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STATE OF ILLINOIS
HENRY HORNER, Governor



A SURVEY OF THE GROUND-WATER RESOURCES OF ILLINOIS

CONDUCTED UNDER THE
AUTHORITY OF THE

CIVIL WORKS ADMINISTRATION

ISSUED BY
DEPARTMENT OF REGISTRATION AND EDUCATION
STATE WATER SURVEY DIVISION

Urbana, Illinois

ORGANIZATION

STATE OF ILLINOIS

HENRY HORNER, *Governor*

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1933—1934

PART I

INTRODUCTION

BY

W. D. GERBER

Under the Civil Works Administration the State Water Survey was granted approval of a project to study the water resources in each county of the state. This approval was given in December, 1933.

The original conception of the C.W.A. program was the organization of work projects on a county basis, therefore, the organization of a *statewide project*, as proposed by the State Water Survey, was in conflict with the original concepts and regulations and much time was lost in obtaining approval of the project in each county and getting such county units organized and to work.

The organization set up by the State Water Survey was divided into two parts. Field work and its administration and chemical analytical work and its administration. For the field work the state was divided into eight field districts embracing from ten to seventeen counties. The work in each district was directed by a supervising engineer with headquarters centrally located within the district. An office engineer was provided as an assistant to the supervising engineer.

In general each county was provided with two field engineers, though in several of the largest counties three men were assigned. In so far as possible the field engineers were drawn from the county to which they were assigned. This arrangement permitted them to live at home. Each man provided his own transportation and met the cost of operating the same out of his compensation.

Because of delays in perfecting the field organization in some of the counties, the full field staff was slow in getting started. The peak of employment occurred between February 15th and March 1, 1934 when a total of 217 engineers was on the rolls.

All the chemical analytical work was done in the water analysis laboratory of the Water Survey; the staff consisted of 13 chemists.

The administration office was manned with two office engineers and three clerks. The largest number of employees on the C.W.A. rolls at any one time was 235 persons.

It was well appreciated at the start that the collection of complete information would be impossible and therefore the program adopted called for an average of two well reports per square mile and at least 10 water samples per county.

The authority for work projects under C.W.A. expired on March 31st at least in so far as the State Water Survey was concerned. The length of time during which the project was active was three and one-half months. During that time work was done in 100 counties (Cook and Lake Counties excepted). The total area surveyed was about 34 percent of the combined area of the 100 counties. A total of 48,900 well records was secured and analyses of some 1250 samples of water were made.

While the quantity as well as the quality of the reports falls far short of any desirable minimum, still they have already proved extremely valuable during the succeeding months. It is hoped that the future may permit completion of this valuable piece of research.

One of the outstanding results noted from this well survey was the change in quantity and mineral quality of ground water that frequently took place in comparatively short distances.

Another fact, hitherto, but little appreciated, was that over large areas of the State there appeared to be a marked recession or lowering of the water table in the ground. This recession is still in progress and the amounts vary between wide limits depending on the location and character of the sub-surface materials. The range of recession extends from as little as one or two feet to as much as 50 feet or more. This is a factor of vital importance to the welfare of the entire state. It has been known for some years that at certain localities industrial and municipal demands from wells is exceeding the rate of inflow and as a result the pumping levels are slowly receding. It was not heretofore appreciated, however, that any state-wide water level recession was taking place.

Life cannot exist without ample water supplies and until a more complete understanding and mapping of the water resources of the State are available, much distress is likely to prevail at times of drought.

A brief statement of the work done and results accomplished in *each county* comprises a major portion of this bulletin.

PART II

DISCUSSION OF CHEMICAL DATA

BY

S. M. MCCLURE, D. TARVIN, and A. M. BUSWELL

During the organization of data from the analyses of water samples collected under cooperation of the Civil Works Administration, the similarity in mineralization of waters from a single county, or from a group of adjacent counties, was noted. This was especially pronounced in areas where a predominant number of wells were of the same approximate depth, as in Champaign County, and indicated a single definite formation as a common source of the samples. The obvious advantages of any close correlation among the mineral content of waters from the geological formation yielding them, indicated the desirability of further information of this relation. Accordingly, a study has been made of the mineralization and geological classification of waters of the state, as represented by more than three thousand of the more recent analyses in the Water Survey files.

CORRELATION OR TRENDS OVER THE STATE

Three types of mineralization, six ranges in amount of residue, and five grades of hardness were made the basis for classification (P. 12). In this classification, probably because of the range of the subdivisions, certain trends in grouping were apparent over sections of the state that roughly corresponded to geological or physiographic areas. Since most of the state is covered by glacial drift and a majority of the wells obtain waters from these drift sheets, it is believed that variation in age, thickness and composition of the drift is perhaps the largest factor making for any correlation shown.

Area A. (I C 4 trend). Twenty-nine counties, containing 1577 analyzed wells, lie in the northeastern quarter of the state, wholly or partly in the Late Wisconsin drift area. Nearly half (46%) contain carbonate hardness only, 43% range from 300-500 p.p.m. in residue and 41% show hardness between 200-350 p.p.m. Accordingly, somewhat less than half

of these waters may be grouped as "I C 4" under the system of classification used. The remaining samples are scattered through the various subdivisions of the scale, with none showing a percentage greater than 36%.

Area B. (III C 4 trend). A northwestern group of eight counties, lying mainly west of the Late Wisconsin drift and north of the outcrop of the formations of the coal basin, show a somewhat greater tendency toward uniformity. Almost one-half of the 178 waters analyzed contain not only carbonate and non-carbonate hardness but corrosive salts as well (Class III) ; two-thirds are in 300-500 p.p.m. range in residue and over half have 200-350 p.p.m. hardness. The remaining samples are scattered throughout the scale of classification. This area is probably the most uniform in mineralization of waters of the seven area groupings made.

Area C. (III C 5 trend). Fifteen counties, mainly in the drainage areas of the Sangamon and lower Illinois rivers, plus Adams and Pike on the Mississippi, show 231 analyzed samples. There is a tendency (45%) toward class III type of mineralization; 45% fall in the residue range of 300-500 p.p.m. and 61% show a hardness greater than 350 p.p.m.

Area D. (II F 5 trend). South, both of this group and of the Shelbyville moraine are twenty-two counties covering much of southern and central Illinois. Extending southward to the limit of glaciation and east to the tier of counties along the Wabash valley, this area lies almost entirely in the Illinoian drift sheet and is generally underlain by formations of Pennsylvanian age. Of the 393 samples analyzed, 54% show both carbonate and non-carbonate hardness, 34% gives residues greater than 1000 p.p.m. and 56%, a hardness greater than 350 p.p.m. These are the predominant groupings; other samples are scattered throughout the scale.

Attempts to relate the mineralization of the waters with location of sources in the various physiographic divisions suggested by MacClintock ("Physiographic Divisions of the Area Covered by the Illinoian Drift-sheet in Southern Illinois," Rept. of Inv. No. 19, (11.) S.G.S. 1929) gave little correlation, possibly due to lack of sufficient and more detailed data.

Area E. (II D 5 trend). In the west-central part of the state, north of the Sangamon-Illinois valley group and west of the newer drift is a region composed of 11 counties. More than half of the samples from this group show a hardness greater than 350 p.p.m. but other 'central tendencies' in the series are almost lacking. Possibly this variation is due to the various formations on or near the surface in this area; counties bordering the Mississippi may obtain water from formations other than the Pennsylvanian and drift sheets of different ages are present in the area.

Area F. (I F 5). Six counties bordering the Wabash valley furnish 121 samples. These waters are characterized by a high residue, greater than 1000 p.p.m. in 36% of the samples, and a hardness greater than 350

p.p.m. in 46% ; a tendency toward the carbonate type of hardness is shown in 45% of the samples. This trend appears to be somewhat characteristic of the waters from the alluvium of river valley.

Area G. (II C 4 trend). To the nine counties partly or wholly below the southern limit of Illinoian glaciation, may be added Monroe and Randolph counties on the Mississippi, where the bedrock is generally penetrated by wells, to form a group of 11 counties from which 188 samples were available. Almost no significant trends appear on classification. The three classes of mineralization are almost evenly distributed, (31%, 33%, 35%). The residues vary in all six ranges with none greater than 38% and the same is true of the hardness, where 35% is the highest percentage. This variation again may be due to the distribution of the wells into various and different formations, both bedrock and valley alluvium.

Summary and Conclusions. Table II summarizes the trends in the mineralization of waters from each area. From the data available, it may be concluded that little more than slight correlations have been found between either the amount or type of mineralization of waters and the physiographic area of the source.

SPECIAL NOTE ON WATERS OF CHAMPAIGN COUNTY

In contrast with the state as a whole, Champaign County shows a decided trend both in kind and amount of mineralization of the waters analyzed. Of the 100 samples, all with one exception, apparently have a common source in the glacial drift. Eighty-six of the 100 wells have carbonate hardness alone, eighty-five give a residue in the range of 300-500 p.p.m. and 72 have a hardness between 200-350 p.p.m.

It is interesting to note that the three wells showing class III characteristics (carbonate, non-carbonate and corrosive hardness) have their sources in the upper layers of the drift. The eleven wells in Class II (both carbonate and non-carbonate hardness) vary, with one exception, between 20 and 65 feet in depth; with two exceptions, these wells show a greater hardness than the 86 in class one; and have a hardness rating greater than 350 p.p.m. Almost all of the other wells vary between 65 and 293 feet in depth, with an average a trifle more than 100 feet. As Knirk, in his resume of drift conditions in the county ("Natural Gas in the Glacial Drift of Champaign County", Bul. 14, (Ill.) S.G.S. p. 272-275, 1908) gives well depths in the drift up to 297 feet, it appears that a majority of these wells obtain waters from intermediate portions of the drift.

While the data given above shows a grouping within the *ranges* given, it must be stated that there is quite a degree of latitude within these ranges and that the series show much scattering within these bounds. (A more detailed study of waters from representative areas of the different drift-sheets is necessary before any valid conclusions may be drawn.)

LIST OF COUNTIES IN EACH PHYSIOGRAPHIC AREA

- Area A. Wisconsin Drift. (2g)* I-C-4
 Lake, McHenry, DeKalb, Kane, DuPage, Cook, Bureau, LaSalle, Kendall, Grundy, Will, Putnam, Marshall, Livingston, Kankakee, Iroquois, Woodford, McLean, Ford, DeWitt, Piatt, Champaign, Vermillion, Macon, Douglas, Moultrie, Shelby, Coles, Edgar.
- Area B. Northern Group. (8)* III-C-4
 Jo Daviess, Stephenson, Winnebago, Boone, Carroll, Ogle, Lee, Whiteside.
- Area C. Illinois-Sangamon Valley. (15)* III-C-5
 Tazewell, Schuyler, Mason, Adams, Brown, Cass, Menard, Logan, Pike, Scott, Morgan, Calhoun, Green, Jersey, Sangamon.
- Area D. Illinoian Drift (22) Southern* II-F-5
 Christian, Macoupin, Montgomery, Cumberland, Madison, Bond, Fayette, Effingham, Jasper, St. Clair, Clinton, Marion, Clay, Washington, Jefferson, Wayne, Edwards, Perry, Franklin, Hamilton, Williamson, Saline.
- Area E. Western Illinoian Drift, etc. (II)* II-D-5
 Rock Island, Henry, Mercer, Stark, Henderson, Warren, Knox, Peoria, Hancock, McDonough, Fulton.
- Area F. Wabash Valley. (6)* I-F-5
 Clark, Crawford, Laurence, Wabash, White, Richland.
- Area G, Drift-free. (II)* II-C-4
 Gallatin, Union, Johnson, Pope, Hardin, Alexander, Pulaski, Massac, Monroe, Randolph, Jackson.

TABLE I
SHOWING CLASSIFICATION BY
PHYSIOGRAPHIC AREAS

| Group | No. of Samples | Carbonate hardness | | | Both carbonate and non-carbonate hardness | As in 2 plus corrosive salts, i.e. MgCl. | Residue | | | | | | Hardness | | | | | No. of Counties |
|--|----------------|--------------------|----------------|----------------|---|--|----------------|-----------------|------------------|-------------|---------------|----------------|----------------|-----------------|-----------|----|--|-----------------|
| | | 0-150 p.p.m. | 150-300 p.p.m. | 300-500 p.p.m. | | | 500-700 p.p.m. | 700-1000 p.p.m. | Over 1000 p.p.m. | 0-50 p.p.m. | 50-125 p.p.m. | 125-200 p.p.m. | 200-350 p.p.m. | Over 350 p.p.m. | | | | |
| | No. | Class | | | Residue | | | | | | Hardness | | | | | | | |
| | | 1 | 2 | 3 | A | B | C | D | E | F | 1 | 2 | 3 | 4 | 5 | | | |
| Wisconsin Drift (A) (1-C-4) per cent. | 1577 | 738 46 | 547 36 | 219 | 4 | 88 | 691 43 | 388 | 143 | 210 | 36 | 93 | 122 | 658 41 | 368 | 29 | | |
| Northern Area (B) (3-C-5) per cent. | 178 | 40 | | 81 45 | 2 | 28 | 116 65 | 24 | 4 | 4 | 2 | 0 | 6 | 91 51 | 79 | 8 | | |
| Illinois-Sangamon (C) (3-C-5) per cent. | 231 | 61 | 68 | 99 45 | 3 | 20 | 98 45 | 58 | 14 | 38 | 3 | 7 | 17 | 71 61 | 183 | 15 | | |
| Illinoian Drift (D) (2-F-5) per cent. | 393 | 83 | 212 54 | 92 | 8 | 28 | 73 | 75 | 57 | 132 34 | 19 | 22 | 32 | 97 | 223 56 | 22 | | |
| Western Area (E) (2-D-5) per cent. | 389 | 152 38 | 161 41 | 76 | 5 | 10 | 97 | 142 | 60 | 135 34 | 6 | 15 | 41 | 111 | 215 55 | 11 | | |
| Wabash Valley (F) (1-F-5) per cent. | 121 | 55 45 | 28 | 38 | 1 | 8 | 20 | 27 | 19 | 44 36 | 16 | 8 | 13 | 27 | 56 46 | 6 | | |
| Drift-free (G) (2-C-4) per cent. | 188 | 63 33 | 66 35 | 59 31 | 10 | 38 | 72 38 | 33 | 13 | 22 | 12 | 22 | 34 | 62 32 | 58 30 | 11 | | |

KEY TO SUMMARIES OF CHEMICAL DATA

A summary for each county is given in a code to save expense in printing; the symbols and their significance are given below. In all cases arabic numerals indicate the number of samples having the characteristic indicated by the succeeding symbol, e.g., 7, I; indicates that seven analyses show the characteristics of group I.

The total number of analyses made of waters in each county is given immediately following the word "Analyses".

The numerals before each symbol (Roman numeral, letter, etc.) give the number of wells in each grouping.

The Roman numerals indicate the kind or type of hardness. I—shows waters that contain carbonate hardness only; II, those with both carbonate and non-carbonate (generally sulphate) hardness; and III, those having, generally, both types of hardness and, in addition, corrosive properties due to magnesium chloride.

The letters in the series A to F give the amount or extent of mineralization or total residue (R). Group RA includes waters having 150 or fewer parts per million of dissolved substances; RB, 150-300; RC, 300-500; RD, 500-750; RE, 750-1000; RF, over 1000.

The degree or amount of hardness (H) is shown by the letters in the series K to O. Group K waters have 50 or fewer parts per million of hardness, (estimated as calcium carbonate); L, 50-125; M, 125-200; N, 200-350; O, 350 or more.

The amount of iron (Fe) is indicated by the letters in the series W to Z. Waters in the W group contain no iron in measurable amounts; X, less than 0.2 part per million; Y, 0.2-1.0; Z, more than 1.0.

The presence or absence of manganese (Mn) is shown by the + or - signs.

KEY TABLE

Number of analyses.

Class I—Carbonate hardness only

Class II—Carbonate and non-carbonate hardness

Class III—Both of above plus corrosive properties

| | | |
|----------------|---|-----------------|
| Residue (R) | A | 0-150 p.p.m. |
| | B | 150-300 p.p.m. |
| | C | 300-500 p.p.m. |
| | D | 500-750 p.p.m. |
| | E | 750-1000 p.p.m. |
| | F | 1000-more |
| Hardness (H) | K | 0-50 p.p.m. |
| | L | 50-125 p.p.m. |
| | M | 125-200 p.p.m. |
| | N | 200-350 p.p.m. |
| | O | 350-more |
| Iron (Fe) | W | Absence |
| | X | Less than 0.2 |
| | Y | 0.2-1.00 |
| | Z | 1.0-more |
| Manganese (Mn) | + | present |
| | - | absent |

PART III

SUMMARIES OF DATA BY COUNTIES
(ARRANGED ALPHABETICALLY)

 ADAMS COUNTY

The territory covered by the well survey in this county embraced parts of Lima, Riverside, Ellington, and Melrose townships. In all, about 12 percent of the county was surveyed and 205 well records secured.

Of the 205 wells reported, 100 are of the dug type from 3 feet to 71 feet deep; 3 are of the bored type from 20 feet to 42 feet deep, and 102 are of the drilled type from 47 feet to 360 feet deep.

Analyses, 11; 5 I, 1 II, 5 III; R. 2 B, 6 C, 1 D, 2 F; H. 2 M, 4 N, 5 O; Fe, 2 W, 3 Y, 6 Z; Mn, 3 +, 8 —.

ALEXANDER COUNTY

The territory covered by the well survey in this county embraced all of Elco, Santa Fe, Unity, Beech Ridge, Goose Island, and Dog Tooth townships, and a considerable part of all the townships within the county boundaries. In all about 81.3% of the county was surveyed and 503 well records secured.

Of the 503 wells reported, 204 are of the driven type from 12 feet to 60 feet deep; 116 are of the dug type from 8 feet to 58 feet deep; 60 are of the drilled type from 30 feet to 1040 feet deep; 15 are springs; and 8 are of the bored type from 23 feet to 40 feet deep.

Analyses, 19; 7 I, 9 II, 3 III; R. 2 A, 6 B, 5 C, 5 D, 1 E; H. 5 L, 2 M, 5 N, 7 O; Fe. 4 W, 2 X, 2 Y, 10 Z; Mn. 12 +, 6 —.

BOND COUNTY

The territory covered by the well survey in this county embraced all of Burgess and Tamaleo townships, and parts of Pleasant Mound and Old Ripley townships. In all about 24 percent of the county was surveyed and 698 well records secured.

Of the 698 wells reported, 664 are of the dug type from 3 feet to 60 feet deep; 29 are of the bored type from 11 feet to 80 feet deep, 1 is of the well point type 20 feet deep and 4 are of the drilled type from 61 feet to 108 feet deep.

Analyses, 20; 4 I, 9 II, 7 III; R. 1 B, 4 C, 6 D, 2 E, 7 F; H. 1 L, 1 M, 3 N, 15 O; Fe. 5 W, 6 X, 7 Y, 2 Z; Mn. 6 +, 14 —.

BOONE COUNTY

The territory covered by the well survey in this county embraced all of Belvidere township and all except 5 sections in Laura township. In all, about 23 percent of the county was surveyed and 330 well records were obtained.

Of the 330 wells reported, 39 were of the dug type, from 14 feet to 80 feet deep; 79 were of the well point type, from 16 feet to 48 feet deep; 3 were of the bored type, from 35 feet to 44 feet deep; 206 were of the drilled type, from 30 feet to 317 feet deep; and 3 springs were used as sources of water supply.

Analyses, 20; 2 II, 18 III; R. 1 B, 11 C; 6 D, 1 E, 1 F; H. 9 N, 11 O; Fe. 4 W, 1 X, 2 Y, 13 Z; Mn. 11 +, 9 — .

BROWN COUNTY

The territory covered by the well survey in this county embraced all of Pea Ridge, Lee, and Buckhorn Townships; parts of Missouri, Mt. Sterling, Cooperstown and Elkhorn Townships. In all about 62 percent of the county was surveyed and 327 well records secured.

Of the 327 wells reported all except 17 are of the dug or bored type of construction and range in depth from 12 feet to 90 feet, the major portion, however, varying from 20 feet to 35 feet deep. Each township has one or more deep wells drilled into the limestone and their range of depth is from 100 feet to 500 feet.

Analyses, 22; 9 I, 7 II, 6 III; R. 5 C, 8 D, 4 E, 5 F; H. 2 K, 2 L, 1 M, 4 N, 13 O; Fe. 5 W, 6 X, 10 Y, 1 Z; Mn. 6 +, 16 — .

BUREAU COUNTY

The territory covered by the well survey in this county embraced all of Fairfield, Greenville, Gold, Manlius, Bureau, Dover, and Princeton townships. In all about 29 percent of the county was surveyed and 813 well records secured.

Of the 813 wells reported, 449 are of the driven type from 12 feet to 55 feet deep; 364 are of the drilled type from 50 feet to 365 feet deep; 148 are of the dug type from 8 feet to 60 feet deep, and 3 are of the bored type from 18 feet to 27 feet deep.

Analyses, 27; 23 I, 3 II, 1 III; R. 1 B, 16 C; 4 D, 1 E, 5 F; H. 1 K, 2 L, 1 M, 16 N, 7 O; Fe. 4 W, 7 Y, 16 Z; Mn 4 +, 21 — .

CALHOUN COUNTY

The territory covered by the well survey in this county embraced all of Carlin Township and parts of Carter, Hardin, and Galead Townships. In all about 22 percent of the county was surveyed and 257 well records secured.

Of the 257 wells reported, 240 are of the dug type from 3 feet to 65 feet deep; 8 are of the bored type from 12 feet to 24 feet deep; 3 are of the well point type from 14 feet to 58 feet deep; 6 are of the drilled type from 75 feet to 175 feet deep.

Analyses, 18; 5 I, 6 II, 5 III; R. 14 C, 4 D; H. 7 N, 11 O; Fe, 6 W, 6 X, 5 Y, 1 Z; Mn, 10 +, 6 —.

 CARROLL COUNTY

The territory covered by the well survey in this county embraced all of Shannon, Salem, Rock Creek, Lima, and Elkhorn Grove townships. In all about 28 percent of the county was surveyed and 399 well records secured.

Of the 399 wells reported, 390 are of the drilled type from 35 feet to 370 feet deep; and 9 are of the dug type from 20 feet to 40 feet deep.

Analyses, 21; 9 I, 4 II, 8 III; R. 19 C, 1 D, 1 E; H. 14 N, 7 O; Fe, 1 W, 4 X, 9 Y, 7 Z; Mn 3 +, 18 —.

 CASS COUNTY

The territory covered by the well survey in this county embraced all of Ashland, Philadelphia, Virginia, Arensville, Hagener, Beardstown and Bluff Springs Townships. In all about 68 percent of the county was surveyed and 877 well records secured.

Of the 877 wells reported, 21 were drilled at depths varying from 40 feet to 1232 feet; 4 were dug then bored to depths of 47 feet to 85 feet; 592 were dug to depths of springs to 70 feet; 260 were well-points having depths of 12 feet to 65 feet. As will be noticed the combined dug and well-point types accounted for 852 of the total and were all under 70 feet in depth.

Analyses, 9; 2 II, 7 III; R. 1 B, 4 C, 2 D, 1 E, 1 F; H. 2 M, 3 N, 4 O; Fe, 4 W, 2 X, 1 Y, 2 Z; Mn 4 +, 5 —.

CHAMPAIGN COUNTY

The territory covered by the well survey in this county embraced all of East Bend, Ludlow, Mahomet, Scott and Champaign townships; and part of all the other townships except Newcomb, Condit, Ogden, Colfax, South Homer, Crittenden, Raymond, and Ayers townships. None of the area in these latter townships was surveyed. In all about 45.4% of the county was surveyed and 745 well records secured.

Of the 745 wells reported 705 are of the drilled type from 36 feet to 505 feet deep; 25 are of the dug type from 12 feet to 40 feet deep; and 15 are of the driven type from 16 to 50 feet deep.

One well was reported to be flowing 2 feet above the ground surface.

Analyses, 103; 87 I, 12 II, 4 III; R. 86 C, 12 D, 2 E, 3 F; H. 1 L, 3 M, 73 N, 26 O; Fe, 4 W, 4 X, 30 Y, 65 Z; Mn, 31 +, 72 —.

CHRISTIAN COUNTY

The territory covered by the well survey in this county embraced all of Ricks, Stonington and Burkhart Townships; parts of Taylorville Township. In all about 21 percent of the county was surveyed and 539 well records secured.

Of the 539 wells reported, 508 were of the dug type and varied in depth from 11 feet to 86 feet; 14 were well-points from 25 feet to 50 feet deep; 10 were bored wells from 15 to 90 feet and 7 were drilled from 40 feet to 140 feet deep. A high percentage of the dug wells were less than 25 feet deep.

Analyses, 11 ; 1 I, 6 II, 4 III; R. 2 B, 1 C, 3 D, 4 E, 1 F; H. 4 N, 7 O; Fe, 1 W, 3 Y, 7 Z; Mn, 7 +, 4 — .

CLARK COUNTY

The territory covered by the well survey in this county embraced all of Darwin, Marshall, and York Townships, and parts of Douglas and Wabash townships. In all, about 21 percent of the county was surveyed, and 151 well records were obtained.

Of the 151 wells reported, 135 were of the dug type, from 12 to 63 feet deep; 1 was of the well point type, 28 feet deep; 14 were of the drilled type, 22 feet to 125 feet deep; and there was 1 spring used as a source of water supply.

Analyses, 20; 7 I, 2 II, 11 III; R. 4 C, 5 D, 5 E, 6 F; H. 3 L, 4 N, 13 O; Fe, 2 W, 5 X, 8 Y, 5 Z; Mn, 3 +, 16 —.

CLAY COUNTY

The territory covered by the well survey in this county embraced Larkinsburg, and Clay townships, and 13 sections in Stanford township. In all, about 20 percent of the county was surveyed and 146 well records obtained.

Of the 146 wells reported, 115 were of the dug type from 9 feet to 39 feet deep; and 31 were of the drilled type from 28 feet to 151 feet deep.

Analyses, 16; 7 I, 8 II, 1 III; R. 1 A, 1 C, 2 D, 4 E, 8 F; H. 2 K, 1 L, 1 M, 2 N, 10 O; Fe, 6 X, 3 Y, 7 Z; Mn, 7 +, 9 —.

CLINTON COUNTY

The territory covered by the well survey in this county embraced parts of Carlyle, Clement, and Breese townships. In all about 4 percent of the county was surveyed and 192 well records secured.

Of the 192 well records secured, 181 are of the dug type from 11 feet to 45 feet deep; 9 are of the bored type from 10 feet to 23 feet deep; 2 are of the drilled type from 45 feet to 90 feet deep.

Analyses, 8; 5 I, 1 II, 2 III; R. 1 C, 1 D, 6 F; H. 2 J, 1 K, 1 L, 1 N, 3 O; Fe, 2 W, 2 X, 3 Y, 1 Z; Mn, 2 +, 4 —.

COLES COUNTY

The territory covered by the well survey in this county embraced all of Mattoon and Lafayette townships, and all except 3 sections of Humbolt township. In all, about 24 percent of the county was surveyed, and 262 well records were obtained.

Of the 262 wells reported, 89 are of the dug type, from 12 feet to 60 feet deep; 5 are of the bored type, 36 feet to 65 feet deep; and 168 are of the drilled type, from 22 feet to 145 feet deep.

Analyses, 21; 15 I, 1 II, 5 III; R. 1 B, 8 C, 8 D, 2 E, 2 F; H. 1 M, 9 N, 11 O; Fe, 2 W, 4 Y, 15 Z; Mn, 6 +, 15 —.

CRAWFORD COUNTY

The territory covered by the well survey in this county embraced all of Honey Creek township and all except 9 sections of Locking township. In all, about 18 percent of the county was surveyed, and 144 well records were obtained.

Of the 144 wells reported, 120 are of the dug type, from 13 feet to 100 feet deep; and 24 are of the drilled type, from 39 feet to 190 feet deep.

Analyses, 23; 9 I, 7 II, 7 III; R. 1 B, 1 C, 9 D, 5 E, 7 F; H. 2 K, 6 M, 3 N, 12 O; Fe, 5 W, 4 X, 3 Y, 11 Z; Mn, 0 +, 23 —.

CUMBERLAND COUNTY

The territory covered by the well survey in this county embraced all of Neoga, Cottonwood, Sumpter, and Greenup townships, and 2 sections in Union township. In all, about 56 percent of the county was surveyed, and 381 well records were secured.

Of the 381 wells reported, 345 are of the dug type from 6 feet to 55 feet deep; 8 are of the well point type, from 18 feet to 22 feet deep; 2 are bored wells, 14 and 18 feet deep; and 26 are of the drilled type, from 31 feet to 335 feet deep, with one drilled to 920 feet.

Analyses, 17; 5 I, 7 II, 5 III; R. 5 C, 6 D, 3 E, 3 F; H. 2 M, 5 N, 10 O; Fe, 6 W, 5 X, 2 Y, 4 Z; Mn, 7+, 10 —.

DE KALB COUNTY

The territory covered by the well survey in this county embraced all of South Grove, Malta, Milan, Afton, and De Kalb townships. In all, about 28 percent of the county was surveyed, and 693 well records were obtained.

Of the 693 wells reported, 33 were of the dug type, from 10 feet to 40 feet deep; 2 were of the well point type, 15 feet deep; and 658 were of the drilled type, of which 648 were from 50 feet to 500 feet deep; 1 was 890 feet deep; and 9 were from 1104 feet to 1345 feet deep.

Analyses, 19; 15 I, 2 II, 2 III; R. 3 B, 13 C, 2 D, 1 F; H. 1 L, 2 M, 13 N, 3 O; Fe, 1 W, 2 X, 10 Y, 6 Z; Mn, 2+, 17 —.

DEWITT COUNTY

The territory covered by the well survey in this county embraces all of every township within the county boundaries. The area covered was 100% and 768 well records were secured.

Of the 768 wells reported, 473 are of the drilled type from 20 to 380 feet; 260 are of the dug type from 7 to 80 feet deep; 42 are of the bored type from 10 to 60 feet deep; 2 are springs; and 1 is of the driven type 25 feet deep.

Analyses, 23; 20 I, 1 II, 2 III; R. 8 C, 13 D, 1 E, 1 F; H. 1 K, 9 N, 13 O; Fe, 1 W, 6 Y, 16 Z; Mn, 5+, 18 —.

DOUGLAS COUNTY

The territory covered by the well survey in this county embraces all of every township within the county boundaries. The area was covered 100% and 704 well records were secured.

Of the 704 wells reported 354 are of the drilled type from 38 to 3017 feet deep; 300 are of the dug type from 6 to 60 feet deep; and 50 are of the bored type from 9 to 60 feet deep.

Six of the wells were reported as flowing wells.

Analyses, 24; 21 I, 2 III; R. 1 B, 8 C, 7 D, 3 E, 5 F; H. 1 K, 3 L, 2 M, 11 N, 7 O; Fe, 1 W, 3 X, 5 Y, 15 Z; Mn, 6 +, 17 —.

DU PAGE COUNTY

The territory covered by the well survey in this county embraced all of Addison and Lisel townships. In all, about 21 percent of the county was surveyed and 459 well records were obtained.

Of the 459 wells reported, 27 were of the dug type, from 9 feet to 58 feet deep; 1 was of the well point type, 45 feet deep; 2 were of the bored type, 32 feet and 36 feet deep; 428 were of the drilled type, of which 422 were from 28 feet to 303 feet deep, and 6 were from 600 feet to 1445 feet deep; and 1 spring served as a source of water supply.

Analyses, 92; 18 I, 62 II, 12 III; R. 53 C, 34 D, 3 E, 2 F; H. 1 L, 3 M, 39 N, 49 O; Fe, 11 W, 8 X, 38 Y, 35 Z; Mn, 9 +, 83 —.

EDGAR COUNTY

The territory covered by the well survey in this county embraced parts of all townships except Prairie, Brouilets Creek, and Kansas townships. Young America township was the only one entirely covered. In all about 43.2% of the county was surveyed and 559 well records secured.

Of the 559 wells reported, 365 are of the dug type from 8 to 80 feet deep; 152 are of the drilled type from 39 to 283 feet; and 42 are of the bored type from 15 to 65 feet deep.

Analyses, 16; 10 I, 3 II, 3 III; R. 9 C, 4 D, 3 F; H. 1 K, 2 M, 9 N, 4 O; Fe, 2 W, 2 X, 4 Y, 8 Z; Mn, 7+, 9 —.

EDWARDS COUNTY

The territory covered by the well survey in this county embraced all of Browns, Bone Gap, Salem, and Dixon townships, and parts of French Creek, Shelby, Albion, and Ellery townships. In all about 67% of the county was surveyed and 226 well records secured.

Of the 226 wells reported, 187 are of the dug type from 9 feet to 52 feet deep, and 39 are of the drilled type from 45 feet to 1785 feet deep.

Analyses, 17; 1 I, 12 II, 4 III; R. 1 A, 2 B, 6 C, 1 D, 2 E, 5 F; H. 1 L, 2 M, 7 N, 7 O; Fe, 3 W, 1 X, 7 Y, 4 Z; Mn, 7 +, 8 —.

EFFINGHAM COUNTY

The territory covered by the well survey in this county embraced all of Douglas and Mason townships; and parts of Banner, Summit and Teutopolis townships. In all about 20 percent of the county was surveyed and 189 well records secured.

Of the 189 wells reported, 176 are of the dug type from 12 feet to 67 feet deep; 12 are of the drilled type from 67 feet to 200 feet deep, and 1 bored well 7 feet deep.

Analyses, 21; 5 I, 11 II, 4 III; R. 2 B, 5 C, 4 D, 4 E, 6 F; H. 1 L, 3 M, 5 N, 12 O; Fe, 5 W, 7 X, 6 Y, 3 Z; Mn, 8 +, 13 —.

FAYETTE COUNTY

The territory covered by the well survey in this county embraced all of Sefton and Avena townships, and part of Otego township. In all about 13.5 percent of the county was surveyed and 199 well records secured.

All wells reported are of the dug type from 12 feet to 42 feet deep.

Analyses, 17; 4 I, 7 II, 6 III; R. 1 B, 7 C, 2 D, 7 F; H. 1 M, 7 N, 9 O; Fe, 5 W, 5 X, 5 Y, 2 Z; Mn, 7 +, 10 —.

FORD COUNTY

The territory covered by the well survey in this county embraced every township within the county boundary lines. The area was surveyed 100% and in all 895 well records were secured.

Of the 895 wells reported 743 are of the drilled type from 30 to 976 feet deep; 80 are of the driven type from 15 to 55 feet deep; 52 are of the dug type from 12 to 60 feet deep, and 20 are of the bored type from 15 to 70 feet deep; 27 of the wells were reported as flowing wells.

Analyses, 24; 15 I, 8 II, 1 III; R. 1 B, 18 C, 2 D, 2 E, 1 F; H. 2 K, 16 N, 6 O; Fe, 1 W, 3 X, 7 Y, 13 Z; Mn, 6 +, 18 —.

FRANKLIN COUNTY

The territory covered by the well survey in this county embraced all of every township except Tyrone Goode, Barien, and Eastern townships. A considerable part of Tyrone Goode township was covered. In all about 83% of the county was surveyed and 826 well records secured.

Of the 826 wells reported, 758 are of the dug type from 4 feet to 70 feet deep; 52 are of the drilled type from 50 feet to 215 feet deep; 16 are springs.

Analyses, 17; 3 I, 11 II, 3 III; R. 1 B, 1 C, 2 D, 4 E, 9 F; H. 2 L, 5 N, 10 O; Fe, 3 W, 5 X, 6Y, 2 Z; Mn, 5 +, 11 —.

 FULTON COUNTY

The territory covered by the well survey in this county embraced all of Deerfield and Doss townships and parts of Union, Young Hickory, Fairview, Lee, Joshua, Harris, Beech-heart, Bernadotte and Lewistown townships. In all about 20 percent of the county was surveyed and 402 well records secured.

Of the 402 wells reported, 31 are of the drilled type varying in depth from 40 feet to 350 feet and 371 are of the dug type varying in depth from 7 feet to 87 feet.

Analyses, 32; 11 I, 17 II, 4 III; R. 1 B, 4 C, 4 D, 23 F; H. 3 K, 1 L, 2 M, 4 N, 22 O; Fe, 8 W, 3 X, 12 Y, 8 Z; Mn, 8 +, 22 —.

 GALLATIN COUNTY

The territory covered by the well survey in this county embraced all of the county except Eagle Creek and Bowles townships. In all about 78% of the county was surveyed and 522 well records secured.

Of the 522 wells reported, 265 are of the driven type from 12 feet to 47 feet deep; 139 are of the dug type from 12 feet to 35 feet deep; 112 are of the drilled type from 60 feet to 300 feet deep; and 6 are springs.

Analyses, 4; 1 II, 1 I, 2 III; R. 3 C, 1 D; H. 3 N, 1 O; Fe, 2 X, 1 Y, 1 Z; Mn, 3 +, 1 —.

GREEN COUNTY

The territory covered by the well survey in this county embraced all of Linder, Carrolton, and Rock Bridge townships, and parts of Roodhouse, Whitehall, Patterson and Kane townships. In all about 30 percent of the county was surveyed and 891 well records secured.

Of the 891 wells reported, 867 are of the dug type from 3 feet to 65 feet deep; 1 is a bored well 20 feet deep; 1 is a well point well 50 feet deep, and 22 are of the drilled type from 41 feet to 350 feet deep. Of the 22 drilled wells 8 were test wells at Greenville and ranged in depth from 41 feet to 95 feet.

Analyses, 14; 4 I, 4 II, 6 III; R. 1 B, 5 C, 6 D, 2 F; H. 1 M, 4 N, 9 O; Fe, 1 W, 8 X, 4 Y, 1 Z; Mn, 5 +, 9 —.

GRUNDY COUNTY

The territory covered by the well survey in this county embraced all of Wauponsee and Saratoga townships. In all, about 17 percent of the county was surveyed and 359 well records were obtained.

Of the 359 wells reported, 163 were of the dug type from 8 feet to 43 feet deep; 21 were of the well point type, from 12 feet to 45 feet deep; 2 were of the bored type, 27 feet and 37 feet deep; 170 were of the drilled type, from 25 feet to 1200 feet deep; and 3 springs were used as sources of water supply.

Analyses, 15; 7 I, 5 II, 3 III; R. 1 B, 8 C, 3 D, 2 E, 1 F; H. 2 L, 2 M, 9 N, 2 O; Fe, 4 W, 1 X, 7 Y, 3 Z; Mn, 2 +, 13 —.

HAMILTON COUNTY

The territory covered by the well survey in this county embraced the entire county. The county was covered 100% and 707 well records were secured.

Of the 707 wells reported, 539 are of the dug type from 6 feet to 50 feet deep; 126 are of the drilled type from 40 feet to 250 feet deep; and 42 are springs.

Analyses, 10; 10 II; R. 1 B, 1 D, 8 F; H. 1 L, 1 N, 8 O; Fe, 2 W, 1 X, 3 Y, 4 Z; Mn, 6 +, 4 —.

HANCOCK COUNTY

The territory covered by the well survey in this county embraces all of Rock Creek, Carthage, Chili and Augusta townships and parts of Prairie, Harmoney, and St. Mary townships. In all about 28 percent of the county was surveyed and 367 well records secured.

Of the 367 wells reported 168 are of the dug or bored type and vary from 10 feet to 85 feet deep; 31 are of the drilled type penetrating gravel or sand and vary from 60 feet to 220 feet in depth, while 168 are of the drilled type into rock formations and vary from 40 feet to 1100 feet deep. However, only three of the drilled rock wells exceed 390 feet.

Analyses, 19; 8 I, 5 II, 6 III; R. 10 C, 3 D, 2 E, 4 F; H. 8 N, 11 O; Fe, 4 W, 1 X, 5 Y, 9 Z; Mn, 9 +, 10 —.

 HARDIN COUNTY

The territory covered by the well survey in this county embraced the entire county. The county was covered 100% and 169 well records were secured.

Of the 169 wells reported, 99 are of the dug type from 9 feet to 70 feet deep; 54 are of the drilled type from 50 feet to 240 feet deep; and 16 are springs.

Analyses, 23; 7 I, 5 II, 11 III; R. 1 A, 6 B, 10 C, 5 D, 1 E; H. 1 K, 4 L, 3 M, 10 N, 5 O; Fe, 3 W, 4 X, 7 Y, 9 Z; Mn, 6 +, 17 —.

 HENDERSON COUNTY

The territory covered by the well survey in this county embraced all of Rozetta, Biggsville, Medea, Paritan and Terre Haute townships; parts of Bold Bluff, Oquawka, Stronghurst and Lomax townships. In all about 56 percent of the county was surveyed and 421 well records secured.

Of the 421 wells reported 97 are wells drilled into the rock and vary in depth from 38 feet to 1009 feet. Aside from the Stronghurst City well, which is the 1009 foot well, there are two wells of depths of 582 feet and 601 feet. With these three exceptions the drilled rock wells as reported do not exceed 265 feet in depth.

There are 20 wells drilled to gravel, varying in depth from 40 feet to 152 feet; 6 well point or drive point wells varying from 30 feet to 50 feet, and 298 dug and bored wells varying in depth from 6 feet to 93 feet deep.

Analyses, 20; 5 I, 3 II, 12 III; R. 1 A, 4 B, 5 C, 7 D, 1 E, 2 F; H. 1 L, 1 M, 7 N, 11 O; Fe, 5 W, 1 X, 10 Y, 4 Z; Mn, 8 +, 12 —.

HENRY COUNTY

The territory covered by the well survey in this county embraced all of Alba, Munson, Cornwell, Annawan, Cambridge, Burns, and Kewanee townships. In all about 30 percent of the county was surveyed and 713 well records secured.

Of the 713 wells reported, 406 are of the dug type from 14 feet to 70 feet deep; 223 are of the drilled type from 40 feet to 485 feet deep; 75 are of the driven type from 12 feet to 54 feet deep; 8 are of the bored type from 23 feet to 55 feet deep; and 1 is a spring.

Analyses, 44; 28 I, 15 II, 1 III; R. 11 C, 12 D, 6 E, 15 F; H. 2 K, 4 L, 16 M, 10 N, 12 O; Fe, 5 W, 7 X, 17 Y, 15 Z; Mn, 4 +, 40 —.

 IROQUOIS COUNTY

The territory covered by the well survey in this county embraced parts of every township except Ridgeland, Pigeon Grove, Love Joy, and Prairie Green townships. No one township was completely covered. In all about 31.4% of the county was surveyed and 524 well records secured.

Of the 524 wells reported 470 are of the drilled type from 35 to 510 feet deep; 38 are of the driven type from 10 to 60 feet deep; 14 are of the dug type from 14 to 58 feet deep; and 2 are of the bored type 10 to 60 feet deep.

Seventy-seven of the wells were reported as flowing wells.

Analyses, 19; 8 I, 11 II; R. 1 B, 6 C, 3 D, 3 E, 6 F; H. 1 K, 1 L, 4 M, 4 N, 9 O; Fe, 5 Y, 14 Z; Mn, 4 +, 15 —.

 JACKSON COUNTY

The territory covered by the well survey in this county embraced parts of Vergennes, Somerset, Carbondale, and Murphysboro townships. In all about 7 percent of the county was surveyed and 200 well records secured.

Of the 200 wells reported, 168 are of the dug type, 2 of these are 135 feet deep while the balance vary from 6 feet to 45 feet; 17 wells are of the bored type from 13 feet to 40 feet deep and 15 are of the drilled type, 1 is 600 feet deep and another 975 feet, the balance varying between 51 feet to 290 feet deep. The 975 foot well was originally drilled for oil.

Analyses, 18; 8 I, 4 II, 6 III; R. 5 B, 3 C, 3 D, 7 F; H. 2 K, 2 L, 4 M, 4 N, 6 O; Fe, 6 W, 2 X, 2 Y, 8 Z; Mn, 7 +, 11 —.

JASPER COUNTY

The territory covered by the well survey in this county embraces all of Willow Hill township, and parts of Grandville township. In all, about 10 percent of the county was surveyed and 87 well records secured.

Of the 87 wells reported, 79 are of the dug type from 12 feet to 42 feet deep; 8 are drilled wells, from 64 feet to 300 feet deep, with 1 well reported drilled to 26 feet.

Analyses, 12; 7 I, 1 II, 4 III; R. 2 C, 6 D, 3 E, 1 F; H. 2 K, 2 L, 2 M, 1 N, 5 O; Fe, 3 W, 4 X, 5 Y; Mn, 3 +, 9 —.



JEFFERSON COUNTY

The territory covered by the well survey in this county embraced all of Casner, Shilo, Mt. Vernon, Webber, Pendleton, and Dobbs townships. In all about 39% of the county was surveyed and 562 well records secured.

Of the 562 wells reported, 347 are of the dug type from 4 feet to 38 feet deep; 206 are of the drilled type from 25 feet to 180 feet deep, and 9 are springs.

Analyses, 18; 2 I, 15 II, 1 III; R. 1 B, 1 C, 2 D, 4 E, 10 F. H. 1 K, 1 M, 1 N, 15 O; Fe, 3 W, 6 Y, 9 Z; Mn, 10 +, 8 —.



JERSEY COUNTY

The territory covered by the well survey in this county embraced all of Piasa township and part of Richwood township. In all about 16 percent of the county was surveyed and 285 well records secured.

Of the 285 wells reported, 270 are of the dug type from 3 feet to 89 feet deep; .3 are of the bored type from 20 feet to 45 feet deep; 3 are of the well point type from 23 feet to 48 feet deep; and 9 are of the drilled type from 128 feet to 406 feet deep.

A large percentage of the dug wells are less than 35 feet deep.

Analyses, 30; 2 I, 11 II, 16 III; R. 14 C, 4 D, 3 E, 9 F; H. 1 K, 8 N, 21 O; Fe, 10 W, 3 X, 10 Y, 7 Z; Mn, 6 +, 23 —.

JO DAVIESS COUNTY

The territory covered by the well survey in this county embraced all of Dunleith, Menominee, West Galena, Vinegar Hill, Council Hill, East Galena, and Elizabeth townships, and a part of Scales Mound, Apple River, Guilford, and Rice townships. In all about 34 percent of the county was surveyed and 576 well records secured.

Of the 576 wells reported, 558 are of the drilled type from 36 feet to 1326 feet deep; 17 are of the dug type from 15 feet to 50 feet deep; and 1 is of the driven type 53 feet deep.

Analyses, 19; 5 I, 9 II, 5 III; R. 7 B, 11 C, 1 D; H. 3 M, 6 N, 10 O; Fe, 7 W, 4 X, 4 Y, 4 Z; Mn, 7 +, 12 —.



JOHNSON COUNTY

The territory covered by the well survey in this county embraced all of Burnside, Tunnell Hill, and Bloomfield townships, and a considerable part of Elvira, Simpson, Grantsburg, Vienna and Cache townships. In all about 74% of the county was surveyed and 530 well records secured.

Of the 530 wells reported, 449 are of the dug type from 8 feet to 67 feet deep; 35 are springs; 23 are of the drilled type from 50 feet to 900 feet deep; 20 are of the bored type from 18 feet to 30 feet deep; and 8 are of the driven type from 10 feet to 45 feet deep.

Analyses, 18; 8 I, 4 II, 6 III; R. 2 A, 2 B, 4 C, 4 D, 4 E, 2 F; H. 3 K, 3 L, 2 M, 4 N, 6 O; Fe, 3 W, 6 X, 6 Y, 3 Z; Mn, 3 +, 15 —.



KANE COUNTY

The territory covered by the well survey in this county embraced all of Elgin, Plato, and Big Rock townships, and parts of Burlington, Dundee, Kaneville, St. Charles and Sugar Grove townships. In all, about 22 percent of the county was surveyed and 470 well records secured.

Of the 470 wells reported, 154 were of the dug type from 6 feet to 70 feet deep; 32 were of the well point type, from 17 feet to 52 feet deep; 5 were of the bored type, from 32 feet to 53 feet deep; 277 were of the drilled type, from 20 feet to 2100 feet deep; and 2 springs were used as sources of water supply.

Analyses, 119; 50 I, 31 II, 38 III; R. 2 B, 69 C, 41 D, 6 E, 1 F; H. 1 K, 7 L, 10 M, 55 N, 46 O; Fe, 16 W, 11 X, 44 Y, 48 Z; Mn. 12+, 107 —.

KANKAKEE COUNTY

The territory covered by the well survey in this county embraced a 1 of Manteno, Bourbonnais, and Salina townships, and parts of Limestone and Kankakee townships. In all, about 18 per cent of the county was surveyed and 321 well records secured.

Of the 321 wells reported, 15 were of the dug type from 11 feet to 30 feet deep; 1 was of the well point type 18 feet deep, and 305 were of the drilled type, of which 300 were from 23 to 340 feet deep, and 5 were from 1042 feet to 1847 feet deep.

Analyses, 28; 1 I, 21 II, 6 III; R. 2 B, 12 C, 6 D, 3 E, 5 F; H. 1 K, 1 L, 6 N, 20 O; Fe, 4 W, 8 X, 9 Y, 7 Z; Mn, 5 +, 23 —.

KENDALL COUNTY

The territory covered by the well survey in this county embraced all of Fox and Little Rock townships. In all, about 22 percent of the county was surveyed, and 266 well records were obtained.

Of the 266 wells reported, 53 were of the dug type from 12 to 72 feet deep; 6 were of the well point type, from 8 feet to 20 feet deep; 201 were of the drilled type from 25 feet to 535 feet deep; and 6 springs served as sources of water supply.

Analyses, 6; 4 I, 1 II, 1 III; R. 6 C; H. 1 M, 5 N; Fe, 2 W, 2 X, 2 Y; Mn, 0 +, 6 —.

KNOX COUNTY

The territory covered by the well survey in this county embraced all of Rio, Onterio, Henderson, Galesburg and Indian Point townships; parts of Sparta and Cedar townships. In all about 33 percent of the county was surveyed and 469 well records secured.

Of the 469 wells reported 89 were drilled either into gravel and sand or into rock. Of these 89 wells, 87 varied in depth between 35 feet and 250 feet. The two remaining wells are at the Abingdon City Waterworks; one is 1355 feet deep into the St. Peter Sandstone and the other is 2583 feet deep into the Dresbach sandstone. The remaining 380 wells were all dug or bored to depths varying between 8 feet and 71 feet.

Analyses, 28; 15 I, 10 II, 3 III; R. 5 C, 7 D, 2 E, 14 F; H. 1 L, 2 M, 12 N, 13 O; Fe, 2 W, 6 X, 9 Y, 11 Z; Mn, 10+, 18 —.

LAKE COUNTY

The well survey of Lake County is complete and is represented by about 750 well records and 350 chemical analyses of water samples.

From the data collected maps have been prepared for office use, showing the surface relief of the Niagaran dolomite, from which it is easy to forecast the depth at which this formation will be encountered in any well.

Maps are also available for study, showing the hardness of the well waters from the various aquifers, i.e., gravel and sand, Niagaran, St. Peter and Cambrian sandstones. This same group of maps also indicates the location of sulphur water and oil and gas. There is just enough of these to make some waters disagreeable as domestic supplies.

In this county the soft waters are obtained from the Niagaran in an area north and west of Waukegan. Some waters have hardness as low as 7 or 8 p.p.m., while many in this area are below the hardness of Lake Michigan water.

Along the lake shore the general depth to the bed rock varies from 90 to 110 feet, while back from the lake shore the depth steadily increases from 165 feet or so to 250 feet or more.

Three rather extensive valleys have been located in the surface of the Niagaran dolomite, which are buried valleys filled with sand and gravel, from which good water can be obtained. The City Libertyville is squarely over one of these buried valleys and secures part of its public supply from the gravel deposits therein.

Analyses, 215; 103 I, 109 II, 3 III; R. 1 A, 35 B, 97 C, 44 D, 17 E, 21 F; H. 19 K, 35 L, 35 M, 65 N, 61 O; Fe, 27 W, 29 X, 102 Y, 56 Z; Mn, 4 +, 209 —.

 LA SALLE COUNTY

The territory covered by the well survey in this county embraced all of Waltham, Utica, Manlius, and Brookfield townships and a considerable portion of Deer Park township. In all about 15% of the county was surveyed and 477 well records secured.

Of the 477 wells reported, 271 are of the drilled type from 50 feet to 900 feet deep; 203 are of the dug type from 8 feet to 75 feet deep; 2 are of the driven type 23 feet and 37 feet deep; and 1 is a spring.

Three of the drilled wells were reported to be flowing wells.

Analyses, 110; 66 I, 25 II, 18 III; R. 25 C, 19 D, 26 E, 40 F; H. 7 L. 8 M, 63 N, 32 O; Fe, 18 W, 9 X, 35 Y, 48 Z; Mn, 13 +, 95 —.

LAWRENCE COUNTY

The territory covered by the well survey in this county embraced all of Lawrence and Bridgeport townships and parts of Liekin, Christy, Petty, Bond, Allison, and Dennison townships. In all about 30 percent of the county was surveyed and 244 well records were secured.

Of the 244 wells reported, 88 are of the dug type from 9 feet to 90 feet deep; 32 are of the well point type from 9 feet to 39 feet deep; 2 are of the bored type each 18 feet deep and 122 are of the drilled type from 16 feet to 490 feet deep.

Analyses, 26; 10 I, 5 II, 11 III; R. 6 B, 3 C, 3 D, 1 E, 13 F; H. 2 K, 3 M, 9 N, 120; Fe, 2 W, 7 X, 10 Y, 7 Z; Mn, 14 +, 12 —.

LEE COUNTY

The territory covered by the well survey in this county embraced all of Palmyra and Dixon townships, and a very small part of Nachusa and Nelson townships. In all only about 10 percent of the county was surveyed and 150 well records secured.

Of the 150 wells reported, 133 are of the drilled type from 37 feet to 255 feet deep; 15 are of the dug type from 16 feet to 50 feet deep; and 2 are of the driven type 18 feet and 24 feet deep.

Analyses, 22; 5 I, 6 II, 10 III; R. 2 A, 2 B, 14 C, 2 D, 2 F; H. 2 K, 1 M, 8 N, 11 O; Fe, 2 W, 4 X, 8 Y, 8 Z; Mn, 5 +, 16 —.

LIVINGSTON COUNTY

The territory covered by the well survey in this county embraced all of Dwight, Round Grove, Union, and Broughton townships, and parts of Nevada, Odell, Avaco, Pleasant Ridge, Charlotte, Indian, Forrest, Chats, Belle and Prairie townships. In all about 29.3% of the county was surveyed and 509 well records secured.

Of the 509 wells reported 333 are of the drilled type from 30 to 390 feet deep; 141 are of the dug type from 11 to 70 feet deep and 35 are of the bored type from 28 to 48 feet deep.

Analyses, 30; 13 I, 13 II, 4 III; R. 5 C, 5 D, 3 E, 17 F; H. 11 L, 2 M, 3 N, 14 O; Fe, 3 W, 7 X, 6 Y, 14 Z; Mn, 7 +, 23 —.

LOGAN COUNTY

The territory covered by the well survey in this county embraced all of Emmence, Orvil, Prairie Creek, Atlanta, Ovan, Sheridan and Corwin townships and a part of Laenna township. In all about 43 percent of the county was surveyed and 693 well records secured.

Of the 693 wells reported, 404 are of the drilled type varying in depth from 27 feet to 285 feet; 11 are well-points from 14 feet to 35 feet deep and 278 are dug from 3 feet to 69 feet deep.

Analyses, 21; 6 I, 7 II, 8 III; R. 3 B, 7 C, 6 D, 3 E, 2 F; H. 6 N, 15 O; Fe, 5 W, 1 X, 5 Y, 10 Z; Mn, 7 +, 14 —.

 MACON COUNTY

The territory covered by the well survey in this county embraced all of Austin, Illini, Harristown, Decatur and Hickory Point townships and parts of Blue Mound, South Wheatland, Long Creek and Niantic townships. In all about 40 percent of the county was surveyed and 662 well records secured.

Of the 662 wells reported 171 are of the dug type from 3 feet to 100 feet deep; 127 are of the bored type from 18 feet to 110 feet deep; 4 are of the well point type from 50 feet to 120 feet deep and 360 are of the drilled type from 30 feet to 272 feet deep.

Analyses, 19; .12 I, 7 III; R. 8 C, 5 D, 1 E, 5 F; H. 4 N, 15 O; Fe, 1 W, 3 Y, 14 Z; Mn, 1 +, 17 —.

 MACOUPIN COUNTY

The territory covered by the well survey in this county embraced all of Dorchester, Shaws Point, and Carlinville townships, and a considerable part of Mt. Olive township. In all about 16 percent of the county was surveyed and 427 well records secured.

Of the 427 wells reported, 423 are of the dug type from 3 feet (springs) to 63 feet deep; 2 are of the bored type from 18 to 21 feet deep and 2 are of the drilled type from 120 feet to 365 feet deep.

A high percentage of the dug wells are less than 35 feet deep.

Analyses, 9; 4 I, 3 II, 2 III; R. 2 C, 2 D, 2 E, 3 F; H. 3 M, 2 N, 4 O; Fe 1 W, 3 X, 5 Z; Mn, 4 +, 5 —.

MADISON COUNTY

The territory covered by the well survey in this county embraced all of Hamel, Fort Russell, Moro, Collinsville, Pin Oak, and Edwardsville townships, and parts of Alton, Wood River, Chouteau, Nameoki, Jarvis, and Godfrey townships. In all about 38 percent of the county was surveyed and 1225 well reports secured.

Of the 1225 wells reported, 1087 are of the common type of dug wells from 4 feet to 106 feet deep; 40 are of the gravel packed type of well from 90 feet to 123 feet deep; 28 are of the well point type from 14 feet to 60 feet deep; 58 are of the bored type from 14 feet to 58 feet deep; 10 are of the bored type from 60 feet to 245 feet deep, and 2 are of the deep well bored type 1325 feet and 1862 feet deep. The 1862 foot well was an oil test ho'e and was uncompleted in March 1934.

Analyses, 63; 5 I, 38 II, 20 III; R. 8 B, 31 C, 11 D, 4 E, 9 F; H. 1 K, 1 L, 6 M, 25 N, 30 O; Fe, 8 W, 7 X, 18 Y, 30 Z; Mn, 44 +, 19 —.

MARION COUNTY

The territory covered by the well survey in this county embraced all of Carrigan township, and parts of Sandovil and Odin townships. In all about 10 percent of the county was surveyed and 126 well records secured.

Of the 126 wells reported, 123 are of the dug type from 9 feet to 50 feet deep; 1 drilled well 120 feet deep and 2 bored wells 16 feet and 18 feet deep.

Analyses, 16; 2 I, 9 II, 5 III; R. 3 A, 5 B, 1 C, 2 E, 5 F; H. 1 K, 6 L, 3 M, 6 O; Fe, 6 W, 3 X, 3 Y, 4 Z; Mn, 4 +, 12 —.

MARSHALL COUNTY

The territory covered by the well survey in this county embraced all of the fractional townships of Henry and Lacon; parts of Saratoga, Whitfield and Richland townships. In all about 20 percent of the county was surveyed and 185 well records secured.

Of the 185 wells reported, 136 are of the dug, drive point, or bored type and range in depth from 6 feet to 110 feet; 48 are of the drilled type varying in depth from 49 feet to 250 feet. The deep city well at Henry is 1355 feet deep. Dug wells in this county, and especially in Henry township, are unusually deep for this type of construction. In Henry township the depths generally vary between 60 feet and 100 feet.

Analyses, 17; 4 I, 7 II, 6 III; R. 9 C, 2 D, 1 E, 5 F; H. 2 K. 11 N, 4 O; Fe, 4 W, 2 X, 7 Y, 4 Z; Mn, 7 +, 10 —.

MASON COUNTY

The territory covered by the well survey in this county embraced all of Mason City, Allen Grove, Pennsylvania, and Sherman townships; the eastern two-thirds of Forest City township; the eastern one-half of Manito township, and parts of Havana township. In all about 36 percent of the county was surveyed and 769 well records secured.

Of the 769 wells reported, 29 are of the dug type, 22 feet to 60 feet; 202 are of the well point type, 14 feet to 70 feet deep, and 538 are of the drilled type 25 feet to 270 feet deep.

Analyses, 13; 2 I, 5 II, 6 III; R. 1 A, 2 B, 6 C, 2 D, 2 F; H. 1 L, 2 M, 4 N, 6 O; Fe, 2 W, 4 X, 4 Y, 3 Z; Mn, 4 + 9 —.

 MASSAC COUNTY

The territory covered by the well survey in this county embraced all of the area within the county boundaries. In all 403 well records were secured from the entire county. Cisterns seem to be the popular method for obtaining water, so in a good many sections not even one well could be found.

Of the 403 wells reported, 358 are of the dug type from 6 feet to 72 feet deep; 29 are of the drilled type from 65 feet to 465 feet deep; 14 are springs; and 2 are of the driven type from 55 feet to 67 feet deep.

Analyses, 13; 4 I, 2 II, 7 III; R. 3 A, 6 B, 3 C, 1 D; H. 2 K, 2 L, 8 M, 1 O; Fe, 9 Y, 4 Z; Mn, 3 +, 10 —.

 MCHENRY COUNTY

The territory covered by the well survey in this county embraced all of Grafton and Algonquin townships, and nearly all of Seneca township. In all, about 18 percent of the county was surveyed and 663 well records were obtained.

Of the 663 wells reported, 203 were of the dug type, from 8 feet to 96 feet deep; 175 are of the well point type from 8 feet to 98 feet deep; 9 were of the bored type, from 18 feet to 42 feet deep; 270 were of the drilled type, of which all except 1 was between 30 feet and 555 feet, and that one was 2005 feet; and 6 springs served as sources of water supply.

Analyses, 60; 38 I, 9 II, 13 III; R. 8 B, 47 C, 4 D, 1 F; H. 2 L, 8 M, 31 N, 19 O; Fe, 5 W, 2 X, 35 Y, 18 Z; Mn, 5 +, 43 —.

MCDONOUGH COUNTY

The territory covered by the well survey in this county embraced all of Prairie City, Bushnell, Walnut Grove, Sciota and New Salem townships. In all about 25 percent of the county was surveyed and 340 well records secured. Of the 340 wells reported, 276 are farm or rural wells, of which 236 are of the dug, bored or well-point types, varying in depth between 12 feet and 90 feet; 40 are drilled wells varying in depth from 60 feet to 966 feet.

Within the municipality of Prairie City records of 51 dug wells varying in depth from 13 feet to 58 feet were obtained, and in the municipality of Bushnell records were secured for 9 dug wells from 16 feet to 48 feet in depth and 4 drilled wells from 106 feet to 127 feet in depth.

The city supply at Bushnell is secured from 2 wells penetrating the St. Peter sandstone at more than 1300 feet.

Analyses, 28; 9 I, 18 II, 1 III; R. 2 B, 5 C, 2 D, 1 E, 18 F; H. 1 L, 2 M, 8 N, 17 O; Fe, 1 W, 1 X, 11 Y, 15 Z; Mn, 8 +, 20 —.

MCLEAN COUNTY

The territory covered by the well survey in this county embraced all of the townships within the county boundary lines except Anchor, Cheney Grove, and Empire townships. The townships of Cropsey, Normal, Towanda, Bloomington, Old Town, Dawson, Downs, West, Bell Flower, Mount Hope, Waynesville, Wapella, Urlson, Rutledge, Santa Anna, and Blue Ridge, were not completely surveyed, but most of the territory was covered. In all about 81.8% of the county was surveyed and 1786 well records secured.

Of the 1786 wells reported 1101 are of the drilled type from 36 to 400 feet deep; 624 are of the dug type from 10 to 85 feet deep; 44 are of the bored type from 18 to 50 feet; 14 are of the driven type 16 to 45 feet deep; and 3 are springs.

Analyses, 48; 26 I, 9 II, 5 III; R. 3 A, 4 B, 22 C, 12 D, 2 E, 5 F; H. 3 L, 5 M, 24 N, 10 O; Fe, 7 W, 3 X, 7 Y, 26 Z; Mn, 5 +, 34 —.

MENARD COUNTY

The territory covered by the well survey in this county embraced all of Oakford and Oak Creek townships and parts of Tullula, Atterberry, Sand Ridge, and Greenview townships. In all about 35 percent of the county was surveyed and 300 well records secured.

Of the 300 wells reported, 245 are of the dug type, from 8 feet to 75 feet deep; 48 are of the well-point type, from 16 feet to 40 feet deep, and 7 are of the drilled type from 75 feet to 180 feet deep.

Analyses, 8; 1 I, 1 II, 6 III; R. 2 B, 1 C, 2 D, 1 E, 2 F; H. 3 N, 5 O; Fe, 3 W, 3 Y, 2 Z; Mn, 6 +, 2 —.

MERCER COUNTY

The territory covered by the well survey in this county embraced all of Richland Grove, Preemption, Perryton, Duncan, Eliza, Green, and Mercer townships. Rivoli and Millersburg townships were partially covered. In all about 50 percent of the county was surveyed and 786 well records secured.

Of the 786 wells reported, 473 are of the dug type from 8 feet to 70 feet deep; 307 are of the drilled type from 45 feet to 291 feet deep; 3 are of the bored type from 22 feet to 35 feet deep, and 3 are springs.

Water from the limestone, while soft, has a strong hydrogen sulfide odor and taste.

Analyses, 30; 22 I, 4 II, 4 III; R. 10 C, 13 D, 4 E, 3 F; H. 1 L, 7 M, 8 N, 14 O; Fe, 1 W, 3 X, 11 Y, 14 Z; Mn, 6 +, 22 —.

MONROE COUNTY

The territory covered by the well survey in this county embraced all of Murdock, Harrisonville, New Design, Prairie Du Long, Renault, and Mitchell townships, and parts of Bluff and Waterloo townships. In all about 73 percent of the county was surveyed and 621 well records secured.

Of the 621 wells reported, 442 are of the dug type from 3 feet to 106 feet deep. A considerable number were dug during the early part of 1934. The number of well point wells reported was 104 from 15 feet to 80 feet deep; 4 are of the bored type from 21 feet to 62 feet deep; 69 are of the drilled type from 35 feet to 376 feet deep. There are two additional drilled wells somewhat deeper than the others, namely 505 feet and 900 feet. The latter was an oil prospect.

Analyses, 19; 3 I, 10 II, 6 III; R. 10 C, 4 D, 3 E, 2 F; H. 1 L, 5 N, 13 O; Fe, 4 W, 4 X, 6 Y, 5 Z; Mn, 4 +, 15 —.

MONTGOMERY COUNTY

The territory covered by the well survey in this county embraced all of Nokomis, Witt, North Litchfield and Zanesville townships, and parts of Irving township. In all about 24 percent of the county was surveyed and 1053 well records secured.

Of the 1053 wells reported, 1040 are of the dug type from 10 feet to 65 feet deep; 5 are of the bored type from 12 feet to 19 feet deep; 5 are of the drilled type from 32 feet to 180 feet deep, and 3 are of the drilled type (oil prospect) from 688 feet to 844 feet deep.

Analyses, 20; 13 II, 7 III; R. 5 C, 6 D, 5 E, 4 F; H. 1 M, 5 N, 14 O; Fe, 6 W, 4 X, 6 Y, 4 Z; Mn, 11 +, 9 —.

MORGAN COUNTY

The territory covered by the well survey in this county embraced all of Prentice, Sinclair, Literberry, Arcadia, and Concord townships, and parts of Meredosia, Alexander, Jacksonville, Markham, Waverly, Frank.in and Pisgah townships. In all about 46 percent of the county was surveyed and 546 well reports secured.

Of the 546 wells reported, 539 are of the dug type, from 11 feet to 110 feet deep, and 7 are of the drilled type from 55 feet to 185 feet in depth. All but seven of the dug wells (532) are 50 feet or less in depth.

Analyses, 14; 1 I, 4 II, 9 III; R. 3 C, 10 D, 1 F; H. 1 N, 13 O; Fe, 1 W, 3 X, 4 Y, 6 Z; Mn, 9 +, 5 —.

MOULTRIE COUNTY

The territory covered by the well survey in this county embraced all of Lovington township, and part of Sullivan township. In all about 20.3 percent of the county was surveyed and 118 well records secured.

Of the 118 wells reported, 30 are of the dug type from 24 feet to 102 feet deep; 23 are of the drilled type from 55 feet to 180 feet deep; 65 are of the bored type from 28 feet to 128 feet deep.

Analyses, 23; 14 I, 3 II, 6 III; R. 1 B, 10 C, 9 D, 3 E; H. 10 N, 13 O; Fe, 1 X, 8 Y, 14 Z; Mn, 4 +, 19 —.

OGLE COUNTY

The territory covered by the well survey in this county embraced all of Forreston, Brookville and Mount Morris townships and part of Lincoln township. In all about 15 percent of the county was surveyed and 486 well records secured.

Of the 486 wells reported, 454 are of the drilled type and vary in depth from 24 feet to 440 feet, and 32 are of the dug type from 13 feet to 40 feet deep.

Analyses, 9; 4 I, 5 III; R. 1 B, 6 C, 1 D, 1 E; H. 6 N, 3 O; Fe. 3 W, 5 Y, 1 Z; Mn, 1 +, 8 --.

PEORIA COUNTY

The territory covered by the well survey in this county embraced all of Akron, Chillicothe, Radnor, Medina and Kickapoo townships and half of Brownfield township. In all about 29 percent of the county was surveyed and 479 well records secured.

Of the 479 wells reported 377 were of the dug, drive-point or bored type and varied in depth from 6 feet to 150 feet, while 102 were of the drilled type and varied from 33 feet to 555 feet in depth.

Analyses, 109; 22 I, 52 II, 34 III; R. 1 B, 20 C, 44 D, 17 E, 27 F; H. 1 L, 4 M, 19 N, 85 O; Fe, 50 W, 16 X, 27 Y, 15 Z; Mn, 32 +, 76 —.

 PERRY COUNTY

The territory covered by the well survey in this county embraced all of Tamaroa, Southwestern, and Cutler townships, and parts of Paradise, Beaucoup, Duquoin, Pinckneyville and Swanwick townships. In all about 58 percent of the county was surveyed and 1011 well records secured.

Of the 1011 wells reported, 954 are of the dug type from 6 feet to 85 feet deep; 46 are of the bored type from 14 feet to 110 feet deep; 7 are of the drilled type from 40 feet to 110 feet deep; 7 are of the drilled type from 40 feet to 110 feet deep, and 4 are of the drilled type from 480 feet to 1367 feet deep, having been constructed for other purposes than water supply.

Analyses, 21; 5 I, 14 II, 2 III; R. 2 B, 2 C, 3 D, 4 E, 10 F; H. 4 M, 4 N, 13 O; Fe, 5 W, 9 X, 5 Y, 2 Z; Mn, 5 +, 16 —.

 PIATT COUNTY

The territory covered by the well survey in this county embraces all townships within the county boundary lines as this county was covered 100%. A total of 1082 well records was secured.

Of the 1082 wells reported, 787 are of the drilled type, varying in depth from 43 feet to 400 feet; 264 of the dug type, with depths from 8 feet to 75 feet; 26 of the bored type, from 18 feet to 50 feet; and 5 of the driven type, from 32 feet to 75 feet.

Two of these wells were reported as flowing wells.

Analyses, 35; 25 I, 1 II, 8 III; R. 18 C, 9 D, 4 E, 4 F; H. 1 K, 1 L, 4 M, 11 N, 18 O; Fe, 2 W, 3 X, 8 Y, 22 Z; Mn, 2 +, 29 —.

PIKE COUNTY

The territory covered by the well survey in this county embraced all of New Salem and Barry townships and part of Hadley township. In all about 12 percent of the county was surveyed and 219 well records secured.

Of the 219 wells reported 144 were of the dug, bored or drive-point type and ranged in depth from 12 feet to 75 feet, while 74 wells of the drilled type varied in depth from 40 feet to 378 feet. In the City Park at Barry is a drilled well 2510 feet deep.

Analyses, 19; 9 I, 5 II, 5 III; R. 2 A, 5 B, 7 C, 2 D, 3 F; H. 3 L, 6 M, 7 N, 3 O; Fe, 4 W, 2 X, 10 Y, 3 Z; Mn, 4 +, 15 —.

POPE COUNTY

The territory covered by the well survey in this county embraced parts of all townships except Polk township. In all, about 71 percent of the county was surveyed and 330 well records were obtained.

Of the 330 wells reported, 167 were of the dug type, from 6 feet to 90 feet deep; 55 were of the well point type, from 13 feet to 52 feet deep; 3 were of the bored type, from 17 feet to 30 feet deep; 34 were of the drilled type, from 30 feet to 309 feet deep; and there were 71 springs used as sources of water supply.

Analyses, 14; 1 I, 9 II, 4 III; R. 2 A, 6 B, 3 C, 3 D; H. 2 K, 2 L, 4 M, 5 N, 1 O; Fe, 2 W, 1 X, 1 Y, 10 Z; Mn, 8 +, 60 —.

PULASKI COUNTY

The territory covered by the well survey in this county embraced parts of all the townships in the county. In all, about 69 percent of the county was surveyed and 428 well records secured.

Of the 428 wells reported, 274 were of the dug type, from 9 feet to 90 feet deep; 74 were of the well point type, from 12 feet to 50 feet deep; 15 were of the bored type from 16 feet to 31 feet deep; 62 were of the drilled type, of which 61 were from 36 feet to 634 feet deep, and 1 was 1005 feet deep; 3 springs were used as a source of water supply.

Analyses, 12; 5 I, 4 II, 3 III; R. 4 B, 4 C, 1 D, 2 E, 1 F; H. 1 L, 3 M, 4 N, 4 O; Fe, 1 X, 5 Y, 6 Z; Mn, 7 +, 5 —.

PUTNAM COUNTY

The territory covered by the well survey in this county embraced all of Senachwine, Hennepin and Granville townships; parts of Magnolia township. In all about 90 percent of the county was surveyed and 369 well reports secured.

Of the 369 wells reported 241 are of the dug type and vary in depth from 3 feet to 132 feet; and 3 are of the well point type and vary in depth from 20 feet to 142 feet. The remainder (125) are of the drilled type, 123 wells vary in depth from 17 feet to 415 feet, while 2 are much deeper, being 1450 feet and 1996 feet respectively.

Analyses, 12; 3 I, 4 II, 5 III; R. 7 C, 1 D, 1 E, 3 F; H. 1 L, 4 N, 7 O; Fe, 1 W, 3 X, 4 Y, 4 Z; Mn, 5 +, 7 —.

RANDOLPH COUNTY

The territory covered by the well survey in this county embraced all of Steelville and Prairie Du Rocher townships, and parts of Coulterville, Tilden, Sparta, Percy, Red Bud, and Brewerville townships. In all about 27 percent of the county was surveyed and 492 well records secured.

Of the 492 wells reported 400 are of the dug type from springs to 85 feet deep; 45 are of the well point type from 22 feet to 70 feet deep; 17 are of the bored type from 10 feet to 30 feet deep, and 30 are of the drilled type from 75 feet to 508 feet deep.

Analyses, 28; 14 I, 10 II, 4 III; R. 14 C, 5 D, 1 E, 8 F; H. 1 K, 2 L, 5 M, 9 N, 10 O; Fe. 6 W, 4 X, 8 Y, 10 Z; Mn, 6 +, 22 —.

RICHLAND COUNTY

The territory covered by the well survey in this county embraced parts of Preston, Denver, Noble, German, Decker and Olney townships. In all about 31.4 percent of the county was surveyed and 271 well records secured.

Of the 271 wells reported, 212 are of the dug type from 4 feet to 55 feet deep; 59 are of the drilled type from 50 feet to 320 feet deep.

Analyses, 23; 14 I, 6 II, 3 III; R. 1 A, 5 C, 5 D, 4 E, 8 F; H. 7 K, 3 L, 2 M, 6 N, 5 O; Fe, 6 W, 4 X, 8 Y, 5 Z; Mn, 6 +, 17 —.

ROCK ISLAND COUNTY

The territory covered by the well survey in this county embraced all of Bowling, Blackhawk, and Cordova townships; parts of Port Byron, Coe, Canoe Creek, Hampton, Zuma and Edington townships. In all about 36 percent of the county was surveyed and 394 well records were secured.

Of the 394 wells reported 74 are of the dug type from 3 feet to 112 feet deep; 121 are of the well point type from 14 feet to 62 feet deep; 47 are of the bored type from 18 feet to 130 feet deep, and 152 are of the drilled type 50 feet to 1985 feet deep.

Analyses, 51; 17 I, 26 II, 8 III; R. 4 A, 2 B, 17 C, 5 D, 2 E, 21 F; H. 1 K, 4 L, 5 M, 20 N, 21 O; Fe, 14 W, 9 X, 17 Y, 11 Z; Mn, 11 +, 40 —.

 SALINE COUNTY

The territory covered by the well survey in this county embraced all of Tate, Long Branch, Rector, Galatia, Brushy, Raleigh and Carrier Mills townships, and parts of Eldorado, Harrisburg, Cottage, Stonefort, Independence, and Mountain townships. In all, about 78 percent of the county was surveyed, and 472 well records were obtained.

Of the 472 wells reported, 388 were of the dug type, from 10 feet to 65 feet deep; 1 was bored to 28 feet; 73 were of the drilled type, of which 70 were from 45 feet to 472 feet deep, and 3 oil prospect holes were 1285, 1547, and 3300 feet deep.

Analyses, 9; 3 I, 6 II; R. 1 C, 1 D, 1 E, 6 F; H. 2 N, 7 O; Fe, 1 W, 1 X, 2 Y, 5 Z; Mn, 4 +, 5 —.

 SANGAMON COUNTY

The territory covered by the well survey in this county embraced all of Buffalo Hart, Williams, Fancy Creek, and Salisbury townships and parts of Lanessville and Cartwright townships. In all about 10 percent of the county was surveyed and 186 well records secured.

Of the 186 wells reported, 175 are of the dug type, from 3 feet to 64 feet deep, and 11 are of the drilled type from 37 feet to 598 feet deep.

Analyses. 6; 2 I, 2 II, 2 III; R. 3 C, 1 D, 1 E, 1 F; H. 2 N, 4 O; Fe, 2 Y, 4 Z; Mn, 3 +, 3 —.

SCHUYLER COUNTY

The territory covered by the well survey in this county embraced all of Littleton, Buena Vista, and Woodstock townships and a part of Rushville township. In all about 27 percent of the county was surveyed and 296 well records secured.

Of the 296 wells reported, 277 were of the dug type and ranged in depth from 2 feet to 135 feet, while 19 wells of the drilled type varied in depth from 81 feet to 450 feet.

Analyses, 11; 3 I, 5 II, 3 III; R. 2 B, 4 C, 3 D, 2 F; H. 1 M, 4 N, 6 O; Fe, 2 W, 3 X, 3 Y, 3 Z; Mn, 6 +, 5 —.

SCOTT COUNTY

The territory covered by the well survey in this county embraced all of Alsey and Glasgow townships and parts of Manchester, South Winchester, East Winchester, North Winchester and Bloomfield townships. In all about 37 percent of the county was surveyed and 284 well records secured.

Of the 284 wells reported, 173 are of the dug type from 3 feet to 51 feet deep; 105 are of the well point type, 14 feet to 90 feet deep and 6 are of the dug type 96 feet to 318 feet deep.

Analyses, 7; 3 I, 4 III; R. 4 C, 3 F; H. 1 M, 3 N, 3 O; Fe, 6 K, 1 L; Mn, 7 —.

SHELBY COUNTY

The territory covered by the well survey in this county embraced all of Moweaqua township and parts of Pickaway, Shelbyville and Clarksburg townships. In all about 13 percent of the county was surveyed and 200 well records secured.

Of the 200 wells reported, 103 are of the dug type 10 feet to 125 feet deep; 48 are of the drilled type from 48 feet to 141 feet deep; 49 are of the bored type from 10 feet to 120 feet deep.

Analyses, 17; 10 I, 3 II, 4 III; R. 7 C, 8 D, 2 E; H. 1 M, 9 N, 7 O; Fe, 2 W, 2 X, 4 Y, 9 Z; Mn, 3 +, 14 —.

STARK COUNTY

The territory covered by the well survey in this county embraced all of Osceola and Elmira townships and parts of Goshen and Penn townships. In all about 45 percent of the county was surveyed and 470 well records secured.

Of the 470 wells reported, 393 were of the dug type and ranged in depth from 4 feet to 134 feet, the major portion have varied within 20 feet to 40 feet. The total of drilled wells reported was 77 and varying in depth from 40 feet to 604 feet.

Analyses, 12; 7 I, 3 II, 2 III; R. 5 C, 2 D, 3 E, 2 F; H. 1 J,* 1 L, 2 M, 2 N, 6 O; Fe, 4 X, 2 Y, 6 Z; Mn, 4 +, 8 —.

*0 p.p.m. hardness.

ST. CLAIR COUNTY

The territory covered by the well survey in this county embraced parts of Centerville Station, Stookey, Millstead, St. Clair, Smithton, and Shiloh Valley townships. In all about 20 percent of the county was surveyed and 305 well records secured.

Of the 305 wells reported, 290 are of the dug type from 10 feet to 115 feet deep; 5 are of the bored type from 22 feet to 35 feet deep; 10 are of the drilled type from 48 feet to 462 feet deep.

Note: Two wells for which there is no location should be added into the totals later on.

Analyses, 37; 14 I, 12 II, 11 Z; R. 1 A, 10 C, 10 D, 5 E, 11 F; H. 8 K, 4 L, 6 N, 19 O; Fe, 5 W, 9 X, 7 Y, 15 Z; Mn, 13 +, 23 —.

STEPHENSON COUNTY

The territory covered by the well survey in this county embraced all of Kent, Ervin, Dakota, Lancaster and Silver Creek townships and parts of Buckeye, Rockvein and Redott townships. In all about 35 percent of the county was surveyed and 652 well records secured.

Of the 652 wells reported 47 are of the dug type 3 feet to 50 feet deep, while 605 are of the drilled type 26 feet to 1285 feet deep. With the exception of two wells (525 feet and 1282 feet deep) all the drilled wells are less than 275 feet deep.

Analyses, 29; 3 I, 11 II, 15 III; R. 1 B, 18 C, 10 D; H. 6 N, 23 O; Fe, 3 W, 6 X, 12 Y, 8 Z; Mn, 10 +, 19 —.

TAZEWELL COUNTY

The territory covered by the well survey in this county embraced all of Washington, Groveland, and Elm Grove townships, and a considerable portion of Morton township. In all about 22 percent of the county was surveyed and 1032 well records secured.

Of the 1032 well records reported, 818 are of the dug type from 3 feet (springs) to 90 feet in depth; 69 are of the bored type from 20 feet to 190 feet in depth (all but one are 100 feet or less in depth); and 145 are of the drilled type from 80 feet to 1400 feet in depth. All but three of the 145 drilled wells are 387 feet or less in depth, the three extra deep ones are 775, 822 and 1400 feet deep. The 822 foot well is reported to yield salt water and the 1400 foot well is reported to yield a water so highly charged with H₂S as to be very objectionable.

Analyses, 28; 9 I, 8 II, 11 III; R. 2 B, 15 C, 7 D, 1 E, 3 F; H. 1 L, 1 M, 11 N, 15 O; Fe, 7 W, 8 X, 3 Y, 10 Z; Mn, 7 +, 21 —.

UNION COUNTY

The territory covered by the well survey in this county embraced parts of Rich, Cobden, Alta Pass, Union No. 1, Union No. 2, Jonesboro, Anna, Western Saratoga, Stokes, Reynoldsville, Misenhimer, Mill Creek, and Dongola townships. In all, about 42 percent of the county was surveyed, and 267 well records were obtained.

Of the 267 wells reported, 130 were of the dug type, from 8 feet to 75 feet deep; 26 were of the well point type, from 16 feet to 50 feet deep; 1 was of the bored type, 18 feet deep; and 51 were of the drilled type, of which 49 were from 60 feet to 656 feet deep, while 2 were oil prospect wells 1440 feet and 2250 feet deep.

Analyses, 20; 5 I, 8 II, 7 III; R. 3 B, 13 C, 1 D, 1 E, 2 F; H. 1 K, 3 M, 13 N, 3 O; Fe, 4 W, 7 X, 1 Y, 6 Z; Mn, 1 +, 15 —.

VERMILION COUNTY

The territory covered by the well survey in this county embraces parts of every political township within the county. While no township was covered 100% the northern half was more fully covered than was the southern half. About 68% of the total area of the county was covered with a total of 969 well records secured.

Of the 969 wells reported, 479 are of the drilled type from 70 feet to 440 feet in depth; 299 of the dug type from 9 feet to 50 feet; 183 of the driven type from 15 to 75 feet; and 8 of the bored type from 20 feet to 50 feet.

Thirty-six of the wells were reported as "flowing" wells.

Analyses, 65; 27 I, 27 II, 11 III; R. 7 B, 26 C, 12 D, 4 E, 16 F; H. 2 L, 8 M, 27 N. 28 O; Fe, 12 W, 8 X, 16 Y, 29 Z; Mn, 21 +, 44 —.

WABASH COUNTY

The territory covered by the well survey in this county embraced parts of Wabash, Lick Prairie, Bellmont, Mt. Carmel, Compton, and Keenesburg townships. In all about 26 percent of the county was surveyed and 98 well records were obtained.

All the wells reported are of the drilled type from 44 feet to 355 feet deep.

Analyses, 15; 9 I, 2 II, 4 III; R. 1 B, 2 C, 4 D, 3 E, 5 F; H. 5 K, 1 L, 1 M, 3 N, 5 O; Fe, 3 W, 4 X, 5 Y, 3 Z; Mn, 6 +, 9 —.

WARREN COUNTY

The territory covered by the well survey in this county embraced all of Kelly, Spring Grove, and Coldbrook townships. In all, about 20 percent of the county was surveyed and 264 well records secured.

Of the 264 wells reported, 99 were of the dug type and varied in depth from 12 feet to 70 feet. The balance were of the drilled type, 164 of which varied in depth from 50 feet to 528 feet, while the city well in Alexes was 1200 feet deep. The majority of the drilled wells varied from 100 feet to 200 feet in depth.

Analyses, 16; 8 I, 7 II, 1 III; R. 7 C, 3 D, 6 F; H. 13 N, 3 O; Fe, 4 W, 1 X, 6 Y, 5 Z; Mn, 3 +, 13 —.

WASHINGTON COUNTY

The territory covered by the well survey in this county embraced all of Beaucoup Township and parts of Covington, Nashville, and Okawville townships. In all about 8 percent of the county was surveyed and 320 well records secured. A majority of these records are of wells in the municipalities of Okawville and Nashville.

Of the 320 wells reported, 308 are of the dug type from 4 feet to 60 feet deep; 6 are of the bored type from 16 feet to 20 feet deep, and 6 are of the drilled type. Of these 6 drilled wells 5 are from 150 to 200 feet deep and 1 is 1576 feet deep.

Analyses, 8; 3 I, 4 II, 1 III; R. 1 A, 1 B, 1 C, 1 D, 1 E, 3 F; H. 2 K, 6 O; Fe, 2 W, 2 Y, 4 Z; Mn, 1 +, 7 —.

WAYNE COUNTY

The territory covered by the well survey in this county embraced all of Hickory Hill, Four Mile, Berry, Arrington, Orel, Lamard, Big Mound, and Grover townships, and parts of Indian Prairie, Bedford, Jasper, Barn Hill, and Elm Drive townships. In all, about 44 percent of the county was surveyed, and 771 well records were obtained.

Of the 771 wells reported, 377 were of the dug type; 376 of the dug wells were from 6 feet to 65 feet deep, and 1 was 101 feet deep. There were 2 bored wells, 18 feet and 20 feet deep; 388 wells were of the drilled type, of which 387 were from 23 feet to 235 feet deep, and 1 was 800 feet deep. There were 4 springs used as sources of water supply.

Analyses, 5; 2 I, 3 II; R. 2 D, 3 F; H. 1 N, 4 O; Fe, 5 Z; Mn, 2+, 3—.

WHITE COUNTY

The territory covered by the well survey in this county embraced all of Indian Creek township, and parts of Mills Shoals, Enfield, Carmi, Hawthorne, Emma, and Herald Prairie townships. In all, about 38 percent of the county was surveyed and 263 well records were obtained.

Of the 263 wells reported, 153 were of the dug type, from 8 feet to 55 feet deep; 48 were of the well point type, from 13 feet to 45 feet deep; 57 were of the drilled type, of which 56 were from 40 feet to 420 feet deep, and one oil-test well was 1700 feet deep; there were 5 surface springs serving as sources of water supply.

Analyses, 14; 6 I, 6 II, 2 III; R. 5 C, 3 D, 1 E, 5 F; H. 1 J,* 1 L, 1 M, 2 N, 9 O; Fe, 1 W, 2 X, 3 Y, 8 Z; Mn, 9+, 5—.

*0 p.p.m. hardness.

WHITESIDE COUNTY

The territory covered by the well survey in this county embraced all of Fulton, Clyde, Albany, Garden Plain, Mount Pleasant and Newton townships; part of Erie and Portland townships. In all about 31 percent of the county was surveyed and 524 well records secured.

Of the 524 wells reported, 8 are of the dug type from 3 feet to 59 feet deep; 100 are of the well point type from 14 feet to 42 feet deep and 416 are of the drilled type from 24 feet to 425 feet. Of the 416 drilled wells one only was 425 feet deep, the balance were all less than 240 feet.

Analyses, 27; 7 I, 8 II, 12 III; R. 7 B, 17 C, 1 D, 1 E, 1 F; H. 1 M, 18 N, 8 O; Fe, 3 W, 6 X, 10 Y, 8 Z; Mn, 10+, 17—.

WILL COUNTY

The territory covered in this county embraced all of Wilmington township, and parts of Peotone, Joliet, and Lockport townships. In all, about 7 percent of the county was surveyed, and 246 well records were obtained.

Of the 246 wells reported, 46 were of the dug type from 10 feet to 62 feet deep; 13 were of the well point type from 20 feet to 30 feet deep; 186 were of the drilled type, of which 185 were from 29 to 900 feet deep, and 1 was 2000 feet deep; and 1 spring served as a source of water supply.

Analyses, 83; 28 I, 40 II, 15 III; R. 35 C, 35 D, 5 E, 8 F; H. 1 K, 4 M, 36 N, 42 O; Fe, 21 W, 10 X, 30 Y, 22 Z; Mn, 8 +, 75 —.

WILLIAMSON COUNTY

The territory covered by the well survey in this county embraced all of Blairsville, Herrin, Lake Creek, Corinth, Carterville, West Marion, East Marion, Grassy, and Southern townships, as well as parts of Crab Orchard, Creal Springs, and Stone Fort townships. In all, about 73 percent of the county was surveyed and 591 well records were secured.

Of the 591 wells reported, 545 were of the dug type, from 5 to 82 feet deep; and 46 were of the drilled type. Of the drilled wells, 42 wells were from 72 feet to 800 feet deep, and 4 were 1150, 1500, 1800, and 2700 feet deep, respectively.

Analyses, 21; 1 I, 12 II, 3 III; R. 1 A, 2 B, 5 C, 3 D, 3 E, 7 F; H. 1 K, 2 L, 1 M, 7 N, 9 O; Fe, 9 W, 3 X, 5 Y, 4 Z; Mn, 9 +, 7 —.

WINNEBAGO COUNTY

The territory covered by the well survey in this county embraced all of Roscoe, Owen and Harlem townships; parts of Rockton, Rockford and Cherry Valley townships. In all about 34 percent of the county was surveyed and 781 well records secured.

Of the 781 wells reported 65 are of the dug type from 3 feet to 85 feet deep; 217 are of the well point type from 15 feet to 72 feet deep; 1 is of the bored type 18 feet deep and 498 are of the drilled type. In general this latter type of well varies from 25 feet to 226 feet in depth but there are three which are 425 feet, 700 feet and 835 feet deep.

Analyses, 31; 7 I, 6 II, 18 III; R. 9 B, 20 C, 2 D; H. 1 M, 24 N, 6 O; Fe, 11 W, 7 X, 5 Y, 8 Z; Mn, 3 +, 28 —.

WOODFORD COUNTY

The territory covered by the well survey in this county embraced all of Spring Bay, Cruger and Olio townships, and a part of Worth township. In all about 14 percent of the county was surveyed and 152 well records secured.

Of the 152 wells reported, 74 are of the dug type from 3 feet (spring) to 90 feet deep; 19 are of the bored type from 21 feet to 84 feet deep; 16 are of the well point type from 16 feet to 39 feet deep and 43 are of the drilled type from 36 feet to 357 feet deep.

Analyses, 30; 20 I, 7 II, 3 III; R. 12 C, 9 D, 4 E, 5 F; H. 1 K, 1 L, 1 M, 13 N, 14 O; Fe, 2 W, 3 X, 7 Y, 18 Z; Mn, 6 +, 24 —.