altitude 2,935 feet. Depth to water 10.8 feet (measured September 14, 1962). Drilled 0.3 mile east of test hole 37-46-31bbb on lower terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-gray	1	1
Clay, brown, sandy	9	10
Sand, very fine, gray; moist at 10 feet	13	23
Gravel, medium to coarse	1	24
Clay, light-brown (bedrock)	6	30
Shale, dark-gray	2	32

Shannon County -- continued.

Test hole 37-46-31bbb. Drilled on 2nd terrace; river is "v" cut stream by USGS. Dry hole.

Material	Thickness (feet)	Depth (feet)
Clay, light-brown to olive, silty (bedrock?)	10	10
Clay, light-brown to gray, mottled, sandy ...	27	37

Test hole 37-47-1ddad. Depth to water 18 feet (measured October 1, 1962). Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Silt, clayey	5	5
Sand, fine, silty	4	9
Sand, very fine	8	17
Gravel, silty	5	22
Sand, coarse, and gravel	2	24
Clay, shaley	1	25
Silt, clayey	4	29
Gravel, clayey	2	31
Shale, bluish-gray (bedrock)	2	33

Test hole 38-42-29bbc. Depth to water 10.8 feet (measured November 6, 1962). Drilled 50 yards south of river by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, brown, silty	12	12
Sand, fine to medium, silty	3	15
Sand, very fine, dark-brown, gravel, fine, intermixed	15	30
Sand, very fine, dark-brown, silty (bedrock)	7	37

Test hole 38-42-29bca. Depth to water 17.6 feet (measured November 5, 1962). Drilled on 3rd terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, buff, sandy	10	10
Sand, very fine, light-brown, silty	20	30
Sand, very fine, dark-brown (bedrock?)	7	37

Test hole 38-42-29bdb. Depth to water 10.4 feet (measured November 5, 1962). Drilled 50 feet north of river by USGS.

Material	Thickness (feet)	Depth (feet)
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Shannon County -- continued

Test hole 38-42-29bdb -- continued.

Silt, brown	10	10
Sand, very fine, dark-brown, silty, gravel intermixed	15	25
Sand, very fine, dark-brown (bedrock)	3	28
Sand, very fine, light-gray, clayey	2	30

Test hole 38-43-2daa. Drilled in valley by USGS. Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, dark-brown, sandy, silty	10	10
Clay, dark-brown, sandy	12	22
Sand, dark-brown, silty (bedrock)	15	37

Test hole 38-44-24dba. Depth to water 7.3 feet (measured November 7, 1962). Drilled 100 yards south of river by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, dark-brown, silty	5	5
Sand, very fine, light-brown, clean	2	7
Sand, very fine, dark-brown, silty	13	20
Sand, very fine, dark-brown; gravel, fine to coarse, clayey	5	25
Sand, very fine, dark-brown, clayey (bedrock)	5	30

Test hole 38-44-24dcc. Depth to water 4.4 feet (measured November 7, 1962). Drilled one third of way from bank by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, dark-brown, sandy	4	4
Sand, very fine, dark-brown, silty	5	9
Sand, very fine, dark-brown, silty; gravel, fine to coarse	12	21
Sand, fine to medium, silty	10	31
Sand, very fine, dark-brown, clayey (bedrock)	2	33

Test Hole 38-47-12dbdd. Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Sand, clayey	15	15
Gravel	13	28
Gravel, clayey	1	29
Sand, fine, silty	1	30

Shannon County – continued.

Test Hole 38-47-12dbdd – continued.

Sand, fine	3	33
Shale, light yellowish-gray (bedrock)	1	34

Test hole 38-47-13cada. Depth to water 18 feet (measured October 1, 1962). Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Clay	3	3
Clay, silty	2	5
Sand, fine	2	7
Clay, silty	1	8
Sand, very fine	4	12
Sand, fine	1	13
Sand, medium	2	15
Silt, clayey	3	18
Sand and gravel	4	22
Clay	2	24
Silt, clayey	5	29
Gravel, clayey	1	30
Shale, greenish-blue (bedrock)	1	31

Test hole 38-47-23daa. Depth to water 47.3 and 47.1 feet (measured September 19, 1962 and November 29, 1962). Drilled on 2nd terrace by USGS. Very wide terrace.

Material	Thickness (feet)	Depth (feet)
Clay, olive-gray, sandy	10	10
Clay, olive-brown (bedrock?)	35	45
Sand, very fine, olive-brown changes to light-gray	10	55
Clay (hard drilling)	3	58
Clay; gravel, fine to coarse	5	63
Clay, olive-brown	19	82

Test hole 38-47-24caa. Altitude 2,875 feet. Depth to water about 12 feet (estimated September 19, 1962). Drilled on 1st terrace 50 yards west of White River by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	6	6
Sand, brown, fine, silty	6	12
Sand, brown, fine, silty; gravel, fine to medium	7	19
Gravel, medium to coarse, clayey	4	23
Sand, brown, fine, clayey	10	33
Clay, light-brown to pink	2	35

Shannon County -- continued.

Test hole 38-47-24caa -- continued.

Clay, gray	7	42
Clay or shale, light-green to gray	5	47

Test hole 38-47-24cba. Altitude 2,875 feet. Depth to water 15.4 feet (measured September 19, 1962). Drilled on 1st terrace west of river 100 yards from second level bank by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	9	9
Sand, light-brown, fine, silty	5	14
Gravel, fine to coarse, clayey	10	24
Clay, light-brown, gravel, fine to coarse	6	30
Gravel, very coarse, clayey	5	35
Clay, light-green (bedrock?)	7	42

Test hole 38-47-24dab. Altitude 2,885 feet. Depth to water 27.2 feet (measured September 19, 1962). Drilled on lower terrace 100 yards east of White River by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	3	3
Clay, dark-brown	12	15
Clay, brown, sandy	5	20
Sand, light-brown, fine, clayey	6	26
Clay, brown, sandy	4	30
Clay, white to pink (bedrock)	1	31
Shale, dark-gray	1	32

Test hole 39-41-6cd. Drilled in valley by USGS. Dry hole.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, silty	28½	28½
Sand, very fine, silty (hard drilling)	3½	32

Test hole 39-41-7bba. Depth to water about 17 feet (estimated November 1962). Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine to fine, silty	21	21
Sand, very fine to fine, silty; scattered gravel	2	23
Sand, very fine, silty	9	32

Shannon County -- continued.

Test hole 39-41-32aba. Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, silty, clayey (samples moist at 17 feet)	21	21
Gravel; sand, fine, silty	1	22
Sand, very fine, silty	14	36
Gravel; sand, fine, silty	1½	37½
Sand, very fine, clayey, silty	1½	39
Gravel; sand, fine, silty	1	40
Sand, very fine, silty (hard drilling)	2	42

Test hole 39-41-33bbb. Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, silty	8	8
Sand, very fine, silty; gravel, fine to medium	3	11
Sand, very fine, silty (hard drilling)	6	17

Test hole 39-43-2aa. Drilled in valley by USGS. Dry hole.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, silty	11	11
Gravel, sandy, silty	2	13
Sand, very fine, silty (hard drilling)	2	15

Test hole 39-43-2bba. Depth to water 16.2 feet (measured November 1962).
Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, silty	6	6
Gravel, fine to medium, silty, sandy	3	9
Sand, very fine, silty (samples moist at 10 feet; hard drilling at 31 feet)	23	32

Test hole 39-43-26bdd. Depth to water about 30 feet (estimated November 6,
1962). Drilled in center of valley by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown, sandy	10	10
Clay, dark-brown, sandy, silty	30	40
Clay, dark-brown, sandy; gravel, fine to medium (bedrock)	5	45
Clay, light-brown, sandy	2	47

Shannon County -- continued.

Test hole 39-43-36cbb. Depth to water 22.2 feet (measured November 6, 1962). Drilled 100 yards north of river by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, dark-brown, sandy, silty	13	13
Gravel, medium to coarse, silty	2	15
Sand, very fine, light-brown, clayey	20	35
Sand, very fine, pinkish, silty (bedrock)	67	102

Test hole 39-44-36abb. Depth to water 5.9 feet (measured November 7, 1962). Drilled in center of valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, dark-brown, silty, clayey gravel, fine	23	23
Sand, very fine, dark-brown, clayey (bedrock)	4	27
Clay, light-brown, sandy	5	32

Test hole 39-45-8caa. Drilled on 2nd terrace by USGS. Dry hole.

Material	Thickness (feet)	Depth (feet)
Clay, dark-gray, silty	15	15
Clay, buff, silty	3	18
Gravel, fine to coarse; clay, buff	3	21
Clay or shale, brownish-pink (bedrock)	6	27

Test hole 39-45-8dcbb. Depth to water 10.0 feet (measured November 1962). Drilled on 1st terrace, 50 yards north of river by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, tan to buff	8	8
Sand, fine, light-brown	2	10
Sand, fine, light-brown; gravel, fine to medium	3	13
Sand, fine, light-brown	7	20
Clay or shale, olive-green, silty (bedrock)	7	27

Test hole 39-45-18abda. Depth to water 10 feet (measured October 5, 1962). Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Silt, clayey	1	1
Silt, sandy	1	2

Shannon County -- continued.

Test Hole 39-45-18abda -- continued.

Sand, very fine	4	6
Gravel, clayey	1	7
Gravel	2	9
Gravel, clayey	1	10
Gravel	6	16
Shale, bluish-olive-brown	1	17

Test hole 39-46-24ccaa. Depth to water 18 feet (measured October 4, 1962).
 Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Silt, sandy	9	9
Sand, silty	2	11
Sand, fine	5	16
Clay, sandy	3	19
Gravel	4	23
Sand, fine	3	26
Gravel	2	28
Sand, fine	1	29
Gravel, and fine sandy, clayey	2	31
Gravel	3	34
Shale, greenish-blue (bedrock)	1	35

Test hole 39-46-32abb. Altitude 2,830 feet. Depth to water 16.5 feet
 (measured September 20, 1962). Drilled on 2nd terrace close to bedrock by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, dark-brown	7	7
Sand, light-brown, very fine	8	15
Sand, light-brown; gravel, fine, clayey	4	19
Clay, light-brown, sandy	9	28
Clay, light-brown, gravelly	12	40
Clay, white (bentonite?) (bedrock)	2	42

Test hole 39-46-32abc. Altitude 2,835 feet. Depth to water 15.6 and
 14.97 feet (measured September 20, 1962 and November 29, 1962). Drilled on
 2nd terrace, 200 yards north of river by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, pink	6	6
Silt, light-brown to pink	9	15
Gravel, coarse to pebbles, silty	4	19
Clay, light-brown, sandy	9	28
Clay, light-brown, gravelly	4	32
Sand, fine, clayey	10	42
Clay, green to buff to white (bedrock)	4	46

Shannon County - continued.

Test hole 39-46-33baaa. Depth to water 16 feet (measured October 4, 1962).
Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Silt, sandy	13	13
Sand, silty	3	16
Gravel, fine	2	18
Sand, very fine	2	20
Gravel	5	25
Silt, sandy	16	41
Shale, bluish-gray	4	45

Test hole 40-41-17ca. Depth to water about 16 feet (estimated November 1962).
Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, silty, clayey	13	13
Sand, fine to medium, silty	4	17
Sand, medium; scattered gravel	5	22
Sand, very fine, silty	8	30
Sand, very fine, silty (hard drilling)	7	37

Test hole 40-41-17bd2. Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, sand, very fine, dark-brown	3	3
Sand, very fine, light-brown, clayey and silty	8	11
Gravel; sand, fine	2	13
Sand, very fine, silty and clayey	3	16
Sand, very fine, silty (bedrock?)	6	22

Test hole 40-41-27ba. Depth to water about 14 to 16 feet (estimated
November 1962). Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Topsoil, black, silty	3	3
Sand, very fine, silty and clayey	11	14
Sand, very fine to medium, silty; scattered gravel	2	16
Sand, very fine, silty	11	27

Test hole 40-43-34ddc. Depth to water 7.5 feet (measured November 1962).
Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
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Shannon County -- continued.

Test Hole 40-43-34ddc -- continued.

Sand, very fine, silty	13	13
Gravel; sand, fine, silty	2	15
Sand, very fine, silty	5	20
Gravel, medium to coarse, sandy	4	24
Sand, very fine, silty	8	32
Sand, very fine, silty (hard drilling)	3	35

Test hole 40-44-8ddc. Altitude 2,660 feet. Drilled on flood plain by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, very coarse	3	3
Clay, light-gray to light-green (bedrock)	7	10

Test hole 40-44-9ccc. Altitude 2,670 feet. Drilled on 3rd terrace by USGS.
Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	9	9
Silt, light-brown; gravel, medium, clayey	4	13
Sand, fine to medium; gravel, fine to coarse, clayey	1	14
Gravel, fine to coarse, clayey	3	17
Clay, light-brown, well indurated (bedrock)	15	32

Test hole 40-44-9cdd. Altitude 2,670 feet. Drilled on 3rd terrace by USGS.
Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown to white	9	9
Silt, light-brown; gravel, fine to medium, clayey	10	19
Gravel, fine to coarse, clayey	1	20
Clay, light-brown (bedrock)	2	22

Test hole 40-44-16aaa. Altitude 2,700 feet. Depth to water about 15 feet
(estimated September 12, 1962). Drilled on 4th terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	9	9
Clay, light-brown, silty	3	12
Sand, fine, clayey	10	22
Clay, light-brown (bedrock)	8	30

Test hole 40-44-17abb. Altitude 2,695 feet. Depth to water about 18 feet
(estimated September 12, 1962). Drilled on 4th terrace by USGS.

Shannon County -- continued.

Test Hole 40-44-17abb -- continued.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	7	7
Silt, light-brown, clayey	2	9
Sand, fine to medium; gravel, fine to coarse, silty	11	20
Gravel, fine to medium, clayey (moist at 20 feet)	2	22
Clay, light-gray (bedrock)	8	30

Test hole 40-44-19dac. Altitude 2,705 feet. Drilled on 4th terrace by USGS.
Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown, clayey	12	12
Sand, brown, clayey	9	21
Clay, light-brown to olive (bedrock)	3	24

Test hole 40-44-19dad. Altitude 2,710 feet. Drilled on 5th terrace by USGS.
Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	10	10
Silt, light-brown, clayey	5	15
Clay, light-brown; gravel, medium to coarse ..	2	17
Sand, fine to coarse, clean	3	20
Clay, light-gray (bedrock)	10	30

Test hole 40-44-19dba. Altitude 2,850 feet. Drilled on 2nd terrace by USGS.
Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	8	8
Sand, fine, light-brown; gravel, fine to medium, clayey	4	12
Clay, light-brown, silty	3	15
Clay, light-brown changing to light, bright- green (bedrock)	5	20

Test hole 40-44-21cdd. Depth to water 5.2 feet (measured November 7, 1962).
Drilled 50 yards east of river by USGS.

Material	Thickness (feet)	Depth (feet)
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Shannon County -- continued.

Test Hole 40-44-21cdd -- continued.

Silt, dark-brown, sandy	14	14
Sand, very fine, dark-brown; gravel, fine to medium	4	18
Sand, very fine, clayey, light-gray (bedrock)	9	27

Test hole 40-44-28bba. Depth to water 7.7 feet (measured November 7, 1962).
Drilled 50 yards west of river by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, dark-brown, sandy	12	12
Sand, dark-brown, silty	6	18
Sand, light-gray, clayey (bedrock)	4	22

Test hole 40-44-29babb. Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Silt, clayey	5	5
Gravel, silty	3	8
Gravel, fine	1	9
Sand, silty	4	13
Gravel, silty	2	15
Gravel	5	20
Shale, greenish-blue-brown	4	24

Test hole 40-45-26ccc. Altitude 2,735 feet. Drilled on 4th terrace by USGS.
Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	8	8
Sand, fine, clean	2	10
Sand, fine; gravel, medium to coarse, clayey	5	15
Clay, light-green (bedrock)	5	20

Test hole 40-45-27daa. Altitude 2,720 feet. Depth to water 13.8 feet
(measured September 13, 1962). Drilled on 3rd terrace, 50 yards from river by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	7	7
Sand, very fine, clayey	3	10
Sand, very fine; gravel, medium to coarse	4	14
Gravel, coarse	1	15
Clay, greenish-blue (bedrock)	5	20

Shannon County - continued.

Test hole 40-45-27dda. Altitude 2,725 feet. Drilled on 3rd terrace by USGS. Moist at 12 feet. Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	10	10
Sand, very fine, silty	6	16
Clay, blue-green (bedrock)	4	20

Test hole 40-45-27ddd. Altitude 2,730 feet. Depth to water 19.9 feet (measured September 13, 1962). Drilled on 4th terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	11	11
Sand, fine; gravel, coarse, very silty	6	17
Sand, fine	3	20
Clay, blue-green (bedrock)	5	25

Test hole 40-45-33adda. Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Silt, clayey	14	14
Clay	1	15
Silt, clayey	2	17
Gravel, silty	1	18
Sand, fine, silty	6	24
Sand, fine	1	25
Shale, greenish-olive-brown	2	27

Test hole 40-45-34dacd. Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Silt, clayey	17	17
Clay, silty	2	19
Silt, clayey	6	25
Sand, fine, silty	4	29
Sand, fine	1	30
Clay	1	31
Sand, very fine, silty	2	33
Sand, silty	3	36
Sand, and fine gravel	5	41
Silt, clayey	9	50

Test hole 40-45-35dadd. Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
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Shannon County -- continued.

Test Hole 40-45-35dadd -- continued.

Silt, clayey	11	11
Sand, silty	38	49
Gravel, medium	11	60
Shale, brownish-olive	2	62

Test hole 41-43-19bada. Depth to water 15.8 feet (measured October 5, 1962).
 Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Silt, clayey	8	8
Sand, very fine, silty	4	12
Sand	1	13
Gravel	3	16
Shale, greenish-blue-brown	2	18

Test hole 41-44-25bcd. Altitude 2,670 feet. Drilled on flood plain by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, coarse	2	2
Clay, greenish (bedrock)	8	10

Test hole 41-44-25cca. Altitude 2,705 feet. Drilled on 5th terrace by USGS.
 Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	6	6
Sand, fine to medium; gravel, medium, silty ..	2	8
Gravel, fine to coarse, silty; sand, fine to medium	2	10
Sand, fine to medium; gravel, fine to coarse, silty	12	22
Clay, light-green (bedrock)	2	24
Shale, white (hard to penetrate)	1	25
Clay, greenish, well indurated	17	42

Test hole 41-44-25ccb. Altitude 2,705 feet. Drilled on 5th terrace by USGS.
 Dry hole.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown	4	4
Sand, fine to medium, light-brown	5	9
Gravel, coarse; pebbles and cobblestones, silty	6	15
Sand, medium to coarse, very silty	5	20

Shannon County -- continued.

Test Hole 41-44-25ccb -- continued.

Gravel, coarse	1	21
Clay or shale, light-gray, well indurated (bedrock)	1	22

Test hole 41-44-25cda. Altitude 2,685 feet. Hole dry (slightly moist).
Drilled on 3rd terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown, sandy	4	4
Sand, fine, light-brown; gravel, coarse	9	13
Clay, greenish, well indurated (bedrock)	2	15

Test hole 41-44-25cdb. Altitude 2,690 feet. Depth to water 12.7 feet
(measured September 11, 1962). Very hard drilling in bedrock. Drilling on 4th
terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown, sandy	2	2
Sand, very fine, light-brown, silty (moist at 9 feet)	16	18
Clay, light-gray to light-green, sandy 18 to 22 feet (bedrock)	4	22

Test hole 41-44-25dbc. Altitude 2,690 feet. All samples dry. Drilled on
3rd terrace by USGS. Very hard drilling in the bedrock.

Material	Thickness (feet)	Depth (feet)
Silt, light-brown, sandy	2	2
Sand, very fine, light-brown, silty	10	12
Clay, light-gray to light-green, sandy	2	14
Clay, light-green to light-gray, silty (bedrock)	8	22

Test hole 41-45-17aaa. Drilled on Cuny Table by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, olive-gray to yellow, sandy	4	4
Sand, buff to tan, silty	4	8
Silt, buff to tan, sandy	2	10
Clay, brownish-pink, silty, sandy	11	21
Clay, brownish-pink, sandy	4	25
Clay, brownish pink, silty	7	32
Clay, brownish-pink, sandy	3	35
Clay, brownish-pink, silty	3	38
Clay, brownish-pink, sandy	7	45

Shannon County – continued.

Test Hole 41-45-17aaa – continued.

Sand, brownish-gray, silty (water came to surface at 50 feet)	15	60
Clay, light-brown, silty (water came to surface at 65 feet)	20	80
Clay, light-gray to brownish-pink, sandy, silty (water came to surface at 105 feet)	35	115
Clay, light-gray to brownish pink, silty; gravel, fine to coarse	2	117
Clay, brownish-pink, silty, well indurated	10	127

Test hole 43-42-29bad. Drilled on sand dunes by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, medium to coarse, brown, silty	53	53
Sand, coarse to very coarse, slightly indurated	61	114
Sand, coarse to very coarse (water at 114 feet)	12	126
Sand, very clayey and silty	4	130
Gravel, sandy, clayey, and silty	1	131
Clay (bedrock)	6	137

WASHABAUGH COUNTY

Test hole 41-37-4ddc. Depth to water 9.0 feet (measured November 1962).
Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, silty (samples moist at 6 feet)	6	6
Sand, very fine, silty, clayey	4	10
Gravel, sandy	½	10½
Sand, very fine, silty	4½	15
Sand, coarse to medium, light-brown, silty (bedrock)	7	22

Test hole 41-38-12ddc. Depth to water 5.9 feet (measured November 1962).
Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, light-grayish-brown, silty	5	5
Sand, fine to medium, silty	10	15
Clay, dark-greenish-gray	7	22

Washabaugh County - continued.

Test hole 43-36-1daa. Drilled on high terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, sandy	4½	4½
Gravel, coarse; sand	2½	7
Sand, medium to coarse, light-brown; scattered gravel	2	9
Clay, silty	1½	10½
Gravel, coarse	7½	18
Gravel, coarse; clay, well indurated (hard drilling)	8	26
Sand, fine, brown, silty	2	28
Clay, gray; scattered sand and gravel	1	29

Test hole 43-36-2cdd. Drilled on high terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Topsoil	2	2
Sand, fine to medium, light-brown, silty; scattered gravel	13	15
Sand, medium to coarse, light-brown; scattered gravel	9	24
Sand, medium to coarse; silt and clay, well indurated	15	39
Gravel, very sandy	3	42
Sand, fine to medium; clay, well indurated (hard drilling)	10	52

Test hole 43-38-27bbc. Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine to coarse, light-brown	6½	6½
Gravel, fine to coarse; scattered coarse sand	5½	12
Silt, fine, clayey; scattered sand and gravel	2	14
Sand, medium to coarse; gravel, clayey	2	16
Clay (bedrock)	6	22

Test hole 43-39-23abd. Depth to water 9.3 feet (measured November 1962).
Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, medium to coarse, brown	7	7
Sand, medium to coarse, brown; gravel, fine to medium	9½	16½
Clay (bedrock)	10½	27

Washabaugh County – continued.

Test hole 43-39-23baa. Depth to water 8.7 feet (measured November 1962).
Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine to fine, light-brown, silty	14	14
Sand, fine to coarse, gravelly	1	15
Sand, medium to coarse; scattered gravel	1	16
Clay (bedrock)	6	22

Test hole 43-39-24cdd. Drilled on terrace by USGS.

Material	Thickness (feet)	Depth (feet)
Topsoil, black	3	3
Sand, fine to medium, light-brown	6	9
Sand, medium to coarse, light-brown; gravel .	3	12
Gravel, fine to coarse; sand, medium to coarse	4	16
Clay (bedrock)	6	22

Test hole 44-35-31aa. Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, very fine, light-brown, silty	7	7
Sand, very fine, light-brown, silty; scattered gravel (water came to surface at 10 feet)	3	10
Gravel, coarse; sand, medium to coarse	2	12
Gravel, medium to coarse, sandy, silty	3	15
Shale (bedrock)	2	17

Test hole 44-35-31daa. Drilled in valley by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine to medium, light-brown	7	7
Sand, fine to medium, light-brown; scattered gravel	2	9
Gravel, medium to coarse; sand, medium to coarse, light-brown	5	14
Sand, medium to coarse, scattered gravel	6	20
Shale (bedrock)	2	22

Table 7.--Logs of Wells

Logs in this table consist of drillers' logs of wells contracted through the U. S. Bureau of Indian Affairs in the mid-1930's, and available logs of more recent public-supply and irrigation wells.

BENNETT COUNTY

City of Martin Well No. 1; 37-37-18ac. Information by Harold Norbeck of the Norbeck Company, drillers. Drilled in 1935.

Material	Thickness (feet)	Depth (feet)
Topsoil, wash	4	4
Light gray clay, hard	14	18
Yellow gray clay	7	25
Light gray clay, hard, some silt	30	55
White limey clay, hard	4	59
Light gray clay, fairly hard	22	81
Yellow silt; 85 feet to 85 feet 6 inches, lime	4	85
Gray clay, fairly hard; some silt; 95 feet to 95 feet 4 inches, lime	20	105
Sand, tough	1	106
Very fine yellow sand, tough	10	116
Gray clay	24	140
Gray and yellow clay, streaks of silt, fairly soft	49	189
Coarse granulated chalk or hard clay	1	190
Yellow clay, silty	13	203
Compact yellow silt with some clay and some very fine sand streaks	48	251
Granulated chalk or hard gray clay	3	254
Fine granulated clays or chalk, yellow, open, soft	19	273
Compact silt, yellow, few very fine sand lenses	5	278
Yellow silt, little fine sand, open but occasional hardening	48	326
Dark gray clay, tough	4	330
Yellow clay, some silt, fairly soft	10	340
Yellow clay and silt, fairly tough	64	404
Gray clay with lime hardening, tough to hard	4	408
Yellow silts, clay partings	24	432
Fine sand, some silt, tough	20	452
Yellow silt, soft	4	456
Yellow silt with some streaks of fine sand, medium soft to fairly hard	39	495

Well 38-33-30bb. Depth to water from surface 285 feet.

Material	Thickness (feet)	Depth (feet)
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Bennett County – continued.

Well 38-33-30bb -- continued.

Surface soil	22	22
Rock and sandstone	296	318
Sand	8	326

Well 38-34-7ca. Depth to water from surface 36 feet.

Material	Thickness (feet)	Depth (feet)
Gumbo, gray	100	100
Sand rock, gray	70	170

Well 38-34-10aa.

Material	Thickness (feet)	Depth (feet)
Sand, gray	60	60
Butte clay, yellow	100	160
Sand rock, gray	72	232

Well 38-35-14b. Depth to water from surface 100 feet.

Material	Thickness (feet)	Depth (feet)
Clay, black	20	20
Clay, hard, dark red	175	195
Sand rock, hard, gray	40	235

Well 38-40-12ac. Depth to water from surface 170 feet.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	9	9
Rock and clay, white	261	270
Sand and gravel, white	20	290

Well 39-34-11ac. Depth to water from surface 125 feet.

Material	Thickness (feet)	Depth (feet)
Sand	10	10
Clay	80	90
Clay, sandy, layers of rock	8	98

Well 39-36-5dd. Depth to water from surface 100 feet.

Material	Thickness (feet)	Depth (feet)
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Bennett County -- continued.

Well 39-36-5dd -- continued.

Butte rock, sandy	30	30
Clay, heavy	204	234
Sandstone	14	248

Well 39-36-23bb.

Material	Thickness (feet)	Depth (feet)
Sand, yellow	61	61
Butte clay, gray	74	135
Sand rock, hard, gray	20	155

Well 39-37-28dc. Depth to water from surface 62 feet.

Material	Thickness (feet)	Depth (feet)
Sand, red	62	62
Sand, white	10	72
Butte rock, red	66	138
Gravel, gray	6	144

Well 39-38-8dd. Depth to water from surface 110 feet.

Material	Thickness (feet)	Depth (feet)
Clay, white	24	24
Butte clay, red	198	222

Well 39-38-15bb. Depth to water from surface 90 feet.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	10	10
Badlands, yellow	135	145

Well 39-38-18dd. Depth to water from surface 130 feet.

Material	Thickness (feet)	Depth (feet)
Clay, black	9	9
Butte rock, gray	157	166
Sand rock, gray	30	196
Gravel, gray	24	220

Well 39-39-6cc. Depth to water from surface 165 feet.

Material	Thickness (feet)	Depth (feet)
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Bennett County – continued.

Well 39-39-6cc – continued.

Surface clay, white	35	35
Butte clay, red	246	281
Sand and gravel, white	25	306

Well 39-39-15bd.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	7	7
Badlands, yellow	31	38
Badlands, soft rock, yellow	172	210

Well 39-39-18cc. Depth to water from surface 210 feet.

Material	Thickness (feet)	Depth (feet)
Sand clay, dark	18	18
Butte clay, red	18	36
Sandstone, gray	169	205
Sand, yellow	20	225
Badlands, soil	3	228
Sandstone, gray	42	270

Well 39-39-26aa. Depth to water from surface 130 feet.

Material	Thickness (feet)	Depth (feet)
Surface clay, white	32	32
Butte clay, red	158	190
Sand and gravel, gray	26	216

SHANNON COUNTY

Well 36-41-22dd.

Material	Thickness (feet)	Depth (feet)
Sand, white	156	156

Irrigation well 36-41-29ac, on Frank Slaby Farm. Logged by M. J. Tipton, S. Dak. Geol. Survey, October 27, 1960.

Material	Thickness (feet)	Depth (feet)
Silty sand, grayish-brown with numerous white, non-calcareously cemented pieces of siltstone	10	10

Shannon County – continued.

Irrigation well 36-41-29ac – continued.

Limestone, light tan to white, silty	10	20
Silty clay, tan to buff, calcareous with limestone as above	20	40
Silty-sand, tan to buff, noncalcareous	10	50
Silty clay, light tan, some very fine sand increasing 100-120, occasional ash shard and cream colored clay particle	70	120
Sand, fine to medium, tan, calcareous	40	160
Fine sand to silt, tan, calcareous; occasional particle of cream-colored clay and grayish-white limestone	60	220
Fine silty sand, tan as above – two sample bags marked fine silty sand, brownish-buff	10	230
Silty sand, tan, calcareous	10	240
Siltstone, light tan, calcareous; one rootlet-like structure	20	260
Silty sand, tan, calcareous; 290- some shell(?) fragments	40	300
Sand, fine, light-brown to tan (very clean looking)	10	310
Sand, as above only silty and containing numerous pieces of limestone	10	320

Well 36-42-36dd.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	8	8
Butte rock	167	175
Gravel, gray	5	180

Well 36-43-17cc.

Material	Thickness (feet)	Depth (feet)
Surface soil, gray	12	12
Butte clay and rock, red	208	220
Sand and gravel, gray	20	240

Well 36-47-24aa.

Material	Thickness (feet)	Depth (feet)
Clay, white	20	20
Butte rock, white	30	50
Butte rock, sandy, green	11	61

Shannon County – continued.

Well 36-47-25aa.

Material	Thickness (feet)	Depth (feet)
Clay, white	20	20
Quick sand, white	—	20

Well 37-42-17cc.

Material	Thickness (feet)	Depth (feet)
Loam, sand, black	24	24
Butte rock, red	224	248
Sand rock, hard, gray	110	358

Well 37-42-30ca.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	7	7
Badlands, yellow	13	20
Rock, soft, red	10	30
Rock, soft, and Badlands, red	184	214

Well 37-42-35ca.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	5	5
Badlands soil, red	51	56
Badlands and soft rock	280	336

Well 37-44-9ca.

Material	Thickness (feet)	Depth (feet)
Butte	80	80
Sand rock	92	172

Well 37-44-36dd.

Material	Thickness (feet)	Depth (feet)
Surface soil, white	15	15
Butte clay and rock, very hard, red	291	306

Shannon County -- continued.

Well 37-46-4bb.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	18	18
Gumbo soil, green	62	80
Badlands shale, yellow	30	110
Badlands shale, blue	124	234

Well 37-46-6bb.

Material	Thickness (feet)	Depth (feet)
Clay, white	22	22
Gravel, red	6	28
Shale, black	½	28½
Gravel, clayey, black	8½	37

Well 37-46-25dd.

Material	Thickness (feet)	Depth (feet)
Clay, white	48	48
Butte clay, red	168	216

Well 38-41-12bb.

Material	Thickness (feet)	Depth (feet)
Clay, black	12	12
Gumbo, brown	2	14
Sand rock, gray	263	277

Well 38-41-21 cc.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	4	4
Butte rock, red	146	150
Sand rock, gray	39	189

Well 38-41-25bb.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	4	4
Butte clay, red	56	60
Butte clay, light red	40	100
Rock, gray	30	130
Butte clay, gray-red	18	148

Shannon County – continued.

Well 38-41-29dd.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	8	8
Rock, gray	1	9
Butte rock, red	191	200
Sandstone, brown	40	240

Well 38-42-9bc.

Material	Thickness (feet)	Depth (feet)
Surface, black	4	4
Butte clay, red	46	50
Rock, blue	18	68
Sandstone, gray	208	276

Well 38-43-32ca

Material	Thickness (feet)	Depth (feet)
Loam, sandy, black	2	2
Clay, red	44	46
Butte clay and sandstone, reddish-gray	305	351

Manderson Day School well 38-44-25dd. Depth to water 52 feet; pump level 148 feet (measured May 1962). Drilled by Thorpe Drilling Co., Des Moines, Iowa. Yield 20 gpm; water bearing - from 246 to 258 feet; temperature <45°; gravel packed - 14 tons of ¼ size gravel.

Material	Thickness (feet)	Depth (feet)
Surface material	2	2
Clay, light brown, sandy	53	55
Siltstone, brown	10	65
Siltstone, brown, and layers of limestone (crevices 65 to 75 feet)	47	112
Clay, brown, and streaks of sandy limestone .	15	127
Siltstone, brown, and layers of limestone	68	195
Clay, brown, sandy, and layers of limestone ..	51	246
Sandstone, brown	12	258
Sandstone, brown, and layers of clays	12	270

Well 38-45-28dd.

Material	Thickness (feet)	Depth (feet)
Clay, brown	20	20
Butte rock, red	180	200

Shannon County – continued.

Well 38-45-28dd – continued.

Sandstone, gray	50	250
Butte rock, red	10	260
Sandstone, gray	31	291
Butte rock, red	19	310

Well 38-46-10cc.

Material	Thickness (feet)	Depth (feet)
Gumbo, gray	100	100
Sand rock, gray	21	121

Well 38-46-16cc.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	15	15
Gumbo, green	18	33
Badlands shale, yellow	111	144
Badlands shale, blue	41	185

Well 38-47-26bd.

Material	Thickness (feet)	Depth (feet)
Clay, white	41	41
Gravel, red	10	51

Well 38-47-35bb.

Material	Thickness (feet)	Depth (feet)
Clay, white	38	38
Gravel, red	11	49

Well 39-41-17ac.

Material	Thickness (feet)	Depth (feet)
Surface soil, loam	6	6
Badlands, red	66	72
Badlands, yellow	74	146

Well 39-42-11dd.

Material	Thickness (feet)	Depth (feet)
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Shannon County – continued.

Well 39-42-11dd – continued.

Surface soil, black	4	4
Sand and gravel, gray	26	30
Gravel, coarse	5	35
Butte clay, red	15	50
Sandstone, gray	50	100

Well 39-42-22aa.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	4	4
Clay, red	21	25
Clay and gravel, gray	40	65
Butte clay, dark red	85	150

Well 39-44-1bb.

Material	Thickness (feet)	Depth (feet)
Gumbo, gray	40	40
Gravel, coarse	4	44
Gumbo, gray	50	94
Sand rock, gray	38	132

Well 40-41-17bd1.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	2	2
Clay, light red	18	20
Gravel, gray	4	24
Butte rock, dark red to gray	96	120
Sandstone, gray	60	180

Well 40-42-25ac.

Material	Thickness (feet)	Depth (feet)
Badlands soil, yellow	9	9
Gravel, gray	1	10
Soft rock, red	16	26
Rock, red	18	44
Badlands, red	19	63
Rock, red	1	64
Badlands, red	46	110

Well 40-43-26b.

Material	Thickness (feet)	Depth (feet)
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Shannon County – continued.

Well 40-43-26b – continued.

Butte rock and clay	85	85
Badlands formation	24	109

WASHABAUGH COUNTY

Well 40-34-15dd.

Material	Thickness (feet)	Depth (feet)
Badlands soil, loose, white	8	8
Badlands soil, firm, red	169	177
Badlands soil, rock, hard, dark red	72	249
Rock and sand	14	263

Well 40-34-24ac.

Material	Thickness (feet)	Depth (feet)
Loam, black	8	8
Silt, light	4	12
Sand and gravel	4	16
Butte rock, loose, red	109	125
Rock, red	26	151
Sand	10	161

Well 40-35-35aa.

Material	Thickness (feet)	Depth (feet)
Loam	2	2
Badlands, loose, yellow	14	16
Badlands, firm, red	95	111
Badlands, and rock, red	124	235
Badlands rock, yellow	55	290
Sandstone	10	300

Well 40-36-12ac.

Material	Thickness (feet)	Depth (feet)
Clay, yellow	200	200
Sand rock	32	232

Well 40-36-23aa.

Material	Thickness (feet)	Depth (feet)
Clay, black	28	28

Washabaugh County – continued.

Well 40-36-23aa – continued.

Badlands clay, yellow	140	168
Sand rock, hard, gray	40	208

Well 40-37-20cc.

Material	Thickness (feet)	Depth (feet)
Loam, sandy, brown	19	19
Butte rock, red	10	29
Sand rock, brown	10	39
Butte rock, red	54	93
Sand rock, hard, gray	33	126

Well 40-37-34ca.

Material	Thickness (feet)	Depth (feet)
Sand, red	24	24
Clay, hard, blue	136	160
Sand rock, gray	42	202

Well 40-39-15bb.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	8	8
Badlands and soft rock, yellow	290	298

Well 40-39-21 cd.

Material	Thickness (feet)	Depth (feet)
Loam, sandy, gray	30	30
Butte rock, red and pink	158	188
Sandstone, gray	18	206

Well 40-39-34ac.

Material	Thickness (feet)	Depth (feet)
Surface soil	10	10
Butte rock	138	148

Well 40-40-16ca.

Material	Thickness (feet)	Depth (feet)
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Washabaugh County – continued.

Well 40-40-16ca – continued.

Surface soil, black	16	16
Badlands, red	17	33
Badlands - changeable, red	31	64

Well 41-37-2bb.

Material	Thickness (feet)	Depth (feet)
Loam, sandy, black	10	10
Loam, sand	30	40
Sandstone, red	10	50
Sandstone, blue	90	140
Clay	90	230
Badlands	121	351

Well 41-37-28bd.

Material	Thickness (feet)	Depth (feet)
Surface soil, sandy, black	10	10
Clay	200	210
Rock	15	225
Clay	115	340
Sandstone	10	350
Chalk rock	51	401

Well 41-39-10cc.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	1	1
Badlands, yellow	16	17
Badlands, rock, soft, red	67	84
Badlands, red	84	168
Badlands, yellow	76	244

Well 41-40-25bd.

Material	Thickness (feet)	Depth (feet)
Surface soil, black	10	10
Badlands soil, yellow	44	54
Badlands rock, yellow	1	55
Rock, soft, yellow	28	83
Badlands soil, red	25	108
Rock, soft, red	37	145

Washabaugh County – continued.

Well 42-35-29dd.

Material	Thickness (feet)	Depth (feet)
Clay, sandy	10	10
Clay	30	40
Sandstone, red	50	90
Clay soil	60	150
Badlands	60	210
Sandstone, red	10	220
Badlands	124	344

Well 42-37-26bb.

Material	Thickness (feet)	Depth (feet)
Loam, sandy, black	10	10
Gravel	20	30
Badlands, blue and white	180	210

Well 43-38-23dd.

Material	Thickness (feet)	Depth (feet)
Loam, sandy, black	10	10
Subsoil, light	20	30
Gravel, coarse	8	38
Sand, coarse	5	43
Badlands	124	167

APPENDIX
SELECTED REFERENCES

Reports describing previous investigations and other literature pertaining to the geology or water resources of the region are listed in the following tabulation. References pertaining to paleontology have been omitted.

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