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Rural Water Supplies in South Dakota : Walworth County

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Walworth County

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RURAL WATER SUPPLIES

IN

SOUTH DAKOTA

WALWORTH COUNTY

BY

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AND

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PREPARED BY THE WORK PROJECTS ADMINISTRATION AS A REPORT ON THE WELL SURVEY CONDUCTED AS WORK PROJECTS ADMINISTRATION OFFICIAL PROJECT 665-74-3-126; SPONSORED BY THE EXTENSION SERVICE AND THE EXPERIMENT STATION SOUTH DAKOTA STATE COLLEGE, IN COOPERATION WITH THE STATE GEOLOGICAL SURVEY.

JANUARY 1940

FOREWORD

This study was first proposed as a project of the Mineral Resources Committee of the State Planning Board under the direction of the State Geological survey and undertaken as a Work Projects Administration project sponsored by the State Planning Board, and was continued under the Planning Board until that body was abolished July 1, 1939 by the State Legislature. At that time sponsorship was transferred to the South Dakota Agricultural Experiment Station and the State College Extension Service, South Dakota State College. Field work was begun October 1, 1938 and was practically completed by February 15, 1939. Workers were assigned in the several counties under the supervision and direction of the County Agricultural Agents and Field Supervisors who were employed by the Work Projects Administration. Questionnaires were mailed out from the offices of the County Agents and were checked and tabulated in these offices. The material was then forwarded to the central office for final tabulation and analysis under the direction of Elmer E. Meleen and Walter V. Searight.

Particular credit should be given to the individual County Agricultural Agents in the various counties of the state who arranged the contacts with the individuals from whom these data were collected, furnished a large portion of the necessary supplies for field work, and directed the workers engaged in collecting field data. Without this assistance in gathering basic data, this study could not have been conducted. The value of the report is therefore in direct proportion to the accuracy and adequacy of these basic data.

INTRODUCTION

PURPOSE

This report on rural water supplies of South Dakota has been prepared to present data recently made available on the types and the sources of water supply, exclusive of stream, lake and dam waters. The information presented is of importance to evaluate present supplies. It should also prove useful as a basis for further development of supplies where they are needed or become necessary. Further, it is hoped that the facts presented may prove of value in any program of water conservation.

SOURCES OF INFORMATION

Questionnaires were sent to all, or essentially all of the farmers of the state, asking for complete data on farm wells and supplementary supplies, with the exception of the supplies above noted. A most gratifying number returned questionnaires, actually 60.1% average for the entire state. The coverage is probably more than 60.1% since it is likely that many unanswered inquiries were those to farmers who were without wells, the type of supply emphasized in the questionnaires. The data thus obtained were supplemented with information contained in the files of the State Geological Survey, the office of the State Engineer, and reports of the United States Geological Survey. This supplementary information, together with that contained in questionnaires was used in making the well location maps included in this report.

PROCEDURE

All data from the questionnaires were tabulated and analyzed statistically by counties, which were made the areal units of study. Within the county,

Acknowledgments - The authors wish especially to acknowledge and commend the conscientious assistance of Mr. E. L. Woodburn, Supervisor, for careful and painstaking supervision of statistical work. The authors also desire to express appreciation for the constant interest and support of this project by Mr. Bob Butts, Director of Research and Records Projects, South Dakota Work Projects Administration.

supplies were allocated as to kind on county maps. Since shallow waters are the most important source of rural supply in South Dakota, wells 200 feet deep and less were plotted on county maps from which maps indicating depths of wells by 50 foot intervals were made. Springs, shown on the well location map, and cisterns were also tabulated as important supplementary supplies, although the latter do not appear on maps or in the tables in this report.

PRESENTATION OF DATA

For convenience and utility, this report has been divided into sections, each covering one county, and each county section bound separately. Each county report contains the following material wherever possible.

1. Well Location Map: This map shows the location of all wells and springs within the county, so far as information is now available. These have been plotted in such a manner that artesian and shallow wells can be differentiated readily by the reader. Artesian wells, where they occur, are divided into flowing and pumped. Artesian wells showing decreased flow and those reported as controlled are also indicated by symbols. Shallow wells are differentiated as adequate and inadequate, and dry holes as of 1938 are located. Wells from other sources of information other than questionnaires collected by this survey are shown in blue.

2. Shallow Well Map: This map shows, as accurately as possible, in 50 foot intervals the depths at which shallow supplies are commonly obtained. Where shallow wells are abundant, as indicated by the well location map, the map is as accurate as the information on which it is based, but where such wells are sparsely distributed errors are likely to occur. In many places reports of shallow wells are absent, in which case the area has been left blank.

3. Table of Pumped Wells, from 0 to 200 feet (inclusive) in depth: This table shows minimum, maximum, and average depths of wells within the county, as reported in the questionnaires. Tabulations are by townships. The general character of the water, hard, medium, and soft, as reported by farm-

ers, and the number of wells suitable or unsuitable for drinking are shown in this table. Further, the adequacy of supply, as indicated on the questionnaires, and use for irrigation are shown here.

4. Table of Wells greater in depth than 200 feet: Minimum, maximum, and average depths are indicated. Character, reported as hard, medium or soft is tabulated. Adequacy and use for irrigation are shown as in the preceding table.

5. Table of flowing wells: Minimum, maximum, and average depths are shown together with general character and use for irrigation. The volume of flow as reported, and the number of flowing wells reported as equipped with control valves is also included in this table.

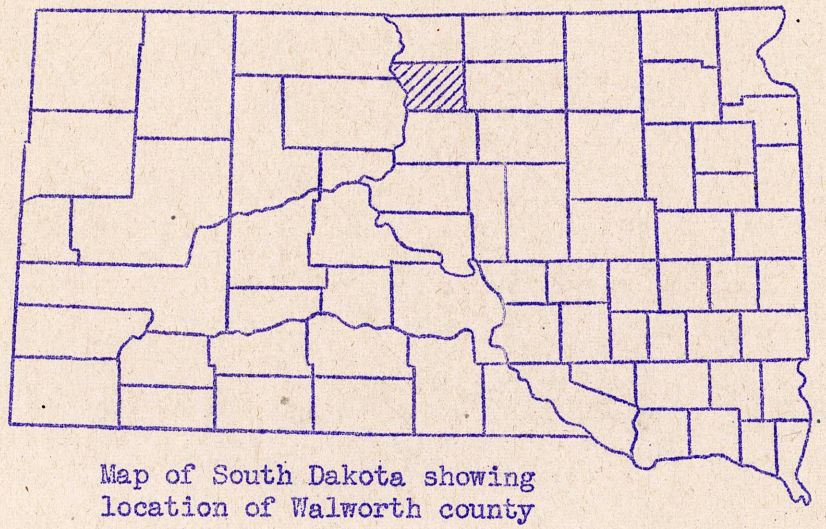
SUMMARY OF STATE SUPPLIES

In the entire state, a total of 48,479 wells were reported in response to questionnaires, returned by 60.1% of the recipients. If those who did not respond have a number of wells in proportion to those who reported, there are approximately 80,000 wells in South Dakota. There are possibly many less than this number since several counties with large numbers of wells returned over 75% of the questionnaires and since many farmers without wells did not reply because they were not requested to do so in the formal questionnaire. Of the wells reported, 16.2% are artesian, including both pumped and flowing wells. Shallow wells are 83.8% of the wells reported. Wells from shallow sources are thus obviously by far the most important means for obtaining water in rural South Dakota.

Important supplementary supplies are cisterns and springs. Roughly, there is more than one cistern to each 40 wells. Many springs are reported, however, in counties with very few wells, so that in some localities they are of considerable importance.

Walworth County

Walworth county lies in the north central part of South Dakota, approximately 23 miles south of the North Dakota boundary and 150 miles west of the Minnesota boundary. It is bounded on the north by Campbell county, on the east by Edmunds county, on the south by Potter county, and on the west by the Missouri river.



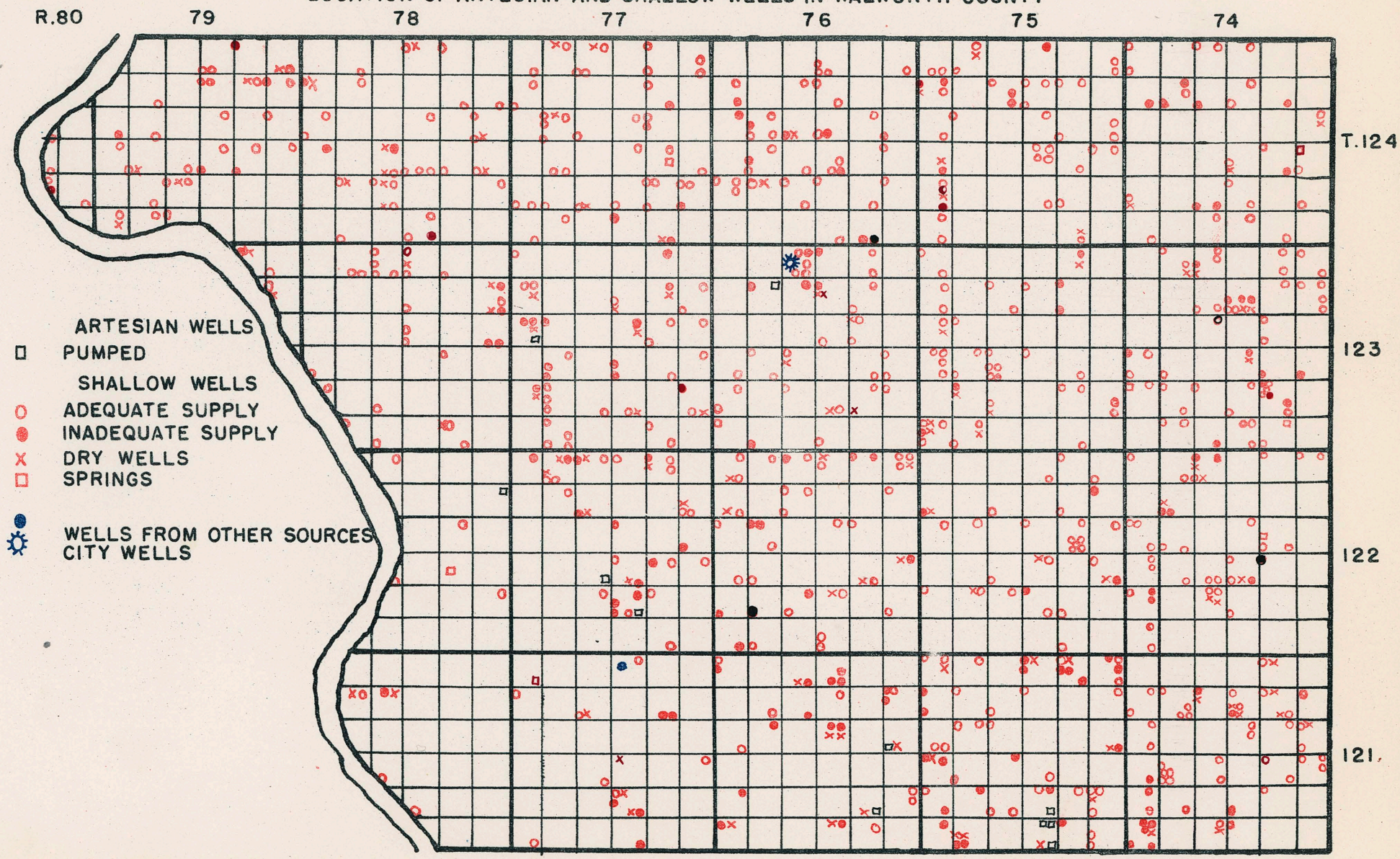
Map of South Dakota showing
location of Walworth county

Walworth is mainly an agricultural county, having an approximate area of 742 square miles, or approximately 474,880 acres. Of this total, 407,935 acres (85.9 per cent)is divided into 755 farm units of approximately 540 acres.There are 238,771 land crop acres, 4,525 pasture plowable acres, and the balance of 164,639 acres is devoted to pasture and other farm uses. The important field crops are wheat, hay, corn, barley, sorghum forage, oats, rye, and flax, these being produced in the order named. Livestock is important; cattle, sheep, and hogs being raised in that order. Dairy products show an increase in production but remain subordinate.*

Farm acreage devoted to livestock and dairy cattle requires generally distributed sources of water supply. The supplies required are not great, but adequate and constant supplies of suitable water at low cost are necessary to operate farms of these sizes and organization profitably. The well location

*South Dakota Agricultural Statistics, Annual Report, 1937

LOCATION OF ARTESIAN AND SHALLOW WELLS IN WALWORTH COUNTY



map of Walworth county indicates that, in general, supplies are available and widely distributed.

On the well location map of Walworth county all flowing and all deep pumped wells obtaining water from the Dakota-Lakota sandstones are shown in black as artesian wells. All other wells are shown in red and are called shallow wells regardless of depth. On all other maps and in tables and text of this report, the term shallow wells applies to all wells 200 feet or less in depth, and those more than 200 feet deep are treated as deep wells, thus including all artesian wells, except those flowing wells 200 feet or less in depth.

Walworth county returned information on 663 wells within the 22 townships with an average of 30.1 wells per township. These figures represented a 77.3 per cent coverage.

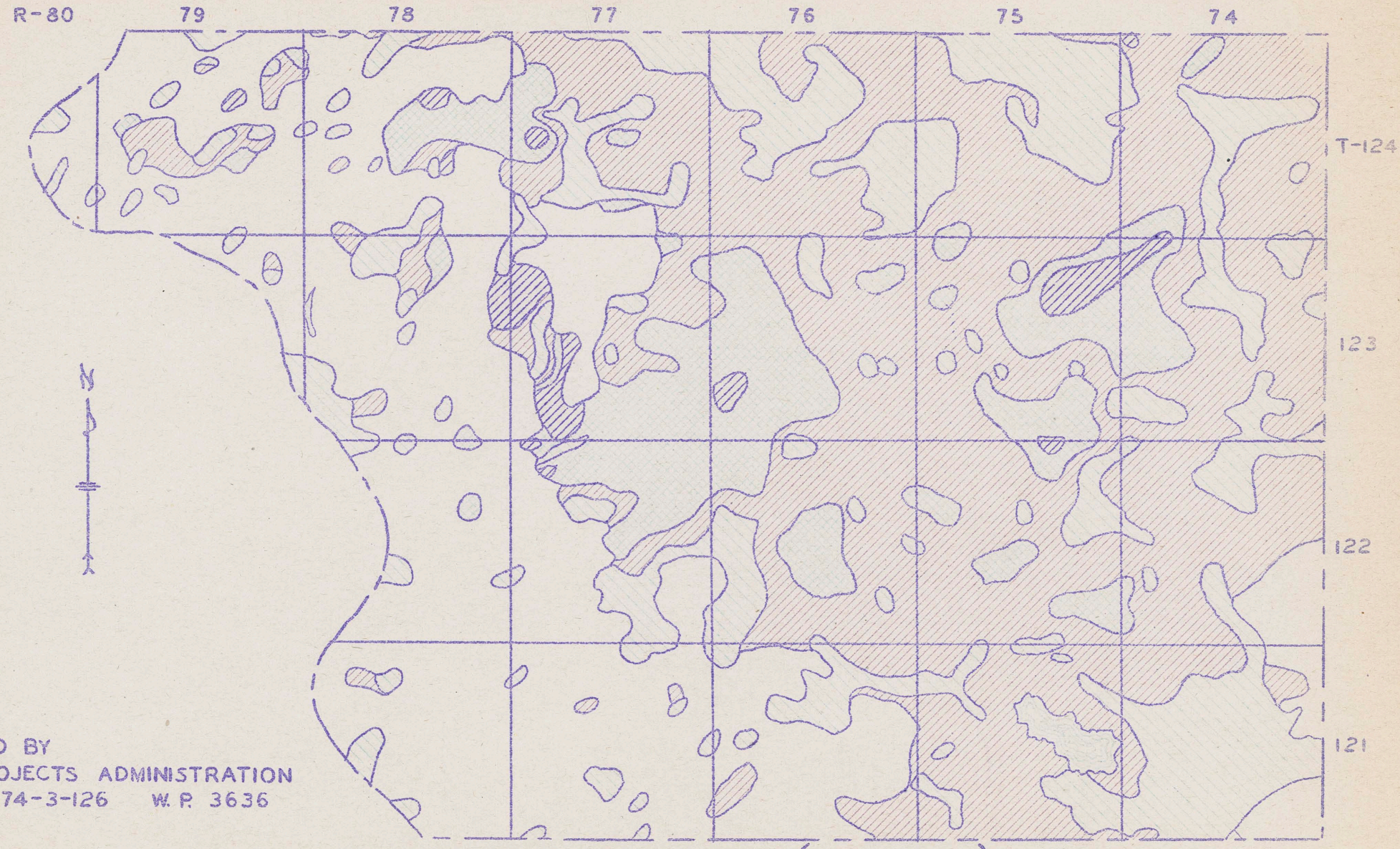
DEPTH AND DISTRIBUTION

Most of the rural water supplies of Walworth county were obtained from wells of shallow depths and were widely distributed over the county.

Shallow wells: Six hundred forty four (97.1 per cent) of the 663 wells reported in the county were shallow wells. Of this number four (.6 per cent) were reported as shallow flowing, with depths from 26 to 61 feet. Of the shallow wells reported, 47.8 per cent were under 50 feet in depth; 33.3 per cent from 50 to 100 feet; 14.1 per cent from 100 to 150 feet; and 4.8 per cent from 150 to 200 feet. Thus, over 80 per cent of all shallow wells reported were less than 100 feet in depth. Following is a tabulation of the number of wells and percentages in each depth range, character of the water, and adequacy within each depth range. Discussion of the character and adequacy of these wells is discussed in pages which follow:

Depth Range	Shallow Wells		Character			Per cent			Adequacy	
	No.	Per cent	H.	M.	S.	H.	M.	S.	No.	Per cent
0-50	306	47.8	102	153	51	33.3	50.	16.7	223	72.5
50-100	213	33.3	105	89	19	49.3	41.8	8.9	158	74.2
100-150	90	14.1	43	39	8	47.8	43.4	8.8	77	85.6
150-200	31	4.8	11	14	6	35.5	45.1	19.4	21	67.7
	640	100.	261	295	84	41.4	45.5	13.1	479	75.

WALWORTH COUNTY



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SHALLOW WELLS (0-200 FT.)

DEPTHS AT WHICH SUPPLIES ARE COMMONLY OBTAINED

MILES
0 2 4 6

0-50 FT. 50-100 FT. 100-150 FT. 150-200 FT. LAKE

In 13 townships of the county, all wells were reported shallow. These have been listed below:

Twp.	Rge.
121N	77W
121	78
122	74
122	75

Twp.	Rge.
122N	76W
123	74
123	75
123	79

Twp.	Rge.
124N	74W
124	75
124	76
124	77
124	80

The shallow well map outlines the areas in which wells of the above depths were reported and shows also the possibility of obtaining supplies at these depths.

Deep wells: Nineteen (2.9 per cent of total wells reported) were deep pumped wells. No deep flowing wells were reported. (See table 2 for distribution and depths). Of the 19 deep pumped wells reported, 11 were artesian wells drawing their supply from the Dakota or other sandstones. Township 121N., Rge. 75W., reported the greatest number (4) of artesian wells. These wells vary in depth from 1680 feet to 2000 feet. The number and variations in depth as reported from various localities, are included in the table which follows:

Twp.	Rge.	Number of Wells	Depths Min.	Depths Max.	Twp.	Rge.	Number of Wells	Depths Min.	Depths Max.
121N	75W	4	1700	1870	122N	78W	1	1680	1680
121	76	2	1695	1800	123	76	1	1800	1800
122	77	2	1800	1990	123	77	1	2000	2000

Eight of the deep wells were classified as deep pumped wells drawing their supply from above the Dakota sandstones. These wells are tabulated below showing number of wells and minimum and maximum depths. Variation in depth is from 207 feet (Twp. 124N., Rge. 78W.), to 327 feet (Twp. 121N., Rge. 75W.).

Twp.	Rge.	Number of Wells	Depths Min.	Depths Max.
121N	74W	1	300	300
121	75	1	327	327
123	76	1	275	275
123	78	1	216	216
124	78	1	207	207
124	79	3	224	256

CHARACTER OF WELL WATERS

In order to determine the character of water in the county, users were

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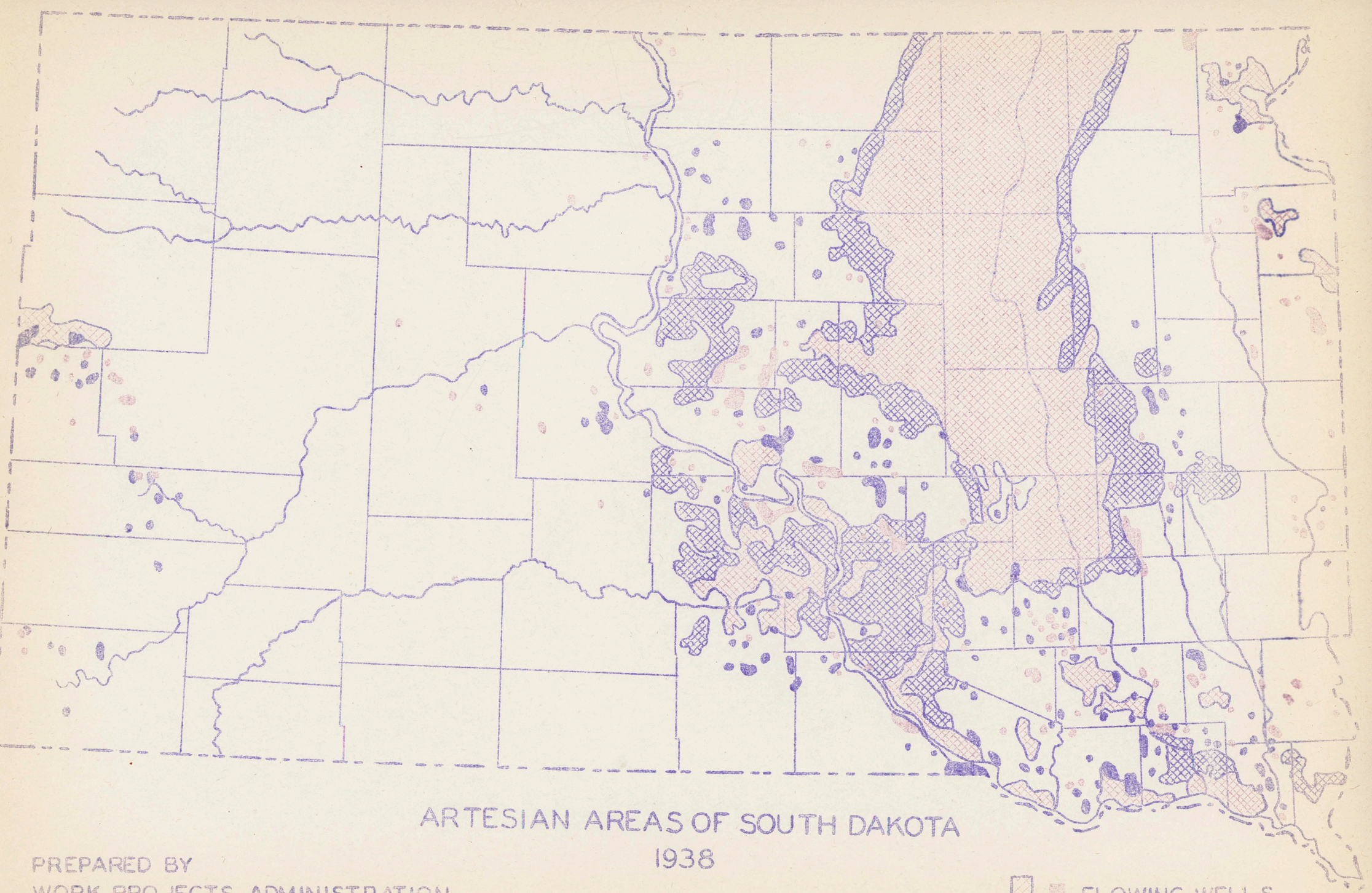
PUMPED WELLS


ARTESIAN AREAS OF SOUTH DAKOTA
1938
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W.P.3636
FLOWING WELLS
PUMPED ARTESIAN WELLS

asked to indicate whether they considered their supplies to be hard, moderately hard, or soft. Use is probably a fairly good criterion of character in the absence of accurate chemical analyses.

Of the 640 shallow wells reported, 41.4 per cent produced hard water; 45.5 per cent moderately hard; and 13.9 per cent soft. Thus, approximately 86 per cent of the shallow rural wells reported in the county were considered definitely or moderately hard. All of the townships reported their shallow well supplies as 80 per cent hard to moderately hard, except Twp. 123N., Rge. 78W., reporting 47.8 per cent of its shallow wells as soft, the highest percentage of soft water wells in the county; Twp. 122N., Rge. 78W., reported 25 per cent; Twp. 123N., Rge. 70W., 33.3 per cent; and two townships, Twp. 122N., Rge. 76W. and Twp. 123N., Rge. 74W., reported approximately 20 per cent soft. Three townships, Twp. 121N., Rge. 76W., Twp. 121N., Rge. 78W., and Twp. 124N., Rge. 80W., reported no soft water shallow wells. Township 123N., Rge. 78W., reported three of its wells unsuitable with an average of 79 feet in depth. Township 123N., Rge. 77W., reported one well at 160 feet in depth and Twp. 124N., Rge. 78W., reported one well at the 75 foot depth, indicating soft water wells may be unsuitable at these depths. All other unsuitable drinking waters obtained from soft water shallow wells ranged from 14 feet to 47 feet in depth. The following tabulation shows the percentage and number of soft shallow wells, depth, suitability, and adequacy in the county:

Twp.	Rge.	Number Soft	Per cent All Shallow	Average Depth (feet)	Unsuitable Water	Depth (feet)	Inadq. Soft Water Wells
121N	74W	3	6.7	51	1	14	1
121	75	6	13.0	37	1	20	1
121	76	0	.0	0	-	-	-
121	77	1	8.3	78	-	-	-
121	78	0	.0	0	-	-	-
122	74	3	8.8	70	1	47	-
122	75	3	10.7	42	-	-	-
122	76	7	20.	44	-	-	3
122	77	4	14.3	34	1	40	2
122	78	1	25.0	16	-	-	-
123	74	10	20.9	23	1	15	4

(continued)

Twp.	Rge.	Number Soft	Per cent of All Shallow	Average Depth (feet)	Unsuitable Water	Depth (feet)	Inadq. Soft Water Wells
123N	75W	4	10.5	56	1	45	-
123	76	4	12.9	92.	-	-	-
123	77	3	8.3	98	1	160	-
123	78	11	47.8	67	3	79	2
123	79	1	33.3	115	-	-	-
124	74	5	17.9	40	-	-	5
124	75	2	12.9	13	-	-	-
124	76	5	13.2	34	-	-	1
124	77	6	14.6	68	-	-	1
124	78	2	7.7	46	1	75	1
124	79	3	12.5	33	-	-	-
124	80	0	.0	0	-	-	-
Totals		84	Avg. 13.1	Avg. 53	11	Avg. 59	21

Of the 454 shallow wells reported as hard or moderately hard, all wells appeared at all depths down to 200 feet and were not confined to any particular locality. Hard water wells unsuitable for drinking were likewise scattered over the county except in the following townships which reported no wells unsuitable for drinking.

Twp.	Rge.	Twp.	Rge.
121N	78W	123N	79W
122	78	124	80

Three of the shallow flowing wells were reported moderately hard and one well in Twp. 124N., Rge. 76W., as soft.One such well in Twp. 122N., Rge. 74W., was reported as unsuitable for drinking.

Three of the deep wells were reported hard and four as moderately hard. Thus, 7 of the deep wells produced definitely or moderately hard water. Ten (58.8 per cent of deep wells reported) were classified as soft. Data does not permit assignment of various characters of water to depth since some are soft at 1800 feet and others classed as definitely or moderately hard at this same depth. One well 216 feet in depth in Twp. 123N., Rge. 78W., reported soft water; another 2000 feet deep in Twp. 123N., Rge. 77W., also reported soft, while each of the three wells in Twp. 124N., Rge. 79W., (at the same depths) reported one well hard, one moderately hard, and one soft. Ten of the nineteen deep pumped wells were unsuitable for drinking due, perhaps, to the chemical

content of the waters.

ADEQUACY OF WELL WATERS

Supplies were reported mostly adequate for current needs in the county. Needs vary, however, and supplies, especially shallow wells, may prove inadequate during dry cycles in this or surrounding land areas.

Of the shallow wells reported, approximately 25 per cent were considered inadequate for present needs.(See table 1 for distribution by townships). All of the shallow flowing wells were adequate.Inadequate supplies of shallow well water were greatest in Twp. 124N.,Rge. 74W.,where all such wells were reported inadequate.Township 123N., Rge. 74W., reported four of the shallow wells inadequate.

Other townships in the county showed no noticeable ratio of inadequacy to number of wells reported (see table on page 16 of this report). Inadequacy in some cases is probably due to lack of repair of casing and well curbs and not to actual water shortage, since several wells were reported inadequate and in poor repair.

Reports on adequacy of deep pumped well waters were incomplete but two of them reported inadequacy at approximately 2000 foot depths. Adequacy as well as suitability of supplies at depths of more than 1800 feet seems doubtful.

DRY HOLES

There were 110 dry holes reported in the county with an average depth of 100 feet. A complete tabulation follows showing location, number and depth of wells reported, and remarks from questionnaires inserted for information on the material and nature of the holes reported. This table shows three townships reporting nine dry holes as the largest number (Twp. 121N., Rge. 74W., Twp. 121N., Rge. 75W., Twp. 124N., Rge. 78W.) and three townships with two dry

holes as the smallest number reported (Twp. 121N., Rge. 78W., Twp. 123N., Rge. 79W., Twp. 124N., Rge. 76W.). The deepest dry hole was reported in Twp. 123N., Rge. 79W., (350 feet), and the shallowest in Twp. 124N., Rge. 76W., (18 feet).

Twp.	Rge.	Number Reported	Average Depth	Twp.	Rge.	Number Reported	Average Depth
121N	74W	9	48	123N	76W	6	250
121	75	9	40	123	77	7	159
121	76	7	39	123	78	4	150
121	77	4	55	123	79	2	350
121	78	2	130	124	74	3	61
122	74	6	48	124	75	4	49
122	75	4	120	124	76	2	18
122	76	7	65	124	77	4	86
122	77	7	100	124	78	9	106
122	78	None	None	124	79	5	60
123	74	3	80	124	80	None	None
123	75	6	90	Total		110	Avg. 100

IRRIGATION

A total of 126 shallow wells was reported used for irrigation of 36 3/4 acres in plots varying in size from 1/8 to 5 acres. One shallow flowing well was used to irrigate 1/4 acre with a volume of 12 gallons per minute, (see table 3). Two deep pumped wells were used to irrigate 1/2 acre in 1/4 acre plots.

SUPPLEMENTARY SUPPLIES

Six springs reported in the county were an important source of supplementary supplies. Township 123N., Rge. 74W., reported two springs with one each in the four townships listed below with character, suitability, and adequacy of the water. The character of five springs was reported, with two reported moderately hard and three soft. All springs were reported to be suitable for drinking purposes, and all were reported adequate. The six springs are tabulated as follows:

Twp.	Rge.	Number of Springs	Character Med.	Character Soft	Number Suitable	Number Adequate
121N	77W	1	-	-	1	1
122	78	1	1	-	1	1
123	74	2	-	2	2	2
124	74	1	-	1	1	1
124	77	1	1	-	1	1
Totals		6	2	3	6	6

Cisterns were reported to be used extensively to supplement inadequate well supplies for drinking purposes, or as a substitute for hard water supplies for laundry purposes. This latter use is the most important use of cisterns in the state where well supplies are hard. Of the total cisterns reported, 161 were supplied by rain, and water was hauled to 30. About 22.5 per cent (41) were used for cooking and drinking, with 94.5 per cent (172) being used for laundry.

WALWORTH COUNTY

Table 1.

DATA ON PUMPED WELLS FROM 0 TO 200 FEET (INCL.) IN DEPTH

LOCATION		Number of Wells	DEPTH OF WELLS			CHARACTER OF WATER					ADEQUACY OF SUPPLY			
Twp	Rge		Min.	Max.	Ave.	Hard	Med.	Soft	Corroded Casing	Unsuitable for Drinking	Adequate	Inade-quate	Number used for Irrigation	Approximate Acres Irrigated
121	74	45	9	90	32	14	28	3	7	7	35	10	20	5
121	75	46	7	126	57	19	21	6	12	10	25	21	8	2 3/8
121	76	22	12	96	38	13	9	-	9	4	8	14	3	5/8
121	77	12	5	78	29	7	4	1	2	3	7	5	-	-
121	78	4	28	59	37	-	4	-	1	-	3	1	-	-
122	74	34	14	130	57	14	17	3	8	9	27	7	7	2 1/2
122	75	28	16	160	73	6	19	3	4	3	24	4	9	1 5/8
122	76	35	10	150	67	19	9	7	16	6	26	9	7	1 7/8
122	77	28	8	160	78	13	11	4	11	10	16	12	5	1
122	78	4	16	68	40	3	-	1	-	-	4	-	-	-
123	74	48	7	185	51	11	27	10	5	3	37	11	15	3 1/8
123	75	38	36	165	84	22	12	4	15	4	33	5	12	2 3/4
123	76	31	16	165	89	13	14	4	6	5	25	6	7	2 1/8
123	77	36	9	200	99	26	7	3	11	9	24	12	3	1/2
123	78	23	20	182	58	5	7	11	6	5	19	4	1	1/8
123	79	3	22	115	67	-	2	1	-	-	2	1	-	-
124	74	28	9	180	62	6	17	5	5	5	20	8	5	2 1/8
124	75	39	5	108	40	20	17	2	8	5	32	7	5	1 1/8
124	76	38	4	90	46	13	20	5	8	3	29	9	10	2 3/4
124	77	41	10	200	54	15	20	6	7	7	36	5	6	5 5/8
124	78	27	12	180	74	9	15	2	9	8	23	4	1	1/4
124	79	25	10	152	57	16	5	3	7	4	20	5	2	1 1/4
124	80	5	20	99	52	-	5	-	-	-	4	1	-	-
Total		640				264	290	84	157	110	479	161	126	36 3/4

WALWORTH COUNTY

Table 2.

DATA ON PUMPED WELLS OVER 200 FEET IN DEPTH

LOCATION		Number of Wells	DEPTH OF WELLS			CHARACTER OF WATER					ADEQUACY OF SUPPLY			
Twp.	Rge.		Min.	Max.	Ave.	Hard	Med.	Soft	Corroded Casing	Unsuitable for Drinking	Adequate	Inade-quate	Number used for Irrigation	Approximate Acres Irrigated
121	74	1	300	300	300	-	1	-	-	1	1	-	-	-
121	75	5	327	1870	1499	1	-	4	2	1	5	-	1	1/4
121	76	2	1695	1800	1748	-	-	2	-	1	2	-	-	-
122	77	2	1800	1990	1895	-	-	1	2	2	1	1	-	-
122	78	1	1680	1680	1680	-	1	-	1	1	1	-	-	-
123	76	2	275	1800	1036	1	-	-	1	1	2	-	-	-
123	77	1	2000	2000	2000	-	-	1	-	-	-	1	-	-
123	78	1	216	216	216	-	-	1	-	-	1	-	-	-
124	78	1	207	207	207	-	1	-	1	1	1	-	-	-
124	79	3	224	256	237	1	1	1	2	2	3	-	1	1/4
Total		19				3	4	10	9	10	17	2	2	1/2

NOTE: No wells in this group were reported for the following townships and ranges: T.121 R.77, 78; T.122 R.74, 75, 76; T.123 R.74, 75, 79; T.124 R.74, 75, 76, 77, 80.

WALWORTH COUNTY
Table 3.
DATA ON FLOWING WELLS

LOCATION		Number of wells	DEPTH OF WELLS			CHARACTER OF WATER					ADEQUACY OF SUPPLY					
Twp.	Rge.		Min.	Mas.	Ave.	Hard	Med.	Soft	Corroded Casing	Unsuitable for Drinking	Adequate	Inadequate	Number used for Irrigation	Approx. Acres Irrigated	Ave. Gallon Per min.	Number Controlled
122	74	1	50	50	50	-	1	-	-	1	1	-	-	-	-	-
122	76	1	30	30	30	-	1	-	-	-	1	-	1	1/4	12	-
123	74	1	61	61	61	-	1	-	-	-	1	-	-	-	-	-
124	76	1	26	26	26	-	-	1	-	-	1	-	-	-	-	-
Total		4					3	1		1	4		1	1/4		

NOTE: No wells in this group were reported in the following townships: T.121 R.74, 75, 76, 77, 78; T.122 R.75, 77, 78; T.123 R.75, 76, 77, 78, 79; T.124 R.74, 75, 77, 78, 79, 80.

Walworth County Well Notes

The following are pertinent remarks quoted from questionnaires returned by farmers and are included opinions of the water situation as expressed by the individual farmers and must be so applied.

Twp. 121N., Rge. 74W. SW 1/4 Sec. 10	65 feet: "Difficulties account rock and coarse gravel."
Twp. 121N., Rge. 74W. NE 1/4 Sec. 31	30 feet: "Difficulty in construction on account shale too close to surface."
Twp. 121N., Rge. 74W. SE 1/4 Sec. 31	90 feet: "There are 4 wells on this farm. Not any supply enough water. Water is found most places at 12 to 20 ft."
Twp. 121N., Rge. 76W. NW 1/4 Sec. 31	70 feet: "I have had great difficulties trying to get water on or near my farm. I have made many holes, all dry or only a very little water in them. I have to go down 70 or more feet for any water at all. There is shale then and you can't get thro' it with a boring outfit. I think a person could make a tubular or artesian well."
Twp. 121N., Rge. 77W. SE 1/4 Sec. 34	16 feet: "It is very hard digging wells on my place. Water is hard to locate. 3 feet from the top I strike shale and it makes it hard to dig."
Twp. 122N., Rge. 76W. SW 1/4 Sec. 28	56 feet: "Water is oily."
Twp. 122N., Rge. 77W. SE 1/4 Sec. 21	1990 feet: (artesian) "Slight amount of oil on surface. When well was new 30 years ago there was gas, but that ceased when well stopped flowing a year after constructed."
Twp. 122N., Rge. 77W. SW 1/4 Sec. 27	14 feet: "Water tastes salty."
Twp. 123N., Rge. 74W. NE 1/4 Sec. 22	15 feet: "When wind blows from the north west we can't use the water for drinking or cooking because it gets so dirty and smells awful."
Twp. 123N., Rge. 78W. SE 1/4 Sec. 12	160 feet: "It is difficult to strike water on my farm. I go down deep and hit shale. Have to go 160 ft. or more to strike water."
Twp. 124N., Rge. 75W. SE 1/4 Sec. 19	32 feet: "Difficulty of construction is account of shale about 30 ft. down, stopping going down deeper."

Twp. 124N., Rge. 77W NW 1/4 Sec. 34	135 feet: "Well has natural gas and water tastes salty."
Twp. 124N., Rge. 78W. NE 1/4 Sec. 18	30 feet: "Well had pocket of oil in shale."
Twp. 124N., Rge. 79W. SW 1/4 Sec. 3	125 feet: "The water from this well comes out of a coal vein and is oily. Fine for stock purposes."

EXTENSION SERVICE

SOUTH DAKOTA STATE COLLEGE

of Agriculture and Mechanic Arts

Brookings, South Dakota

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