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Rural Water Supplies in South Dakota : Codington County

Walter V. Searigh

Cooperative Extension Service, South Dakota State College

Elmer E. Meleen

Cooperative Extension Service, South Dakota State College

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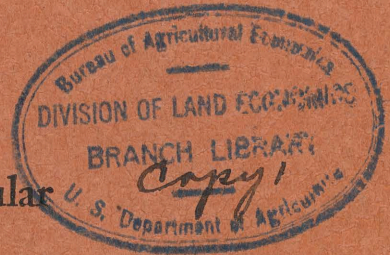
EXTENSION SERVICE FILE

Rural Water Supplies in South Dakota

Codington County

January, 1940

Special Extension Circular
Number 47



Extension Service
South Dakota State College
Brookings, S. D.

630.732
5087.18
NO. 47
pt. 14

RURAL WATER SUPPLIES
IN
SOUTH DAKOTA
CODINGTON COUNTY

BY
WALTER V. SEARIGHT
AND
ELMER E. MELEEN

PREPARED BY THE WORK PROJECTS ADMINISTRATION
AS A REPORT ON THE WELL SURVEY CONDUCTED
AS WORK PROJECTS ADMINISTRATION OFFICIAL PROJ-
ECT 665-74-3-126; SPONSORED BY THE EXTENSION
SERVICE AND THE EXPERIMENT STATION SOUTH DAK-
OTA 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,

Acknowledgements - 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.

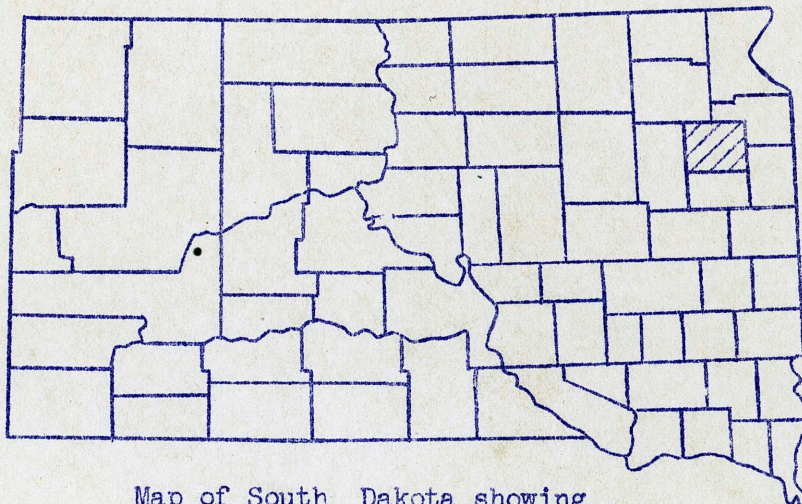
SUMMARY OF STATE SUPPLIES

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 33.8% 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.

Codington County

Codington county is in the northeastern part of South Dakota about 50 miles south of the northern boundary of the state and approximately 20 miles west of the eastern boundary. It is bounded on the north by Day and Grant counties, on the east by Grant and Deuel counties, on the south by Hamlin county, and on the west by Clark county. The area is approximately 715 square miles.



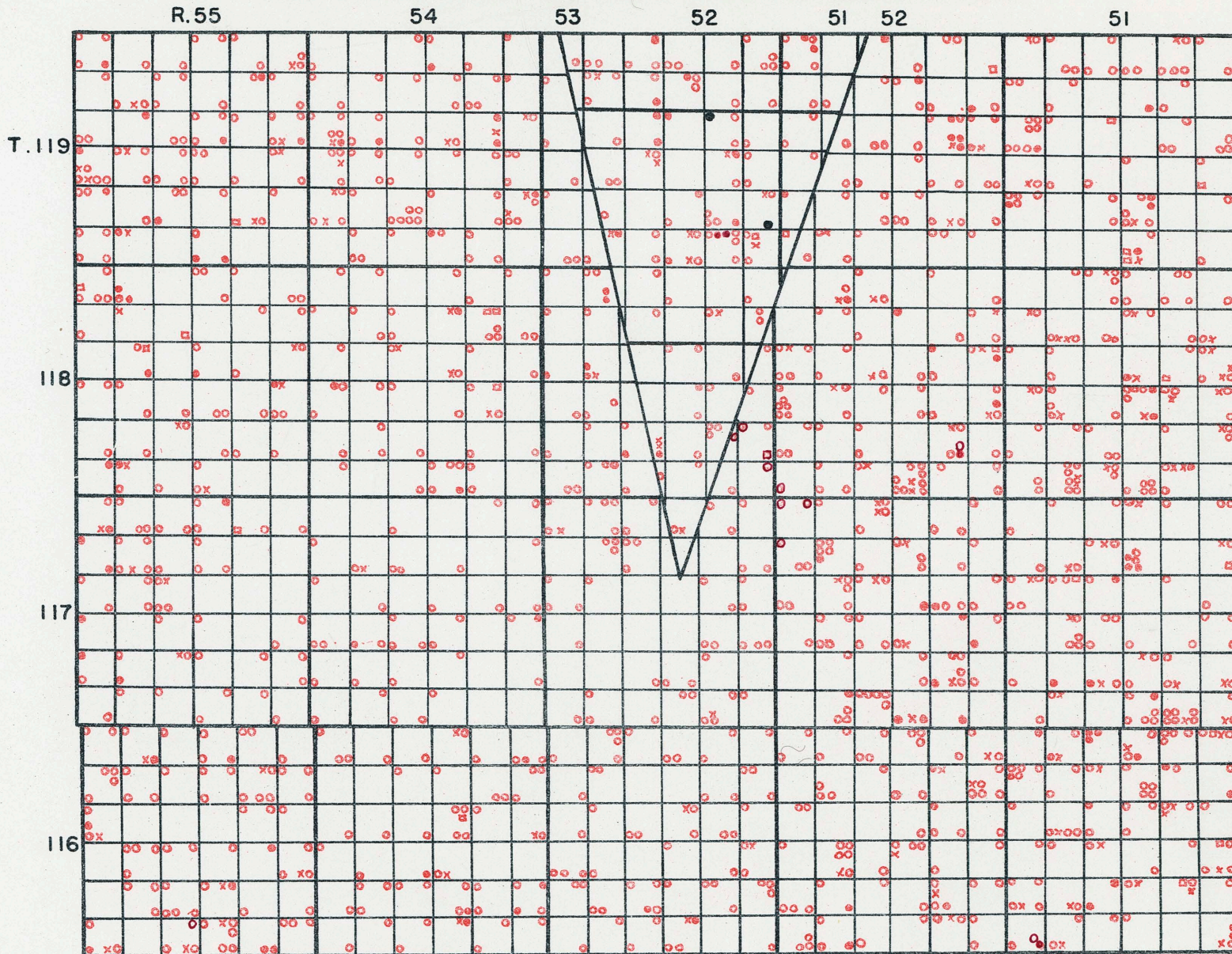
Map of South Dakota showing location of Codington county

Agriculture is the chief industry of the county, with 87.9 per cent of the total 448,640 acres in farms. The farm area is divided into 1300 farm units of an average of 345 acres in each farm unit. Wheat, corn, oats, rye, hay, potatoes, barley and flax are the important field crops, the first five being produced in the order named. Livestock is also important, cattle, horses and mules, sheep and hogs being produced in the order named. Dairy products are important but subordinate.*

In an agricultural area such as Codington county, divided into small farm units and where livestock is important, particularly hogs and dairy cattle, generally distributed sources of water supply are essential. Supplies required are not great, but adequate and constant supplies of suitable water at relatively low cost are necessary to operate farms of these sizes and or-

*South Dakota Agricultural Statistics, Annual Report, 1937

LOCATION OF ARTESIAN AND SHALLOW WELLS IN CODINGTON COUNTY



ARTESIAN WELLS

● FLOWING WELLS—STEADY OR INCREASING

SHALLOW WELLS

- ADEQUATE SUPPLY
- INADEQUATE SUPPLY
- X DRY WELLS
- SPRINGS

ganization profitably. The well location map of Codington county indicates that, in general, water supplies are available and are widely distributed.

On the well location map, all flowing wells and 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 included with shallow wells, regardless of depth. On all other maps, in all tables, and in the text of this report, all wells 200 feet or less in depth are shallow wells and all wells more than 200 feet deep are deep wells, unless otherwise stated. Thus, most of the artesian wells are included with deep wells except flowing wells 200 feet or less.

DEPTH AND DISTRIBUTION

Wells of Codington county are generally distributed over the area (well location map) and most of them are shallow. Replies to questionnaires were 81.4 per cent of those sent out and report a total of 1192 wells and 60 reported no wells. All townships in the county reported one or more wells for each section except T.119N., R.51W., including only about two square miles with but one well. Ten townships in the county reported an average of two wells per square mile (see well location map and tables 1 and 2).

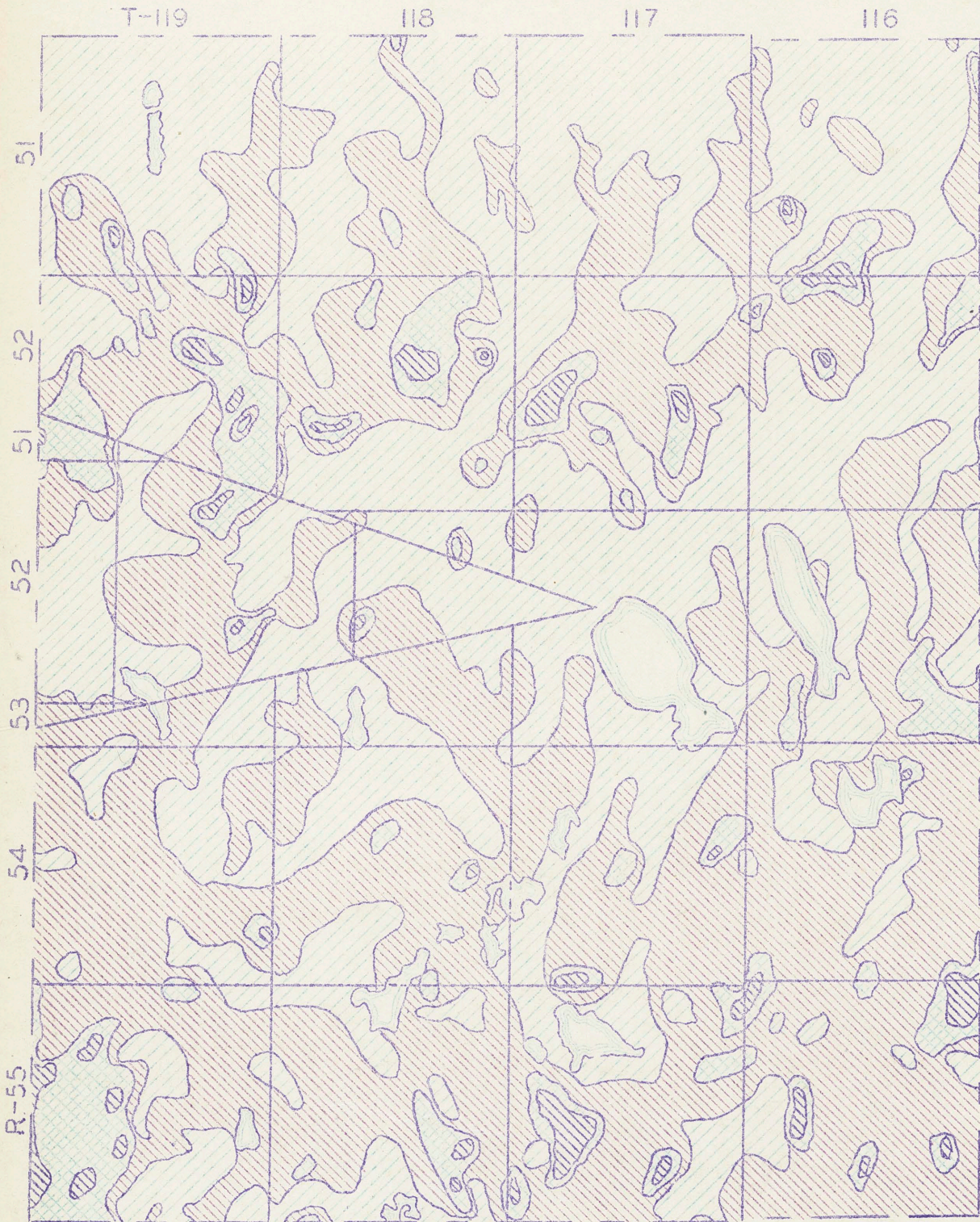
Codington county wells derive most of their supplies from shallow sources. Out of a total of 1192 wells reported 1046 were 200 feet or less in depth. Thus, 87.9 per cent of the wells reported were shallow, suggesting that possibly 88. per cent of all of the wells of the county, including those on which reports were not made, are shallow wells.

In nine townships 90 per cent or more (average 95 per cent) of the wells reported were shallow. These are tabulated together with the percentage of shallow wells in the table which follows:

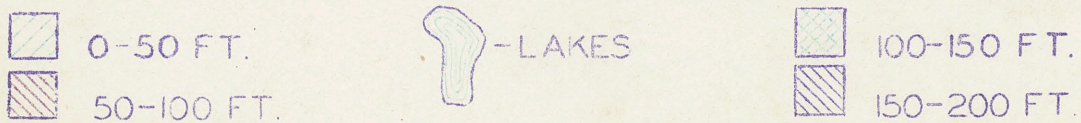
T.119N., R.54W. - 98.5%	T.117N., R.54W. - 97.2%	T.118N., R.55W. - 93.3%
118 54 - 97.7%	118 53 - 96.7%	116 54 - 92.4%
119 55 - 97.3%	119Res. 52 - 93.7%	119 51 - 91.6%

CODINGTON COUNTY

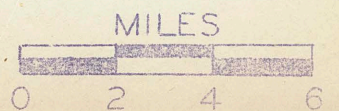
SHALLOW WELLS (0-200 FT.)



DEPTHS AT WHICH SUPPLIES ARE COMMONLY OBTAINED



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 O.P. 665-74--3-126 W.P. 3636



In an additional ten townships 80 to 90 per cent of all wells were reported (average 85 per cent) shallow. These townships together with percentages of shallow wells are tabulated as follows:

Twp.	Rge.	Percent	Twp.	Rge.	Percent	Twp.	Rge.	Percent
116N	53W	89.8	117N	53W	85.1	116N	51W	83.
119	52	87.3	118	52	84.8	117	52	82.6
118	51	86.1	117	55	84.	116	52	82.3
			118	52Res.	85.7			

A small area comprised in the partial townships, T.119N., R.53W., T.120N. R.52W., Res., and T.120N., R.53W., Res., reported all shallow wells. Two townships, T.120N., R.51W. and T.116N., R.65W., reported 78.2 and 68.5 per cent of the wells to be shallow.

Apparently more than four fifths of the shallow wells of Codington county are 100 feet deep, or less. Nearly half, 45.4 per cent, were reported 50 feet or less in depth and 36.3 per cent from 50 to 100 feet, a total of 81.7 per cent. Deeper shallow wells were reported to make up 10.3 per cent from 100 to 150 feet and 8.0 per cent from 150 to 200 feet deep. These data show clearly the tendency of wells to decrease in number with depth.

The shallow well map outlines areas of shallow wells of various depths by 50 foot depth intervals. This map may be used to predict future wells. Accuracy of prediction depends on the abundance of present wells reported and on future changes in the ground water table.

Deep wells, 200 feet or more in depth, are important in Codington county although they make up only 12.1 per cent of the wells reported. A total of 144 deep wells was reported. These wells have been tabulated by township, number in each township, percentage of total wells, and minimum and maximum depth. These are listed in the table which follows:

Location		Number of Wells	Per cent of Total Wells	Depths	
Twp.	Rge.			Min.	Max.
116N.	51W.	12	17.	232	609
116	52	12	17.7	205	640
116	53	6	10.2	230	455
116	54	4	7.5	232	573
116	55	23	31.5	205	560
117	51	14	21.8	210	550
117	52	12	17.4	216	600
117	53	7	14.9	250	480
117	54	1	2.8	450	
117	55	8	16.	240	420
118	51	10	13.9	245	480
118	52	10	15.2	240	450
118	53	1	3.3	376	
118	54	1	2.3	519	
118	55	3	6.7	212	400
119	51	5	8.4	250	476
119	52	6	12.7	216	295
119	54	1	1.5	210	
119	55	2	2.7	208	406
*118	52	2	14.3	385	500
*119	52	3	6.3	250	380
*120	51	1	100.	225	

*Reservation

Deep wells vary between 1.5 per cent and 100 per cent in these townships. It should be noted that several of these townships are small. Variations in depth from 205 to 640 feet occur in the reports.

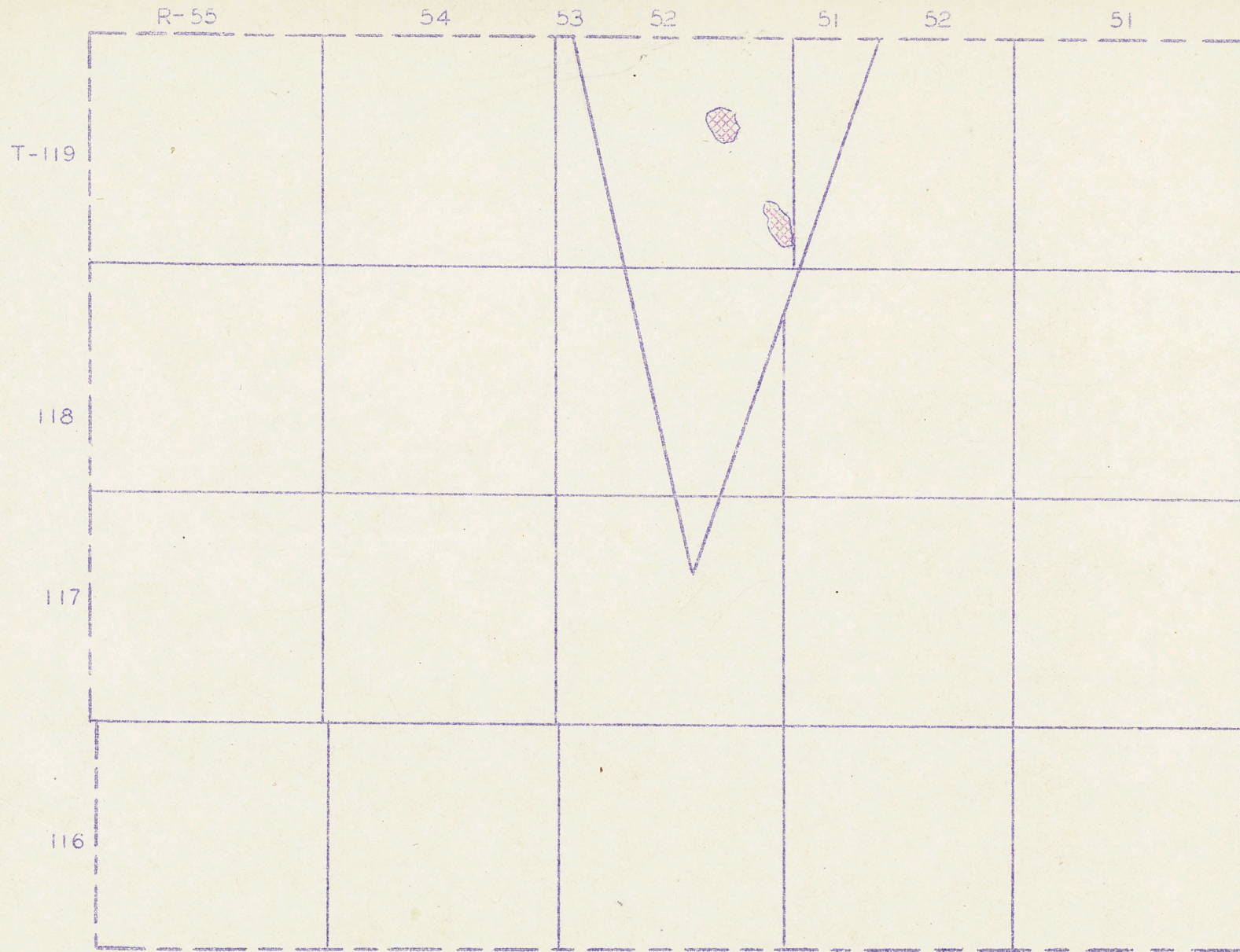
Flowing wells: Only two flowing wells are reported and these are shallow wells of 104 and 128 feet, respectively, in depth. They were both reported from T.119N., R.52W.

CHARACTER OF WELL WATERS

The character of the well waters of Codington has been determined from reports by users. Farmers were asked in questionnaires whether the supply used was considered to be hard, moderately hard, or soft, and whether it was suitable for drinking. Although chemical analysis is the most satisfactory means of determining character and quality of waters, such data is rarely in the hands of farm users. Accurate and detailed data on quality must await adequate laboratory analyses.

Most of the shallow waters of Codington county are moderately to defin-

ARTESIAN AREAS 1938

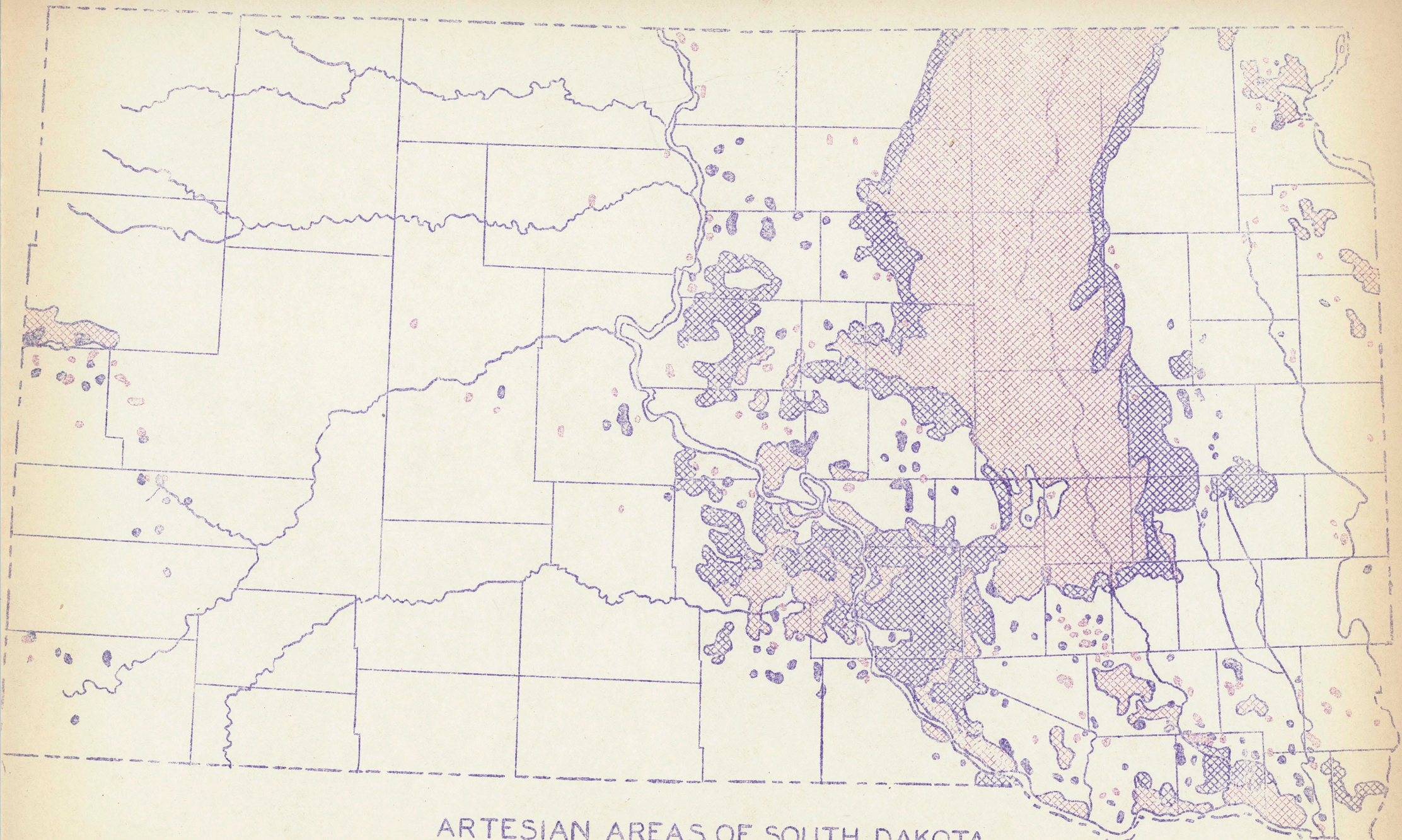


CODINGTON COUNTY







FLOWING WELLS

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ARTESIAN AREAS OF SOUTH DAKOTA
1938

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WP 3636

-   FLOWING WELLS
-   PUMPED ARTESIAN WELLS

itely hard as indicated by reports. Users considered 48.2 per cent hard and 46.6 per cent moderately hard. Thus, 94.8 per cent of the shallow wells were reported to be moderately to definitely hard, and only 5.2 per cent soft. Two shallow flowing wells in T.119N., R.52W., Res., are reported to be moderately hard. A definite tendency toward increase in hardness with depth is indicated by reports. This trend is indicated by the following table which shows that no shallow wells deeper than 100 feet were reported to be soft. The possibility of producing soft water below 50 feet is remote. The depths of shallow wells are tabulated in 50 foot depth groups, together with percentage reports on hardness and percentage of unsuitable supplies

Depths	Percent Hard	Percent Medium	Per cent Soft	Unsuitable Drinking
0-50 feet	30.	60.	10	2.5
50-100 "	60.4	37.4	2.2	12.7
100-150"	72.5	27.5	0.	5.5
150-200"	62.2	37.8	0.	6.1
(incl.)				

Most of the shallow water is satisfactory for drinking purposes in spite of hardness. Seventy one wells, or 6.8 per cent of the total, were reported unsatisfactory. The reasons for unsuitable character are not known, but contamination is responsible in many cases. There is the possibility also that unpalatable or obnoxious chemical compounds occur in the waters of some wells. These can be determined only by chemical analysis.

More deep pumped wells appear to be hard than shallow wells. Of 142 reported, 74.7 per cent were hard and 25.3 per cent were considered moderately hard. These data indicate again the marked tendency for hardness to increase with depth of source in Codington county. Sixteen wells, or 11.3 per cent were reported to produce water unsatisfactory for drinking. The fact that this percentage is nearly twice that of shallow wells suggests that in Codington county many wells are unsatisfactory for drinking because of objectionable chemical compounds, since, on the whole, pollution is likely to decrease with depth.

The flowing wells, two reported, were reported to be moderately hard.

ADEQUACY OF SUPPLY

In order to determine the adequacy of the rural water supplies of Codrington county, users were asked whether supplies were adequate for current needs. Obviously changes in needs due to changes in land use and farm organization or variations in supply at the source cannot be predicted. In this and surrounding areas, inadequacy will doubtless increase with dry periods, particularly in supplies derived from shallow sources.

Shallow water supplies are adequate for the most part in Codrington county. Of all the wells reported, 12.5 per cent did not supply sufficient water for current farm use. (See table 1). Inadequate wells are about twice as common among shallow as for deep wells, of which only 6.3 per cent are reported to be inadequate. Inadequate shallow wells are not restricted to any part of the county, but inadequate deep wells are restricted to the southern half of the county,

The flowing wells were reported to be adequate. They flow one and four gallons per minute respectively.

IRRIGATION

Well waters are used to irrigate small garden plots in Codrington county. Forty eight shallow wells were used to irrigate a total of $15 \frac{3}{8}$ acres in plots varying from $\frac{1}{8}$ acre to two acres in size. Fourteen deep wells were used to irrigate a total of three acres, in small plots. One flowing well was used to irrigate a $\frac{1}{2}$ acre plot.

DRY HOLES

Dry holes occur in most townships. Greater number occur in the east central part of the county; a total of 145 dry holes, 129 of which range in depth from 6 to 330 feet. More than two thirds, 68 per cent, were 50 feet or

less in depth. Twenty one per cent were 50 to 100 feet deep and 11 per cent range between 100 and 330 feet.

SUPPLEMENTARY WATER SUPPLIES

Springs are of some importance as supplementary supplies and cisterns are very important in Codington county.

A total of 24 springs was reported to be distributed over the county. These have been tabulated by township as percentages of wells and springs to show their relative importance in the following table:

Location		Springs	Per cent Springs	Number Wells & Springs
Twp.	Rge.			
116N.	51W.	3	4.	74
116	54	1	1.9	54
117	51	2	3.	66
117	55	1	2.	51
118	51	1	1.4	73
118	52	1	1.5	67
118	53	1	3.2	31
118	54	3	6.4	47
118	55	3	6.3	48
119	51	4	6.4	63
119	52	1	2.1	48
119	55	1	1.4	73
119	52Res.	2	4.	50

The hardness of water from 11 springs was reported. They apparently are less hard than most well water since 27.3 per cent were reported soft, 54.5 per cent moderately hard, and 18.2 per cent hard. One was reported unsuitable for drinking purposes and one was reported inadequate. Fifteen users of springs reported the use of four for stock and domestic use, 10 for stock watering only and one for domestic use only.

In any area such as Codington county, where much of the water supplies are hard or where water unsatisfactory for drinking is produced, cisterns are most important supplementary supplies. In this county there is approximately one cistern to two wells, a total of 632. Approximately 96 per cent are used for laundry purposes and 32 per cent for cooking and drinking.

CODINGTON 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	Corrode Casing	Unsuitable for Drinking	Adequate	Inadequate	Number used for Irrigation	Approximate Acres Irrigated
116	51	59	5	180	53	15	30	3	1	2	46	13	-	-
116	52	56	7	200	69	28	22	2	4	2	52	4	7	1/8
116	53	53	10	165	68	16	29	6	3	2	51	2	3	1
116	54	49	16	166	68	30	13	4	11	6	43	6	2	1/8
116	55	50	15	200	83	37	11	1	11	13	44	6	-	-
117	51	50	6	190	52	23	24	-	2	3	44	6	-	-
117	52	57	10	200	66	30	27	-	3	1	50	7	1	1
117	53	40	8	100	37	1	33	4	1	-	40	-	3	1/2
117	54	34	15	180	70	19	13	2	5	3	32	2	3	2 1/4
117	55	42	14	180	91	22	17	1	3	9	36	6	3	3
118	51	62	8	200	48	30	22	9	2	1	56	6	1	1/4
118	52	56	11	186	72	31	21	-	2	1	51	5	4	1 1/2
118	53	29	6	200	55	14	15	-	1	1	23	6	3	1/2
118	54	43	7	180	60	18	20	3	10	1	40	3	3	2 1/8
118	55	42	9	180	63	18	19	-	6	4	35	7	1	1/8
119	51	54	6	200	44	23	26	3	1	1	48	6	-	-
119	52	41	12	200	87	14	22	3	4	1	32	9	3	3/8
119	53	7	16	98	64	3	2	2	-	-	7	-	-	-
119	54	67	16	145	62	37	28	-	11	6	58	9	3	1/4
119	55	70	10	200	78	42	23	2	8	9	59	11	5	1
*118	52	12	15	175	40	8	3	1	1	1	10	2	1	1
*119	52	43	12	195	63	9	27	5	3	4	33	10	-	-
*120	51	-	-	-	-	-	-	-	-	-	-	-	-	-
*120	52	29	10	180	56	8	16	1	3	-	24	5	2	1/4
*120	53	1	-	-	90	1	-	-	-	-	1	-	-	-
Total		1046				477	463	52	96	71	915	131	48	15 3/8

* Indian Reservation

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GODINGTON 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	Corrode Casing	Unsuitable for Drinking	Adequate	Inadequate	Number used for Irrigation	Approximate Acres Irrigated
116	51	12	232	609	322	6	5	-	5	1	11	1	-	-
116	52	12	205	640	403	11	1	-	1	-	11	1	-	-
116	53	6	230	455	386	3	2	-	-	-	11	1	1	-
116	54	4	232	573	421	2	2	-	-	-	6	-	-	-
116	55	23	205	560	328	17	6	-	10	1	4	-	1	1/4
117	51	14	210	550	373	11	3	-	3	4	21	2	4	1 5/8
117	52	12	216	600	371	8	4	-	3	-	13	1	-	-
117	53	7	250	480	374	7	-	-	3	1	9	3	1	1/8
117	54	1	-	-	450	1	-	-	-	2	7	-	2	1/2
117	55	8	240	420	293	4	4	-	3	-	1	-	-	-
118	51	10	245	480	352	9	1	-	2	1	7	1	1	1/4
118	52	10	240	450	322	9	1	-	1	1	10	-	1	1/8
118	53	1	-	-	376	-	1	-	-	1	10	-	-	-
118	54	1	-	-	519	1	-	-	1	-	1	-	1	-
118	55	3	212	400	303	2	1	-	-	-	1	-	-	-
119	51	5	250	476	336	3	2	-	1	2	3	-	-	-
119	52	6	216	295	253	4	2	-	1	1	5	-	-	-
119	53	-	-	-	-	-	-	-	-	1	6	-	1	1/8
119	54	1	-	-	210	1	-	-	-	-	-	-	-	-
119	55	2	208	406	307	2	-	-	1	-	1	-	-	-
*118	52	2	385	500	443	1	1	-	-	-	2	-	-	-
*119	52	3	250	380	303	3	-	-	-	-	2	-	-	-
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*120	52	-	-	-	-	-	-	-	-	-	1	-	-	-
*120	53	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		144				106	36	-	33	16	135	9	14	3

*Indian Reservation

Codington 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.

- T.116N., R.51W. 13 feet:
Sec. 14 "Ten feet from this 13 ft. well water could not be obtained at 30 ft. - all blue clay."
- T.116N., R.52W. 88 feet:
Sec. 31 "No trouble digging but hard to find plenty of water. I just get enough to water 30 head of cattle, ten horses and hogs."
- T.116N., R.53W. 150 feet:
Sec. 6 "Cistern not used for rain water - all household water is hauled from Lake Kempeska."
- T.116N., R.53W. 230 feet:
Sec. 16 "I have one drilled well 230 ft. deep and 5 in. casing plenty of water, but had trouble with it filling up with fine sand - this is called an open well - no screen on bottom. Just had it cleaned out. Good water seems hard. One bored well 60 ft. deep (soft water) 3 ft. curb also had trouble with fine sand."
- T.116N., R.53W. 90 feet:
Sec. 34 "Well diggers claim water may be gotten at 160 ft."
- T.116N., R.54W. 16 feet:
Sec. 13 "Have trouble with quicksand, well must be cleaned every 2 years."
- T.116N., R.54W. 80 feet:
Sec. 28 "Several wells were bored here but quicksand always bothered by coming up in casing. Our present well waters 100 head of stock at all times - good water supply."
- T.117N., R.51W. 30 feet:
Sec. 24 "Have dug wells several times but with poor equipment could not get deeper than 10 or 15 ft. because of sand and gravel but the last one, we put casing in to hold the gravel and dug a smaller hole to about 35 ft. - had no water shortage after that."
- T.117N., R.51W. 90 feet:
Sec. 32 "Have dug and bored in valley for water but had no success."
- T.117N., R.51W. 380 feet:
Sec. 28 "There has been trouble getting water because the well is so deep and it corrodes easy - the pump must be pulled in a short time and the sand point driven."
- T.117N., R.52W. 15 feet:
Sec. 26 "Well on our farm is located on lowland, about 100 ft. from

barn directly below it. The well was dug square and walled up and floored with concrete to keep out surface water. The water is very hard and because of poor condition of casing, we usually haul drinking water from town. An attempt was made years ago to dig a well on higher ground but it failed."

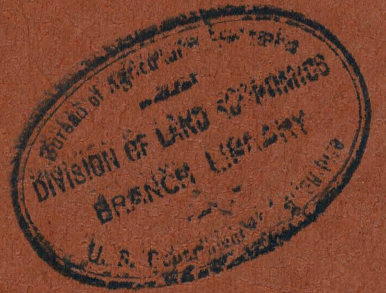
- T.117N., R.53W. 410 feet:
Sec. 34 "We had no difficulty getting water, but we have trouble with the sandpoint. Since the well was drilled 18 years ago, the sandpoint has been pulled 7 times. In the last 6 years the sandpoint has been pulled once every two years. The corrosion found on the point is as hard as concrete. When well was first drilled water came within 18 ft. of surface, now it has dropped to 25 ft."
- T.118N., R.51W. 75 feet:
Sec. 20 "It is difficult to construct wells because a strong enough vein to supply enough water has not been found."
- T.118N., R.51W. 480 feet:
Sec. 20 "We have a shallow well about 60 ft. deep located 30 ft. east of deep well - this supplies water for our domestic needs. Water from well is rather hard but good tasting. Well is 60 ft. deep but water rises 30 ft. from surface - the well will supply about half a dozen livestock. This well is a bored 2 ft. hole, curbed with wood and in good condition - pump cylinder is down 40 ft."
- T.118N., R.51W. 65 feet:
Sec. 22 "I have bored down 103 ft. and failed to get water."
- T.118N., R.51W. 25 feet:
Sec. 28 "Several wells have been sank here but all failed."
- T.118N., R.51W. 60 feet:
Sec. 33 "Three wells on farm but does not furnish enough water for 15 head of cattle. One 60 ft. well is dry."
- T.118N., R.51W. A spring:
Sec. 14 "The well on top of hill was 36 ft. deep; good hard water but well is now filled in. A spring down in the meadow furnishes a good supply of sweet water which would take care of more stock than we now own. The water in the spring comes thru coarse sand."
- T.118N., R.52W. 60 feet:
Sec. 13 "We have not enough water for stock in summer, and it is very hard."
- T.118N., R.52W. 245 feet:
Sec. 24 "We can't get water at less than 100 ft. insufficient supply at that."
- T.118N., R.52W. 368 feet:
Sec. 30 "Well here is a deep drilled well, the water is usable but very poor for drinking purposes. No sand comes up in pump but the sandpoint collects a coat of sand stone. A new point has been put in on this account. It will pump a steady stream indefinitely."

- T.118N., R.54W. 519 feet:
Sec. 23 "Twenty foot well in valley does not furnish enough water in dry seasons. In fact it has been practically dry since 1932!"
- T.118N., R.55W. 72 feet:
Sec. 3 "The well here is a sand vein and bored to the blue clay for bottom."
- T.119N., R.51W. Spring:
Sec. 34 "Spring located 100 rods from buildings - produces 100 barrels a day. Spring never goes dry, have plenty water for stock and domestic use. - Water is good. We bored a well 105 ft., but found no water - after going down 20 ft. we struck blue clay."
- T.119N., R.52W. 280 feet:
Sec. 8 "There has been a dozen dry holes dug here-I need a well for drinking water."
- T.119N., R.52W. 12 feet:
Sec. 10 "We have two good wells on this place and the Sioux river runs thru the pasture so we have lots of good water."
- T.119N., R.52W. 60 feet:
Sec. 19 "The difficulties in getting wells here are, first, the problem of locating water. When water is found the wells last for only a few months then stop, the wells also fill up with fine sand. The water from these wells is not good to drink - used by stock only."
- T.119N., R.52W. 60 feet:
Sec. 14 "There has been several wells dug on this farm but failed to give sufficient water in dry years. I have three wells on farm at present, two for livestock and one for domestic use, but none of them give a great deal of water. I also have a dam here which is used in an emergency."
- T.119N., R.54W. 30 feet:
Sec. 13 "The wells here must be dug on the upland by the barn but my new well is in the valley and so far furnishes plenty of water."
- T.119N., R.54W. 65 feet:
Sec. 29 "Have two drilled wells 130 ft. deep - pressure of water was so great that they soon filled up with sand and gravel. The water has excellent quality."
- T.119N., R.55W. 196 feet:
Sec. 3 "I have spent a good deal of money on this 60 ft. hole and get only a small supply of alkali water."
- T.119N., R.55W. 140 feet:
Sec. 5 "Trouble in getting water is mainly due to depth of supply and rocks interfere with digging."
- T.119N., R.55W. 60 feet:
Sec. 26 "I have had three dry holes here. The reason for lack of water is rocks and curbing caving in."

T.119N., R.55W. 76 feet:
 Sec. 30 "There is two wells on the farm, one on the west of barn and one east side. These wells are 5 or 6 rods apart and the east well cannot be used for stock. We had a sample of it sent to Brookings to be tested and found out the water had too much chemical for stock."

T.120N., R.52W. 30 feet:
 Sec. 31 "I have not lived here long but they say water is very good to drink."

T.120N., R.52W. 34 feet:
 Sec. 32 "About 3 ft. of sand filled in from bottom up, if sand could be kept out water supply would be almost unlimited."



EXTENSION SERVICE
SOUTH DAKOTA STATE COLLEGE
of Agriculture and Mechanic Arts
Brookings, South Dakota

Published and distributed under Acts of
Congress, May 8 and June 30, 1914, by the
Agricultural Extension Service of the South
Dakota State College of Agriculture and
Mechanic Arts, Brookings, A. M. EBERLE,
Director, U. S. Department of
Agriculture cooperating.